JAMES B. GILPIN, Bar No. 151466
james.gilpin@bbklaw.com
STEVE M. ANDERSON, Bar No. 186700
steve.anderson@bbklaw.com
SARAH CHRISTOPHER FOLEY, Bar No. 277223
sarah.foley@bbklaw.com
BEST BEST & KRIEGER LLP
655 West Broadway
15th Floor
San Diego, California 92101
Telephone: (619) 525-1300
Facsimile: (619) 233-6118

Attorneys for Plaintiff
BORREGO WATER DISTRICT

FILED
SUPERIOR COURT OF CALIFORNIA
COUNTY OF ORANGE
CENTRAL JUSTICE CENTER

APR 08 2021

DAVID H. YAMASAKI, Clerk of the Court

BY:________________, DEPUTY

EXEMPT FROM FILING FEES PURSUANT TO GOVERNMENT CODE SECTION 6103

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF ORANGE

BORREGO WATER DISTRICT,

Plaintiff,

v.

ALL PERSONS WHO CLAIM A RIGHT TO EXTRACT GROUNDWATER IN THE BORREGO VALLEY GROUNDWATER SUBBASIN NO. 7.024-01 WHETHER BASED ON APPROPRIATION, OVERLYING RIGHT, OR OTHER BASIS OF RIGHT, AND/OR WHO CLAIM A RIGHT TO USE OF STORAGE SPACE IN THE SUBBASIN; et al.,

Defendants.

Case No. 37-2020-00005776
Judge: Peter J. Wilson
Dept. CX102

STIPULATED JUDGMENT

Complaint Filed: January 30, 2020
Trial Date: None Set

TABLE OF CONTENTS

Page

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

INTRODUCTION AND BACKGROUND INFORMATION

A. **Judgment**. This Judgment is entered pursuant to Code of Civil Procedure sections 830 et seq., to comprehensively determine and adjudicate all Groundwater rights in the Borrego Springs Subbasin ("Basin") of the Borrego Valley Groundwater Basin, whether based on appropriation, overlying right, prescriptive right, or other basis of right in the Basin; and to provide a physical solution for the perpetual management of the Basin, which long-term management will achieve Sustainable Groundwater Management for the Basin consistent with the substantive objectives of the Sustainable Groundwater Management Act ("SGMA") and with reasonable and beneficial use under Article X, section 2 of the California Constitution. This Judgment considered together with the Groundwater Management Plan ("GMP") attached hereto as **Exhibit "1"** constitutes the Physical Solution; provided, however, that the provisions of this Judgment control over and supersede any contrary provisions contained in the GMP.

B. **Basin**. The Basin is located in eastern San Diego County, California and underlies the unincorporated community of Borrego Springs and surrounding areas. The Basin includes three management areas: the north, central and south management areas. The California Department of Water Resources ("Department" or "DWR") designated the Basin as a critically overdrafted high-priority basin under SGMA.

C. **Stipulation for Entry of Judgment**. A substantial majority of the Parties ("Stipulating Parties"), by number and by quantity of water rights herein adjudicated, stipulated for entry of a judgment in substantially the form of this Judgment. The stipulation for entry of judgment ("Stipulation") is attached to this Judgment as **Exhibit "2."**

D. **Pleadings**. The Complaint in this action was filed on January 30, 2020, by Plaintiff, Borrego Water District ("District"), in the Superior Court for the County of San Diego, seeking a comprehensive determination of Groundwater rights and adjudication of water rights in the Basin pursuant to Chapter 7 (commencing with section 830) of Title 10, Part 2 of the Code of Civil Procedure. BWD, together with the County of San Diego ("County"), established a GSA for the Basin pursuant to SGMA in 2016. The County withdrew as a GSA, effective December 31, 2019. The Stipulating Parties represent to this Court that the optimal means of achieving Sustainable Groundwater Management for the Basin consistent with the directives of SGMA and Article X, section 2 of the California Constitution, and to achieve a durable solution to alleviate the significant Overdraft now occurring in the Basin, is by way of this Comprehensive Adjudication of Groundwater rights, the substitution of the Watermaster in place of the GSA and the substitution of this Judgment as an alternative to a GSP under SGMA as approved by the Department and as authorized by Water Code sections 10733.6 and 10737.4. BWD filed the Complaint in this action, pursuant to the Stipulation among the Stipulating Parties, to undertake the Comprehensive Adjudication of Groundwater rights of the Basin pursuant to sections 830 et seq. of the Code of Civil Procedure and so comply with SGMA. Upon entry of this Judgment establishing the Watermaster, BWD is to withdraw as a GSA by notifying the Department under Water Code section 10723.8(e).

E. Notice of Commencement of Groundwater Basin Adjudication. A Notice of Commencement of Groundwater Basin Adjudication with the information required by Section 836 of the Code of Civil Procedure was lodged with the Court on February 4, 2020.

F. Answer To Adjudication Complaint. A draft Answer to Adjudication Complaint ("Form Answer") in the form required by Section 836 of the Code of Civil Procedure was lodged with the Court on February 4, 2020.

G. Court Approval of Notice & Form Answer. BWD filed a motion pursuant to section 836 of the Code of Civil Procedure, and on July 20, 2020, the Court approved the Notice of Commencement of Groundwater Basin Adjudication and draft Answer to Adjudication Complaint and authorized service of the landowners overlying the Basin pursuant to Section 836 of the Code of Civil Procedure.

H. Service. All holders of fee title to real property in the Basin were identified using the assessor or assessors of the County, and served by registered mail or certified mail, return receipt requested, or by other means authorized by the Court, the Notice, Complaint, and Form Answer to all holders of fee title to real property in the Basin. Where the physical address of the real property differed from the mailing address of the holder of fee title, the Notice, Complaint, and Form Answer were mailed by registered or certified mail, return receipt requested, to the physical address of the real property and the mailing address of the holder of fee title. The notice was also published at least once per week for four consecutive weeks in one or more newspapers of general circulation in the County on all persons interested in the proceeding, consistent with Code of Civil Procedure section 835 and orders of this Court. A notice of completion of mailing was filed with the Court on December 29, 2020, consistent with Code of Civil Procedure section 836.

I. **Notice**. BWD provided the Notice and Form Answer to the Department and the County. The Department and County provided a link to the Notice and Form Answer on the home page of their respective websites consistent with Code of Civil Procedure section 836(m).

J. **Parties**. All persons who hold fee simple ownership in a parcel in the Basin, or Pumps or stores water in the Basin, or that claim any other right or interest in the Basin are subject to the jurisdiction of the Court in this proceeding pursuant to Code of Civil Procedure sections 830 et seq.

K. **Defaults**. Numerous Parties have failed to respond timely, or at all, to the Complaint, and their defaults have been entered. The Court has given the defaulted Parties notice of this Judgment and Physical Solution, together with the opportunity to be heard regarding this Judgment, and hereby enters default judgments against all such Parties and incorporates those default judgments into this Judgment.

L. **Jurisdiction**. By the pleadings herein, operation of sections 830 et seq. of the California Code of Civil Procedure, and by Order of this Court, the issues have been made those of an in rem adjudication of all Basin Groundwater rights as between each and all of the Parties. Having complied with the notice and service requirements of Section 836 of the Code of Civil Procedure, the in rem jurisdiction over all Basin Groundwater rights and the comprehensive effect of this Comprehensive Adjudication have been established. This Court has jurisdiction of the subject matter of this action and of the Parties herein.

M. **Stipulation for Entry of Judgment**. The Stipulating Parties represent a substantial majority of the Pumpers, by number and by quantity of water rights defined herein. The Judgment is consistent with and meets the requirements of Code of Civil Procedure section

850(b). The Stipulating Parties represent at least 50% percent of all Pumpers and at least 75% percent of all groundwater extraction from in the Basin. The Stipulating Parties intend for this Court to comprehensively adjudicate all Groundwater rights in the Basin. BWD submitted the form of this Judgment, inclusive of the GMP which together constitutes the Physical Solution that is established by this Judgment, to DWR for review and approval to serve as an alternative to a GSP pursuant to SGMA. (Wat. Code, §§ 10733.6; 10737.4.)

DECREE

NOW, THEREFORE, IT IS ORDERED, ADJUDGED AND DECREED:

I. DEFINITIONS AND EXHIBITS

A. Definitions. As used in this Judgment, the following terms shall have the meaning set forth below.

1. 2030 Target – A cumulative Basin-wide Rampdown of 50 percent by Water Year 2029-2030.

2. Adaptive Management – Changes to Basin management based on new data or improving science collected or acquired over time necessary to achieve and sustain Sustainable Groundwater Management and reasonable and beneficial use of the Basin's water resources.

3. Adjusted Pumping Calculation – As defined in Section IV.E.4.

4. AFY – Acre-feet per Water Year.

5. Annual Allocation – The maximum amount of Pumping allowed for a Party to this Judgment in a given Water Year (excepting any Pumping of Carryover or imported water if available), which for any particular Water Year will be determined by multiplying the Party's BPA by the Pumping Percentage in effect for that Water Year. Annual Allocation will be rounded to the nearest whole acre-foot.

6. Annual Report – An annual report of Basin management and Watermaster activities filed with this Court pursuant to Section IV.E(5) herein.

7. Basin – Borrego Springs Subbasin of the Borrego Valley Groundwater Basin as defined by California Department of Water Resources (DWR) Bulletin No. 118 as

Subbasin No. 7-024.01. The boundaries of the Basin are set forth in DWR Bulletin 118, Subbasin No. 7-024.01.

8. Baseline Pumping Allocation (BPA) – The maximum allowed Pumping quantity allocated to a Party to this Judgment.

9. BPA Parcel(s) – The parcel(s), identified by assessor parcel numbers, to which BPA is assigned, and on which Groundwater Pumped pursuant to the Annual Allocation will be used.

10. BVHM – The Borrego Valley Hydrologic Model developed by the U.S. Geological Survey using the numerical modeling code MODFLOW One-Water Hydrologic Flow Model (OWHM) Version 1.0 software, which has been updated by the GSA's consultant to extend the simulation period to September 2016, and is to be periodically updated to further extend the simulation periods through the processes discussed in Section III.F.

11. BWD – Borrego Water District.

12. Carryover – Any portion of a Party's Annual Allocation not Pumped in the Water Year in which it is allowed, which may be accrued and produced in future Water Years, provided that the Party complies with the provisions of Section III.B herein.

13. CEQA – California Environmental Quality Act, California Public Resources Code section 21000 et seq.

14. Complaint – The complaint filed in the underlying action for a Comprehensive Adjudication of Groundwater rights of the Basin pursuant to the Code of Civil Procedure sections 830 et seq.

15. Comprehensive Adjudication – An action filed in superior court to comprehensively determine rights to extract groundwater in a basin. (Code Civ. Proc., § 832(c).)

16. County – The County of San Diego.

17. Cure Period – As defined in Section III.I(3).

18. De Minimis Pumper – Any Party who Pumps two acre-feet or less per year for use on real property overlying the Basin.

19. "DWR" or "Department" – The California Department of Water Resources.

20. Eligibility Requirement – As defined in Section III.I(2).

21. Eligibility Proof – As defined in Section III.I(2).

22. Eligibility Violation – As defined in Section III.I(3).

23. Entry Agreement – An agreement between Watermaster and a Party to enter private property consistent with the form of the template agreement set forth in **Exhibit "8"**.

24. Environmental Working Group (EWG) – As defined in Section IV.H.

25. Form Answer – A draft, form Answer to Adjudication Complaint approved by the Court pursuant to section 836 of the Code of Civil Procedure.

26. Fourth Five-Year Period – Water Years 2035/2036 through 2039/2040.

27. Groundwater – Water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water that flows in known and definite channels. (Code Civ. Proc., § 832(g).)

28. Groundwater Dependent Ecosystem (GDE) – Ecological communities or species that depend on Groundwater emerging from aquifers or on Groundwater occurring near the ground surface. (Cal. Code Regs., tit. 23, § 351(m).)

29. Groundwater Management Plan (GMP) – The plan, attached to this Judgment as **Exhibit "1,"** which, together with the Judgment, is intended to implement the Physical Solution for the Basin, satisfy the substantive objectives of SGMA, and serve as an alternative to a GSP under SGMA following approval by DWR, as authorized by Water Code sections 10733.6 and 10737.4.

30. GSA – Groundwater Sustainability Agency as defined by Water Code section 10721(j).

31. GSP – Groundwater Sustainability Plan as defined by Water Code section 10721(k).

32. Lease – A transfer of Annual Allocation or Carryover for one Water Year or for several Water Years, as set forth in a written lease agreement.

BEST BEST & KRIEGER LLP

33. Management Areas – The North, Central and Southern areas of the Basin, as described in the GMP.

34. Minimum Fallowing Standards – As defined in **Exhibit "3"**.

35. Max Overproduction Limit – As defined in Section III.G(2).

36. Original BPA Parcel – A parcel of land listed in **Exhibit "4"** to which BPA was originally granted.

37. Overdraft – The sustained cumulative Pumping of Groundwater from the Basin in quantities that exceed the Basin's Sustainable Yield.

38. Overproduction – Pumping by a Party in any particular Water Year in excess of the sum of the Party's Annual Allocation and any leased Annual Allocation for that Water Year plus any accrued Carryover.

39. Overproduction Penalty Assessment – A penalty fee for Overproduction.

40. Party (Parties). Any Person(s) that has (have) been named and served or otherwise properly joined, or has (have) become subject to this Judgment of this Court and all their respective heirs, successors-in-interest and assigns.

41. Parties in Disagreement – As defined in Section VII (A)(1)).

42. Permanent Transfer – A transfer of BPA, including any portion of a Party's total BPA, which will be permanently added to the grantee's cumulative BPA and subtracted from the grantor's BPA, and when multiplied by the Pumping Percentage will establish additional Annual Allocation of the grantee in each Water Year (less any water Pumped in that year by the selling Party) and thereafter.

43. Person – Includes, but is not limited to, corporations, partnerships, trusts, firms, counties, local agencies, state agencies, federal agencies, tribes, business entities, individuals, and groups of individuals.

44. Physical Solution – The terms of this Judgment, including the GMP, attached hereto as **Exhibit "1,"** which are intended to achieve Sustainable Groundwater Management for the Basin consistent with the substantive objectives of SGMA and Article X,

section 2 of the California Constitution, and which may be modified over time in compliance with the procedures described herein.

45. Planning and Implementation Horizon – The 50-year time period over which this Court determines that the Physical Solution prescribed by this Judgment will be implemented to ensure that the Basin is operated within its Sustainable Yield, consistent with SGMA. (Wat. Code, § 10721(r).)

46. Pump – The process of extracting Groundwater from the Basin.

47. Pumper – Any Person who Pumps Groundwater from the Basin.

48. Pumping Assessment – Defined in Section IV.E(3).

49. Pumping Percentage – The percent of a Party's BPA that is authorized to be Pumped in any particular Water Year.

50. Rampdown – The reduction in cumulative authorized Pumping of BPA imposed pursuant to the terms of this Judgment to alleviate the Overdraft of the Basin and achieve Sustainable Groundwater Management and the reasonable and beneficial use of the Basin's water resources.

51. Rampdown Rate – The percentage reduction in cumulative authorized Pumping of BPA effective across the Basin in any particular Water Year, which when subtracted from 100 percent will determine the effective Pumping Percentage.

52. Second Five-Year Period – Water Years 2025/2026 through 2029/2030.

53. SGMA – The Sustainable Groundwater Management Act set forth at California Water Code sections 10720 et seq.

54. State Park – The Anza Borrego Desert State Park.

55. Supermajority Vote – An affirmative vote of no less than four members of the Watermaster Board.

56. Sustainable Groundwater Management – Management of the Basin and Pumping and use of Groundwater from the Basin in a manner that can be maintained during the Planning and Implementation Horizon without causing Undesirable Results, consistent with SGMA. (Wat. Code, § 10721(v).)

57. Sustainable Yield – The maximum quantity of water, calculated over a base period representative of long-term conditions in the Basin that can be cumulatively Pumped on an annual basis from the Basin without causing an Undesirable Result, consistent with SGMA. (Wat. Code, § 10721(w)).

58. Technical Advisory Committee – The advisory body established pursuant to Section IV.G(1) of this Judgment to study technical aspects of the Basin and to issue recommendations to Watermaster based on such technical study for the purpose of achieving Sustainable Groundwater Management in the Basin in an effective and efficient manner, consistent with the rights and obligations of the Parties established by this Judgment.

59. Third Five-Year Period – Water Years 2030/2031 through 2034/2035.

60. Undesirable Results – As defined by Water Code section 10721(x).

61. Water Budget – An accounting of the total Groundwater and surface water entering and leaving the Basin including the changes in the amount of water stored consistent with SGMA. (Wat. Code, § 10721(y).)

62. Watermaster – The special master to this Court appointed pursuant to Section IV.A of this Judgment for the purpose of executing the powers, duties, and responsibilities assigned therein.

63. Watermaster Board – The five-member Board governing the Watermaster as defined in Section IV.B.

64. Watermaster Budget – The budget to fund the operation and administration of the Watermaster, and programs undertaken by, or on behalf of Watermaster, which will be prepared annually by Watermaster consistent with the provisions of Section IV.E(3) of this Judgment.

65. Watermaster Rules and Regulations – The rules and regulations attached as **Exhibit "5"** as may be amended from time to time by the Watermaster consistent with the terms of this Judgment.

66. Water Rights Restrictive Covenant – As defined in Section III.I(6).

67. Water Year – October 1st to September 30th. (Wat. Code, § 10721(aa).)

B. **Exhibits**. The following exhibits are attached to this Judgment and made a part hereof.

Exhibit "1" Groundwater Management Plan

Exhibit "2" Stipulation

Exhibit "3" Minimum Fallowing Standards

Exhibit "4" Baseline Pumping Allocations

Exhibit "5" Watermaster Rules and Regulations

Exhibit "6" Water Rights Restrictive Covenant Forms

Exhibit "7" Process for Selecting Watermaster Public/Community Representative, Process for Selecting Watermaster Recreational Sector Representative, and Process for Selecting Watermaster Agricultural Sector Representative

Exhibit "8" Entry Agreement Form

Exhibit "9" Facility Standards for Mutual Water Companies Formed After Entry of Judgment.

C. **Construction**. Unless the context clearly requires otherwise:

1. The plural and singular forms include the other;
2. "Shall," "will," and "must" are each mandatory;
3. "May" is permissive;
4. "Or" is not exclusive; and
5. "Includes" and "including" are not limiting.
6. Reference to any agreement, document, instrument, or report means such agreement, document, instrument or report as amended or modified and in effect from time to time in accordance with the terms thereof.

II. PHYSICAL AND LEGAL SETTING

A. **Complexity and Scope of Action**. The physical and legal issues of this case are complex. Pumping of those persons Pumping Groundwater from the Basin has been ascertained. In excess of 4,500 owners of land overlying the Basin have been provided notice. The Groundwater rights of the entire Basin have been brought into issue and the action has been made a full in rem adjudication of water rights to the Basin as to all real property owners in the Basin pursuant to Sections 830 et seq. of the Code of Civil Procedure.

B. **Basin as Common Source of Supply**. The area of the Basin is defined by Bulletin 118 issued by the Department of Water Resources and identified by Bulletin 118 as Subbasin No. 7-24.01. The Groundwater within the Basin constitutes a common source of supply to the Parties herein and the Borrego Springs community.

C. **Overdraft and Need for Physical Solution**. The Basin has been, and presently is, in a condition of long-term Overdraft for a period longer than ten years consistent with Code of Civil Procedure sections 832(d) and 847(a). There is presently no viable means to cure the Basin's Overdraft through artificial recharge or other supply augmentation strategy under current Basin conditions and cumulative average annual Pumping quantities. Therefore, it is necessary, and consistent with applicable law, to implement the Physical Solution set forth in this Judgment inclusive of the prescribed Rampdown over time. The Physical Solution takes into consideration the unique physical and climatic conditions of the Basin, the use of water within the Basin, the character and rate of return flows, the character and extent of established uses, and the current lack of availability of imported water. This Court has received evidence to support its conclusion that the Physical Solution appropriately balances competing economic, social, and environmental considerations, and that it will result in the optimal management of the Basin consistent with Article X, section 2 of the California Constitution.

D. **Need for Flexibility**. The Physical Solution is intended to provide flexibility and adaptability to allow this Court to use existing and future technological, social, institutional, and economic options to maximize reasonable and beneficial water use in the Basin.

E. **Determination of Sustainable Yield**. The initial Sustainable Yield is 5,700 AFY. A refined and specific estimate of the Sustainable Yield shall be determined by the Watermaster by January 1, 2025, and periodically updated thereafter, through the Technical Advisory Committee processes described herein based on best available science including BVHM runs and consideration of all sources of Basin replenishment and outflow.

F. **Judgment as a Basis of SGMA Compliance for the Basin**. Consistent with the requirements of Water Code section 10737.8, this Court finds this approach for compliance with SGMA, and the comprehensive determination of all Groundwater rights within the Basin, to be a prudent, legal, and durable means to achieve Sustainable Groundwater Management within the Basin as intended by SGMA. This Court further finds that the Physical Solution is consistent with the mandate of Article X, section 2 of the California Constitution and California water policy, generally. The Judgment defines the Groundwater rights of the Basin in a manner which will equitably allocate the Basin's Groundwater supplies. Sufficient information and data are known to formulate a reasonable and just allocation of existing Groundwater supplies. Such Physical Solution will accelerate water-saving actions and provide flexibility and adaptability in order to maximize the reasonable and beneficial use of the Basin's Groundwater and protect against undue economic harm to the Borrego Springs community.

G. **Pumping Groundwater Only Pursuant to Judgment**. This Judgment, and the Physical Solution decreed herein, addresses all Groundwater rights of the Basin. Any Pumping inconsistent with this Judgment will frustrate efforts to achieve Sustainable Groundwater Management and public, environmental, and economic interests in the Basin, injure the rights of all Parties, and interfere with the Physical Solution. Therefore, each and every Party, its officers, agents, employees, successors, and assigns, is enjoined and restrained from Pumping Groundwater from the Basin except pursuant to the provisions of this Judgment. Should Watermaster become aware of any unauthorized Pumping, it shall promptly bring a motion before this Court to enforce the terms of this Judgment pursuant to Section IV.E(9).

III. DECLARATION OF RIGHTS AND OBLIGATIONS

A. **Pumping Rights**. The BPA of each Party is as set forth in **Exhibit "4."** **Exhibit "4"** also identifies the legal parcel(s) to which the BPA attaches (excepting the BWD and mutual water companies) and the well(s) to which the BPA is assigned.

If BPA is transferred to one or more new BPA Parcels and wells pursuant to a Permanent Transfer, Watermaster will update **Exhibit "4"** to identify the reallocated BPA to each Party to the transfer, new BPA Parcel(s) and well(s) (excepting the BWD and mutual water companies with respect to BPA Parcel) to which the BPA is assigned and include an updated version of **Exhibit "4"** as an attachment to its Annual Report. No Party may commence Pumping Groundwater pursuant to BPA following April 8, 2021 ~~October 1, 2020~~, until and unless (i) the Party has paid the full assessment assessed by Watermaster to fund the Watermaster through the first permanent Pumping Assessment in December 2021, and (ii) the Party is compliant with all orders of the Court, including without limitation, payment of all assessments or other monies owed to Watermaster or any other Party(ies) pursuant to order of the Court.

The BPA represents the allowed total annual Pumping by each Party prior to the commencement of the 2020-2021 Water Year. The BPA will be subject to the Rampdown commencing with the 2020-2021 Water Year. Through operation of Rampdown and the resulting Pumping Percentage then in effect, each Party's allowed Pumping for each Water Year will be limited to a percentage of their BPA as reflected within their Annual Allocation. Pumping of Groundwater used to fight fires shall be exempt from Pumping limitations and associated assessments.

All water credits issued by BWD and/or the County pursuant to the BWD's Demand Offset Mitigation Water Credits Policy (revised May 19, 2015) have been converted to BPA and are included in **Exhibit "4"**, unless otherwise agreed to by the water credit holder and BWD and approved by the Court. To the extent a former water credit holder no longer owns real property overlying the Basin at the time of this Judgment, the associated BPA is held in abeyance, in the name of such owner until the BPA is attached to a specific legal parcel pursuant to the Judgment.

The basis for the amount of each Party's BPA set forth in **Exhibit "4"** to the Judgment is as follows: (i) for the BWD, a compromise amount agreed upon among the Parties that is based on metered data and water credit conversion; (ii) for Parties that previously held water credits pursuant to the BWD's Demand Offset Mitigation Water Credits Policy (revised May 19, 2015), the amount of BPA calculated based on a conversation factor taking into account water credit type, formerly irrigated acreage, and relevant crop types of the formerly irrigated agricultural acreage; and (iii) for all other Parties granted BPA, the amount of BPA specified in a final letter addressed to each Party from Jim Bennett, Water Resources Manager for the County's Planning and Development Services, which the GSA intended to allocate to each of those Parties pursuant to the previously anticipated GSP and that is based on metered data or irrigated acreage calculated by the GSA for relevant crop types.[1] This Court acknowledges that the individual BPA established for each Party reflects the settlement and compromise of the Parties respecting water rights among them subject to the terms of this Judgment. Such water rights are a form of property right, subject to rights and restrictions pursuant to the reasonable and beneficial use doctrine set forth in Article X, section 2 of the California Constitution. The allocation of BPA among the Parties reflects a compromise of all water rights of all Parties to this action, which the Court finds to be equitable and consistent with applicable law, including but not limited to Article X, section 2 of the California Constitution. All BPA are of equal priority.

It is therefore consistent with constitutional protections afforded to the Parties, California's common law, and the interest of legal certainty that the BPA adjudicated cannot be adjusted following the entry of this Judgment. Sustainable Groundwater Management of the Basin will be achieved through the Physical Solution prescribed herein inclusive of the necessary Rampdown to alleviate the current Overdraft.

B. Carryover. Unused Annual Allocation may be carried over for use in subsequent Water Years as Carryover if the Pumping Assessment is paid in the current year, subject to restrictions on the amount or duration of Carryover specified below. The initial maximum quantity of Carryover that a Pumper can accrue is two times the amount of BPA then held by that Pumper. Carryover will be re-evaluated by January 1, 2025, by Watermaster, with consultation of the Technical Advisory Committee. If Watermaster determines that it is necessary to adjust the amount of individual Carryover or the duration that Carryover may be held within the Basin to prevent Undesirable Results, the Watermaster shall so advise this Court through a noticed motion for a subsequent order amending this Judgment. Once Carryover is accrued pursuant to rules then in effect, the rules may not be changed as to the accrued Carryover (e.g., the rate or amount of loss may not be modified) because the Groundwater reflected in Carryover is treated,

[1] Certain Parties are granted BPA based on such County of San Diego letters and based on previously-held water credits. In those circumstances, the amount of the Party's BPA specified in Exhibit 4 reflects a combination of the BPA resulting from both bases.

for purposes of Basin-wide production accounting, as if already Pumped and used. Accordingly, any Basin-wide need for reduced Pumping will be achieved through additional Rampdown of BPA rather than reduction of a Pumper's existing Carryover.

C. Technical Approach to Basin Management. The Physical Solution, including this Judgment and the GMP attached as **Exhibit "1,"** will serve as the technical approach for Basin management, subject to modification as appropriate for Adaptive Management by order of this Court pursuant to this Court's continuing jurisdiction under Section VII, including periodic updates of Sustainable Yield through the processes described herein.

D. Rights of State Park and Borrego Elementary School.

1. In lieu of a grant of BPA to the State Park, the State Park will be authorized to Pump an annual maximum of 20 acre-feet of Groundwater for their uses. Such authorization is distinct from the Pumping rights of other Pumpers pursuant to BPA. The State Park's authorized Pumping pursuant to this Section III.D shall not be subject to Rampdown, and also shall not be eligible for Carryover, Lease, or subsequent transfer, and will be subject to all other relevant provisions of this Judgment including but not limited to payment of an assessment on each acre-foot of water pumped that is equivalent to the Pumping Assessments charged to Party's Pumping BPA, consistent with Section IV.E(4).

2. In lieu of a grant of BPA to Borrego Elementary School, the Borrego Springs Unified School District will be authorized to Pump an annual maximum of 22 acre-feet of Groundwater for exclusive use at Borrego Elementary School. Such authorization is distinct from the Pumping rights of other Pumpers pursuant to BPA. Borrego Springs Unified School District's authorized Pumping pursuant to this Section III.D shall not be subject to Rampdown, and also shall not be eligible for Carryover, Lease, or subsequent transfer, and will be subject to all other relevant provisions of this Judgment including but not limited to payment of an assessment on each acre-foot of water pumped that is equivalent to the Pumping Assessments charged to Party's Pumping BPA, consistent with Section IV.E(4).

E. Initial Rampdown. The Rampdown schedule through the 2024-2025 Water Year is as follows:

Water Year	Annual Rampdown Schedule	Cumulative Rampdown
2020-2021	5% reduction of BPA	5%
2021-2022	5% reduction of BPA	10%
2022-2023	5% reduction of BPA	15%
2023-2024	5% reduction of BPA	20%
2024-2025	5% reduction of BPA	25%

F. Process for Determining Sustainable Yield and Implementation of Subsequent Rampdown. The amount and pace of Rampdown for the Water Years following the 2024-2025 Water Year (i.e., commencing with the 2025-2026 Water Year) will be determined through the following process:

1. By June 1, 2021, the Watermaster shall seek agreement with the Technical Advisory Committee on a scope of work and budget for technical work through September 30, 2023. Any disputes as to scope or budget will be resolved on hearing and order pursuant to Section VII prior to the commencement of the Water Year beginning October 1, 2021. The choice to perform specific technical tasks will be informed by considering the value and importance of the work to attain a better understanding of the Basin and the goal of advancing Sustainable Groundwater Management in comparison to the cost of the work.

2. During the first four Water Years (2020-2021 to 2023-2024), the Watermaster will collect additional data and refine the BVHM, using model runs to update the determination of Sustainable Yield in collaboration with the Technical Advisory Committee.

3. By January 1, 2025, the Watermaster will, following receipt of input and recommendations from the Technical Advisory Committee, revise the determination of Sustainable Yield for Water Years 2025/2026 through 2029/2030 (the "Second Five-Year Period"). The revised determination of Sustainable Yield will consider all sources of replenishment, including return flows and underflows, and all outflows from the Basin, and will consider, among other data, information derived from updated runs of the BVHM. Any

disagreement with Watermaster's determination may be appealed to this Court for review, subject to the provisions of Section VII. The revised estimate of Sustainable Yield will determine the Rampdown Rate for the Second Five-Year Period as provided in Section III.F.5 of this Judgment.

4. If the revised estimate of Sustainable Yield remains at 5,700, AFY the Rampdown rate will continue at five percent per year for the Second Five-Year Period, thus achieving a cumulative Basin-wide Rampdown of 50 percent by Water Year 2029-2030 ("2030 Target").

5. If the revised estimate of Sustainable Yield for the Second Five-Year Period exceeds or falls below 5,700 AFY, the Rampdown Rate will be reduced or increased, and the 2030 Target will be increased or reduced, proportional to the percentage that the revised estimate of Sustainable Yield exceeds or falls below 5,700 AFY, thus achieving a cumulative quantity of all Pumpers' Annual Allocation equal to the mid-point between the revised estimate of Sustainable Yield and the cumulative quantity of all Pumper's BPA by Water Year 2029-2030.

6. By January 1, 2025, the Watermaster will also determine a scope of work and budget for further technical work through September 30, 2029. Any disagreement with Watermaster's determination may be appealed to this Court for review, subject to the provisions of Section VII.

7. By January 1, 2030, the Watermaster will, following receipt of input and recommendations from the Technical Advisory Committee, determine the revised estimate of Sustainable Yield for Water Years 2030/2031 through 2034/2035 (the "Third Five-Year Period"). The revised determination of Sustainable Yield will consider all sources of replenishment, including return flows and underflows, and all outflows from the Basin, and will consider, among other data, information derived from updated runs of the BVHM. Any disagreement with Watermaster's determination may be appealed to this Court for review, subject to the provisions of Section VII. The revised estimate of Sustainable Yield will determine the Rampdown Rate for the Third Five-Year Period as described in Section III.F(8) of this Judgment.

8. The annual Rampdown Rate for each Water Year of the Third Five-Year Period will be calculated to reduce the then cumulative allowed Pumping (i.e., cumulative Annual

Allocation in effect for Water Year 2029-2030) over 10 years to equal the revised determination of Sustainable Yield by Water Year 2039-2040. Thus, the annual Rampdown Rate will be established by dividing the necessary ten-year cumulative Rampdown by ten.

9. By January 1, 2030, the Watermaster will also determine a scope of work and budget for further technical work through September 30, 2034. Any disagreement with Watermaster's determination may be appealed to this Court for review, subject to the provisions of Section VII.

10. By January 1, 2035, the Watermaster will, following receipt of input and recommendations from the Technical Advisory Committee, determine the revised estimate of Sustainable Yield for Water Years 2035/2036 through 2039/2040 (the "Fourth Five-Year Period"). The revised determination of Sustainable Yield will consider all sources of replenishment, including return flows and underflows, and all outflows from the Basin, and will consider, among other data, information derived from updated runs of the BVHM. Any disagreement with Watermaster's determination may be appealed to this Court for review, subject to the provisions of Section VII(A). The revised estimate of Sustainable Yield will determine the Rampdown Rate for the Fourth Five-Year Period as described in Section III.F(11) of this Judgment.

11. The annual Rampdown Rate for each Water Year of the Fourth Five-Year Period will be calculated to reduce the then cumulative allowed Pumping (i.e., cumulative Annual Allocation in effect for Water Year 2034-2035) over five years to equal the revised determination of Sustainable Yield by Water Year 2039-2040. Thus, the annual Rampdown Rate will be established by dividing the necessary five-year cumulative Rampdown by five.

12. Notwithstanding the Rampdown schedule described herein, this Court, pursuant to motion of any Party or sua sponte, may adjust the rate of Rampdown up or down for any 5-year period or subdivision thereof, upon a finding that an adjustment to the Rampdown Rate is appropriate, and taking into account the limitations on Pumping necessary to avoid an Undesirable Result.

G. Overproduction. This Court finds that it is appropriate to afford (i) reasonable time and accommodation to allow the Parties to adjust to the initiation of Pumping limitations under this Judgment during the initial Water Years, and (ii) reasonable flexibility to allow a Party that has overproduced its Annual Allocation in a particular Water Year to cover the Overproduction during the next Water Year. Therefore, the following Overproduction rules apply:

1. Overproduction up to the Max Overproduction Limit (defined below), must be covered within one year of the Overproduction, either by using less allocation (under-Pumping the allowed Annual Allocation or applying Carryover) in the subsequent Water Year or by Lease or Permanent Transfer from another Party. If not covered by under-Pumping, Carryover, Lease, or Permanent Transfer in the subsequent Water Year, the Party will be assessed an Overproduction Penalty Assessment. In calculating Overproduction, any Carryover will be applied first to the Party's production, then any Groundwater Pumped pursuant to a Lease, and then the Party's Annual Allocation, so that Overproduction does not occur until the Party has exceeded the sum of its Carryover, Leased Annual Allocation/Carryover, and its Annual Allocation. The first Groundwater produced by a Party during any Water Year will be deemed to be an exercise of any Carryover.

2. During the first three Water Years (2020-2021 through 2022-2023; Water Years 1-3), no Party will be subject to an immediate Overproduction Penalty Assessment so long as such Party's total cumulative Overproduction in those Water Years does not exceed 20 percent of the Party's total cumulative Annual Allocation for those Water Years ("Max Overproduction Limit"). Any Party that engages in Overproduction in any of Water Years 1-3 that does not exceed the Max Overproduction Limit will be notified by the Watermaster of the amount of Overproduction annually during Water Years 1-3 following the end of Water Year. The Party engaging in Overproduction shall cover the cumulative quantity of its Overproduction occurring in Water Years 1-3 by the end of Water Year 5 (2024-2025) through either Carryover, reduced production below authorized Annual Allocation in Water Years 4 (2023-2024) and 5 (2024-2025), or through Lease or Permanent Transfer. If the Party has not covered its Overproduction

from Water Years 1-3 by the end of Water Year 5 (September 30, 2025), an Overproduction Penalty Assessment will be assessed.

3. Any Party that engages in Overproduction in any of Water Years 1-3 that does exceed the Max Overproduction Limit will be assessed an Overproduction Penalty Assessment for the Overproduction in excess of the Max Overproduction Limit unless such Overproduction in excess of the Max Overproduction Limit is covered and cured through under-Pumping, Carryover, Lease, or Permanent Transfer for all such Overproduction during the subsequent Water Year.

4. The Watermaster has the authority to enforce the terms of this Judgment, including the Rules and Regulations and Physical Solution, which authority includes at a minimum, the enforcement authority granted to a GSA under Water Code section 10732. Notwithstanding the monetary limits in Water Code section 10732(a)(1), the Watermaster has authority to establish an Overproduction Penalty Assessment, which will be no less than $500 per acre-foot. All Overproduction Penalty Assessments will be used by Watermaster to fund either (i) acquisition of Annual Allocation to offset the Overproduction or (ii) its Watermaster Budget and thereby reduce the amount of funds that must be raised from the annual Pumping Assessment. Failure to pay the Overproduction Penalty Assessments will incur further enforcement terms, as permitted by law, including but not limited to the right of the Watermaster to seek injunctive relief and the right to lien real property for unpaid assessments.

H. De Minimis Pumpers. This Court finds that production of Groundwater by any person or entity owning real property overlying the Basin who is a De Minimis Pumper at the time of filing of the Complaint is not likely to significantly contribute to Undesirable Results to the Basin or any interest related to the Basin. Accordingly, this Judgment is not intended to regulate a Party that was Pumping Groundwater as a De Minimis Pumper at the time of filing of the Complaint, provided the Pumping by such De Minimis Pumper remains within the two acre foot limitations established in this Judgment and provided that such De Minimis Pumper does not seek to transfer their Pumping to another real property owned by another Person. All persons who are not Pumping as of the date of filing the Complaint who seek to initiate Pumping as a De

Minimis Pumper in the future shall submit an application to the Watermaster and the Watermaster shall determine whether the proposed Pumping will contribute to or threaten to contribute to Undesirable Results or other interest related to the Basin, and the application shall be denied if it contributes to or threatens to contribute to Undesirable Results or other interest related to the Basin. Any such Watermaster determination may be appealed to the Court pursuant to the procedures described in Section VII, below. Notwithstanding any of the provisions of this Section III(H), to the extent this Court determines in the future that Pumping by De Minimis Pumpers has significantly contributed to or threatens to significantly contribute to Undesirable Results, this Court may regulate Pumping by De Minimis Pumpers as it deems prudent pursuant to its reserved jurisdiction provided in Section VII.

I. BPA Transfer. In the interest of advancing the effective and efficient management of the Basin and the policy of maximizing the beneficial use of the Basin's Groundwater, consistent with Article X, section 2 of the California Constitution, all BPA may be Permanently Transferred or Leased, subject to the provisions of this Section III.I. Unless otherwise noted, all provisions within this Section III.I will be applicable to both Permanent Transfers and Leases, provided that the assignment of BPA to a BPA Parcel(s), or in the case of the BWD or a mutual water company, their respective service area boundaries, including any future modifications thereto, will not constrain the Lease of such BPA for use elsewhere in the Basin consistent with the other provisions of this Section III.I.[2]

1. Good Standing and Intervention Requirements. Permanent Transfers and Leases may only be completed in accordance with these rules by Parties to this Judgment (including without limitation those Persons that have become subject to this Judgment by virtue of having been named and served with the Complaint) in good standing (meaning both grantee and grantor have paid all applicable Pump assessments, fees, charges or will do so prior to completion of the transfer, and are otherwise in compliance with this Judgment). A transferee

[2] The County may in the future purchase BPA for the purpose of subsequently transferring it to parcels to facilitate discretionary project approvals within the County's land use jurisdiction. If the County does initiate such purchases, then all provisions of this Section III.I applicable to the BWD or a mutual water company will apply to the County.

who is not already a Party must intervene as a Party as a condition of completing any Lease or Permanent Transfer.

2. Anti-Speculation Provision. A grantee of BPA pursuant to a Permanent Transfer must own at least one acre overlying the Basin for every five acre-feet of BPA transferred to the grantee, or, if the grantee of BPA is a mutual water company that exists now or in the future to serve parcel(s) with existing or later-acquired County land use entitlements, then the mutual water company must own no more BPA than the amount that is reasonably required to satisfy the demands of the land use entitlements to be served by such mutual water company taking into consideration future reductions of Annual Allocation (the "Eligibility Requirement"). The "Anti-Speculation" and Eligibility Requirement provisions of this section do not apply to: (a) BWD; and (b) an owner of an Original BPA Parcel so long as either (i) the Original BPA Parcel owner retains the same or greater quantity of acreage in proportion to its originally granted BPA or (ii) the Original BPA Parcel owner does not hold an amount of Annual Allocation in excess of the quantity of its originally granted BPA; and (c) Borrego Air Ranch Mutual Water & Improvement Co. ("Borrego Air Ranch"), the only mutual water company overlying the Basin allocated BPA in **Exhibit "4"** as of the date of entry of this Judgment, provided that Borrego Air Ranch does not own more BPA than the amount that is reasonably required to satisfy the demands of all legal lots within its service area shown on the Attachment to **Exhibit "4"** to this Judgment taking into consideration future reductions of Annual Allocation.

a. As a condition of completing a Permanent Transfer, the Watermaster may demand that a BPA grantee (excepting BWD, Borrego Air Ranch satisfying the criteria specified above, and an owner of an Original BPA Parcel satisfying the criteria specified above) (i) submit a deed reflecting the grantee's ownership in fee duly recorded, or Court order evidencing ownership by the grantee, of a legal parcel or parcels overlying the Basin of sufficient acreage to satisfy the Eligibility Requirement, or (ii) in the case where a BPA grantee is a mutual water company formed after the date of entry of this Judgment, submit a copy of the County ordinance, County zoning letter(s), and such other documentation reasonably required by the

Watermaster to verify water demands for County approved land use entitlements of sufficient quantity to meet the Eligibility Requirement (the "Eligibility Proof").

b. For purposes of establishing the Eligibility Proof, a grantee may show the requisite ownership of a legal parcel or parcels overlying the Basin to satisfy the Eligibility Requirement held in the name of the grantee, a subsidiary of the grantee where the grantee possesses at least a 51% ownership interest, or an affiliate of the grantee that has at least 51% common ownership with the grantee.

3. Eligibility Violation. In the event that the Watermaster determines that a grantee has not satisfied the Eligibility Requirement (an "Eligibility Violation"), the Watermaster will provide written notice of such Eligibility Violation to the grantee and such written notice will specify a period of not more than one year to cure such Eligibility Violation ("Cure Period"). To thereafter cure such Eligibility Violation, the grantee must submit the Eligibility Proof within the Cure Period. If the grantee fails to so cure the Eligibility Violation within the Cure Period, the BPA or that portion of the BPA to be transferred which is in excess of the Eligibility Requirement following the end of the Cure Period, which ever quantity is less, will be returned to the grantor if required by the terms of the Permanent Transfer, or else forfeited by the grantee and such BPA will be permanently retired for the benefit of the Basin as a whole. No forfeiture of BPA or any portion thereof will be valid except by order of this Court upon noticed motion and after hearing.

4. Transfer Records. Upon completion of the Permanent Transfer, the BPA transferred will be assigned to the grantee's BPA Parcel(s) on the records of the Watermaster and removed from the grantor's BPA Parcel(s) on the records of the Watermaster. Notwithstanding the foregoing, upon completion of the Permanent Transfer to BWD or a mutual water company, the BPA will be assigned on the records of the Watermaster to BWD or the mutual water company, as applicable, and such BPA will be assigned for use within the service area boundaries, including any future modifications thereto, of such entity.

5. Restrictions on Transfers. In order to protect the Basin and protect against Undesirable Results, the Watermaster, with input from the Technical Advisory Committee, may restrict Permanent Transfers and Leases to specific areas of the Basin based on reasonable,

evidenced-based concern that the Permanent Transfer or Lease will cause or exacerbate Undesirable Results, and then only in a manner that is equitable to all affected Pumpers.

6. Permanent BPA Transfers with Land Conveyances.

a. BPA Parcels may be conveyed in full or in portions. With respect to a conveyance of a fee interest to all of a BPA Parcel, the associated BPA will automatically transfer to the successor of said BPA Parcel unless the grantor expressly retains BPA by meeting the following conditions: (i) the deed, or comparable instrument, conveying such full BPA Parcel expressly excludes all or a portion of the BPA from the conveyance, and specifies the quantity of the applicable BPA that is retained by the grantor and the quantity, if any, that is conveyed with the BPA Parcel to grantee; (ii) the grantor records a water rights restrictive covenant on the BPA Parcel being conveyed with the San Diego County Recorder in a form substantially similar to the applicable example provided in **Exhibit "6"** to this Judgment ("Water Rights Restrictive Covenant") specifying the quantity of the applicable BPA that was retained by the grantor and the quantity, if any, that was conveyed with the BPA Parcel to grantee; and (iii) within ten (10) business days of closing, grantor delivers via email and USPS (or other nationally-recognized carrier) a copy of the recorded Water Rights Restrictive Covenant to the Watermaster and identifies in writing to Watermaster the parcel(s) and well number(s) to which the BPA will attach. The conveyed parcel will thereafter only be benefited by any residual BPA not retained by the grantor, and if all BPA is retained by the grantor, the conveyed parcel will cease to be benefited by BPA, and thus will no longer be a BPA Parcel, unless BPA is subsequently acquired and designated for the benefit of such parcel through a Lease or Permanent Transfer.

b. With respect to a conveyance of a fee interest to a portion of a BPA Parcel, the grantor shall: (i) specify in the deed, or comparable instrument, conveying such portion of the BPA Parcel, the quantity of the applicable BPA retained by the grantor, if any, and the quantity that is conveyed with the portion of the BPA Parcel to grantee, if any; (ii) if any portion of the applicable BPA is conveyed with the portion of the BPA Parcel to grantee, record a Water Rights Restrictive Covenant against both the portion of the BPA Parcel conveyed to the grantee and the portion of the BPA Parcel retained by the grantor, with each Water Rights

Restrictive Covenant specifying the amount of the applicable BPA conveyed, or retained, by each parcel; (iii) if no portion of the applicable BPA is conveyed with the portion of the BPA Parcel to grantee, record a Water Rights Restrictive Covenant against only the portion of the BPA Parcel conveyed to the grantee specifying that none of the applicable BPA was conveyed to the parcel; and (iv) within ten (10) business days of closing, deliver via email and USPS (or other nationally-recognized carrier) a copy of the recorded Water Rights Restrictive Covenant(s) to the Watermaster and identify in writing to Watermaster the parcel(s) and well number(s) to which the BPA attaches with respect to the parcel(s) conveyed to grantee and the parcel(s) retained by grantor.

c. All Water Rights Restrictive Covenants must include a covenant prohibiting the future Pumping of Groundwater from the parcel upon which the Water Rights Restrictive Covenant is recorded in excess of the amount of BPA specified in the Water Rights Restrictive Covenant as conveyed or retained, as applicable, to such parcel, unless BPA is subsequently acquired for the benefit of that parcel.

7. <u>Compliance with Watermaster Review for Permanent Transfers</u>. Except for a Permanent Transfer of BPA concurrently with the transfer of a BPA Parcel or a Permanent Transfer of a Party's BPA to other overlying parcels owned by that Party or its affiliates, all Permanent Transfers must be reviewed and approved by Watermaster prior to closing to consider the means by which Groundwater use will be permanently reduced to facilitate the Permanent Transfer of BPA and to confirm satisfaction of the Eligibility Requirements (Sections III.I(2) above).

8. <u>Permanent Transfer of BPA Separate from Parcel Transfer</u>. If a Party's BPA is Permanently Transferred from a BPA Parcel separately from a conveyance of a fee interest to the BPA Parcel, for the Permanent Transfer to become effective, (i) the Parties to the Permanent Transfer must comply with the fallowing standards set forth in **<u>Exhibit "3"</u>** and (ii) except for a conveyance of a portion of the applicable BPA to the BWD or a mutual water company as a condition of obtaining water service, the grantor must record a Water Rights Restrictive Covenant against the BPA Parcel with the San Diego County Recorder and

subsequently deliver a copy of the recorded Water Rights Restrictive Covenant to the Watermaster. The Water Rights Restrictive Covenant must specify the amount of BPA transferred from the BPA Parcel, include a covenant prohibiting future Pumping from the parcel from which the BPA is transferred inconsistent with the Permanent Transfer or the terms of this Judgment, and identify the parcel(s) and wells(s) to which the transferred BPA is to be assigned. If all BPA is transferred from the parcel, as specified in the Water Rights Restrictive Covenant, the parcel will cease to be benefited by BPA, and thus will no longer be a BPA Parcel, unless BPA is subsequently acquired and designated for the benefit of such parcel through a Lease or Permanent Transfer.

9. Required Notices to Watermaster.

a. Leases. A Lease will only be effective after a written notice has been received by Watermaster, signed by both Parties to the Lease, specifying the amount of Annual Allocation leased, the term of the Lease, the well(s) to which the BPA is assigned during the term of the Lease, the Party responsible for payment of applicable Pumping Assessments, and if the BPA is then benefitted by Carryover, the amount of any Carryover leased to the lessee as a component of the Lease. If the Lease is for one or more Water Years other than the then-current Water Year, the notice will specify the BPA that correlates to the Lease in the future Water Years subject to the Lease (i.e., all Water Years subject to the Lease other than the current Water Year), and the amount of the Lease of Annual Allocation for such future Water Years will be determined by multiplying the amount of BPA to which the Lease correlates by the Pumping Percentage applicable to each of the future Water Years during the Lease.

b. Permanent Transfers. A Permanent Transfer will only be effective after a written notice has been received by Watermaster, signed by both Parties to the Permanent Transfer, specifying the amount of BPA permanently transferred; the new BPA Parcel and well(s) to which the transferred BPA is to be assigned (excepting the BWD and mutual water companies with respect to BPA Parcel); and certifying that the conditions in Sections 6 and 7 above have been satisfied; and, except for a transfer of BPA concurrently with the transfer of fee title to an Original BPA Parcel or a transfer of a Party's BPA to other overlying parcels owned by that Party (see Subsection D.5), no Permanent Transfer will be effective until the grantor has obtained approval from Watermaster for the transfer of the BPA following Watermaster review. If the BPA grantor fails to deliver the required Permanent Transfer documents to the Watermaster in accordance with, and at the time specified in this Subsection III.I, the BPA grantor and BPA grantee shall be jointly and severally liable for the payment to Watermaster of all assessments, including any unpaid Pumping Assessment and any Overproduction Penalty Assessment, together with applicable interest and penalties relating to any delinquent assessment, through the date of delivery of the Permanent Transfer documents to the Watermaster, as well as for any costs of suit, attorneys' fees and reasonable costs of collection, which may include obtaining a lien on the BPA Parcel (including any portion conveyed or retained), as prescribed by this Judgment. Watermaster may elect to pursue recovery of amounts owed pursuant to this III.I.9 against grantor, grantee, or both and against BPA Parcel(s) held by grantor and grantee.

c. Transfers of BPA Excluded from Conveyance of Parcel. Upon written notice to the Watermaster, a Party may transfer all or any portion of that Party's BPA excluded from the conveyance in accordance with Section III.I(9)(b) to any other parcel or portion thereof overlying the Basin owned by that Party or its affiliate provided that such notice identifies the BPA Parcel(s) and well(s) to which the BPA is to be assigned.

10. Transfer Costs. All costs of transfers (including costs of any fallowing remediation) will be borne by the Parties to the transfer transaction, not by Pumping Assessments. Likewise, enforcement costs will be borne by the Parties to the transfer with the ability for the prevailing party to recoup its legal costs from the non-prevailing party. If the Watermaster is the prevailing party in a Watermaster enforcement action, the Watermaster may recoup its legal costs from the non-prevailing party. If the Watermaster is not the prevailing party in a Watermaster enforcement action, the Watermaster will provide for the payment of the costs and expenses of the Watermaster from the Watermaster Budget.

11. Temporary Assignments. Temporary assignment of Annual Allocation (for up to six months of use, which period may be extended for cause upon application to and approval of the Watermaster) will be allowed for well sharing during well maintenance and

emergencies, which will be documented by the Parties to the well sharing and a notice signed by both Parties submitted to the Watermaster within 30 days of use for accounting on Watermaster records identifying the nature of the emergency necessitating the temporary assignment, and the BPA Parcels and wells to which the Annual Allocation is assigned.

J. Fallowing Standards

1. Applicable Standards. For the purposes of avoiding blight associated with dead agricultural vegetation and to reduce potential air quality and public health impacts from wind-blown dust, if all or any portion of BPA is to be permanently transferred to another Party by way of permanently fallowing any portion of a Party's irrigated tree crop, the portion permanently retired from irrigation will follow any and all County standards as may be promulgated under the County's land use authority, including any standards imposed under any applicable CEQA document, as may apply. Provided, however, that the Minimum Fallowing Standards described in **Exhibit "3"** shall serve as the minimum fallowing standards, as supplemented by any County-imposed fallowing standards.

2. Compliance with Fallowing Standards. Where practicable, fallowing shall be undertaken prior to the consummation of a permanent transfer. Where pre-transaction fallowing is not practicable, one of the following methods shall be utilized to ensure fallowing is completed within 12 months of the transaction: (1) deposit with the Watermaster 120% of the funds needed to complete the fallowing; (2) securing of a security or performance bond in favor of the Watermaster in an amount equal to 120% of the anticipated cost of the fallowing; or (3) establishment of an escrow for the transaction with a reputable title company with a holdback from the purchase price equal to 120% of the anticipated cost of fallowing payable to the Watermaster if fallowing is not timely completed within 12 months of the transaction. The Watermaster shall be charged with certifying that fallowing standards have been met. Upon such certification, retained funds held by escrow or Watermaster shall be promptly refunded to the appropriate Party or Parties and/or security/performance bonds shall be released. The Party responsible for the costs of complying with the fallowing standards, including the cost of security, are to be negotiated between the Parties to the transfer.

3. Fallowing Standards Applicable to Multi-Year Leases. To the extent the Watermaster determines that a multi-year Lease of BPA has resulted in significant amounts of dead trees or other crops on the land of the lessor Party and that the fallowing standards described in Section III.J(1). have been disregarded or not met for a period of at least 24 months, the Watermaster shall have authority to seek a Court order to compel fallowing or impose a monetary assessment to undertake fallowing. Watermaster will be entitled to recover its costs and attorney's fees from the lessor Party should Watermaster be a prevailing Party in such action. The provisions of this Subsection III.J(3) shall not apply to cover crops described in the Minimum Fallowing Standards attached as **Exhibit "3"** nor customary farming practices on the lessor property.

4. Fallowing and Water Credits. Annual Allocation associated with BPA that is granted in relation to a conversion of water credits may not be exercised (i.e., Groundwater may not be Pumped pursuant to the BPA) nor the underlying BPA transferred until and unless (a) the fallowing standards set forth in this Judgment have been satisfied for the parcel(s) from which such water credits were generated, as approved by Watermaster, and (b) a restrictive covenant limiting Groundwater production on such parcel(s) was recorded as part of the water credits program, and if that was not recorded, then a new Water Rights Restrictive Covenant is recorded against such parcel(s). Within six (6) months of its formation, the Watermaster shall review the state of satisfaction of requirements (a) and (b) and issue a status letter to each applicable BPA holder informing them that these requirements have been met or what further action is necessary to satisfy these requirements. When the requirements are met, the BPA holder shall then update, if needed, the parcels (identified by assessor parcel numbers) and well(s) (identified by state well number(s)) to which the BPA is assigned and request necessary changes to **Exhibit "4."** Notwithstanding the foregoing, if the BPA holder meets the requirements of this Section J(4) upon or after receipt of the transfer status letter, such BPA holder will have all rights and be burdened with all responsibilities attendant to the BPA, including Carryover accrual, retroactively to the date of this Judgment.

K. **Available Groundwater Storage Capacity**

There likely exists in the Basin a substantial amount of available Groundwater storage capacity which is not utilized for storage or regulation of Groundwater. Such storage capacity can appropriately be utilized for storage and conjunctive use of water that may in the future be imported to the Basin. It is essential that such storage capacity utilization be undertaken only under Watermaster control and regulation, in order to protect the integrity of the Basin, its Groundwater and any water imported to the Basin. Accordingly, any Person who wishes to store and Pump imported water in the Basin must do so pursuant to a storage agreement with Watermaster. All storage and recovery of imported water in the Basin, and all export of Groundwater Pumped from the Basin for use on lands that do not overly the Basin, is enjoined and restrained except pursuant to agreement with Watermaster. In any future allocation of Basin storage capacity by Watermaster, the needs and requirements of lands overlying the Basin and of the holders of BPA shall have priority and preference over storage for export.

L. **Changes in Point of Extraction and New Wells**.

Parties may change the point of Pumping on their real property for any BPA or portion thereof to another point of Pumping on the same Party's real property, whether by County-permitted new wells or replacement wells, so long as such change of point of Pumping does not cause Undesirable Results or interfere with an existing well of another Party.

IV. BASIN ADMINISTRATION

A. **Watermaster**. To assist this Court in the administration of this Judgment, this Court establishes a Watermaster. Watermaster shall administer and enforce the provisions of this Judgment (including the administration of the Physical Solution) and any subsequent instructions or orders of this Court. Watermaster shall, in carrying out its duties, powers and responsibilities herein, act in an impartial manner without favor or prejudice to any Pumper or Party.

B. **Watermaster Board**

1. Composition and Selection. The Watermaster Board will be comprised of five members, with each member having one vote, as follows: one representative and one alternate representing the BWD; one representative and one alternate representing the County;

one representative and one alternate representing the agricultural sector Parties; one representative and one alternate representing the recreational sector Parties; and one public/community representative and one alternate. The Parties within the respective agricultural and recreational sectors, and the process for selecting the respective agricultural, recreational, and public/community representatives are specified in **<u>Exhibit "7."</u>** Any Watermaster Board member or alternate may be removed by the Court for cause. Any vacancy on the Watermaster Board shall be filled by the same procedure used in the appointment of the vacant seat.

2. <u>Decisions of the Watermaster</u>. Except for decisions concerning a subject matter for which a Supermajority Vote is required for approval, as specified in Section IV.B(3) below, a decision agreed to by a majority of the Watermaster Board made when a quorum is present will be a decision of the Watermaster; provided, however, that no action of the Watermaster Board shall become effective without the affirmative vote of at least three members of the Watermaster Board. A quorum constitutes three members of the Board. All Watermaster decisions are final when made and may be appealed to this Court pursuant to Section VII.

3. <u>Supermajority Subject Matters</u>. Decisions by the Watermaster Board concerning the following subject matters must receive a Supermajority Vote for approval

a. Decisions concerning the Watermaster Budget inclusive of the Pumping Assessments;

b. Any change in the Watermaster Budget resulting in an increase of more than $50,000;

c. Establishment of the rate of Overproduction Penalty Assessments;

d. Approval of capital projects;

e. Borrowing of funds; and

f. Purchasing or disposing of real property.

4. <u>Watermaster Board Meetings</u>. All Watermaster Board meetings and hearings must be conducted in substantial accordance with the requirements of the California open meeting laws under Government Code sections 54950 et seq., otherwise known as the "Brown Act". Provided, however, that notwithstanding Government Code, section 54953(b)(3),

at least two of the Watermaster Board members shall participate in Board meetings from locations overlying the Basin. Further, because the Watermaster Board acts under the authority of the Superior Court and does not qualify as a "local agency" under Government Code section 54951, any and all challenges to Brown Act compliance by the Watermaster Board may be heard only by the Superior Court Judge with continuing jurisdiction over the Judgment in the underlying action, in compliance with the requirements of the Judgment. Regular Watermaster meetings must be noticed with an agenda and supporting materials made available to the public at least three days prior to the meeting, and shall be open to the public in a public location that overlies the Basin. Meeting minutes must be taken of all Watermaster Board meetings, a copy of which must be furnished to any member of the public requesting such minutes.

C. Watermaster Staff. Watermaster may hire employees or contractors as needed, which may include without limitation (a) one or more technical advisors to provide input to the Technical Advisory Committee, Watermaster staff and the Watermaster Board, (b) a person to prepare meeting notes, prepare an Annual Report to this Court, and administer this Judgment and (c) an attorney to advise and represent the Watermaster. In order to avoid a potential conflict of interest, the Watermaster Technical Consultant (interim or otherwise) must be independent (not under contract with any Party) and selected by the Watermaster with input from the Technical Advisory Committee through an arms-length RFP process, unless otherwise agreed to by a Supermajority Vote of the Watermaster. Any technical advisor, attorney, executive director, or similar employee or contractor performing services that concern technical or policy matters must be independent (not under contract with any Party) and selected by the Watermaster (and if a technical advisor, following input from the Technical Advisory Committee) through an arms-length RFP process unless otherwise agreed by a Supermajority Vote. Any other Watermaster employee or contractor may be employed by, or under contract with a Party, provided that he or she abides by any relevant Court orders, Watermaster determines that the employee or contractor will not be issuing technical or policy recommendations to Watermaster, and the retention of the employee or contractor is appropriate to perform services to Watermaster in the most effective and cost-efficient manner.

D. **Rules and Regulations**. The Watermaster will operate pursuant to the Watermaster Rules and Regulations attached hereto as **Exhibit "5."** The Watermaster may amend the Watermaster Rules and Regulation by Supermajority Vote after public hearing, noticed to all Parties, with a specific draft of the proposed modifications, no less than thirty days prior to the date of the hearing thereon. Upon the request of any objecting member of the Watermaster, the Watermaster must obtain Court approval of any proposed changes before they become effective.

E. **Watermaster Powers and Responsibilities**.

1. Powers. Subject to the continuing supervision and control of this Court, the Watermaster will have and may exercise: (i) the powers and duties set forth for a GSA pursuant to Water Code sections 10725 through 10726.5 and 10726.8 to the extent not inconsistent with any provision of this Judgment and subject to the limitations under SGMA; and (ii) any specific powers, authority and duties granted or imposed elsewhere in this Judgment.

2. Notice List. The Watermaster shall maintain a current list of Parties to receive notice hereunder.

3. Annual Budget Process. The Watermaster shall prepare a Watermaster Budget for each Water Year, hold hearings thereon, and adopt a final Watermaster Budget. The annual Watermaster Budget will be determined by the Watermaster in an amount necessary to fulfill the duties of Watermaster as prescribed by this Judgment and a reasonable reserve, all of which will be subject to review and revision by the Court pursuant to Section VII. Following the adoption of the Watermaster Budget, expenditures within budgeted items may thereafter be made by Watermaster in the exercise of powers herein granted, as a matter of course. Commencing with the Watermaster Budget for the 2021-2022 Water Year, the annual budget process to determine the budget for the following Water Year will be as follows:

Completion Deadline	Action
June 30[3]	Watermaster publishes the Watermaster Budget for ensuing Water Year
July 31	Any challenge to the budget by a Party must be initiated by notice to the Watermaster

[3] These dates commence in June preceding the beginning of the ensuing Water Year on October 1st for which the Watermaster Budget is being calculated. Therefore, Watermaster will publish the Watermaster Budget for the 2021-2022 Water Year on or before June 30, 2021.

August 30	Mediation of any challenge to the budget is completed pursuant to Section VII.A(1)
October 15	Any challenge to the budget by a Party unresolved by mediation will be heard by the Court
October 15	Watermaster issues notice to each Party of that Party's prior Water Year Pumping (specifying the amount of Pumping of Annual Allocation and Carryover, respectively), and the maximum amount of Annual Allocation eligible for Carryover from the preceding Water Year. Watermaster also provides each Party an estimate of the Pumping Assessment to assist Parties in making informed decisions regarding Carryover election and any election not to Pump or Carryover Annual Allocation in the ensuing Water Year
October 31	Court order is entered on any Party's challenge to budget heard by the Court
October 31	Each Party informs Watermaster of Carryover election and amount, and any election to forego Pumping and Carryover of its Annual Allocation in the ensuing Water Year. Any Party that did not Pump Groundwater during the preceding Water Year that intends to Pump Groundwater in the ensuing Water Year informs Watermaster of such election.
November 30	Watermaster provides Pumping Assessment invoice, based on the Adjusted Pumping Calculation for the preceding Water Year, to each Party for first installment of Pumping Assessment
December 31	First installment of Pumping Assessment due
May 31	Watermaster provides Pumping Assessment invoice, based on the Adjusted Pumping Calculation for the preceding Water Year, to each Party for second installment of Pumping Assessment
June 30	Second installment of Pumping Assessment due

4. Pumping Assessments. The annual Watermaster Budget costs in excess of applicable grants, loans, any Overproduction Penalty Assessment funds elected by Watermaster to be applied to the Watermaster Budget (i.e. any such funds not used to Lease Annual Production to offset the Overproduction), and assessments levied and collected on the State Park and the Borrego Springs Unified School District for their Pumping, will be funded by a uniform "Pumping Assessment". To determine each Party's Pumping Assessment, Watermaster will first determine for each Party an "Adjusted Pumping Calculation," which will equal the Amount of Annual Allocation Pumped by the Party during the preceding Water Year (or by the Party's lessee if the Party has Leased any portion of its Annual Allocation to another Party), minus the amount

of Carryover Pumped during the preceding Water Year[4] by the Party (or any lessee of the Carryover) and minus any amount of Groundwater Pumped pursuant to a Lease of Annual Allocation or Carryover from another Party, plus the amount of Carryover elected for the ensuing Water Year by the Party. The amount of each Party's Pumping Assessment will be calculated by multiplying the amount of the annual Watermaster Budget against a percentage derived by dividing the amount of the Party's Adjusted Pumping Calculation by the total of all Parties' Adjusted Pumping Calculations. If a Party timely notifies Watermaster that no Pumping will occur pursuant to the Party's BPA during the ensuing Water Year and that the Party will not Carryover any of its Annual Allocation from the preceding Water Year, that Party's Adjusted Pumping Calculation shall be excluded from the total of all Parties' Adjusted Pumping Calculations in calculating Pumping Assessments for the ensuring Water Year under this Subsection IV(E)(4) and the Party will not be assessed a Pumping Assessment in the ensuing Water Year. Under such election, no Pumping may be made pursuant to the applicable Annual Allocation during the ensuing Water Year. If a Party electing to forego Pumping in a Water Year pursuant to a BPA subsequently elects to Pump Groundwater pursuant to the BPA in a future Water Year (i.e., any Water Year after the ensuing Water Year) or transfers the BPA to another Party pursuant to a Lease or Permanent Transfer and the transferee elects to recommence Pumping in the future Water Year pursuant to the BPA, the Party's Adjusted Pumping Calculation for purposes of determining the amount of the Party's (or the transferee's) Pumping Assessment during the Water Year in which it intends to recommence Pumping will be determined on the basis of the Party's Annual Allocation in effect during the preceding Water Year (i.e., for purposes of calculating the Pumping Assessment the Party [or transferee] will be deemed to have Pumped the applicable Annual Allocation during the preceding Water Year). The cumulative Adjusted Pumping Calculations used as the denominator for determining Pumping Assessments will be adjusted in a like amount.

[4] There will be no Carryover Pumped during the 2020-2021 Water Year because this will be the first Water Year with Annual Allocations.

5. Annual Report

a. Process. The Watermaster shall file an Annual Report with this Court not later than February 1 of each Water Year beginning February 1 following the first full Water Year after entry of Judgment. Prior to filing the Annual Report with this Court, Watermaster shall notify all Parties that a draft of the Annual Report is available for review and shall provide notice of a hearing to receive comments and recommendations for changes in the report. The notice of hearing may include such summary of the draft report as Watermaster may deem appropriate. Watermaster shall also distribute the Annual Report to the Parties requesting copies and file it with DWR.

b. Contents. The Annual Report shall include the information set forth in Water Code section 10728 and 23 California Code of Regulations section 356.2, an annual fiscal report of the operation of Watermaster during the preceding Water Year, an audit of all assessments and expenditures by Watermaster, a summary of the management of the Basin and Watermaster activities pursuant to this Judgment, a summary of aggregate Pumping, a record of Leases and Permanent Transfers of BPA and the amount of Carryover held by each Party, any recommendations to the Court concerning further orders of this Court to advance the Sustainable Groundwater Management for the Basin, and such additional information as may be required by order of the Court.

6. Pumping Reports. Each Pumper shall transmit to Watermaster, pursuant to procedures and time schedules to be established by Watermaster, water production data from the Pumper's meter system. Each Pumper shall annually file with Watermaster, on a form to be prescribed by Watermaster, a report that provides: (i) a written verification by the manufacturer or qualified meter installer certifying the ongoing accuracy of the meter readings and meter calibration, as well as verification that there are no valves or other devices upstream of the meter that could lead to pumped water being diverted before being read by the meter; and (ii) such additional information as may be required by order of the Court.

7. Meetings with the Technical Advisory Committee. The Watermaster shall meet on a regular basis and at least semi-annually with the Technical Advisory Committee to

review Watermaster activities pursuant to this Judgment and to receive advisory recommendations from the Technical Advisory Committee.

8. Unauthorized Pumping. The Watermaster shall undertake any action, including bringing any motion to the Court, necessary to enjoin unauthorized Pumping.

9. Data, Estimates and Procedures. The Watermaster shall use, among other available data, BVHM runs and best available records and data to support the implementation of this Judgment. Where actual records of data are not available, Watermaster shall rely on and use sound scientific and engineering estimates for the BVHM runs. Watermaster may use preliminary records of measurements, and, if revisions are subsequently made, Watermaster may reflect such revisions in subsequent accounting.

10. Watermaster's Access to Private Property. Watermaster may enter the private property of Parties for the purpose of administering its responsibilities under this Judgment, provided that, excepting any entry only for the specified water quality monitoring and alternative meter inspection purposes pursuant to Sections VI(A) and VI(B), such entry may only be made at the permission of the Party and following execution of another Entry Agreement as specified in **Exhibit "8"** specifying the other activities to be undertaken, or pursuant to or an inspection warrant under Water Code section 10725.4.

F. Injuries Caused by Watermaster and Board Member, Officer, and Appointing Entity Liability. As a special master of this Court, Watermaster will not be held liable to any Person for any injury, at law or in equity, alleged to result or arise from, Watermaster's actions or omissions. The Court may, however, through noticed motion to this Court under the continuing jurisdiction provisions set forth in Section VII of this Judgment, order Watermaster to effect an appropriate remedy for any Person demonstrating an injury resulting from Watermaster's actions or omissions, including without limitation payment of monetary sums. No Watermaster Board member or officer, nor any Person appointing a Watermaster Board member, will be held liable for any injury arising from or relating to a Watermaster Board member's or officer's service on behalf of Watermaster if such Board member or officer conducted himself or herself in good faith and reasonably believed that his or her conduct was lawful and in compliance with the Judgment, Rules and Regulations of the Watermaster and orders of the Court. If any dispute arises concerning the satisfaction of this criteria for such exemption of liability pursuant to the preceding sentence, the Court will determine such matter on noticed motion pursuant to the continuing jurisdiction provisions set forth in Section VII of this Judgment. If this Court determines in such a proceeding that the Board member's or officer's conduct was made in good faith and pursuant to a reasonable belief that his or her conduct was lawful and in compliance with the Judgment, Rules and Regulations of the Watermaster and orders of the Court, then: (i) any monetary remedies ordered by this Court will not be paid by the subject Watermaster Board member, officer, or appointing Person, but rather by Watermaster; and (ii) any reasonable attorney fees, costs, or other expense incurred by such Watermaster Board member, officer, or appointing Person in defense of, or as a result of, the matter will be paid in advance or reimbursed by Watermaster. Watermaster shall obtain and maintain liability insurance, including Officers and Directors coverage, in amounts reasonably necessary to cover Watermaster's obligations under this Section IV.F, provided that Watermaster shall only be obligated to obtain as much of such insurance as is available to Watermaster at reasonable rates.

G. **Technical Advisory Committee**

1. Selection of Technical Advisory Committee. A Technical Advisory Committee is established to advise the Watermaster on technical matters. TAC meetings may be conducted by meeting within the Basin, by telephone conference, or by web-based video conference, as determined by the TAC members from time to time. TAC meetings shall be open to the public, and shall provide an opportunity for public comment. Membership of the Technical Advisory Committee will be open to an expert hired by any Party holding BPA or the County. To participate on the Technical Advisory Committee, the expert must be a California licensed hydrogeologist, California licensed engineer, professional hydrogeological modeler, professional Groundwater statistician, or other California licensed member of a recognized professional discipline approved by the Watermaster. The Technical Advisory Committee will endeavor to decide all matters by consensus. If consensus cannot be achieved, the Technical Advisory Committee will present a report to the Watermaster describing the differences of opinion and

arguments in support thereof, with a draft of the report circulated for comment and input by all Technical Advisory Committee members prior to submission of the report to Watermaster.

2. Technical Advisory Committee Duties and Responsibilities. The Technical Advisory Committee's responsibilities will include, without limitation, making recommendations based on best science and data collected regarding the Water Budget and the avoidance of Undesirable Result, determined by the TAC based on best available data, including without limitation information generated from BVHM model runs. Such assessment must consider all inflows and outflows from the Basin, including without limitation mountain front underflow and flux into the Borrego Springs Basin across the Coyote Creek fault and all other underflows, agricultural and recreational irrigation return flows; specific yield differences of the three aquifers (upper, middle, and lower) within the different Management Areas of the Basin; and other matters approved by the Watermaster to improve upon initial assumptions regarding the Water Budget that will enable better Adaptive Management of the Basin.

H. Environmental Working Group. An Environmental Working Group (EWG) will be established to advise the Watermaster on GDE and any other matters approved by the Watermaster. The EWG budget, which shall be adequate for the EWG to carry out its responsibilities as directed by the Watermaster, will be included in the Watermaster Budget.

V. ASSESSMENTS

A. Authorized Assessments. The Watermaster is authorized to set, levy and collect assessments from the Parties as described herein.

1. Pumping Assessment. The Watermaster shall provide an invoice for the assessed Pumping Assessment to each Party pursuant to the schedule set forth in Section IV.E(3). Each Party who does not timely notify Watermaster of their election to forego Pumping and Carryover of its Annual Allocation in the ensuing Water Year will be liable for the payment of such invoice regardless of whether they subsequently Lease or Permanently Transfer part or all of their Annual Allocation during that Water Year. An appeal of the Watermaster's calculation of any Pumping Assessment must be brought pursuant to Section VII of this Judgment within thirty (30) days of receipt of Watermaster's invoice. Payment of any Pumping Assessment appealed to

the Court must be made within ten (10) days following the Court order on appeal. If payment is not made on or before the applicable due date, the Watermaster will add a penalty of one percent (1%) per month thereof to such Party's statement.

2. Overproduction Penalty Assessment. The Watermaster shall provide an invoice for an Overproduction Penalty Assessment to each Party who produces in excess of the Party's Max Overproduction Limit, subject to Section III.G herein no later than thirty (30) days following the end of the Water Year in which the Overproduction occurred. Any appeal of an assessed Overproduction Penalty Assessment must be brought pursuant to Section VII of this Judgment within thirty (30) days of receipt of Watermaster's invoice for the Overproduction Penalty Assessment. Unless timely appealed, payment of Watermaster's invoice for the Overproduction Penalty Assessment must be made within ten (10) days of receipt of the invoice.

3. Failure to Pay Assessment and Enforcement of Assessments. If a Party knowingly fails to pay an assessment after receipt of the notice of assessment pursuant to the terms of this Judgment within 30 days of it becoming due pursuant to the terms of this Judgment, the Party shall be liable to the Watermaster for interest at a rate of 1 percent per month on the delinquent amount of the assessment and a 10-percent penalty of the amount of the assessment without any interest thereon, consistent with Water Code section 10730.6(b). To collect payment of any delinquent assessment properly levied pursuant to this Section V, Watermaster may exercise the same collection methods authorized to a GSA under Water Code section 10730.6 or the statutory authority of BWD to collect on the tax rolls unpaid assessments pursuant to the BWD's enabling legislation. (Wat. Code, §§ 37200 et seq.).

VI. WELL METERING AND WATER QUALITY TESTING

A. Meter Installation for the Purpose of Accurately Measuring Water Use. Parties holding BPA will install and maintain, at their own expense, meters approved by Watermaster that can electronically transmit a recording of the amount of Groundwater Pumped from the Basin and other data to the Watermaster in real time on a schedule as determined by the Watermaster. This meter program will result in cost savings by avoiding the need for the Watermaster to physically read, inspect and validate the accuracy of meters. Alternatively, any

Party holding BPA may elect to install and maintain, at its own expense, other meters approved by Watermaster on condition that: (i) the Watermaster physically read the meters on the schedule determined by the Watermaster and the Party pay all costs associated with the Watermaster's reading, accounting and reporting related to such meters; and (ii) the Party has executed an Entry Agreement as specified in **Exhibit "8"** for the purpose of allowing Watermaster access to the Party's well.

B. Water Quality Monitoring Plan

1. Purpose. Regular water quality monitoring is essential to avoiding Undesirable Results and achieving Sustainable Groundwater Management for the Basin.

2. Administration. Water quality monitoring will be conducted at times and places established by a water quality monitoring plan, which will include a designated network of monitoring wells, developed by the Watermaster with Technical Advisory Committee input within 24 months of entry of Judgment. The Watermaster will determine if changes in water quality are significant and unreasonable following consideration of the cause of impact, the affected beneficial use, potential remedies, input from the Technical Advisory Committee, and subject to approval by this Court exercising independent judgment. Any Party may appeal the approval of the water quality monitoring plan to this Court for resolution pursuant to Section VII. Qualified Watermaster staff or consultants are permitted to access private property for the sole purpose of water quality testing under the approved water quality monitoring program in compliance with the terms of an Entry Agreement with the landowner. Such Entry Agreement must be in substantial compliance with the form of agreement attached hereto as **Exhibit "8."** which will protect the landowner from liability for damage and injury resulting from Watermaster's entry onto the parcel (including naming the landowner and all businesses operating on the property as additional insured), provide for advance notice, limit activities on the parcel to those necessary to accomplish the purpose of the entry, avoid undue interference with agricultural or other business activities upon the parcel, and ensure the safety of third parties entering onto operating agricultural properties. Nothing in this Judgment shall preclude the Watermaster from obtaining an inspection warrant under Water Code section 10725.4.

VII. CONTINUING JURISDICTION AND APPEAL OF WATERMASTER DECISIONS

A. **Jurisdiction Reserved**. Consistent with Section 852 of the Code of Civil Procedure, full jurisdiction, power and authority are retained by and reserved to this Court for purposes of enabling this Court upon the noticed motion of any Party or the Watermaster, or sua sponte, to make such further or supplemental orders or directions as may be necessary or appropriate for: (i) the operation of the Physical Solution established by this Judgment; (ii) interpretation, enforcement or carrying out of this Judgment, or (iii) the modification, amendment, or amplification any of the provisions of this Judgment, or to add to the provisions hereof, consistent with the rights herein decreed.

1. Contested Watermaster decisions or other matters of disagreement will be reviewed by this Court upon noticed motion of any Party, any Watermaster Board member or the Watermaster. The Court review shall be de novo, without evidentiary weight to the Watermaster action or decision. The decision of the Court upon any such motion shall be an appealable "Supplemental Order" in this case. When the Supplemental Order is final it shall be binding upon the Watermaster and the Parties. With the exception of motions to review the Watermaster Budget or any assessment issued by Watermaster, which are subject to a thirty (30) day filing deadline, any such motion must be filed with the Court within ninety (90) days of the Watermaster decision or action or it is barred. Unless otherwise agreed by all Parties in disagreement, any Watermaster Boardmember in disagreement, and Watermaster if the dispute involves Watermaster ("Party(ies) in Disagreement"), upon filing a motion with this Court to resolve the disagreement, the Parties in Disagreement shall first engage in mediation, which mediation will extend the Court hearing date for up to sixty (60) days while the mediation is pending. Unless otherwise provided for herein or the Parties in Disagreement agree otherwise, the mediation will be initiated and conducted under the applicable rules of the American Arbitration Association that are applicable as of the date of the dispute. The mediation will be limited to one full day unless extended by the Parties in Disagreement. The Parties in Disagreement participating in any such mediation will be responsible for their own individual

costs of participation and shall split evenly the cost of the mediation unless the Watermaster is a Party in Disagreement, in which case the Watermaster shall contribute 50% of the cost, using funds from Watermaster's annual budget, and the other 50% of the cost will be split evenly among the other Parties in Disagreement participating in the mediation.

2. This Court may appoint an independent special master or referee to advise this Court with respect to any dispute.

3. Annual status conferences will be established as part of this Judgment for the Watermaster to report to this Court, for this Court to consider any matters presented by the Watermaster requiring Court approval, and for review of any disputed matters noticed for hearing on the date of the annual status conference in accordance with this Section VII.A(3).

4. Any Watermaster Board member, officer, or Person appointing a Watermaster Board member, including but not limited to the County of San Diego, named in litigation filed after the close of the Annual Budget and Pumping Assessment proceedings under Section IV.E(3), (4), may bring a motion to this Court without the necessity of engaging in mediation pursuant to Section VII.A(1), to obtain an order of this Court to revise the Annual Budget and Pumping Assessment as necessary to ensure that the Watermaster is properly capitalized to promptly fund Watermaster's responsibilities set forth in Section IV.F.

B. <u>Watermaster Enforcement</u>. Watermaster (as well any Party upon Watermaster's failure or refusal to enforce) may petition this Court to issue enforcement orders, upon noticed motion and after hearing, as necessary to remedy any non-compliance with the terms of this Judgment. The prevailing party, including without limitation the Watermaster, in an enforcement action will be entitled to recover its costs of suit, attorneys' fees and reasonable costs of collection, which may include obtaining a lien on the Party's (Parties') BPA Parcel, if applicable, as prescribed by this Judgment. Watermaster is also authorized to coordinate with the County in connection with County enforcement of land use and nuisance ordinances related to fallowing.

VIII. FINDINGS

A. The Judgment is consistent with Section 2 of Article X of the California Constitution, requiring that the water resources of the State be put to beneficial use to the fullest extent possible.

B. The Judgment is consistent with the water right priorities of all non-stipulating Parties and any Persons who are De Minimis Pumpers.

C. The Judgment treats all objecting Parties and any persons who have claims that are exempt equitably as compared to the Stipulating Parties.

D. Plaintiff complied with the service and notice provisions of Code of Civil Procedure sections 835 and 836, which compliance is deemed effective service of process of the Complaint and notice on all interested parties of the Comprehensive Adjudication of the Basin for purposes of establishing in rem jurisdiction and the comprehensive binding effect of the Comprehensive Adjudication, consistent with Code of Civil Procedure sections 836(j) and 851.

E. All rights to Pump and store water in the Basin are comprehensively determined by this Judgment consistent with Code of Civil Procedure sections 830(b)(7) and 834. All unexercised rights and future rights to Pump water in the Basin are subordinated to all rights of the Parties currently being exercised and rights authorized under this Judgment, consistent with Code of Civil Procedure section 830(b)(7).

F. Pumping by Parties that are De Minimis Pumpers as of the time of the filing of the Complaint does not presently have a material effect on the groundwater rights of other Parties. Accordingly, this Judgment does not presently regulate a Party that was Pumping Groundwater as a De Minimis Pumper as of the time of the filing of the Complaint, provided the Pumping by such De Minimis Pumper remains within the two acre foot use limitations established in this Judgment and provided that such De Minimis Pumper does not seek to transfer their Pumping to another real property owned by another Person. The Court may revisit and change this finding upon a showing of necessity for the Adaptive Management of the Basin pursuant to the Court's continuing jurisdiction.

IX. BINDING EFFECT

The Judgment is binding on the Parties to the Comprehensive Adjudication and all their successors in interest, including, but not limited to, heirs, executors, administrators, assigns, lessees, licensees, the agents and employees of the Parties to the Comprehensive Adjudication and all their successors in interest, and all landowners or other persons claiming rights to Pump Groundwater from the Basin, consistent with Code of Civil Procedure section 851. The Judgment also is an in rem judgment binding on all real property overlying the Basin. The Watermaster may cause this Judgment to be recorded against any or all parcels overlying the Basin. The grantor of any real property subject to this Judgment shall notify the purchaser of the existence of the Judgment and its binding effect on the real property.

X. MISCELLANEOUS PROVISIONS

A. Water Quality. Nothing in this Judgment shall be interpreted as relieving any Party of its responsibilities to comply with State or Federal laws for the protection of water quality or the provisions of any permits, standards, requirements, or orders promulgated thereunder.

B. Well Abandonment. The Parties and Watermaster agree to cooperate with the County in the enforcement of the County's well abandonment ordinance in effect in the Basin as improperly abandoned wells have the potential to provide a migration pathway of contaminants into the Basin.

C. Designation of Address for Notice and Service. Each Party shall designate the name, address, and e-mail address to be used for purposes of all subsequent notices and service, either by its endorsement on this Judgment or by a separate designation to be filed within thirty days after Judgment has been entered. This designation may be changed from time to time by filing a written notice of such change with Watermaster. Any Party desiring to be relieved of receiving notices may file a waiver of notice on a form approved by the Watermaster. If no designation is made, a Party's designee shall be deemed to be, in order of priority: i) the Party's attorney of record; ii) if the Party does not have an attorney of record, the Party itself at the address specified on the Watermaster's list.

D. Notice and Service of Documents. All notices or service of documents pursuant to this Judgment by Watermaster or any Party will be made by electronic mail to the greatest extent feasible.

E. No Abandonment of Rights. In the interest of the Basin and its water supply, and the principle of reasonable and beneficial use, no Party shall be encouraged to Pump and use more water in any Water Year than is reasonably required. Failure to Pump all of the Groundwater to which a Party is entitled will not be deemed or constitute a forfeiture or an abandonment of such Party's right, in whole or in part, except upon a written election by the Party holding the BPA or by order of the Court exercising continuing jurisdiction under Section VII upon noticed motion and after hearing.

F. Costs. Except subject to any existing Court orders and stipulations or separate agreement of one or more Parties, each Party shall bear its own costs and attorneys' fees arising from the Comprehensive Adjudication.

G. Headings; Paragraph References. Captions and headings appearing in this Judgment are inserted solely as reference aids for ease and convenience; they shall not be deemed to define or limit the scope or substance of the provisions they introduce, nor shall they be used in construing the intent or effect of such provisions.

H. Third Party Beneficiaries. There are no intended third party beneficiaries of any right or obligation of the Parties.

I. Severability. Except as specifically provided herein, the provisions of this Judgment are not severable.

J. Mutual Water Companies Formed After Entry of Judgment. Any mutual water company formed after entry of Judgment shall only construct, install and operate water conveyance, production, storage and supply facilities, including but not limited to wells and pipelines, that meet the laws, standards and regulations specified in **Exhibit "9."** Further, no mutual water company formed after entry of Judgment shall seek to be acquired by, merge with, or be taken over by BWD without the express, advance written consent of BWD.

Nothing in this Judgment is intended to preclude any party, including but not limited to BWD, from advancing positions regarding any such mutual water company's ability to meet the laws, standards and regulations applicable to mutual water companies.

K. **Cooperation; Further Acts**. The Parties shall fully cooperate with one another, and shall take any additional acts or sign any additional documents as may be necessary, appropriate or convenient to attain the purposes of this Judgment.

L. **Exhibits and Other Writings**. Any and all exhibits, documents, instruments, certificates or other writings attached hereto or required or provided for by this Judgment, if any, will be deemed part of this Judgment and will be considered set forth in full at each reference thereto in this Judgment.

Dated: April 8, 2021

By: ________________
Peter J. Wilson
Superior Court of the State of California for the County of Orange

EXHIBIT

2

EXHIBIT 1

Draft Final

Groundwater Management Plan for the Borrego Springs Groundwater Subbasin January 2020

A Draft Final Groundwater Sustainability Plan (GSP) was prepared for the Borrego Springs Groundwater Subbasin (Basin) of the Borrego Valley Groundwater Basin by the Borrego Water District (BWD) and the County of San Diego (County) acting as the Borrego Valley Groundwater Sustainability Agency (GSA) for the Basin. This Groundwater Management Plan (GMP) includes modifications to the GSP to conform its terms to the Stipulated Judgment proposed in the pending comprehensive adjudication of groundwater rights in the Basin. The "Physical Solution" proposed for the Basin consists of the GMP and the Stipulated Judgment, as overseen by the Court; provided, however, that the provisions of the Stipulated Judgment control over and supersede any contrary provisions contained in the GMP. The stipulating parties propose to substitute the proposed Watermaster in place of the GSA, and to seek the Department of Water Resources' approval of the Physical Solution to serve as an alternative to the GSP, as authorized by Water Code sections 10733.6 and 10737.4. Accordingly, all references to the GSA and GSP should be substituted with "Watermaster" and "GMP", respectively.

Draft Final

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

Borrego Valley Groundwater Sustainability Agency
5510 Overland Avenue, Suite 310
San Diego, California 92123
Plan Manager: James Bennett
August 2019

BACK COVER PHOTOGRAPHS

Bottom left: **Borrego Springs Subbasin nursery plants**, courtesy of Hugh McManus

Bottom middle: **Coyote Canyon spring 2019 flower bloom**, courtesy of Sicco Rood, Steele/ Burnand Anza-Borrego Desert Research Center

INTENTIONALLY LEFT BLANK

SIGNATURE PAGE

This draft Final Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin has been prepared under the direction of a professional geologist licensed in the State of California as required per California Code of Regulations, Title 23 Section 354.12 consistent with professional standards of practice.

PROFESSIONAL GEOLOGIST
ARTHUR
DRISCOLL
No. 8511
STATE OF CALIFORNIA

Arthur L. Driscoll

Arthur Storer Driscoll, III (Trey)
PG No. 8511, CHG No. 936

INTENTIONALLY LEFT BLANK

The Table of Contents is NOT current.
It will be updated upon finalization of the GMP.

TABLE OF CONTENTS

Section **Page No.**

APPENDICES

EXHIBIT

FIGURES

TABLES

INTENTIONALLY LEFT BLANK

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AB	Assembly Bill
ABDSP	Anza-Borrego Desert State Park
AC	Advisory Committee
AF	acre-feet
AFY	acre-feet per year
AGR	agriculture supply
BCM	Basin Characterization Model
BMP	best management practice
BPA	baseline pumping allocation
BSUSD	Borrego Springs Unified School District
BVGB	Borrego Valley Groundwater Basin
BVHM	Borrego Valley Hydrologic Model
BWD	Borrego Water District
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CDP	Census Designated Place
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CMA	Central Management Area
COC	constituent of concern
CWC	California Water Code
DEH	Department of Environmental Health
DMS	data management system
DWR	Department of Water Resources
EDA	Economically Distressed Area
EIR	Environmental Impact Report
FMP	Farm Process
FTE	fulltime equivalent
FY	fiscal year
GDE	groundwater dependent ecosystem
GIC	Groundwater Information Center
GIS	geographic information system
GMP	Groundwater Management Plan
GSA	groundwater sustainability agency
GSP	Groundwater Sustainability Plan
GWE	groundwater elevation
HCM	hydrogeologic conceptual model
ID	Improvement District
ID4	improvement district 4
ILRP	Irrigated Lands Regulatory Program
IND	industrial service supply
IRWM	Integrated Regional Water Management

Acronym/Abbreviation	Definition
MCL	Maximum Contaminant Limit
MCS	Monte Carlo Simulation
MOU	Memorandum of Understanding
MUN	municipal and domestic supply
MWELO	Model Water Efficient Landscape Ordinance
NCCAG	Natural Communities Commonly Associated with Groundwater
NMA	North Management Area
NO_3	nitrate
NPDES	National Pollutant Discharge Elimination System
OWTS	on-site wastewater treatment system
PET	potential evapotranspiration
PMA	project and management action
RWQCB	Regional Water Quality Control Board
SAP/QAPP	Sampling and Analysis Plan and Quality Assurance Project Plan
SB	Senate Bill
SDAC	Severely Disadvantaged Community
SGMA	Sustainable Groundwater Management Act
SMA	South Management Area
SWID	State Well Identification
SWRCB	State Water Resources Control Board
TDS	Total dissolved solids
TNC	The Nature Conservancy
USGS	U.S. Geological Survey
UZP	Unsaturated Zone Package
WCP	Water Credits Policy
WDR	Waste Discharge Requirement
WWTF	Wastewater Treatment Facility

EXECUTIVE SUMMARY

The Borrego Valley Groundwater Sustainability Agency (GSA, Agency), which comprises the Borrego Water District (BWD) and the County of San Diego (County), developed a Groundwater Sustainability Plan (GSP, Plan) to provide a structure to enable local government, groundwater users and the local community to work together to achieve sustainable use of groundwater resources in the Borrego Springs Groundwater Subbasin (Subbasin) (California Department of Water Resources (DWR) Basin No. 7.024.01) of the Borrego Valley Groundwater Basin. The GSP was subsequently repurposed as a Groundwater Management Plan (GMP), an integral part of a Physical Solution in a groundwater rights adjudication consistent with the requirements of the Sustainable Groundwater Management Act (SGMA). The purpose of this GMP is to refine and expedite implementation of the Physical Solution and to avoid litigation over the GSP and its associated Project and Management Actions (PMAs).

The GSP and this resulting GMP was developed through a process of stakeholder negotiation among major water users, landowners and government agencies. Specifically, this GMP is adopted as part of the Physical Solution by means of a Judgment Pursuant to Stipulation in [INSERT CASE NAME] (Judgment). The Judgment was agreed to by Stipulating Parties accounting for more than 75% of groundwater production and more than 50% of non-minimal producer well owners as an alternative to the GSA/GSP process for the Borrego Springs Subbasin under SGMA (California Water Code Sections 10733.6 and 10737.4). This GMP includes and is to be interpreted and implemented consistent with and subject to the provisions of the Judgment. The provisions of the Judgment control over and supersede any contrary provisions contained in this GMP.

ES 1.0 INTRODUCTION

The multi-agency Borrego Valley GSA consists of BWD, which has water supply and water management responsibilities within its Borrego Springs service area; and the County, which has land use responsibilities and implements the County's Groundwater Ordinance throughout the Subbasin. The Watermaster Board appointed under the Judgment takes the place of the GSA.

Current groundwater use in the Subbasin, which is located in northeastern unincorporated San Diego County, greatly exceeds groundwater recharge (i.e., the basin is being overdrafted). The Subbasin has been designated as being in critical overdraft by the DWR. According to the Sustainable Groundwater Management Act (SGMA), "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." The intent of this GMP is to achieve long-term groundwater sustainability by restoring balance to (i.e., reaching "sustainability" in) the Subbasin no later than 2040, as required by SGMA.

The overarching aim of SGMA is to establish and achieve the "sustainability goal" for the Subbasin through the development and implementation of a GSP or approved alternative. In enacting SGMA, the Legislature also set forward more specific purposes underlying the legislation, which include providing for sustainable management of groundwater, avoiding six designated "undesirable results" to groundwater resources that could occur without proper management, enhancing the ability of local agencies to take action to protect groundwater resources, and preserving the security of water rights to the greatest extent possible consistent with sustainable management of groundwater.

The intent of the Physical Solution is to meet the requirements of SGMA. To this end, this Plan includes the scientific and other background information about the Subbasin required by SGMA and its implementing regulations. The Plan is also intended to provide a roadmap for how sustainability is to be reached in the Subbasin, including through projects and management actions (PMAs) to be taken, as well as the financial and other implications of implementing the Plan. At the same time, the GMP also recognizes that while some management actions can be taken early on in the Physical Solution implementation process, other actions are to be implemented over time.

SGMA also mandates that steps be taken to ensure the broadest possible public participation in the GSP development process. From its inception, the GSA was focused on soliciting and receiving input from a wide variety of stakeholders regarding Subbasin issues. As part of the GSA's effort to consider the interests of all beneficial uses and users of groundwater (as defined by California Water Code Section 10723.2), the GSA formed the Borrego Basin GSP Advisory Committee made up of key stakeholders from the Borrego Springs community. Beginning in March 2017, the Advisory Committee provided regular input to aid the GSA in the development of the planning and policy recommendations contained in the GSP.

ES 2.0 SUMMARY OF BASIN SETTING AND CONDITIONS

DWR has designated the 98-square-mile Subbasin as high priority and critically overdrafted. The majority of recharge that replenishes the Subbasin comes from streamflow exiting the mountains onto the desert alluvial fans that abut the mountain front. Land uses consist primarily of private land under County jurisdiction, and both the private land and the Subbasin itself are surrounded on nearly all sides by the Anza-Borrego Desert State Park. The developed land uses in the Subbasin include residential, agricultural, recreational, and commercial.

As represented in the "Hydrogeologic Conceptual Model" developed for the GSP, which is based in large part on work conducted by the U.S. Geological Survey, the unconsolidated sediments that fill the Subbasin are divided into three principal aquifers referred to as the upper, middle and lower aquifers, with the highest yielding wells located in the upper aquifer.

Prior to development in the Subbasin, the natural direction of groundwater flow was predominantly from the northwest near Coyote Creek to the southeast toward the Borrego Sink. The shallowest groundwater-level elevations occurred east of the Borrego Sink, an area of natural drainage in the middle of the valley that is dry most of the time. Groundwater levels and water quality in the Subbasin have been tracked by county, state, and federal agencies for over 50 years. The Watermaster will monitor groundwater levels from a network consisting of approximately 46 wells.

Over the past 65 years, groundwater levels have declined as much as 126 feet (average of nearly 2 feet per year) in the northern part of the Subbasin and about 87 feet (average of 1.3 feet per year) in the west–central part. In the southeastern part of the Subbasin where less groundwater has been pumped, groundwater levels have remained relatively stable along the perimeter of the Subbasin during the same time period. Recent pumping in the South Management Area has resulted in a localized groundwater level depression south of the Borrego Sink. Given the physical characteristics of the groundwater within the Subbasin, water quality, and other factors, this GMP establishes three management areas for the Subbasin: the North Management Area, the Central Management Area, and the South Management Area. These management areas will be utilized to monitor the status of groundwater quality and other SGMA parameters, and measure the progress towards achieving sustainability goals.

Defining the Subbasin setting also requires an examination of groundwater quality issues. In the Subbasin, the most critical aspect of water quality is ensuring that available supplies at municipal well sites are and remain in compliance with drinking water standards. Groundwater quality provided by BWD water supply wells meets California drinking water maximum contaminant levels without treatment. Arsenic concentrations were increasing in multiple BWD water supply wells until 2014, but have since decreased. Historically, there have been nitrate-related water quality problems encountered in BWD wells that led to well reconstruction, abandonment, and replacement.

Total dissolved solids and sulfate are presently the only water quality constituents that show increasing concentrations with simultaneous declines in groundwater levels. Overall, the long standing overdraft has resulted in changes to water quality in the Subbasin over time. High salinity, poor quality connate water is thought to occur in deeper formational materials in select areas of the aquifer as well as shallow groundwater in the vicinity of the Borrego Sink in the southern portion of the Subbasin. BWD does not operate wells in the immediate vicinity of the Borrego Sink. The Watermaster will monitor water quality from a groundwater quality network consisting of 30 wells.

The water budget for the Subbasin provides an accounting and assessment of the average annual volume of groundwater and surface water entering (i.e., inflow) and leaving (i.e., outflow) the basin and enables an accounting of the cumulative change in groundwater in storage over time.

From 1945 to 2016, about 520,000 acre-feet of water was estimated to have been removed from storage. At present, the total baseline pumping allocation (BPA)[1] of 24,215 acre-feet per year (AFY) greatly exceeds the Subbasin's estimated long-term sustainable yield of 5,700 AFY. The BPA is defined as the amount of groundwater each pumper in the Subbasin is allocated prior to SGMA-mandated reductions, and serves as a cap from which annual pumping reductions to reach the sustainable yield by no later than 2040 will proceed.

ES 3.0 OVERVIEW OF SUSTAINABILITY INDICATORS, MINIMUM THRESHOLDS, AND MEASURABLE OBJECTIVES

To maintain a viable water supply for current and future beneficial uses and users of groundwater in the Subbasin, the Physical Solution's sustainability goal is to ensure that by 2040, and thereafter within the planning and implementation horizon of this GMP (50 years), the Subbasin is operated within its sustainable yield and does not exhibit undesirable results as defined by California Water Code Section 10721(x). The GMP has established minimum thresholds and measurable objectives for the following sustainability indicators determined to be a current and/or potential future undesirable result.

Groundwater in Storage

The sustainability goal is to halt the overdraft condition in the Subbasin by bringing the groundwater demand in line with sustainable yield by 2040. This will be monitored by estimating the change of groundwater volume in storage every year, based on the observed changes in groundwater levels.

Chronic Lowering of Groundwater Levels

The sustainability goal is for groundwater levels to stabilize or improve and to ensure groundwater is maintained at adequate levels for key municipal wells. Observed groundwater levels will be compared to the Borrego Valley Hydrologic Model (BVHM) projected levels for the Physical Solution implementation period.

Water Quality

The sustainability goal is for California Title 22 drinking water standards to continue to be met for potable water sources, and that water quality in irrigation wells be suitable for agricultural

[1] This total is determined by adding up the maximum amount of water produced by each pumper of groundwater in the Subbasin over the 5-year baseline period from January 1, 2010, to January 1, 2015. Because various users' pumping maximum could have occurred at any time during this period, the total BPA is higher than the total pumping in any one year.

and recreational irrigation use. Water quality monitoring will occur throughout Physical Solution implementation.

ES 4.0 OVERVIEW OF PROJECTS AND MANAGEMENT ACTIONS

The primary management tool to eliminate the overdraft is to require aggressive pumping cut-backs to a level that does not exceed the Subbasin's estimated sustainable yield of 5,700 AFY before 2040. Reaching this goal requires an approximately 76% reduction in pumping compared to the BPA. The purpose of the GMP's PMAs are primarily to (1) reduce water demand within the Subbasin by reducing the amount of water allocated to non-*de minimis* users and (2) maintain water quality suitable for current and future beneficial uses. The selected PMAs are described, as follows:

PMA No. 1 – Water Trading Program

The Water Trading Program is intended to enable groundwater users to purchase needed groundwater resources to maintain economic activities in the Subbasin, encourage and incentivize water conservation, and facilitate adjustment of pumping allocations as water demands and Subbasin conditions fluctuate during the Physical Solution implementation. The Water Trading Program will be implemented as set forth in the Judgment.

PMA No. 2 – Water Conservation Program

The Water Conservation Program would consist of separate components for the three primary water use sectors: agricultural, municipal, and recreation. A water conservation program will be highly dependent upon securing funding such as through existing and future grants and low interest loan programs.

PMA No. 3 – Pumping Reduction Program

Each non-*de minimis* groundwater user within the Subbasin will be assigned an allocation based on its historical groundwater use. That allocation will be reduced incrementally as necessary over the Physical Solution implementation period such that the total extraction from the Subbasin will be equal to the estimated sustainable yield target (the initial sustainable yield target is 5,700 AFY) by 2040. Mandatory water metering for all non-*de minimis* groundwater users will take place following adoption of this GMP. The Pumping Reduction Program will be implemented as set forth in the Judgment.

PMA No. 4 – Voluntary Fallowing of Agricultural Land

The voluntary Fallowing Program will create a process to convert high water use irrigated agriculture land to low water use open space or public land, on a voluntary basis. Once implemented, the Fallowing Program would provide property owners with transferable BPAs in exchange for land fallowing. This PMA is implemented by the Water Trading Program, PMA No. 1 above.

PMA No. 5 – Water Quality Optimization

The Water Quality Optimization program is intended to identify as-needed direct and indirect treatment options for BWD and other pumpers to optimize groundwater quality and its use and minimize the need for expensive water treatment to meet drinking water standards.

PMA No. 6 – Intra-Subbasin Water Transfers

The purpose of intra-subbasin transfer program is to mitigate existing and future reductions in groundwater storage and groundwater quality impairment by establishing an intrabasin conveyance capability for transferring groundwater production from higher to lower production alternative areas in the subbasin. This PMA would only be implemented after the Watermaster evaluates the feasibility and effectiveness of utilizing new or existing well sites in the subbasin where groundwater conditions are more favorable for continued groundwater extraction.

Watermaster Responsibilities

The Watermaster is responsible for implementing the Physical Solution over SGMA's planning and implementation horizon and thereafter, with Subbasin sustainability required to be achieved by January 31, 2040. The Watermaster will submit annual and more detailed 5-year reports to DWR by April 1 of each year. The annual reports will document new data being collected to track groundwater conditions within the Subbasin, monitor progress on implementation of PMAs, and present an evaluation of measured data in comparison to interim milestones for each sustainability indicator. The 5-year reports provide the Watermaster an opportunity to evaluate the success and/or challenges in Physical Solution implementation, including reporting on the effectiveness of PMAs. If knowledge of Subbasin conditions have changed based on updated data, if management criteria (e.g., sustainable yield, minimum thresholds, or interim milestones) need to be modified, or if PMAs need to be modified or added, revisions to the Physical Solution may be proposed and the necessary steps taken by the Watermaster.

The GSA has performed substantial work toward estimating the cost of GSP implementation. Chapter 5, Plan Implementation, contains a breakdown of tasks and associated cost estimates. The total estimated GSP implementation cost for the anticipated 20-year implementation period is $20,352,000. This estimate includes (1) operations and monitoring costs; (2) management, administration, and other costs; (3) 5-year annual reviews; (4) 10% contingency; (5) PMAs development; and (6) California Environmental Quality Act review but does not include the implementation of all PMAs or final costs incurred by BWD for internal management and administration. Additional budget will be required to implement PMAs once they have been developed. In general, the GSA planned to fund GSP implementation using a combination of administrative pumping fees, assessments/parcel taxes, and/or grants. The Watermaster's costs for Physical Solution implementation are likely less than those GSP implementation costs estimated by the GSA due to anticipated efficiencies entailed by the negotiated terms of the Physical Solution that have been agreed to by participating pumpers.

CHAPTER 1
INTRODUCTION

1.1 PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN

The County of San Diego (County) and the Borrego Water District (BWD), acting together as the groundwater sustainability agency (GSA) for the Borrego Valley Groundwater Basin (BVGB), developed a Groundwater Sustainability Plan (GSP) in compliance with the 2014 Sustainable Groundwater Management Act (SGMA) (California Water Code Section 10720–10737.8, et al.) and the Department of Water Resources (DWR) GSP Regulations (California Code of Regulations, Title 23, Section 350 et seq.). Among the legislative purposes of SGMA are for California's groundwater basins to be managed sustainably, "to manage groundwater basins through the actions of local government agencies to the maximum extent feasible," and to provide local public agencies acting as GSAs with the authority and technical and financial assistance necessary to achieve basin sustainability (California Water Code Section 10720.1). Appendix A includes the *Preparation Checklist for GSP Submittal*, which identifies where in this GMP each of the statutory requirements under SGMA are addressed.

In October 2016, the California DWR released final 2016 modifications to California's groundwater basin boundaries (Bulletin 118 Basins (2016 Edits)), which included the subdivision of the BVGB into two separate subbasins: the Borrego Springs Groundwater Subbasin (7-024.01) and the Ocotillo Wells Groundwater Subbasin (7-024.02) (Figure 1-1).[1] The GSA jurisdictional boundary consists of the entire Borrego Springs Subbasin (Plan Area) and the portion of the Ocotillo Wells Subbasin within San Diego County. The Borrego Springs Subbasin is designated by DWR as high priority and critically overdrafted; whereas, the Ocotillo Wells Subbasin is designated as very low priority and not critically overdrafted (DWR 2019).[2] The presence and potential interconnectedness of groundwater basins and subbasins adjacent to the Borrego Springs Subbasin, including the Ocotillo Wells Subbasin, are described and considered in this GMP, though the focus and requirement of the GMP is on achieving sustainable groundwater management in the Borrego Springs Subbasin by January 31, 2040. The 21 basins in California designated as critically overdrafted must be managed by a GSP or acceptable alternative by January 31, 2020, to avoid potential State Water Resources Control Board (SWRCB) intervention.

---

1 The Borrego Springs Groundwater Subbasin (7-024.01) and the Ocotillo Wells Groundwater Subbasin (7-024.02) are abbreviated as the "Borrego Springs Subbasin" and "Ocotillo Wells Subbasin" in this document.

2 The basin prioritization process automatically assigns basins considered to be in critical overdraft a high priority, and automatically assigns basins whose pumpers are using less than 2,000 acre-feet per year of groundwater a very low priority, regardless of the prioritization score received from other metrics (DWR 2019).

SGMA defines sustainable groundwater management as the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results." "Undesirable results" are defined in SGMA and are summarized here as any of the following effects caused by groundwater conditions occurring throughout the basin:[3]

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable degraded water quality
- Significant and unreasonable seawater intrusion
- Significant and unreasonable land subsidence
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

As described in Chapter 2, Plan Area and Basin Setting, undesirable results within the Borrego Springs Subbasin are occurring with respect to chronic lowering of groundwater levels and significant and unreasonable reduction of groundwater storage. Portions of the Subbasin are also experiencing, or are under threat of experiencing, degraded water quality. Seawater intrusion is not possible for this inland basin. Land subsidence has been minimal to date and is unlikely to produce undesirable results in the foreseeable future. The depletions of interconnected surface water and resulting deleterious effects on groundwater dependent ecosystems have occurred pre-January 1, 2015, within the Borrego Springs Subbasin, as documented in Chapter 2.

The GSP was subsequently repurposed as this Groundwater Management Plan (GMP) as part of the Physical Solution under the Judgment. This GMP represents a key milestone in achieving groundwater sustainability within the Plan Area by 2040 as required by SGMA. This GMP characterizes groundwater conditions, trends, and the cumulative impacts of groundwater pumping for each of the SGMA-defined sustainability indicators (Chapter 2); establishes minimum thresholds, measurable objectives, and interim milestones by which sustainability can be measured and tracked (Chapter 3, Sustainable Management Criteria); identifies projects and management actions to be implemented by the Watermaster and/or stakeholders to minimize undesirable results (Chapter 4, Projects and Management Actions); and outlines a plan for annual reporting and periodic (i.e., 5-year) evaluations (Chapter 5, Plan Implementation). The Physical

[3] "Basin" as defined in SGMA, means a groundwater basin or subbasin identified and defined in Bulletin 118 or as modified pursuant to California Water Code Section 10722, et seq. (Basin Boundaries).

Solution documents a viable path, determined by the GSA in collaboration with stakeholders, and informed by the best available information, to achieving the sustainability goal within the Borrego Springs Subbasin.

1.2 SUSTAINABILITY GOAL

The Physical Solution is intended to meet the overarching sustainability goal of SGMA to operate the Borrego Springs Subbasin within sustainable yield without causing an undesirable result. The Subbasin must meet its sustainability goal no later than 2040.

1.3 AGENCY INFORMATION

The Borrego Valley GSA was comprised of the BWD, which has water supply and water management responsibilities within its Borrego Springs service area; and the County, which has land use responsibilities and implements the County's Groundwater Ordinance throughout the limits of the BVGB within the boundary of the County of San Diego. The Watermaster takes the place of the GSA.

Pending the Watermaster's formation and hiring of a Technical Advisor, the contact name and mailing address of the Watermaster for the Borrego Valley GSA is as follows:

Jim Bennett, Water Resources Manager
Borrego Valley Groundwater Sustainability Agency
5510 Overland Avenue, Suite 310 | San Diego, California 92123 | 858.694.3820

1.3.1 Organization and Management Structure of the Groundwater Sustainability Agency

The Watermaster takes the place of the GSA to implement the Judgment. The following information is provided for background information pertaining to the GSA's development of the draft final GSP. In October 2016, the BWD and the County entered into a Memorandum of Understanding (MOU) establishing the process/structure in which the GSP will be developed and establishes the organization and management structure of the GSA (Appendix B). The MOU designated a Borrego Basin Plan Core Team (Core Team) and an Advisory Committee (AC) made up of stakeholders. The Core Team consists of representatives from the County and the BWD, working cooperatively together to achieve the objectives of SGMA. Core Team members serve at the request of the GSA and may be removed/changed by the appointing party (either BWD or the County) at any time. Members of the GSA must notify all other parties to the MOU in writing if the first party removes or replaces any Core Team members. "Each Core Team member's compensation for their service on the Core Team is the responsibility of the appointing

Party" (Appendix B). During the development of the GSP, at least two members from each party participated in the Core Team from project conception through completion of the GSP.

The Core Team worked cooperatively with the AC to develop bylaws for the governance of the AC. These bylaws were subject to approval by the Core Team prior to adoption by the AC. The AC provided input to the Core Team on GSP development on basin sustainability measures, as well as the planning, financing, and implementation of the GSP. Members of the GSA agreed on the composition of the AC and acknowledged that the AC must meet the requirements established in SGMA (Appendix B). Members of the AC were not compensated for activities associated with the AC, GSP development, or any activity conducted under the MOU. Since early 2017, the AC regularly held public meetings and received detailed reports on a wide array of GSP related issues. In addition, the AC provided input to the Core Team on GSP development topics, including sustainability measures, projects and management actions and the planning, financing, and implementation of the GSP.

AC bylaws were adopted and approved at the June 29, 2017, Borrego Valley GSP AC Meeting. The AC was limited to nine members (Appendix B). AC representatives were nominated by the following six stakeholder organizations apportioned as follows:

1. Four members were nominated by the Borrego Water Coalition and fill the following representative roles (i.e., one agricultural member, one recreation member, one independent pumper, and one at-large member). The Borrego Water Coalition represents a cross-section of groundwater pumpers in Borrego Springs.
2. One member was nominated by the Borrego Springs Community Sponsor Group, which is an advisory board that provides local review and input for land use issues to the County.
3. One member was nominated by the Borrego Valley Stewardship Council, which represents community groups associated with the Anza-Borrego Desert State Park and geotourism initiative.
4. One member was nominated by the BWD Board of Directors to represent ratepayers/property owners, and is not an employee or elected official. The BWD represents over 2,000 ratepayers/property owners in Borrego Springs.
5. One member was nominated by the County to represent the Farm Bureau, and is not an employee or elected official. The San Diego County Farm Bureau represents farming interests in Borrego Springs.

6. One member was nominated by the California State Parks, Colorado Desert Region to represent the Anza-Borrego Desert State Park. The California State Parks represent the approximately 600,000-acre Anza-Borrego Desert State Park that surrounds Borrego Springs.

Each AC member served a term, which ran concurrently with the development and completion of the GSP. A vacancy was recognized for any AC member who: (1) died, (2) resigned, (3) had unexcused absences from more than three of the scheduled AC meetings within a single calendar year, (4) missed three meetings in a row, (5) regularly failed to abide by the discussion covenants of the AC, (6) violated the Ralph M. Brown Act, or (7) failed to properly exercise the purpose and authority of the AC. The composition of the AC is described in Section 2.1.5, Notice and Communication.

Appendix B contains documentation, in reverse chronological order, of the formation of the GSA and initiation of the GSP in compliance with SGMA. Appendix B also includes the GSP AC bylaws followed by the GSA's notices to DWR regarding its intent to cooperatively develop a GSP. Appendix B includes the MOU between BWD and the County that describes the purpose, management, and structure of the GSA; and their mutual agreement to serve cooperatively as the basin's GSA. Previous notices to DWR from the County and BWD to individually serve as the GSAs, prior to their agreement to serve jointly as the GSA (thus eliminating geographic overlap) are included at the end of Appendix B as well, for reference. Information regarding the Borrego Valley GSA, including the MOU, Stakeholder Engagement Plan, Notice of Intent to Develop a GSP, and AC Bylaws can also be found at the County's SGMA Borrego website, http://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html.

1.3.2 Legal Authority of the Groundwater Sustainability Agency

The Watermaster takes the place of the GSA and is authorized to exercise the powers of a GSA consistent with the Judgment. On September 16, 2014, Governor Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739 as part of the SGMA legislation, which provides among other powers local groundwater agencies the authority and the technical and financial assistance necessary to sustainably manage groundwater. SGMA legislation paved the way for the formation of the GSA between BWD and the County to manage the BVGB. The GSA has statutory authorities that are essential to groundwater management as well as SGMA compliance.

Section 10720.7 of SGMA requires that all basins designated in Bulletin 118 as high or medium priority be managed under a GSP and all critically overdrafted basins, such as Borrego Springs Subbasin, be managed under a GSP by 2020. Pursuant to Section 10727 of SGMA, the parties are required to develop, adopt, and implement a GSP or alternative to manage the basin and intend on using the authorities granted to them to memorialize the roles and responsibilities for developing and implementing the Physical Solution as a GSP alternative under section 10737.4 of SGMA.

1.3.3 Estimated Cost of Implementing the Groundwater Sustainability Plan and the Groundwater Sustainability Agency's Approach to Meet Costs

The Watermaster is responsible for implementing the Physical Solution under the Judgment. Annual implementation costs may vary from year to year as a result of the status of project and management actions (PMAs), significance of new data, and increased milestone reporting requirements every fifth year of implementation. The GSA's initial estimate of GSP implementation cost for the anticipated 20-year implementation period for operations and monitoring, management, administration and other costs, 5-year annual reviews and 10% contingency was approximately $19,200,000. Estimated total GSP implementation costs assumed the following general components:

- Data collection, management, and evaluation
- Annual reporting
- 5-year review assessment and reporting
- Data gap analysis and additional evaluation (e.g., Coyote creek boundary condition analysis, etc.)
- PMAs development and implementation of components as funding allows
- Management, administration, and other costs
- 10% contingency assumed over 20-year plan implementation period

In addition to the $19,200,000 required for 20-Year GSP implementation costs, an additional $652,000 was estimated to be required for PMA development costs. In addition, $500,000 was budgeted for preparation of the Environmental Impact Report (EIR) for GSP Plan Implementation. Budget for the EIR has been secured though funding provided by Proposition 1 Severely Disadvantaged Community grant. Thus, the initial estimate of total GSP implementation cost is $20,352,000 including a contingency of $1,745,000. It is emphasized that this estimate did not include the implementation of all PMAs or final costs incurred by BWD for internal management and administration. Additional budget may be required to implement PMAs once they have been developed. Implementation of PMAs such as the water conservation program will be highly dependent upon securing funding such as through state or federal grants.

Additional information on GSP implementation costs, and how the GSA planned to fund these costs, is provided in Chapter 5. In general, the GSA planned to fund GSP implementation using a combination of groundwater extraction charges, including monthly fixed charges and variable pumping fees, assessments/parcel taxes, and/or grants. Potential funding sources specific to PMAs are presented in Chapter 4.

The Watermaster's costs for Physical Solution implementation are likely less than those GSP implementation costs estimated by the GSA due to anticipated efficiencies entailed by the negotiated terms of the Physical Solution that have been agreed to by participating pumpers. Stipulating parties representing a super-majority of water production within the Subbasin have agreed among themselves in a separate agreement to fund the initial Watermaster costs under the GMP until the Judgment is approved by the Court and until the Watermaster develops its own budget as per the Judgment.

1.4 GROUNDWATER MANAGEMENT PLAN ORGANIZATION

This GMP is organized as follows:

- The **Executive Summary** is a plain language summary that provides an overview of the GMP and a description of groundwater conditions in the basin.
- **Chapter 1, Introduction,** includes the purpose of the GMP, sustainability goals, and agency information and outlines document organization.
- **Chapter 2, Plan Area and Basin Setting,** consists of two main parts. This first part provides a general overview of the Plan Area, including agency jurisdiction, relevant water resources monitoring and management plans, a description of land uses and land use policies, and an overview of GMP notice and communication activities. The second part describes, in depth, the hydrogeologic setting of the plan area, including a description of current and historical conditions related to each undesirable result defined under SGMA. The second part also provides a summary of the groundwater modeling and water budget components established for the Plan Area.
- **Chapter 3, Sustainable Management Criteria,** describes criteria by which the GMP has defined conditions that constitute sustainable groundwater management for the basin, including the process by which the GSA characterized undesirable results, and established minimum thresholds and measurable objectives for each applicable sustainability indicator.
- **Chapter 4, Projects and Management Actions,** consists of a description of the projects and management actions the Physical Solution has determined will achieve the sustainability goal

for the basin, including projects and management actions to respond to changing conditions in the basin.

- **Chapter 5, Plan Implementation,** provides an estimate of GSP implementation costs, a schedule for implementation, and a plan for annual reporting and periodic (5-year) evaluations.

1.5 REFERENCES CITED

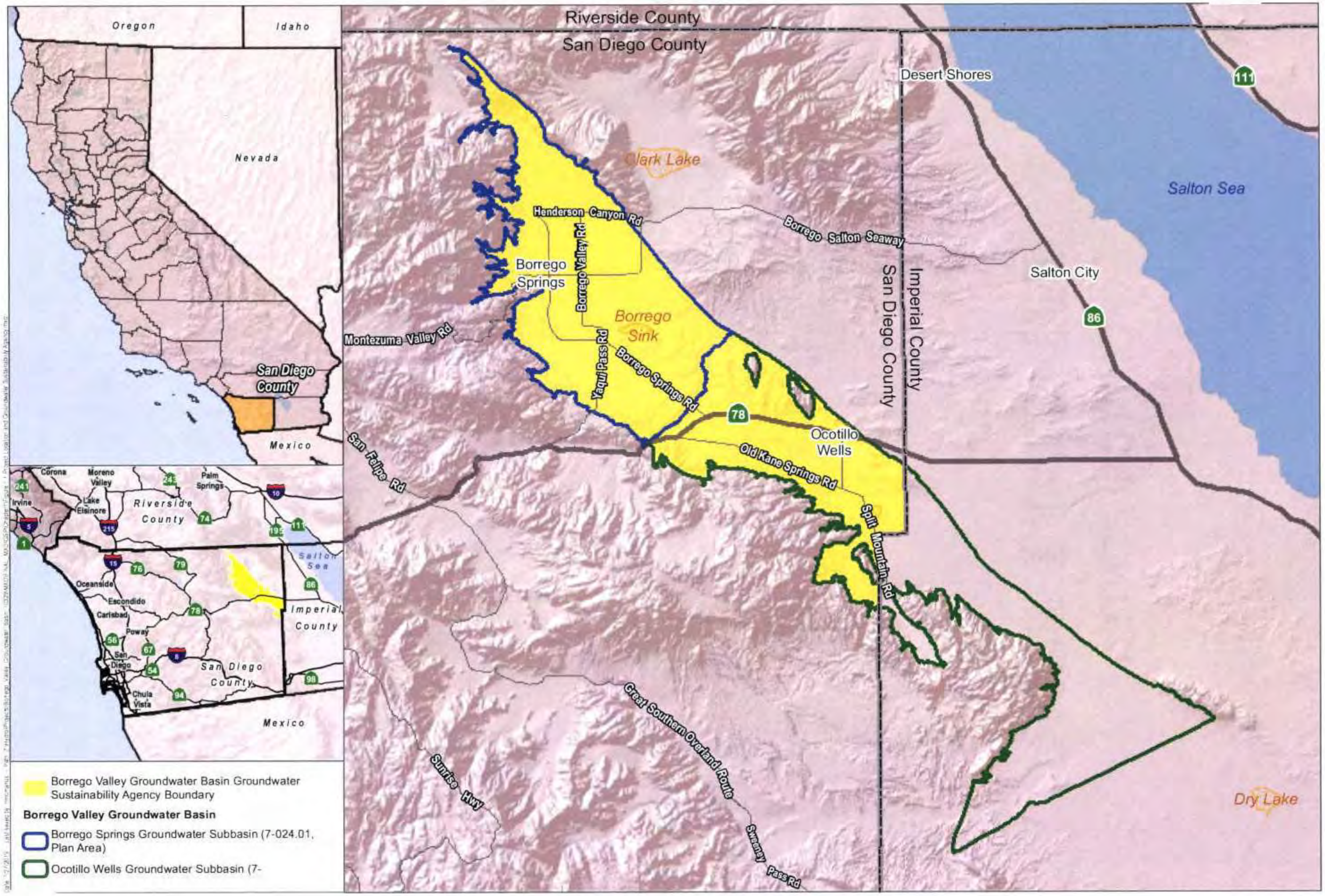
Department of Water Resources (DWR). 2019. *Sustainable Groundwater Management Act 2018 Basin Prioritization Process and Results*. January 2019.

INTENTIONALLY LEFT BLANK

Figure 1-1 Project Location and Groundwater Sustainability Agency

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983 DATA SOURCE: DWR 2016

DUDEK January 2020 0 3 6 Miles

FIGURE 1-1

Project Location and Groundwater Sustainability Agenc

yGroundwater Management Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK

CHAPTER 2
PLAN AREA AND BASIN SETTING

2.1 DESCRIPTION OF THE PLAN AREA

As described in Chapter 1, Introduction, the Groundwater Sustainability Agency (GSA) boundary encompassed the entire Borrego Springs Groundwater Subbasin and the portion of the Ocotillo Wells Groundwater Subbasin within San Diego County.[1] The GSA comprised the County of San Diego (County) and the Borrego Water District (BWD). The California Department of Water Resources (DWR) has designated the Borrego Springs Subbasin (Subbasin) of the Borrego Valley Groundwater Basin (BVGB) to be high priority[2] and critically overdrafted (DWR 2016, 2018). The 2018 Sustainable Groundwater Management Act (SGMA) basin prioritization process automatically assigns basins considered to be in critical overdraft a high priority (DWR 2019). Under the DWR Groundwater Sustainability Plan (GSP) regulations, GSA's "have the responsibility for adopting a Plan that defines the basin setting and establishes criteria that will maintain or achieve sustainable groundwater management" (Title 23 California Code of Regulations (CCR) Section 350.4(e)).

For the purpose of this GMP, the "Plan Area" is defined as the Borrego Springs Subbasin, which has a surface area of approximately 98 square miles or 62,776 acres (Figure 2.1-1). The western and southwestern boundary of the Borrego Springs Subbasin is defined by the contact of poorly to moderately consolidated sediments with the plutonic and metamorphic basement of Pinyon Ridge and the San Ysidro Mountains. The northern and eastern boundaries are defined by the mapped trace of the Coyote Creek fault that trends northwest–southeast. East of the Coyote Creek fault lies Coyote Mountain, the Borrego Badlands, and the Ocotillo-Clark Valley Groundwater Basin. The southeastern boundary of the Plan Area is defined by the location of San Felipe Creek, as mapped by the U.S. Geological Survey (USGS) National Hydrography Dataset, which also marks the northern boundary of the Ocotillo Wells Subbasin.

Although the Plan Area is limited to the Borrego Springs Subbasin, information applicable to the Ocotillo Wells Subbasin, as well as the hydrologic characteristics of the watersheds contributing to the Borrego Springs Subbasin, is also provided in this chapter. DWR has characterized the Ocotillo Wells Subbasin as having a "very low" priority, because it meets the uniformly applied

1 The Borrego Springs Groundwater Subbasin and Ocotillo Wells Groundwater Subbasin are referred to as the Borrego Springs Subbasin and the Ocotillo Wells Subbasin in this document.

2 Basin prioritization classifies the California's 517 basins and subbasins into priorities based on components identified in the California Water Code. The priority process consists of applying datasets and information in a consistent, statewide manner in accordance to the provisions in California Water Code, Section 10933(b). Further information on DWR's basin prioritization process can be found on the following website: https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization.

standard that any basin whose pumpers are using less than 2,000 acre-feet[3] per year (AFY) of groundwater be automatically assigned a very low priority, regardless of the prioritization score received from other metrics (DWR 2019). For reference, however, the Ocotillo Wells Subbasin received low priority rankings for most components of the 2018 SGMA basin reprioritization process because it has very low pumping demand, population density, and groundwater well density, as well as a lack of irrigated agriculture (DWR 2019). The Ocotillo Wells Subbasin is approximately 141 square miles or 90,075 acres. GSAs are not required to prepare a GSP for basins categorized as low or very low priority (California Water Code Section 10727).

The watersheds draining to Borrego Springs Subbasin contribute the majority of recharge to the Plan Area (focused infiltration of runoff) in the form of streamflow exiting the mountains onto the desert alluvial fans that abut the mountain front. The major contributing watersheds to the Subbasin include the Coyote Creek Watershed, which is approximately 179 square miles (114,615 acres); the Upper San Felipe Creek Watershed, which is approximately 194 square miles (124,124 acres); and the Borrego Valley-Borrego Sink Wash Watershed, which is approximately 158 square miles (101,371 acres). A summary of the groundwater subbasins, contributing watersheds and DWR designations is provided in Table 2.1-1.

Table 2.1-1
Summary of the Borrego Valley Groundwater Basin and Watershed Areas

	Area			DWR Designations					
Basin Name	*Acres*	*Square Miles*	*Portion in San Diego County*	*Basin Number*	*Critically Overdrafted*	*Basin Priority*[1]	**Previous Groundwater Management Plan**	**2015 USGS Groundwater Basin Model**	**GSP Required per SGMA**
Borrego Springs Groundwater Subbasin	62,776	98	100%	7-024.01	Yes	High	Yes[2]	Covered	Yes
Ocotillo Wells Groundwater Subbasin	90,075	141	44%[3]	7-024.02	No	Very Low	No	Partially covered	No
Watersheds Contributing to the Borrego Springs Groundwater Subbasin	277,334	433	80%[4]	*Not applicable, but relevant for recharge to the Borrego Springs Subbasin and the water budget. Consists of the Coyote Creek Watershed, Upper San Felipe Creek Watershed, and Borrego Valley-Borrego Sink Wash Watershed. This area excludes watershed areas overlapped by the Borrego Springs Subbasin*					

Notes: DWR = Department of Water Resources; USGS = U.S. Geological Survey; GSP = Groundwater Sustainability Plan; SGMA = Sustainable Groundwater Management Act.

1 Based on the 2018 SGMA Basin Prioritization (DWR 2019).

2 The previous Groundwater Management Plan was Adopted by the Borrego Water District in 2002 per Assembly Bill 3030 (BWD 2002).

3 The volume of water required to cover 1 acre of land (43,560 square feet) to a depth of 1 foot. Equal to 325,851 gallons or 1,233 cubic meters.

3 The remainder of the Ocotillo Wells Subbasin is within Imperial County.
4 The remainder of the contributing watershed (Coyote Creek Watershed) is within Riverside County.

2.1.1 Summary of Jurisdictional Areas and Other Features

The Plan Area consists primarily of private land under County jurisdiction, which is surrounded on nearly all sides by land owned by the State of California. The developed land uses in the Plan Area include residential, agricultural, recreational, and commercial (County of San Diego 2011). The public water district serving the Plan Area is the BWD, which provides water and sewer service to the developed portions of Borrego Valley within its service area (Figure 2.1-2). BWD's service area is approximately 31,846 acres in size. Approximately 29,938 acres of BWD's service area is within the Plan Area, and the remainder, or about 1,908 acres, is outside of the Plan Area. BWD's service area covers approximately 48% of the Plan Area. With the exception of Air Ranch, a farm to the north of the BWD boundary, certain visitor facilities on Anza-Borrego Desert State Park (ABDSP) land, and a few other minor developed uses, the developed portions of the Plan Area are entirely within BWD's service area boundary. As shown on Figure 2.1-2, there are several small water systems apart from BWD that also provide water service within the Plan Area, including Anza-Borrego Desert State Park at Palm Canyon and Horse Camp, Borrego Air Ranch Water Company, and Smoke Tree Ranch. Figure 2.1-2 also shows public water districts and small water systems within Ocotillo Wells Subbasin for reference.

Approximately 67% of the Plan Area consists of private land under County jurisdiction, and 27% of the Plan Area consists of a portion of the ABDSP, based on mapping by the California Protected Areas Database (CPAD 2017).[4] ABDSP, which is owned and managed by the California Department of Parks and Recreation, intersects the edges of the Plan Area on all sides except a small part of the northeastern border, and occupies the mountain regions above Borrego Valley (Figure 2.1-3). Approximately 5% of the land within the Plan Area is owned by the Anza-Borrego Foundation, which acquires land for conservation in and around the park, supports research in the region, and is a reserve partner in public service programs. Approximately 1% of the Plan Area is owned by the County for parks and preserves, and the BWD for operations in conjunction with BWD's pre-existing water demand reduction program. Table 2.1-2 summarizes the land ownership and jurisdiction in the Plan Area.

To evaluate current and historical land uses within the Plan Area and the Ocotillo Wells Subbasin in San Diego County, each subbasin was intersected with land use layers from the San

4 The California Protected Areas Database contains GIS data about lands that are owned in fee and protected for open space purposes by over 1,000 public agencies or non-profit organizations, and is produced and managed by GreenInfo Network (http://www.calands.org/data).

Diego Geographic Information Source[5], which has land use mapping specific to years 1990, 1995, 2000, 2004, 2008, and 2015. The percentage of various land use categories are presented in Table 2.1-3 for the Plan Area. The land uses in the Plan Area are shown on Figure 2.1-4. The ABDSP is included as "Open Space/Undeveloped Land" in the land use mapping presented in Table 2.1-3.

Table 2.1-2
Summary of Land Ownership in the Plan Area

Ownership Type	Agency	Description	Acres / % of Total
Private	Private	Urban/developed land, rural residential, agriculture, and open space under San Diego County jurisdiction	42,022 / 67%
State	California Department of Parks and Recreation	Anza-Borrego Desert State Park	17,072 / 27%
Non-Profit	Anza-Borrego Foundation	The foundation purchases land from willing sellers for addition to Anza-Borrego Desert State Park	3,190 / 5%
County	San Diego, County of	Old Springs Road Open Space Preserve, Borrego Springs Park Site Dedication	335 / <1%
Special District	Borrego Water District	District operations and historical water demand reduction program	158 / <1%
		Grand Total	**62,776**

Source: CPAD 2017.

Within the Plan Area, the majority of the land is undeveloped open space (Table 2.1-3). The primary developed land uses in the Plan Area are agriculture, residential, transportation infrastructure, and recreational (including golf course). Less than 1% of the Plan Area consists of institutional and commercial/industrial uses. Since 1990, the coverage of agricultural, residential, and recreational uses has increased. Agriculture is the most water-intensive land use in the Plan Area. From 1995 to 2015, as much as 4,000 acres within the Plan Area were estimated to have been used for irrigated agriculture (SANGIS 2017; County of San Diego 2011; BWD 2009a) (Table 2.1-3). Implementation of the BWD Water Credits Program has resulted in some reductions in the extent of lands used for agriculture in recent years. As further discussed under Section 2.1.2, property owners have fallowed approximately 600 acres of agriculture in exchange for water credits that can be sold to offset future increases in municipal water demand (BWD 2015). Note that the "agriculture" category in San Diego Geographic Information Source and shown in Table 2.1-3 does not distinguish between active, irrigated, and/or fallowed agricultural land and therefore does not assign these 600 acres to a different land use category. Currently, the total area of irrigated agriculture is approximately 2,624 acres based on updated mapping at the

[5] The San Diego Geographic Information Source is a Joint Powers Authority of the City of San Diego and the County of San Diego responsible for maintaining a regional GIS landbase and data warehouse.

parcel level done by the GSA in 2018. The parcel level mapping performed by the GSA is more detailed than the San Diego Geographic Information Source mapping presented in Table 2.1-3, and is therefore not directly comparable but should be considered the most accurate estimate for current conditions. The parcel level mapping includes only areas of the parcel actively irrigated and does not include areas of the parcel not irrigated such as farm roads, equipment storage areas and buildings.

Table 2.1-3
Plan Area Land Uses by Year in Acres and Percent

Land Use Category	1990		1995		2000		2004		2008		2015		1990–2015 Change	
	Acres	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Plan Area														
Open Space/Undeveloped Land	57,133	91.0%	55,649	88.7%	55,685	88.7%	55,054	87.7%	54,632	87.0%	54,500	86.8%	-2,632	-4.6%
Agriculture	2,343	3.7%	3,651	5.8%	3,582	5.7%	3,599	5.7%	3,472	5.5%	3,474	5.5%	1,131	48.3%
Residential	1,149	1.8%	1,288	2.1%	1,376	2.2%	1,809	2.9%	2,318	3.7%	2,369	3.8%	1,220	106.1%
Roadway/Parking Lot/Airstrip	1,048	1.7%	1,048	1.7%	1,064	1.7%	1,057	1.7%	1,064	1.7%	1,047	1.7%	-1	-0.1%
Park/Recreation/Golf Course	568	0.9%	573	0.9%	604	1.0%	723	1.2%	745	1.2%	838	1.3%	270	47.6%
Government/Other Public Institutions	300	0.5%	332	0.5%	192	0.3%	334	0.5%	335	0.5%	340	0.5%	40	13.2%
Commercial/Industrial	229	0.4%	229	0.4%	268	0.4%	195	0.3%	204	0.3%	202	0.3%	-27	1.1%

Source: SANGIS 2017.

Each jurisdictional area is described in greater detail below.

State of California

The total size of the ABDSP is about 615,000 acres. About 17,072 acres, or 27% of the Plan Area, is occupied by the ABDSP. Outside the Plan Area, the ABDSP occupies 23,383 acres within the portion of the Ocotillo Wells Subbasin within San Diego County. ABDSP draws hundreds of thousands of visitors per year, the vast majority of whom arrive between November and April, with up to 35% visiting in March with significant increases in visitors occurring during the wildflower season. Most visitors are day-users, with about one in four camping overnight. Most (75%) visit the Park's northern sections. Half of visitor traffic is concentrated in the ABDSP Visitor Center/Borrego Palm Canyon area (CDPR 2015). The ABDSP Visitor Center and Palm Canyon Campground, group sites, and trailheads are located in the western part of the Plan Area, and the Vern Whitaker Horse Camp, Desert Garden, and portions of the Wildflower fields are located in the northern end of the Plan Area. The desert springs, palm groves, and the routes/trails within the hilly and mountainous areas of the park are outside the Plan Area. A 2012 economic study developed for the Anza-Borrego Foundation estimates the revenue to the region generated by visitation to the park during an average year is approximately $40 million annually (BBC 2012).

ABDSP partners with the Steele/Burnand and Anza-Borrego Desert Research Center and the Anza Borrego Foundation to advance research opportunities and provide educational and interpretive programs. The Anza Borrego Foundation currently holds 3,190 acres (or 5% of the Plan Area) in fee for the purpose of adding to ABDSP lands for conservation in and around the Park, educating the public about the Park's resources, and supporting research relevant to the region (ABF 2017). The Steele/Burnand Anza-Borrego Desert Research Center, housed in the former Desert Club building at the western end of Palm Canyon Drive, hosts field research by biologists, astronomers, anthropologists and others, and is operated through the University of California, Irvine (UCI 2018). The center encourages research within ABDSP and its environs to foster management of the park's natural and cultural resources informed by science.

County of San Diego

Approximately 42,022 acres, or 67% of the Plan Area, consists of private land under County jurisdiction. Outside the Plan Area, there are approximately 15,408 acres of private land within the portion of the Ocotillo Wells Subbasin within San Diego County. The developed portions of the Plan Area consist of residential, agricultural, recreational, and commercial uses, with the majority of agricultural lands located in the northern portion of the Plan Area, where citrus crops and nursery stock, such as date palms, are grown for export out of the Subbasin (County of San Diego 2011).

The permanent population of the Plan Area is concentrated in the County-designated Borrego Springs Community Plan Area (CPA; Figure 2.1-4). About 13,283 acres of the Borrego Springs CPA extends outside the Plan Area; however, all of the currently developed portions of the CPA are within the Plan Area. The CPA within the Plan Area covers about 49,972 acres of the Plan Area, or about 79%. Aside from California State Park wells within ABDSP, the water wells serving the Plan Area are under County and BWD jurisdiction. Based on County well permits and DWR well logs (including identification of database overlaps), BWD well data, field reconnaissance, and aerial imagery, it is estimated that there are approximately 121 active wells within the Plan Area, including municipal wells, irrigation wells, and private/domestic wells (Figure 2.1-5). Of these 121 wells, 53 are considered to be de minimis[6] users, the majority of which (49) are domestic wells. Of the non-de minimis users, 42 are in agricultural use, 8 are in municipal use by BWD, 13 are in recreational use, and the remainder are small water systems, non-recreational irrigation, and California State Park uses. The average well density within the Plan Area for all active and inactive wells is 2.6 wells per square mile (250 wells per 98 square miles). Figure 2.1-5 shows an estimate of the well density for each square mile township and range section in the Plan Area. The estimated average well density shown on Figure 2.1-5 is based on available well log records and may include wells that are inactive or abandoned.

Population within the Plan Area is reported by several sources. A substantial number of residents choose to reside in the Plan Area during the winter, spring, and fall only, when temperatures are more temperate. The seasonal change in population complicates the population counts. According to the Borrego Springs Community Plan prepared in 2011, the full-time population within the CPA was approximately 2,700, with another 2,000 or more seasonal or "snow bird" residents (County of San Diego 2011). According to the BWD Integrated Regional Water Management (IRWM) Plan prepared in 2009, the population is reported to range from less than 3,000 in summer months to over 8,000 in the height of the winter season (BWD 2009b). The 2010 Decennial Census reported a population of 3,429 and an average household size of 2.18 persons/household (U.S Census Bureau 2018; Table 2.1-4). The 2010 census counted 2,611 housing units, of which only 1,571 were found to be occupied for year-round residence, with the remainder occupied for seasonal use, not rented, or otherwise vacant (U.S. Census Bureau 2018).

It should be noted that the census count for 2010 appears to be high when compared to the population reported by the Borrego Springs Community Plan and the IRWM Plan. In addition, the 2011–2015 American Community Survey 5-Year Estimate for population within the Borrego Springs Census Designated Place (CDP) is 2,518 in 2015 (U.S Census Bureau 2018). For the purpose of projecting future growth, the 2015 estimate by the American Community Survey was used as the current population of the CDP.

Table 2.1-4 projects future population growth using a linear extrapolation of decennial census data from 1990 and the 2015 American Community Survey 5-Year Estimate. Because the 2010

[6] SGMA defines a de minimis extractor as "a person who extracts, for domestic purposes, two acre-feet or less (of groundwater) per year."

census count appears to have captured at least some portion of non-permanent population, future growth population projections would be too high if based on the 2010 census count. Furthermore, the apparent growth in population in 2010 is not borne out by recently observed trends (for example, the American Community Survey estimate for 2015), and the same rate of population increase is unlikely to occur when considering current and future constraints on growth. These constraints include physical constraints such as the high Plan Area coverage within the FEMA 100-year floodplain, and economic and public service constraints, which besides groundwater availability limitations, also include the lack of economic sectors that provide year-round employment and limited medical services (particularly important for the older demographic of the Plan Area).

Table 2.1-4
Historical and Projected Permanent Population

Year	Population[a]
1990	2,244
2000	2,541
2010	3,429[b]
2015	2,518
2020[c]	2,582
2030[c]	2,714
2040[c]	2,852
2050[c]	2,998
Estimated Annual Growth Rate[d]	**0.5%**

Source: U.S. Census 2010, 2018.
Notes:
a Borrego Springs is a Census Designated Place. The population estimates in this table are the permanent population. Seasonal population is a large factor in Borrego Springs since the winter population may exceed 8,000 according to Borrego Water District (BWD's) Integrated Regional Water Management Plan.
b The 2010 census count is considered an anomalous count and is not used in the annual growth rate estimate for the reasons discussed in the preceding paragraph
c. Population Future = Population Current x $(1 + 0.005)^n$. Where Population Current = 2015 Population (2,518), annual growth rate = 0.005 and n = 25 years between periods.
d Annual growth rate = ((Present Value – Past Value)/Past Value)) x100 = Growth Rate/Years (N) = Annual Growth Rate, N = 25; The population in 1990 was used for the past value and the population in 2015 was used for the present value.

Borrego Springs Severely Disadvantaged Community

The Borrego Springs CDP is considered a Severely Disadvantaged Community (SDAC)[7] and located within an Economically Distressed Area (EDA). As defined in California Health and Safety Code, Section 116760.20, SDACs are Census geographies having less than 60% of the statewide annual median household income. The median household income for the Borrego Springs CDP is $36,583 per year (U.S Census Bureau 2018). As defined by California Water Code Section

[7] Map-based DAC information developed by the DWR can be reviewed at https://gis.water.ca.gov/app/dacs/,

79702(k), an EDA is a municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality with a population of 20,000 persons or less, with a median household income that is less than 85% of the statewide median household income, and with one or more of the following conditions: (1) financial hardship, (2) unemployment rate at least 2% or higher than statewide average, and/or (3) low population density. The boundary of the SDAC is shown on Figure 2.1-2.

The Borrego Water District conducted a survey of municipal water user households to gather information about the community related to future water use reduction strategies. A total of 367 Borrego Municipal User surveys were collected out of 2,200 total distributed surveys. This translates to a 16.7% response rate. A total of 44 surveys were completed online via Survey Monkey, while 323 paper surveys were mailed in or collected by BWD and local promotoras. Some of the key characteristics of the SDAC community gathered as part of community characteristics survey are as follows (ENSI 2019):

- **Population, Employment, Economy, and Tourism have Large Seasonal Fluctuations**: Borrego Springs population is seasonal, with the population peaking during the high season being from October to May, during which time it is estimated that part-time residents inflate the population from a 2,518 (2015 population) up to almost two-fold. The average seasonal tenure for households reported in the Borrego Municipal User Survey was 9.8 months per year, with about 30% of households reporting they are part-time residents (less than 9 months per year). There are approximately 2,615 total housing units in Borrego Springs, with over 1,000 units estimated to be for seasonal, recreational, or occasional use.

  The majority of business activity in Borrego Springs occurs from October to May, although the village is still active during the summer months. Tourism supports lodging, food service, and retail establishments. Wintertime attractions aside from the ABDSP include golfing and related country club activities. The area experiences extreme heat during the summer months, so the primary economic activity, tourism, is largely limited to the cooler months of the year. Much of the Borrego Springs economy is supported by "outside money" such as revenue derived from tourism, retirement income, and various forms of direct government assistance.

- **Aging Population**: The median age of residents in Borrego Springs is 53.8 years, with almost 60% of the population aged 55 years or older and 31% of the population aged 65 or older. The Census estimates 45.2% of households receive Social Security income at an average of $18,201 per year, and 30.3% of households have retirement income at an average of $19,371 per year.

- **Education and Healthcare Services**: A total of 84% of students in the Borrego Springs Unified School District (BSUSD) are Hispanic/Latino and 44% of students are English

Language Learners (ELL). The BSUSD includes a public elementary, middle, and high school, and oversight of three charter schools that have campuses in Borrego Springs. A total of 92% of BSUSD students are considered "socioeconomically disadvantaged," meaning neither of the student's parents have a high school diploma, or the student is eligible for the National School Lunch Program. Borrego Springs is located within a Medically Underserved Area in San Diego County, as defined by the federal Health Resources and Services Administration. A Medically Underserved Area is an area with too few primary care providers, high poverty rates, a higher older adult population, and/or a high infant mortality rate. There is only one medical clinic that provides comprehensive healthcare for residents in the Borrego Valley, and it does not provide emergency services.

Other than agriculture, recreation, and tourism, there is no major industry or source of high-quality employment within the Plan Area likely due to its remote location. Nearly all of the SDAC community receives water service from BWD.

2.1.2 Water Resources Monitoring and Management Programs

Already existing water resources monitoring and management programs within the Plan Area are described as follows, beginning with statewide programs and ending with local programs. Since there are no surface water resources or imported water sources within the Plan Area, the programs described are exclusively related to groundwater monitoring and management. Furthermore, there are no urban water management plans or agricultural water management plans applicable to the Plan Area, because the thresholds required for the preparation of such plans under the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7 (California Water Code, Section 10610 et seq.), are not exceeded. BWD does not qualify as an urban water supplier, as defined in California Water Code, Section 10617, because it does not serve more than 3,000 customers or supply more than 3,000 AFY. BWD serves potable water through 2,059 water meters and related infrastructure and provided approximately 1,645 AFY of water in 2016, with a 10-year average (between 2005 and 2015) of 2,502 AFY. Furthermore, BWD is not an agricultural water supplier[8] and thus is not required to prepare an agricultural water management plan.

California Statewide Groundwater Elevation Monitoring Program

In response to SBX7-6, passed by the legislature in 2009, DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) Program to encourage collaboration

[8] An "Agricultural water supplier" is defined as a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding the acreage that receives recycled water (California Water Code, Section 10608.12(a)).

between local monitoring parties and DWR and to collect statewide groundwater elevations for the purpose of tracking seasonal and long-term groundwater elevation trends in groundwater basins statewide. DWR works cooperatively with local agencies, referred to as CASGEM "Monitoring Entities," to collect and maintain groundwater elevation data in a manner that is readily and widely available to the public through the CASGEM online reporting system.

The BWD and the County are the Monitoring Entities for the purpose of tracking groundwater elevation trends within the BVGB. Both parties have been reporting groundwater levels to the CASGEM online reporting system at least semi-annually since 2011. Within the Borrego Springs Subbasin, the County has been submitting groundwater elevation data for two wells (Dr. Nel and MW-5B), and the BWD has been submitting groundwater elevation for eight wells (RH-1, ID4-1, ID4-2, ID4-6, MW-1, MW-3, MW-4, and Paddock).

Data collected as part of the CASGEM program have been integrated into the BVGB data management system, the Borrego Valley Hydrologic Model (BVHM)[9], and the monitoring and reporting program developed as part of this GSP. The groundwater elevation data collected through the CASGEM program are also made available to the public through DWR's "Groundwater Information Center (GIC) Interactive Map" application.[10]

Assembly Bill 3030: Borrego Water District Groundwater Management Plan

BWD adopted a Groundwater Management Plan (BWD GMP) in 2001. However, the BWD GMP will no longer be in effect once the GMP is adopted (California Water Code, Section 10750.1(a)).

Under the existing BWD GMP, BWD is the designated Assembly Bill (AB) 3030 groundwater management agency and, per California Water Code, Section 10754, has had the authority of a groundwater replenishment district for the BVGB (BWD 2002). Under the groundwater replenishment district law (California Water Code, Section 60220 et seq.), BWD has the authority, among other powers, to buy and sell water, exchange water, distribute water in exchange for ceasing or reducing groundwater extraction, recharge the basin, and build necessary works to achieve groundwater replenishment. Additionally, BWD has the authority to levy a replenishment assessment, but only if replenishment water is available. The intent of AB 3030 was for water districts to obtain the voluntary agreement of large water users regarding how much groundwater they would extract and how much they would rely upon purchasing imported water. BWD has used AB 3030 to do groundwater planning even though it is an isolated basin that has no access or right to

[9] The BVHM refers to the executable USGS model files (USGS 2015) updated by Dudek which Dudek provided to the Stipulating Parties.

[10] http://www.water.ca.gov/groundwater/MAP_APP/index.cfm.

any imported surface water from either the Colorado River or state water derived from the Sacramento-San Joaquin Delta.

Prior to implementation of this GMP, the BVGB remains an unmanaged basin, as the statutory provisions of the AB 3030 did not provide adequate authority for establishing a managed basin in the absence of imported water. Additionally, AB 3030 did not provide a cost-effective means to collect water extraction fees. For these reasons, BWD has previously attempted to address groundwater overdraft in the Plan Area through voluntary measures (BWD 2002, 2010). These measures have been paid for primarily by BWD's ratepayers through new development, although the water used by BWD ratepayers between 2010 and 2015 accounted for only approximately 10%–12% of annual withdrawals from the Borrego Springs Subbasin. Since 2002, despite the efforts of the Borrego Valley stakeholders to address and manage the area's groundwater resources, the BWD has lacked the authority and funding mechanisms to eliminate the overdraft within the Plan Area.

Integrated Regional Water Resources Management Plan

The Anza-Borrego Desert IRWM Region (Region), was formally approved through the California DWR's Region Acceptance Process in 2009. In 2006, the BWD began working to secure a position within an IRWM Region in the San Diego or Colorado River Funding Areas. However, these attempts were unsuccessful due to jurisdictional boundary considerations. In 2009, BWD partnered with the County and Resource Conservation District of Greater San Diego County to form the Anza-Borrego Desert IRWM Region, to better reflect the geologic and hydrologic conditions of the Borrego Valley area.

The original Region Acceptance Process submittal for the Borrego Valley area was limited to the Borrego Valley Watershed within San Diego County but was later expanded to include the portion of San Diego County that lies in the Colorado River Hydrologic Basin, the entire Borrego Valley Watershed that extends into Riverside County, and the area of San Diego County east of the Tecate Divide. The expanded Region includes the entire Anza-Borrego Desert State Park, four public water purveyors, and six separate tribal lands. The IRWM Plan prepared in 2009 presented an update on the water management and conservation measures being implemented or contemplated by stakeholders in the BVGB, including an evaluation of alternatives and costs for augmenting water resources by importing non-local supplies from sources outside the BVGB (BWD 2009b). The report accompanied applications to receive state grant funding through Proposition 50 (and subsequently Proposition 84) for a proposed water importation pipeline. Ultimately, BWD did not receive funding for the projects contemplated in the IRWM Plan.

The BWD is engaged in a Conservation Management Program as part of its continued efforts to preserve groundwater resources (BWD 2009b). The program is designed to reduce water use and mitigate impacts of new water uses in the community. The program includes a tiered rate schedule for residential, commercial, and irrigation water usage. Conservation incentive policies include an education program, promotion of low flush toilets, low water use washing machines, turf removal, and irrigation efficiency auditing (BWD 2009b).

Porter–Cologne Water Quality Control Act and Clean Water Act Permitting

The Porter–Cologne Water Quality Control Act (codified in California Water Code, Section 13000 et seq.) is the primary state water quality control law for California; whereas, the federal Clean Water Act applies to all waters of the United States, the Porter–Cologne Act applies to waters of the state[11], which includes isolated wetlands and groundwater in addition to federal waters. It is implemented by the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). In addition to other regulatory responsibilities, the RWQCBs have the authority to conduct, order, and oversee investigation and cleanup where discharges or threatened discharges of waste to waters of the state could cause pollution or nuisance, including impacts to public health and the environment. The BVGB is within the Colorado River Basin (RWQCB Region 7) and within the Anza Borrego Hydrologic Unit per the RWQCB Basin Plan. These statutes are relevant to the GSP in that they regulate the quality of point-source discharges (e.g., wastewater treatment plant effluent, industrial discharges, and on-site wastewater treatment systems (OWTSs) and non-point source discharges (e.g., stormwater runoff) to the underlying aquifer.

The *Water Quality Control Plan for the Colorado River Basin* (Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan (California Water Code, Sections 13240–13247). The Porter–Cologne Act provides the RWQCBs with authority to include within their basin plan water discharge prohibitions applicable to particular conditions, areas, or types of waste. The Basin Plan is continually being updated to include amendments related to implementation of total maximum daily loads, revisions of programs and policies within the Colorado River Basin RWQCB region, and changes to beneficial use designations and associated water quality objectives. The beneficial uses for groundwater for the Anza Borrego Hydrologic Unit are MUN,[12] IND,[13] and AGR[14]. According to the SWRCB "Sources of Drinking Water" policy, as adopted by the SWRCB on May 19, 1988 (Resolution No. 88-63),

---

11 "Waters of the state" are defined in the Porter–Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050(e)).

12 Municipal and Domestic Supply: Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

13 Industrial Service Supply: Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.

14 Agriculture Supply: Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

groundwater is considered to be suitable, or potentially suitable, for municipal or domestic water, except where:

- Total dissolved solids (TDS) exceed 3,000 milligrams per liter (mg/L) (5,000 microSiemens, electrical conductivity), and it is not reasonably expected by the RWQCB to supply a public water system;
- There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either BMPs or best economically achievable treatment practices; or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day (gpd).

The Basin Plan recognizes that some hydrologic units contain multiple aquifers that may each support different beneficial uses.

The Basin Plan also designates beneficial uses for surface waters. The designated beneficial uses for San Felipe Creek are agriculture; fresh water replenishment; groundwater recharge; water contact and non-water contact recreation; warm freshwater habitat; wildlife habitat; and preservation of rare, threatened, or endangered species. The Borrego Sink Wash, receiving flows from ephemeral streams, is listed in the Basin Plan as having intermittent beneficial uses of fresh water replenishment, groundwater recharge, non-water contact recreation, and wildlife habitat.

The Porter–Cologne Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. California Water Code Section 13260 subdivision (a) requires that any person discharging waste or proposing to discharge waste—other than to a community sewer system—that could affect the quality of the waters of the state, file a Report of Waste Discharge with the applicable RWQCB. For discharges directly to surface water (waters of the United States), a National Pollutant Discharge Elimination System (NPDES) permit is required, which is issued under both state and federal law; for other types of discharges, such as waste discharges to land (e.g., spoils disposal and storage), erosion from soil disturbance, or discharges to waters of the state (such as groundwater and isolated wetlands), Waste Discharge Requirements (WDRs) are required and are issued exclusively under state law. WDRs typically require many of the same best management practices (BMPs) and pollution control technologies as required by NPDES-derived permits.

The NPDES and WDR programs regulate construction, municipal, and industrial stormwater and non-stormwater discharges under the requirements of the Clean Water Act and the Porter–Cologne Act, respectively. The construction and industrial stormwater programs are administered by the SWRCB; whereas, individual WDRs, low-threat waivers, and other basin-specific programs are administered by the Colorado River Basin RWQCB. Programs and policies that have particular relevance to the BVGB include the following:

- **Stormwater General Permits (construction and industrial general permits):** The SWRCB and Colorado River Basin RWQCB administer a number of general permits that are intended to regulate activities that collectively represent similar threats to water quality across the state and thus can appropriately be held to similar water quality standards and pollution prevention BMPs. Construction projects over 1 acre in size are regulated under the Statewide Construction General Permit and are required to develop and implement a Stormwater Pollution Prevention Plan. Similarly, industrial sites are also required to develop a Stormwater Pollution Prevention Plan that identifies and implements BMPs necessary to address all actual and potential pollutants of concern. The entities within the BVGB currently subject to an industrial Stormwater Pollution Prevention Plan include Borrego Landfill Inc., the Borrego Valley Airport, and the BSUSD (for its bus maintenance yard) (SWRCB 2018).
- **Irrigated Lands Regulatory Program:** Water discharges from agricultural operations include irrigation runoff, flows from tile drains, irrigation return flows, and stormwater runoff. These discharges can affect water quality by transporting pollutants, including pesticides, sediment, nutrients, salts (including selenium and boron), pathogens, and heavy metals, from cultivated fields into surface waters and/or groundwater. To prevent agricultural discharges from impairing the waters that receive these discharges, the Irrigated Lands Regulatory Program (ILRP) regulates discharges from irrigated agricultural lands. This is done by issuing WDRs or conditional waivers of WDRs to growers. These orders contain conditions requiring water quality monitoring of receiving waters and corrective actions when impairments are found. Through a series of events related to the passage of SB 390 (Alpert), the ILRP originated in 2003. Initially, the ILRP was developed for the Central Valley RWQCB. As the Central Valley RWQCB ILRP progressed, a groundwater quality element was added to the filing requirement for agricultural lands that had previously been subjected to only surface water discharge concerns. To date, the different RWQCBs are in different stages of implementing the ILRP. The Colorado River RWQCB has a conditional waiver program for farms in the Imperial Valley but does not have a similar program for the Borrego Valley.
- **OWTS Requirements:** Requirements for the siting, design, operation, maintenance, and management of OWTSs are specified in the SWRCB's "Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy)." The OWTS policy sets forth a tiered implementation program with requirements based upon levels (tiers) of potential threat to water quality. The OWTS policy includes a conditional waiver for on-site systems that comply with the policy. The County Department of Environmental Health (DEH) enforces these statewide

requirements through Chapter 3, Division 8, of Title 6 of the San Diego County Code and the Local Agency Management for OWTS. The DEH Local Agency Management Program for OWTS prepared by the County in February 2015 applies to both the San Diego and Colorado River Basin RWQCBs. Provided that no public sanitary sewer system is available, the ordinance allows for installation of OWTS if the requirements and standards of the ordinance are complied with, and a permit issued by the DEH is obtained. Standards and requirements include, but are not limited to, soil percolation tests to determine soil suitability; the selection of a treatment system appropriate for the site conditions; groundwater separation requirements; contractor licensing requirements; and specific layout/setback requirements from lakes, streams, ponds, slopes, and other utilities and structures. The County DEH also provides permitting services for graywater systems.

- **Individual WDRs**: Individual WDRs are required for point source discharges to land not otherwise covered under a general permit program or conditional waiver. The purpose of individual WDRs are to define discharge prohibitions, effluent limitations, and other water quality criteria necessary to ensure discharges do not result in exceedances of Basin Plan objectives for receiving waters, including groundwater. Examples of individual WDRs in the Plan Area include those for the Rams Hill Wastewater Treatment Facility (WWTF) owned and operated by BWD (Colorado River Basin RWQCB Order No. R7-2007-0053) and the Borrego Springs Landfill (Order No. R7-2014-0051).

Implementation of the GMP would not affect the applicability or implementation of the regulatory programs discussed above, and continued implementation of Porter–Cologne Water Quality Control Act and Clean Water Act permitting would advance the GMP's sustainability goals. The County requires that new development and redevelopment projects proposed within the Subbasin comply with NPDES permits, WDRs, and OWTS requirements as part of its permitting and approval process. These programs will continue to provide benefits to water quality by requiring both point and non-point discharges to comply with Basin Plan water quality objectives and to be protective of Basin Plan beneficial uses throughout SGMA's planning and implementation horizon. In addition, the application of stormwater permits means specific performance standards for capture and infiltration of stormwater runoff would be implemented where applicable, providing opportunities for enhanced recharge of the Subbasin.

Demand Offset Mitigation Water Credits Policy

The current Demand Offset Mitigation Water Credits Policy (WCP) was initiated in 2004 as a means for the BWD and later the County to encourage the voluntary immediate cessation and/or reduction of measurable water use in the Subbasin. The objectives of the WCP include: (a) to reduce the demand on the upper groundwater aquifer that underlies the Borrego Valley; (b) to provide a mechanism by which new water demands are mitigated in compliance with the

California Environmental Quality Act (CEQA); and (c) to create economic incentives for property owners engaged in high water demand activities to cease or reduce their groundwater demands consistent with the objectives of the BWD BMP as adopted by the BWD in 2001, and as subsequently amended and updated (BWD 2015). The WCP is designed to encourage the conversion of local farmland and high water use areas (i.e., golf courses) to land uses with less water demand. A Memorandum of Agreement between the County and the BWD identifies criteria that must be met to receive water credit for fallowed lands (BWD and County of San Diego 2013).

The BWD began issuing credits in 2008 that did not necessarily meet County approval standards but abided by the BWD's WCP and aimed to further encourage reduced groundwater demand within the Subbasin. A water credit is an entitlement created under the WCP that recognizes the fallowing of actively irrigated land in the Plan Area. Water credits can be used to offset the future groundwater use of proposed development. One water credit is defined as 1 AFY of groundwater use. The number of water credits issued is calculated by multiplying the total area of irrigated land by a groundwater consumptive use factor based on crop type. Water credits for future groundwater use are made available by the BWD and can be obtained from private landowners with existing water credits issued by the BWD. Although the County can decide if water credit applications meet County requirements, BWD has authority and has issued credits without County input.

To date, fallowed sites are placed in one of two categories: (1) groundwater restrictive easements on lands that were fallowed as direct mitigation measures for development in which no water credits were assigned and (2) fallowing and/or groundwater reduction measure sites that were allotted water credits by the BWD without being related to any particular development. Four groundwater restrictive easements have thus far been issued for direct mitigation, and 12 groundwater restrictive easements for water credits. To date, these fallowed lands consist of approximately 600 acres of irrigated land and 1,886.5 originally issued credits. Of this total, the County has approved approximately 178 acres and 727 credits. As of December 2018, 46.5 water credits have been retired, and there are 1,840 remaining water credits. Under the Physical Solution, existing water credits associated with the WCP will be converted to a Baseline Pumping Allocation of approximately 2124 AFY using the groundwater consumptive use factors developed by the GSA, as further discussed in Section 4.4, Pumping Reduction Program.

Groundwater Mitigation Program

By resolution, the BWD implemented a groundwater mitigation program that works in conjunction with the County's *Department of Planning & Land Use Policy Regarding Cumulative Impact Analyses for Borrego Valley Groundwater Use* (adopted in 2004) in the Borrego Valley (County of

San Diego 2007). The County policy, originally adopted in 2004, and most recently revised in 2007, requires all proposed development projects subject to discretionary land use review by the County[15] to also be reviewed for potential adverse impacts on the Borrego Springs Subbasin. The County requires these projects to demonstrate that the proposed water demands are offset by an equal water demand reduction or additional water supply (County of San Diego 2007). In 2016, the BWD implemented a more stringent policy in anticipation of SGMA, in which all new development in Borrego Springs supplied by the BWD must retire existing water demands on a 4:1 basis (BWD Resolution No. 2016-01-01).

In 2019, the Governor's Office of Planning and Research released an update to the CEQA Guidelines that included a new requirement to analyze discretionary projects for their compliance with adopted GSPs. Specifically, the new applicable significance criteria include the following:

- Would the program or project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?
- Would the program or project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Therefore, to the extent general plans allow growth that could have an impact on groundwater supply, such projects would be evaluated for their consistency with adopted GSPs and for whether they adversely impact the sustainable management of the Subbasin. Under CEQA, potentially significant impacts identified must be avoided or substantially minimized unless significant impacts are unavoidable, in which case the lead agency must adopt a statement of overriding considerations.

County of San Diego Groundwater Ordinance

The County adopted the San Diego County Groundwater Ordinance in 1991; it was last amended in 2013 (San Diego County Code Title 6, Division 7, Chapter 7, Secs. 67.701 through 67.750). The ordinance establishes legal standards for the protection, preservation, and maintenance of groundwater resources. One of the purposes of the ordinance is to ensure that development is not approved in groundwater-dependent areas of the County unless a project applicant can demonstrate that there are adequate supplies available to serve both existing and proposed uses (County of San Diego 2013). The ordinance includes provisions specific to the Borrego Valley Exemption Area, in which a project[16] that will

[15] This means discretionary land development applications for a project which proposes to use groundwater, including but not limited to, (a) general plan and specific plan adoptions and amendments, (b) tentative and revised tentative maps and parcel maps, (c) zoning and use regulation amendments, (d) major use permits or modifications, (e) certificates of compliance, and (f) lot line adjustments.

[16] A project is defined in the ordinance as any of the following: General Plan and Specific Plan Adoptions and Amendments, new or revised Tentative Parcel Maps and Tentative Maps, Zoning Reclassifications, new or

extract or use at least 1 AFY is required to include one or more groundwater use reduction measures listed in in the ordinance to meet the performance standard of "no net increase" in the amount of water extracted from the basin. The ordinance incorporates the aforementioned groundwater mitigation and water credits program so that land use approvals do not occur within the BVGB without complying with the performance standard of "no net increase" in water demand. Updates to the Groundwater Ordinance are anticipated to ensure consistency with the GMP sustainability goals.

Permitting of New Well, Replacement Well, and/or Well Destruction/Abandonment

The San Diego County DEH, Land and Water Quality Division, regulates the design, construction, modification, and destruction of water wells throughout San Diego County to protect San Diego County's groundwater resources (County of San Diego 2016). San Diego County Code, Sections 67.401 through 67.424, provide the regulatory authority to DEH to require and issue water well permits. In addition, Section 67.421 adopts standards from DWR Bulletin 74-81 and 74-90 (i.e., California Well Standards) for the construction, repair, reconstruction or destruction of wells (DWR 1981, 1991). California's Water Well Standards include requirements to avoid sources of contamination or cross-contamination, proper sealing of the upper annular space (i.e., first 50 feet), disinfection of the well following construction work, use of appropriate casing material, and other requirements. The County requires wells to meet certain setback criteria (e.g., septic system setback) and specific construction and sealing requirements. In addition, well drilling activities are required to reduce pollution to the maximum extent practicable using BMPs such as installing a sediment basin to contain run-off, using geotextile fabric to contain sediments and drilling mud, or eliminating the use of drilling foam (County of San Diego 2016).

The DEH monitors and enforces these standards by requiring drilling contractors with a valid C-57 license to submit permit applications for the construction, modification, reconstruction (i.e., deepening), or destruction of any well within its jurisdiction. The processing and issuance of a water well permit is currently considered a ministerial action, meaning permits are issued to drillers meeting California Water Well Standards and County sealing requirements, and notwithstanding errors in the application. Certain circumstances, however, such as when installing a well could cause the spread of contaminants to uncontaminated water zones, may prevent DEH from issuing a well permit.

The passage of SB 252 added Article 5, Wells in Critically Overdrafted Groundwater Basins, to chapter 10 of the California Water Code requiring collection of specific information for water wells proposed in critically overdrafted groundwater basins. To facilitate the collection of the required information, DEH has revised the Well Permit Application and created a Supplemental

modified Major Use Permits, Certificates of Compliance filed pursuant to San Diego County Code, Section 81.616.1 or 81.616.2, or in some cases Lot Line Adjustments filed pursuant to San Diego County Code, Section 81.901 et seq.

Well Application. The Supplemental Well Application is included in the Well Permit Application and must be submitted for wells proposed in the Borrego Springs Subbasin. Wells drilled by the BWD to provide water solely for the residents are exempt from this requirement. The provisions of SB 252 are effective until January 30, 2020. Consistent with SGMA, SB 252 was passed to support groundwater management by local agencies.

2.1.3 Land Use Considerations

County of San Diego General Plan

The County's General Plan outlines the County's vision for growth, community services, infrastructure, quality of life, and environmental resources. The Land Use Element is a framework that provides maps, goals, and policies that guide planners, the general public, property owners, developers, and decision makers as to how lands are to be conserved and developed in unincorporated San Diego County.

A major component to guiding the physical planning of San Diego County is the "Community Development Model." The Community Development Model is implemented by three regional categories—Village, Semi-Rural, and Rural Lands—that broadly reflect the different character and land use development goals of San Diego County's developed areas, its lower-density residential and agricultural areas, and its very low–density or undeveloped rural lands. The Community Development Model directs the highest intensities and greatest mix of uses to Village areas, while directing lower-intensity uses, such as estate-style residential lots and agricultural operations, to Semi-Rural areas. The Semi-Rural category may effectively serve as an edge to the Village, as well as a transition to the lowest-density category, Rural Lands, which represent large, remote areas where only limited development may occur. The General Plan Land Use Element includes a Community Services and Infrastructure section, which addresses the availability of public infrastructure such as roads, drainage facilities, sewer and water lines, and treatment plants, as appreciable growth cannot occur without such services being available or in place.

The General Plan land use categories within the Plan Area are shown on Figure 2.1-6. It should be noted that General Plan land use categories mapped within the Plan Area may not necessarily mirror the actual land uses on the ground, which are described in Section 2.1.1 and Table 2.1-4. For example, a large portion of the Plan Area mapped as rural or semi-rural residential (RL or SR) currently has an open space/undeveloped land use. In addition, there is no General Plan land use distinction between rural residential and agricultural uses, as the agricultural areas in the northern part of the basin have the RL and SR general plan land use designations. Overall, the most intensive General Plan land use categories are village residential, commercial, and industrial, and these are concentrated in a small portion of the Plan Area generally along the east-west Palm Canyon Drive and the north-south portion of Borrego Springs Road. Rural land designations dominate the Plan Area, with the portion of the Plan Area belonging to ABDSP shown as "public agency lands."

The development and implementation of the GMP is relevant to several General Plan elements, including the Land Use Element, Conservation and Open Space Element, and the Housing Element. The Land Use Element includes a requirement to document and annually review floodways and floodplains (LU-6.12) and to encourage sustainable use of groundwater and properly manage groundwater recharge areas (LU-8). The Conservation Element identifies and describes the natural resources of the County and includes policies and action programs to conserve those resources. The Conservation and Open Space Element identifies policies necessary to achieve (a) long-term viability of the County's water quality and supply through a balanced and regionally integrated water management approach (Goal COS-4), and (b) protection and maintenance of local reservoirs, watersheds, aquifer-recharge areas, and natural drainage systems to maintain high-quality water resources (Goal COS-5). The Housing Element describes the County's plan to provide decent and affordable housing, including appropriately designated land, opportunities for developing a variety of housing types, and policies and programs designed to assist in the development of housing for all income levels and special needs.

The Regional Housing Needs Assessment for San Diego County for 2013–2020 period projects an additional 22,412 residential units, 80% of which are to be accommodated within the San Diego County Water Authority boundary, where water and other public services are more readily available (County of San Diego 2011).[17] The eastern extent of the San Diego County Water Authority in North County is the Ramona Municipal Water District located about 30 miles west of the Plan Area. Recognizing the constraints on growth presented by the lack of readily available water sources and other public services, the last General Plan Update (adopted in 2011) substantially reduced the degree to which backcountry communities such as Borrego Springs were expected to meet the future housing demand. The General Plan Update reduced the maximum allowable additional residential units in Borrego Valley from 19,466 units to about 8,689 units (County of San Diego 2011).

Under the County's current zoning, there are 3,454 vacant and undeveloped parcels that could be converted to residential development and 526 vacant and undeveloped lots that potentially could be converted to commercial, industrial, office space, rural commercial, open space, public agency, or public/semi-public facilities (SANGIS 2017; County of San Diego 2011). This GMP uses the legal lot status estimate of 85% from the *Evaluation of Groundwater Conditions in*

17 The Regional Housing Needs Assessment is a state-supervised process by which the San Diego Association of Governments allocates to its local jurisdictions their share of an eleven-year projected housing need at various affordability levels

Borrego Valley to develop a more realistic number of buildable lots (County of San Diego 2010). The County developed this estimate considering that:

> "Having a legally created lot which meets Zoning requirements still may not be buildable due to a number of factors such as floodplain issues, having legal access to roadways, having access to sewer or water, etc. Building permits are granted on a case-by-case basis by the County, and it is not possible to accurately estimate the number of legally buildable parcels in Borrego Valley. However, the significant inventory of existing unbuilt lots could possibly provide up to an additional 3,000+ future residential units without any additional subdivision (County of San Diego 2010)."

Zoning ordinance designations for the Plan Area are shown on Figure 2.1-7. It should be noted that only 19 building permits for residential units have been issued in Borrego Springs since 2011 (County of San Diego 2018). As of 2018, there are approximately 2,615 existing residential units within Borrego Springs (County of San Diego 2018).

The 2011 County of San Diego General Plan Update Programmatic Environmental Impact Report (EIR) included a groundwater study that evaluated the impacts that maximum buildout under the 2011 General Plan would have on groundwater. The Programmatic EIR concluded that the buildout of the General Plan Update would have a potentially significant impact to the Borrego Valley aquifer in Borrego Springs. The General Plan Update groundwater study indicated that the General Plan Update allows for an additional 8,689 residential units, plus an additional 3,000+ residential units without subdivision, for a total of 11,689 additional units. Assuming 0.5 acre-feet/year water demand per residential unit, this would equate to 5,844.5 acre-feet/year for the 11,689 units. Future general plan and community plan updates should consider the sustainability goals of this GMP. Updated buildout estimates should be considered in conjunction with the sustainability goals, projects, and management actions outlined in this GMP.

Table 2.1-5 provides the residential buildout potential of the existing General Plan.

Table 2.1-5
General Plan Residential Buildout in Borrego Springs Subbasin

General Plan Residential Capacity	Number of Units
Existing Residential Units	2,615
Vacant Buildable Lots (Without Further Subdivision)	3,000+
Additional General Plan Capacity (Requires Future Subdivision)	8,689
Total	14,304

The County uses General Plan elements, goals, and policies to guide its discretionary permit decision making, and the policies relevant to the Borrego Springs Subbasin are included in Table 2.1-6.

Borrego Springs Community Plan

The CPA applicable to the Borrego Springs Subbasin is the Borrego Springs Community Plan (County of San Diego 2011). A community plan focuses on a particular region or community within the overall General Plan area. They are meant to refine the policies of the General Plan as they apply to a smaller geographic region and provide a forum for addressing unique local issues. As required by state law, community plans must be internally consistent with General Plan goals and policies of which they are a part. They cannot undermine the policies of the General Plan. Community plans are subject to adoption, review, and amendment by the County Board of Supervisors in the same manner as the General Plan. Table 2.1-6 presents a summary of general plan and community plan elements, goals, and policies in the Plan Area.

When the County prepares its next General Plan (including community plan) update for Borrego Springs, this GMP will be a key consideration with respect to related goals and policies. The implementation of this GMP and the County's General Plan update process are separate but related processes. Review of the policies in Table 2.1-6 indicate that the current policies are generally consistent with the sustainability goals of this GMP. The existing General Plan designations and policies allow for growth (e.g., community plan goal LU-2.4) and promote agricultural conservation (e.g., General Plan goals LU-7 and COS-6) in a manner that may be inconsistent with the sustainability criteria and project and management actions described and/or referenced in Chapters 3 and 4 of this GMP. However, there are no urban water management plans or agricultural water management plans applicable to the Plan Area that contain assumptions or projections of water supply/demand that would be in conflict with implementation of this GMP (e.g., too generous given the GMP's sustainability goals). Existing County land use regulations, including the Demand Offset Mitigation WCP, the Groundwater Mitigation Program, the Groundwater Ordinance, and the CEQA process, significantly constrain growth by requiring that new land uses result in no net increase in water demand. This, along with economic factors and other public service constraints, is the reason such limited growth has occurred in the Subbasin (e.g., issuance of only 19 building permits for residential units since 2011).

At the next County General Plan update, land use policies will be brought in line with the sustainability goals of this GMP. This will be done by considering the sustainability goals and the management actions of the GMP in the updated community plan and through revisions to the County's groundwater ordinance. Furthermore, all future general plan and community plan updates will undergo an analysis of environmental impacts under the CEQA, which now includes a new requirement to analyze programs and projects for their compliance with adopted GSPs. The implementation of existing land use plans would not affect the ability of the GMP to achieve sustainable groundwater management over the planning and implementation horizon.

The Borrego Springs Community Sponsor Group is a seven-member group of representatives that assists the County Planning Director, the Zoning Administrator, the Planning Commission, and the Board of Supervisors in the preparation, amendment, and implementation of community and subregional plans. The principal function of a sponsor group is to be an information link between the community and the County on matters dealing with planning and the use of land in its community. The group provides a public forum for the discussion of planning issues that are important to the community. All meetings are open to the public, held in a publicly accessible place, and the agenda is published in advance according to Brown Act provisions.

Table 2.1-6
Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area

Element	Policy	Description	GMP Consistency
		County of San Diego General Plan	
Land Use Element	Goal LU-5: Climate Change and Land Use		
	LU-5.2	Incorporate into new development sustainable planning and design.	Yes
	LU-5.3	Ensure the preservation of existing open space and rural areas (e g., forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas) when permitting development under the Rural and Semi Rural Land Use Designations.	Yes
	Goal LU-6: Development—Environmental Balance		
	LU-6.1	Require the protection of intact or sensitive natural resources in support of the long-term sustainability of the natural environment.	Yes
	LU-6.3	Support conservation-oriented project design.	Yes
	Goal LU-7: Agricultural Conservation		
	LU-7.1	Protect agricultural lands with lower-density land use designations that support continued agricultural operations.	Supporting continued agricultural operations in Borrego Valley at current groundwater extraction rates may be inconsistent with the goal of reducing groundwater demand.

Table 2.1-6
Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area

Element	Policy	Description	GMP Consistency
	LU-7.2	Allow for reductions in lot size for compatible development when tracts of existing historically agricultural land are preserved in conservation easements for continued agricultural use.	Yes, although pumping limits in GMP may restrict continued expansion of agricultural lands.
	Goal LU-8: Aquifers and Groundwater Conservation		
	LU-8.2	Require development to identify adequate groundwater resources in groundwater dependent areas. In areas dependent on currently identified groundwater overdrafted basins, prohibit new development from exacerbating overdraft conditions. Encourage programs to alleviate overdraft conditions in Borrego Valley.	Yes
	LU-8.3	Discourage development that would significantly draw down the groundwater table to the detriment of groundwater-dependent habitat	Yes
	LU-8.4	Support the Borrego Valley Water District with their program to slow the overdrafting and extend the life of the aquifer supporting the residents of the Borrego Valley.	Yes
	Goal LU-13: Adequate Water Quality, Supply, and Protection		
	LU-13.1	Coordinate water infrastructure planning with land use planning to maintain an acceptable availability of a high quality sustainable water supply. Ensure that new development includes both indoor and outdoor water conservation measures to reduce demand.	Yes
	LU-13.2	Require new development to identify adequate water resources, in accordance with state law, to support the development prior to approval.	Yes
Conservation and Open Space Element	Goal COS-4: Water Management		
	COS-4.1	Require development to reduce the waste of potable water through use of efficient technologies and conservation efforts that minimize the County's dependence on imported water and conserve groundwater resources.	Yes
	COS-4.2	Require efficient irrigation systems and in new development encourage the use of native plant species and non-invasive drought tolerant/low water use plants in landscaping.	Yes
	COS-4.3	Maximize stormwater filtration and/or infiltration in areas that are not subject to high groundwater by maximizing the natural drainage patterns and the retention of natural vegetation and other pervious surfaces.	Yes
	COS-4.4	Require land uses with a high potential to contaminate groundwater to take appropriate measures to protect water supply sources.	Yes
	COS-4.5	Promote the use of recycled water and gray water systems where feasible.	Yes
	Goal COS-5: Protection and Maintenance of Water Resources		
	COS-5.2	Require development to minimize the use of directly connected impervious surfaces and to retain stormwater run-off caused from the development footprint at or near the site of generation.	Yes

Table 2.1-6
Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area

Element	Policy	Description	GMP Consistency
	COS-5.5	Require development projects to avoid impacts to the water quality in local reservoirs, groundwater resources, and recharge areas, watersheds, and other local water sources.	Yes
	Goal COS-6: Sustainable Agricultural Industry		
	COS-6.1	Support the economic competitiveness of agriculture and encourage the diversification of potential sources of farm income, including value added products, agricultural tourism, roadside stands, organic farming, and farmers markets.	Yes, although pumping limits in GMP may restrict continued expansion of agricultural lands.
	COS-6.2	Protect existing agricultural operations from encroachment of incompatible land uses.	Land use designations may need to change to meet groundwater sustainability goals
	COS-6.4	Support the acquisition or voluntary dedication of agriculture conservation easements and programs that preserve agricultural lands	Yes. Note: The GMP is not inconsistent with this policy although the preservation of agricultural lands in Borrego Valley at the same intensity of water use might not help to fulfill the long-term goals of the GMP. It should also be noted that the land fallowing program of the GMP may result in open space conservation easements or other uses to replace the fallowed agricultural lands
	COS-6.5	Encourage best management practices in agriculture and animal operations to protect watersheds, reduce GHG emissions, conserve energy and water, and utilize alternative energy sources, including wind and solar power.	Yes
	Goal COS-14: Sustainable Land Development		
	COS-14.3	Require design of residential subdivisions and nonresidential development through "green" and sustainable land development practices to conserve energy, water, open space, and natural resources.	Yes

Table 2.1-6
Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area

Element	Policy	Description	GMP Consistency
	COS-14.4	Require technologies and projects that contribute to the conservation of resources in a sustainable manner, that are compatible with community character, and that increase the self-sufficiency of individual communities, residents, and businesses.	Yes
	Goal COS-19: Sustainable Water Supply		
	COS-19.1	Require land development, building design, landscaping, and operational practices that minimize water consumption.	Yes
	COS-19.2	Require the use of recycled water in development wherever feasible. Restrict the use of recycled water when it increases salt loading in reservoirs.	Yes
Borrego Springs Community Plan			
Community Growth Policy	Goal LU-2.4: The conversion of existing agricultural uses to other, less consumptive uses by 2020 consistent with a Plan population of 8,000.		
	LU-2.4.1	Establish a special study area to work with the BSCSG and Borrego Water District to devise a plan to: a.) convert a majority of agricultural uses existing at the time of the adoption of this Plan (generally, those lands north of Henderson Canyon Road) to other less water consumptive uses and/or b.) secure a permanent alternative supply of water, together sufficient to meet forecast requirements.	Though BPA transfers are being pursued, imports from adjacent basins have been determined to be economically infeasible. See Section 2.1.6 for details.
	Goal LU-2.5: Restoration and revegetation of existing fallowed (abandoned) farmlands and their conversion to open space uses to enhance community character, health and safety, and tourism appeal.		
	LU-2.5.1	Prioritize the preservation and restoration of existing fallowed and abandoned farmlands with their conversion to open space lands held in trust by the County or other suitable governmental or non-governmental organization.	Yes
	LU-2.5.2	Encourage the use of existing fallowed farmlands for the installation of solar farms for energy production.	Yes
Infrastructure and Utilities	Goal CM-10.1: A capacity in the Borrego aquifer that supports continued domestic and recreational demand in Borrego Springs and development of options to augment the water supply to create a sustainable/renewable supply for the community.		
	CM 10.1.1	Analyze the capacity of the existing groundwater aquifer and develop programs to create sustainable supplies of water for the projected build-out of the community.	Yes
	CM 10.1.2	Create incentives for golf courses to decrease turf areas and convert those areas to desert landscape with less water use.	Yes
	CM 10.1.3	Prohibit the approval of any new agricultural, golf or other water intensive activities in any area overlying or tributary to the Borrego aquifer.	Yes. Offsetting transfers of BPA may provide mechanism to allow approval.

Table 2.1-6
Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area

Element	Policy	Description	GMP Consistency
	CM 10 1 4	Request, upon achieving a sustainable supply of water for the domestic water use in the community planning area, the adjudication of the aquifer to insure that future use does not continue to overdraft the aquifer except in times of drought, thus protecting the elements of the local environment dependent on the aquifer in its diminished capacity.	GMP projects and management actions, including baseline pumping allocation, are being pursued as means to regulate the aquifer through court adjudication.
Conservation and Open Space	Goal COS 1.1: Incremental reductions of agricultural production in the Borrego Valley over the next 20 years while protecting the rights of farmers and the continued environmental health of the Borrego community.		
	COS 1.1.1	Encourage a reduction in the production of citrus crops and palm trees to manageable levels or their replacement with low to very low water consumptive crops	Yes
	Goal COS 1.4: A sustainable supply of water, ending the current overdrawing of the Borrego Springs sole-source aquifer.		
	COS 1.4.1	Encourage and develop methods for Community Plan Area groundwater system human withdrawals to be less than or equal to replenishment amounts on an average ongoing basis.	Yes
	COS 1.4.2	Prohibit the construction of any new golf courses in the Community Plan Area, unless an alternate water source, such as recycled water is made available.	Yes. Baseline pumping allocation and BPA transfers will need to be adhered to.
	COS 1.4.3	Encourage xeriscape landscaping in residential and business developments.	Yes. A County of San Diego landscape restrictive ordinance applies to Borrego Springs.

Source: County of San Diego 2011.
Notes: GHG = greenhouse gas; BSCSG = Borrego Springs Community Sponsor Group; GSP = Groundwater Sustainability Plan, County = County of San Diego

2.1.4 Beneficial Uses and Users

As discussed in Section 2.1.2, designated beneficial uses for groundwater in the Plan Area include municipal and domestic supply (MUN), industrial service supply (IND) and agriculture supply (AGR) based on the Basin Plan. The Basin Plan definition of recreational beneficial uses applies only to surface waters where ingestion of the water is reasonably possible (e.g., contact and non-contact water recreation), and thus is not applicable to groundwater as an underground resource. However, as an important recreational use in the Plan Area, groundwater used to irrigate golf courses and/or to supply ornamental ponds is considered in this GMP separately from the municipal and domestic supply designations. Thus, the "beneficial uses" evaluated in this GMP are not strictly synonymous with those analyzed in the Basin Plan. Three primary sectors extract the majority of groundwater in the Subbasin: (1) agriculture use; (2) municipal use, consisting of BWD; and (3) recreational use, which consists of six golf courses—Borrego Springs Resort, Club Circle, De Anza Country Club, Rams Hill Country Club, Road Runner Golf and Country Club, and The Springs at Borrego RV Resort and Golf Course.

Other groundwater users include two active small water systems and two non-potable irrigators. The two small water systems are the ABDSP and the Borrego Air Ranch Water Co. The two non-potable irrigators are the BSUSD (Elementary School) and La Casa Del Zorro Resort and Spa. Industrial service supply includes use for two utility scale solar facilities, a redi-mix plant, a County service yard and the Republic Services Borrego Landfill. Private groundwater users who extract less than 2 AFY are considered de minimis users under SGMA.

There are an estimated 52 active de minimis users within the Subbasin. Domestic well users are generally considered to be de minimis users unless those properties contain irrigated areas in excess of about 0.5 acres, which would result in more than 2 AFY of water use. Table 2.1-7 lists beneficial uses and users of groundwater in the Subbasin, including general location and estimated water use.

Table 2.1-7
Beneficial Uses and Users of Groundwater in the Plan Area

Beneficial Users	RWQCB Basin Plan Beneficial Use	Areas of the Subbasin	*Baseline Pumping Allocation (AFY)*	*2018 Estimate (AFY)*
		Non-De Minimis Users		
Agriculture Sector	AGR	NMA, CMA	17,875	14,788 [a]
Municipal Sector	MUN	NMA, CMA, SMA	2,222	1,600
Recreation Sector	N/A [b]	NMA, CMA, SMA	4,050	3,245 [c]
Other Users [d]	MUN	NMA, CMA, SMA	71	58
		TOTAL	**24,215**	**19,691**
		De Minimis Users		
Small Domestic, Industrial and/or Utility Uses [e]	MUN and IND	NMA, CMA, SMA	N/A	34

Notes: RWQCB = Regional Water Quality Control Board; AFY = acre-feet per year; AGR = Agriculture Supply; NMA = North Management Area; CMA = Central Management Area; MUN = Municipal and Domestic Supply; SMA = South Management Area; N/A = not applicable; IND = Industrial Service Supply.

a. The BPA number for the agricultural sector includes 2,214 AFY for Water Credits that have been previously transferred to other sectors. The 2018 estimate includes fallowing of 153 acres of citrus on the Burnand parcels at an estimated water use factor of 6.29 feet per year (153 acres X 6 29 feet/year = 961 AFY, so 2018 Estimate is 15,749 AFY – 961 AFY = 14,788 AFY). The water use factor is determined from local station specific evapotranspiration, documented plant factors, and irrigation efficiency.

b. The recreational beneficial uses under the Basin Plan definition applies only to surface waters where ingestion of the water is reasonably possible (e.g., contact and non-contact water recreation), and thus is not applied to groundwater as an underground resource. In addition, there is no RWQCB Basin Plan beneficial use specific to groundwater dependent ecosystems.

c The 2018 estimate was determined by removing the irrigation formerly applied at the Borrego Springs Resort, using a factor of 6 45 feet/acre.

d. Consists of active small water systems (ABDSP and Air Ranch) and non-potable irrigators (school and resort).
e. Consists of domestic well users not connected to BWD service, two utility scale solar facilities, the redi-mix plant, and the County service yard. These users were not given a baseline pumping allocation because they are anticipated to extract less than two acre-feet per year.

2.1.5 Notice and Communication

In 2017, the GSA prepared a Stakeholder Engagement Plan to provide individual stakeholders, stakeholder organizations, and other interested parties an opportunity to be involved in the development and evaluation of the draft final GSP. To this end, the Stakeholder Engagement Plan, included as Appendix C of this GMP, describes the steps the GSA has taken to achieve broad, enduring and productive public involvement during the development and implementation phases of the draft final GSP. The Stakeholder Engagement Plan includes a list of identified stakeholders as of 2017 and describes the methods and avenues in which the GSA has continued to identify additional stakeholders, continued to solicit public involvement and feedback, and considered and/or incorporated stakeholder comments and concerns into the development and future implementation of the draft final GSP. In addition to the Stakeholder Engagement Plan, Appendix C also includes a list of public meetings that have been held to date as a means to document the level of public outreach that has occurred thus far.

One of the primary ways the GSA considered the beneficial uses and users of groundwater, pursuant to California Water Code, Sections 10723.2 and 10723.4, was through the establishment and regular meetings of an Advisory Committee (AC) to aid in developing and implementing the draft final GSP. The AC was composed of nine members:

- Four members nominated by the Borrego Water Coalition and filling the following representative roles: one agricultural member, one recreation member, one independent pumper, one at large member
- One member nominated by the Borrego Springs Community Sponsor Group
- One member nominated by the Borrego Valley Stewardship Council
- One member, who is not an employee or elected official, nominated by the BWD Board of Directors to represent ratepayers/property owners
- One member, who is not an employee or elected official, nominated by the County to represent the Farm Bureau
- One member nominated by the California State Parks, Colorado Desert Region to represent the Anza-Borrego Desert State Park

The Borrego Water Coalition represents a broad cross-section of groundwater pumpers and users of the Subbasin who together represent approximately 80% of annual withdrawals from the Subbasin. The Borrego Springs Community Sponsor Group is the officially appointed representative body charged with addressing land use issues to the County. The Borrego Valley

Stewardship Council represents community groups associated with the Anza-Borrego Desert State Park and geotourism economic development initiative. The BWD represents over 2,000 ratepayers/property owners in Borrego Springs. Through the Agricultural Alliance for Water and Resource Education, the San Diego County Farm Bureau represents farming interests in Borrego Springs who, at present, collectively use approximately 70% of annual withdrawals from the Borrego Basin. The California State Parks represent the approximately 600,000-acre ABDSP that surrounds Borrego Springs. Table 2.1-8 describes and lists the various stakeholders with interest in the development and implementation of the draft final GSP.

Throughout Plan development, the AC provided input to the Core Team[18] in the formation of the planning and policy recommendations included in the draft final GSP. The AC was tasked with reviewing technical materials and providing comment, data, and relevant local information related to GSP development; assisting in communicating concepts and requirements to the stakeholder constituents that they represent; providing comments on materials and reports prepared; and assisting the Core Team to anticipate short- and long-term future events that may impact groundwater sustainability, and trends and conditions that will impact groundwater management. The Core Team regularly met between AC meetings to consider input from the AC and other stakeholders.

The first meeting of the SGMA AC occurred March 6, 2017. Meetings have occurred on a nearly monthly basis through the entirety of GSP development (see list of meetings in Appendix C). AC meetings were facilitated by the Sacramento State Consensus and Collaboration Program funded primarily through a DWR grant. In accordance with California Water Code, Section 10727.8(a), interested parties were encouraged to participate in the AC meetings by attending meetings in Borrego Valley and/or signing up to receive information about AC meetings and GSP development at the County's webpage. AC meeting notices were posted at the Borrego Post Office as well as outside of the meeting venue a minimum 72 hours in advance of the meeting, provided to the Borrego Sun, and posted to the BWD website at http://www.bvgsp.org. The County website publishes all AC meeting agendas, materials, and minutes. All AC meetings were webcast and/or accessible via teleconference line; public comment periods were held during each AC meeting; and correspondence sent to the Core Team and/or AC was published in each AC meeting agenda packet.

In addition to facilitating regular AC meetings, the GSA disseminated information and resources about SGMA and GSP development, as well as opportunities for public participation through email, newsletters/columns, water bill inserts, and the County's SGMA website designed to update the public. Periodic updates in the Borrego Sun newspaper were provided to advise, educate, and inform the public on SGMA implementation in Borrego Valley. A variety of information about SGMA and groundwater conditions in BVGB—including maps, timelines, frequently asked

[18] The Core Team is comprised of County and District staff tasked with coordinating the activities of the GSP AC.

questions, groundwater information, and schedules/agenda of upcoming meetings and milestones—have been produced by the County and the BWD. This information is accessible on the County's SGMA Borrego webpage located at: http://www.sandiegocounty.gov/pds/SGMA.html. County staff update the website regularly and invite users to request information or be added to the interested persons list. Additionally, the BWD maintains a repository of groundwater, economic, and GSP-related technical studies on its website at: http://www.bvgsp.org/sustainability-plan.html.

Table 2.1-8
Stakeholder Categories in the Plan Area

Category of Interest	Examples of Stakeholder Groups	Engagement Purpose
General Public	General Public Borrego Springs Community Sponsor Group	Inform to improve public awareness of sustainable groundwater management
Land Use	County of San Diego (Land Use and Environment Group) Community of Borrego Springs Borrego Springs Community Sponsor Group	Consult and involve to ensure land use policies are supporting GSP and vice-versa
Private users	Domestic users	Inform and involve to avoid negative impact to these users
Urban/ Agriculture users/ Golf Courses	Borrego Water District Borrego Water Coalition Agricultural Alliance for Water and Resource Education Small Water Systems Golf Courses and Recreational Facilities	Collaborate to ensure sustainable management of groundwater
Environmental and Ecosystem	California Department of Fish and Wildlife California Department of Parks and Recreation (Anza-Borrego Desert State Park) Anza-Borrego Foundation	Inform and involve to sustain a vital ecosystem
Economic Development	The Borrego Springs Chamber of Commerce and Visitors' Bureau State Assembly Member Randy Voepel State Senator Joel Anderson County District 5 Supervisor Jim Desmond	Inform and involve to support a stable economy
Human right to water	Domestic water users Disadvantaged and Severely Disadvantaged Communities	Inform and involve to provide a safe and secure groundwater supplies to DACs
Integrated Water Management	Regional water management groups (IRWM regions)	Inform, involve, and collaborate to improve regional sustainability

Notes: DAC = disadvantaged community, IRWM = Integrated Regional Water Management.

In addition to the regular AC meeting process, AC members participated in an Ad Hoc Committee to work with BWD and Le Sar Development Consultants on additional outreach and engagement activities focused on educating the Borrego SDAC about the GSP, and for soliciting feedback related to water quality and availability, environmental and economic impacts, and GSP implementation and adaptive management strategies. With an emphasis of outreach to the severely disadvantaged portion of the community, the engagement team developed culturally appropriate educational materials (English and Spanish) and a variety of strategies for information dissemination, education, needs assessment, and ongoing feedback. Activities included a series of community meetings, surveys (residential and business), and distribution of educational materials and meeting announcements through door-to-door outreach and digital platforms. Stakeholders were also encouraged to attend SGMA AC and BWD ratepayer meetings.

Through these efforts, the GSA gathered valuable information about community concerns, which primarily related to rising water rates, economic impacts (e.g., job loss), land use changes, water use allocations, water quality, and long-term environmental impacts. This information was then incorporated into the development of the draft final GSP and considered in the evaluation of groundwater dependent ecosystems (GDEs), development of projects and management actions, seeking additional funding opportunities to minimize impacts on ratepayers, and land use implications. For example, the GSA has sent letters to pumpers informing them of their specific baseline pumping allocation, along with information about opportunities to engage in the process.

In addition, the BWD commissioned an SDAC Impact/Vulnerability Assessment to understand the implications that SGMA implementation will have on the SDAC population of Borrego Springs (ENSI 2009). The SDAC is not a homogeneous group and is comprised of low-income sub-populations. Of note are two sub-populations: (1) households with school age children and (2) retirees. The report describes specific vulnerabilities, including challenges associated with potential loss of seasonal jobs in the agricultural and recreational sectors, funding and access to public schools, and water rate impacts to the lowest income portion of the community. Concerns specific to the SDAC include water affordability (BWD rate impacts), loss of jobs/local economy, impacts to infrastructure, and/or quality of life. The report remarks that the 20-year SGMA compliance period does provide time for the community to adapt, and the community's tourism industry is not highly dependent on water (in contrast to agriculture), which could be further developed to help offset agricultural job losses. The BWD's tiered rate structure (maintenance of low water rates for baseline water use) and seeking state funding to support the SDAC are potential strategies to consider the needs of the SDAC during GSP implementation.

BWD continues to actively work to assess water use and to evaluate how to best structure water costs for the SDAC. SGMA- and SDAC-related grants and other publicly funded support is expected to continue to be available and pursued by BWD to assist in subsidizing future water costs. Borrego Springs is a key part of the utilization experience for the ABDSP.

The outreach effort was guided by the GSP Stakeholder Communication and Guidance Document, the Borrego Valley Groundwater Basin Stakeholder Engagement Plan (Appendix C), and the AC. Many of the activities discussed above were funded through a Proposition One Grant from DWR.

An additional period of public review by the Advisory Committee and members of the public took place to comment on the Judgment, including the Physical Solution and this GMP.

2.1.6 Additional GSP Components

The elements included as "additional GSP components" in DWR's annotated outline released in December 2016 (Title 23 CCR Section 354.8(g)) are presented in Appendix A.

- Control of sea water intrusion. Sea water intrusion is not applicable to the Plan Area because it is not a coastal groundwater basin.
- Wellhead protection. A summary of well development and destruction policies, including wellhead protection is provided in Section 2.1.2, New and/or Replacement Well Permitting. This topic also implicates the potential issue of inducing the migration of groundwater with undesirable quality within the hydraulic capture zone of groundwater wells. Groundwater quality issues within the subbasin are addressed in Section 2.2.2.4, as well as the water quality specific portions of Chapters 3 and 4.
- Migration of contaminated groundwater. Migration of contaminated groundwater from point sources (e.g., industrial and service commercial uses such as gas stations) has limited applicability to the Plan Area, because there are few release of contamination cases in the basin (as reported by regulatory agencies), and the depth of the static groundwater table is well below the areas of concern. The status and severity of open and historic cleanup cases managed by either Department of Toxics Substances Control, RWQCB, or the County are briefly discussed in Section 2.2.2.4. Contaminants of concerns from non-point sources, such as agricultural uses, consist of elevated nitrate concentrations in the upper aquifer of the North Management Area (NMA), discussed in Section 2.2.4.1.
- Well abandonment and well destruction program. San Diego County Code Section 67.421 adopts standards from DWR Bulletin 74-90 for destruction of wells. Section 67.430 through 67.431 provide for investigation and abatement if an abandoned or other well is causing a nuisance by polluting or contaminating groundwater, or constitutes a safety hazard. Well owners and/or well drilling contractors are required to follow DWR well standards, as

described in Section 2.1.2, New and/or Replacement Well Permitting, when abandoning or destroying a well, and update the County to list the permit status as inactive or abandoned.

- Replenishment of groundwater extractions. There is currently no program to actively replenish the aquifer. Projects and management actions are described in Chapter 4, though aquifer storage and recovery are not being considered as an option at this time. As discussed in Section 2.2.3.7, a study by the U.S. Bureau of Reclamation (USBR 2015) determined that using imported water to recharge the basin was economically infeasible. The Watermaster will be supportive of small distributed projects such as rain water harvesting, reuse and/or surface water capture, and recharge projects, for example, in conjunction with proposed development and/or redevelopment, and consistent with Porter–Cologne Water Quality Control Act and Clean Water Act Permitting (see Section 2.1.3).
- Conjunctive use and underground storage. There is currently no conjunctive use and/or underground storage program within the Plan Area. Because the Subbasin lacks surface water, conjunctive use (i.e., coordinated use of surface water and groundwater) is not possible. Projects and management actions are described in Chapter 4.
- Well construction policies. Well construction policies are described in Section 2.1.2.
- Groundwater contamination cleanup, recharge, diversions to storage, conservation, water recycling, conveyance, and extraction projects. Section 2.2.2.4 provides background regarding contamination release cases listed in the SWRCB's "Geotracker" database. There are no active groundwater cleanup sites in the Plan Area. Recharge is discussed in Section 2.2.3. Recharge includes stream recharge, irrigation return flows, septic recharge and subsurface inflow. There are no major diversions to storage in the Plan Area other than for irrigation ponds such as those located at the golf courses. Conservation has historically been used by all sectors to reduce water demand and is discussed in Section 4.3, including proposed water conservation projects and management actions. Water recycling has been evaluated by the BWD and determined to be economically infeasible at this time (Dudek 2018). Use of greywater systems may be evaluated as part of the Water Conservation Project and Management Action. Conveyance is discussed in Section 4.7.5 and limited to intra-basin transfers to mitigate existing and future reductions in groundwater storage and groundwater quality impairment by establishing conveyance of water between different management areas in the Subbasin. Extraction projects include drilling of replacement municipal wells to mitigate for loss of production.
- Efficient water management practices. Project and management action no. 2 (Water Conservation), addresses efficient water management and is described in Section 4.3.
- Relationships with state and federal regulatory agencies. This is addressed in Sections 2.1.2 of this chapter.

- Land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity. This is addressed in Sections 2.1.2 and 2.1.3. Notably, the County is both the local land use agency, was a member of the GSA; and will have a representative on the Watermaster Board, thus, coordination has been inherent in the GMP development process.
- Impacts on GDEs: See Sections 2.2.2.6 and 2.2.2.7.

2.2 BASIN SETTING

Hydrogeologic studies of the Borrego Valley date back to the early 1900s, though the importance of the Plan Area's groundwater resources increased starting in the mid-1940s when more wells were drilled to support the growing agricultural and municipal water demand. Since the mid-1950s, various studies have been completed to assess the Subbasin's groundwater supply and quality and to evaluate the adequacy of water supplies. These studies included summaries of drillers' logs, compilations of geologic data, and hydrogeologic investigations to support planned development. In the early 1980s, the USGS and DWR completed a multiphase study to evaluate hydrogeologic characteristics, recharge rates, future water demand, and possible alternate water supplies in the Borrego Valley, including the application of a numerical model to simulate basin-wide changes in aquifer groundwater levels and storage (USGS 1982, 1988; DWR 1983a, 1983b, 1984). The U.S Bureau of Reclamation studied the adequacy of water supply and later evaluated the options for importing water into the basin when it became clear that there was an overdraft problem in the Subbasin (USBR 1972, 2003, 2015). Since then, the Plan Area has been the subject of two Masters' theses by Netto (2001) and Henderson (2001); and a comprehensive update to the earlier 1980's work that incorporates updated numerical modeling methods, geophysical and remote-sensing techniques, and groundwater quantity and quality observations for the years between 1945 and 2010 (USGS 2015).

This section describes the basin setting of the Plan Area based on the existing studies as well as an update of the existing USGS numerical model to incorporate the 2010–2011 to 2015–2016 water years.[19] The General Plan Update Groundwater Study, prepared by the County of San Diego (2010), states:

> Borrego Springs Subbasin is completely groundwater dependent, has a well-documented groundwater overdraft condition where year after year groundwater extraction exceeds the amount of groundwater that is recharged back into the aquifer. Groundwater extraction exceeds 20,000 AFY whereas average groundwater recharge

[19] A water year is a continuous 12-month period selected to present data relative to hydrologic or meteorological phenomena during which a complete annual hydrologic cycle normally occurs. The water year used by the U.S. Geological Survey runs from October 1 through September 30, and is designated by the year in which it ends.

is estimated at approximately 5,000 AFY. The aquifer holds a large amount of groundwater in storage, estimated to be approximately 1.6-million acre-feet of usable groundwater. Groundwater levels have been declining for decades as a result of the overdraft condition and groundwater production at current rates is not sustainable.

Under existing conditions, the overall magnitude of the overdraft problem within the Plan Area remains similar to that described in 2010, although updated estimates of extraction and recharge are provided in Section 2.2.3.

This section is organized as follows: Section 2.2.1 describes the hydrogeologic conceptual model (HCM) of the Plan Area; Section 2.2.2 summarizes the current and historical groundwater conditions in terms of groundwater elevations, storage, water quality, and the other issues identified in SGMA; Section 2.2.3 establishes the water budget of the Plan Area based on the updated groundwater model; and Section 2.2.4 describes the boundaries, basis and purpose of the three groundwater management areas established for the Plan Area.

2.2.1 Hydrogeologic Conceptual Model

The Hydrological Conceptual Model (HCM) provides the framework for the development of water budgets, analytical and numerical models, and monitoring networks. Additionally, the HCM serves as a tool for stakeholder outreach and communication, and assists with the identification of data gaps. A HCM provides a general understanding of the physical setting, characteristics, and processes that govern groundwater occurrence and movement within the basin. Figure 2.2-1 presents the parameters of the HCM developed for the Plan Area, which conceptually depicts basin boundaries, stratigraphy, groundwater table, land use, and the components of inflow and outflow from the Borrego Springs Subbasin. The arrows depict schematically the inflows and outflows averaged over a 10-year period between 2005 and 2015 for various components of the water budget. Groundwater pumping for agricultural and recreational uses (i.e., golf courses) together and individually exceed the magnitude of pumping for municipal/domestic uses. Inflows/outflows for the period 2005–2015 are quantified based on the results of the BVHM that indicates outflows are about 20,000 AFY; whereas, inflows are about 5,000 AFY (Figures 2.2-1, 2.2-23A).

The following subsections detail the physical setting of the Subbasin.

2.2.1.1 Climate

The primary sources of current and historical climate data come from the National Oceanic and Atmospheric Administration, the Western Regional Climate Center, the California Irrigation Management Information System (CIMIS), and the San Diego County Flood Control District. The primary web access portal for historical climate information is the National Oceanic and

Atmospheric Administration National Centers for Environmental Information (formerly known as the National Climatic Data Center). In addition, weather stations were installed in 2015 by the University of California, Irvine as part of its Anza-Borrego Desert Research Center. Table 2.2-1 lists the weather stations available in the vicinity of the Plan Area.

Table 2.2-1
Weather Stations in the Vicinity of the Plan Area

Station Name (Agency No./ID)	Latitude	Longitude	Status	Period of Record
National Oceanic and Atmospheric Administration National Centers for Environmental Information and Western Regional Climate Center				
Borrego Desert Park, CA US (40983)	33 2559	-116.4036	Active	1942–present
Borrego Springs 2.4 WSW, CA US (CASD0014)	33.2225	-116.3904	Inactive	2009–2016
Borrego Springs 3 NN, CA US (46386)	33.28333	-116 35	Inactive	1944–1967
Borrego Springs 7.1 SE, CA US (CASD0130)	33.1934	-116.2786	Active	2016–present
Ocotillo Wells 2 W, CA US (40986)	33.1552	-116.1688	Active	2003–present
Ocotillo Wells, CA US (46383)	33.15	-116.13333	Inactive	1932–1975
California Irrigation Management Information System				
Borrego Springs/Station 207	33.26844722	-116.36505	Active	2008–present
University of California, Irvine, Steele/Burnand Anza-Borrego Desert Research Center				
Viking Ranch 6 (VR)	33.328633	-116.356917	Active	2016–present
Clark Dry Lake 7 (CL)	33.296579	-116.280926	Active	2016–present
Elementary 2 (ELEM)	33.254722	-116.346389	Active	2016–present
Dry Canyon Weather Station 5 (MONT)	33.2194	-116.419583	Active	2016–present
Wilcox Well 3 (BWD-W)	33.211001	-116.365133	Active	2016–present
University of California, Irvine, Steele/Burnand Anza-Borrego Desert Research Center	33 240123	-116.388973	Active	2016–present
Culp Valley 4 (BAKER)	33.203721	-116.4772	Active	2016–present
San Diego County Flood Control District				
Borrego Palm (BRPC1 / 62)	33.2686111	-116.4113889	Active	1983–present
Coyote Creek (CCYC1 / 61)	33.3655556	-116.4161111	Active	1984–present
Borrego CRS (BGOC1 / 63)	33.2211111	-116.3369444	Active	1983–present
Ocotillo Wells RS (OCWC1 / 3886)	33.1536111	-116.1769444	Active	1988–present

Precipitation

Within the Plan Area, the County's 30-year isopluvial[20] map (1971–2001) shows that the average annual precipitation ranges from up to 8 inches/year along the northwest edge of the valley, to less than 4 inches per year to the southeast (Figure 2.2-2; SDCFCD 2004). Average yearly

[20] A line on a map connecting places registering the same amount of precipitation or rainfall

precipitation is greater outside the plan area in the mountains to the west, north, and northeast of the Borrego Valley (Figure 2.2-2).

Precipitation patterns in the Plan Area are influenced by two distinct sources. The first source is Pacific frontal systems that bring regional rain bands to Southern California, typically between October and April. The second source is isolated and scattered thunderstorms that occur when moisture from the Gulf of California advects from south to north through the Plan Area. This phenomenon, commonly referred to as the "monsoon" season, is strongest in the summer months, but is not a regular or consistent occurrence. Occasionally, the decaying remnants of former tropical storms or hurricanes can pass through the area and in some years these further enhance the precipitation totals during the monsoon season. As a consequence of these disparate influences, the precipitation record is highly variable both seasonally and annually (Figure 2.2-3 and Figure 2.2-4). This makes defining the parameters of "wet" or "dry" years difficult (e.g., one thunderstorm may drop half of the yearly total in an otherwise dry season). For the purpose of the precipitation record, years with above average precipitation are considered "wet," and years with below average precipitation are considered "dry."

The weather station in the Plan Area with the longest and most complete precipitation record is the Borrego Desert Park Station, which spans the period from water year 1942 to 2017 (Figure 2.2-3). Based on this record, the mean annual precipitation at Borrego Desert Park Station is 5.55 inches (shown as dashed line on Figure 2.2-3). The cumulative departure from mean precipitation shows a wet period for the basin between 1972 and 1986, with 1983 being the wettest year on record (Figure 2.2-3). The total precipitation in the 1983 water year was 21.82 inches. In contrast, the period from 1946 to 1972 was dominated by years of below average rainfall. In addition to year to year precipitation being highly variable, precipitation by month also has a wide spread. Figure 2.2-4 shows average monthly precipitation at the Borrego Park Station (1947–2017) along with a measure of one standard deviation which provides a statistical estimate of precipitation variability. The record of precipitation by month also shows the influence of the monsoon season, with an uptick in the average precipitation for June, July, and August.

Temperature

The climate of the Borrego Valley is arid with hot summers and cool winters. Based on the Borrego Desert Park Station, the average annual high (daytime) temperature is 87.6°F, ranging from a low of 68.9°F in December to a high of 107.4°F in July. The average annual low (nighttime) temperature is 58.3°F, ranging from a low of 43.3°F in December, to a high of 75.8°F in July. The historical minimum and maximum monthly mean temperature, and average temperature record for the Plan Area is shown on Figure 2.2-5.

Evapotranspiration

Reference evapotranspiration (ETo) in the Plan Area has been calculated from the data collected at CIMIS Station 207 on a daily basis since 2008 (Figure 2.2-6; Table 2.2-2). The average ETo measured at CIMIS Station 207 between 2008 and 2017 is 72.21 inches per year or 6.02 feet per year (Table 2.2-2). In contrast, the average annual precipitation in the Plan Area is 5.6 inches per year. The ETo values calculated from the CIMIS data reflect the amount of water that could be transpired by grass or alfalfa if supplied by irrigation, but do not represent the actual transpiration from any specific crop or native vegetation. To calculate the ET rate for a specific crop or native vegetation, the ETo is multiplied by a crop coefficient that adjusts the water consumption for each crop relative to the water consumption for alfalfa.

Table 2.2-2
Monthly and Yearly Reference Evapotranspiration (ETo) Totals for California Irrigation Management Information System Station No. 207 from 2008 to 2017 (Inches)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
2008[a]	0.46	3.43	6.16	7.60	9.30	10.02	9.07	6.76	6.77	5.13	3.36	2.27	70.33
2009	2.68	5.16	5.69	7.07	8.76	8.28	8.87	8.71	7.21	5.00	3.08	1.96	72.47
2010	2 41	3.21	8.81	9.84	8.58	9.22	9.51	9.11	7.44	4 36	2 88	1.98	77.35
2011	2 68	3.35	5.55	7.12	8.77	8.23	7.98	8.47	6.43	4.92	2.72	2.11	68.33
2012	2.85	3.56	5.33	6.77	7.66	9.47	8.77	8.04	7.09	5 04	3 20	2.23	70.01
2013	2.54	3.57	5.75	7.56	8.64	9 02	8.01	7.57	6.46	5.05	3.00	2.27	69.44
2014	2.67	3.66	5.94	7.23	8.66	9.13	8.83	8.00	6.97	4.55	3.14	1 58	70.36
2015	2.17	3.54	5.82	7.22	7.96	8.51	8.76	8.74	6.54	5.15	3.37	2 40	70.18
2016	2.42	4.15	6.35	7.44	8.97	9.79	10.17	8.91	6.51	5.17	3.37	1.99	75.24
2017	2.33	3 28	6.27	8 18	9.14	10.20	9.70	9.43	6.99	5.38	3.16	2.47	76.53
9-Year Average	**2.53**	**3.72**	**6.17**	**7.60**	**8.57**	**9.09**	**8.96**	**8.55**	**6.85**	**4.96**	**3.10**	**2.11**	**72.21**

Source: CIMIS 2018.
Notes:
[a] 2008 is excluded from the average as the record for that year is not complete.

According to the State of California Reference Evapotranspiration Map developed by CIMIS, the Plan Area is located within Evapotranspiration Zone 18, with an annual average ETo of 71.6 inches or 5.97 feet (CIMIS 1999). This regional average annual ETo estimate is comparable to the ETo measured at CIMIS Station 207 (Table 2.2-2).

2.2.1.2 Geology and Geologic Structure

The Borrego Springs Subbasin lies along the boundary of two major geomorphic provinces. To the west of the Subbasin is the Peninsular Ranges Geomorphic Province, which extends from the Pacific Ocean in the west, to the Colorado Desert in the east (CGS 2002). The Peninsular Ranges are dominated by granitic rock intruding older metamorphic rocks that makeup the San Ysidro

Mountains, Pinyon Ridge, Yaqui Ridge and other local mountaintops that surround the Subbasin. The Peninsular Ranges trend northwest-southeast, subparallel to major branches of the San Andreas fault, including the San Jacinto fault and Elsinore fault (Figure 2.2-7).

The San Andreas fault is located approximately 30 miles east and the Elsinore fault is located approximately 22 miles west of the Subbasin. Individual segments of the San Jacinto fault zone are located in the vicinity of the Subbasin, including the Coyote Creek fault that forms the eastern boundary of the Subbasin. The Borrego Valley is often described as an embayment of the Salton Trough because the physiographic features of the Colorado Desert Geomorphic Province are also expressed in the Subbasin. This is indicated by the presence of the West Salton detachment fault that is part of a large block of basement rock that broke away from the mountains as a result of crustal stretching between active branches of the San Andreas fault.

The juxtaposition of these two Geomorphic Provinces result in dramatic vistas within the Plan Area. The elevation of the Borrego Springs Subbasin ranges between approximately 450 feet above mean sea level (amsl) east of the Borrego Sink to over 2,000 feet amsl at the northern tip of the subbasin (Figure 2.2-7). As shown on Figure 2.2-8, the Borrego Springs Subbasin, which underlies the Borrego Valley, is bounded to the north and west by the contact between Quaternary-age[21] sedimentary deposits (i.e., alluvium) and Cretaceous- to Mesozoic-age[22] plutonic and metamorphic basement rocks. The eastern boundary of the Borrego Springs Subbasin is defined by the trace of the Coyote Creek fault. The Borrego Badlands and the Ocotillo-Clark Valley Groundwater Basin lie to the east of the Coyote Creek fault (Figure 2.1-8; DWR Basin No. 7-025). The southern boundary of the Subbasin is marked by the course of San Felipe Creek. It should be noted that this section focuses on geologic structures, geologic history, and traditional geologic nomenclatures (i.e., formations); whereas Section 2.2.1.3 generalizes the geology of the water bearing formations, described as follows, into three aquifers based on a textural model developed by the USGS (2015). Therefore, the stratigraphic boundaries of geologic units below do not necessarily co-occur with the three aquifer boundaries described in Section 2.2.1.3.

Geologic History

The geologic history of the Subbasin is complex but can be generally divided into three primary phases of activity. The first begins 450 million years ago when the region's oldest rocks were deposited in a near-shore marine environment along a passive continental plate margin. As stated on the Anza-Borrego Desert Natural History Association website,

21 The most recent Period of the Cenozoic Era. Encompasses the time interval of 1.6 million years ago through today.
22 The Cretaceous period spans from 65 to 144 million years ago, the Mesozoic era spans from 65 to 245 million years ago.

With deep burial and cementation, these ancient sediment layers hardened into marine sedimentary rocks, including sandstone, mudstone, and limestone. Later, these marine sedimentary rocks would be squeezed and baked by intruding magma (molten rock in Earth's interior) and transformed by pressure and heat into metamorphic rock. Limestone transformed into marble, sandstone into quartzite, and mudstone into layered schist and banded gneiss--all metamorphic rocks exposed in Anza-Borrego's prominent mountain ranges, including Coyote Mountain as well as the Santa Rosa, Vallecito, and San Ysidro Mountains (Barrie 2018).

The intruding magma marks the second major phase of geologic activity, when the Eastern Peninsular Ranges Batholith[23] formed in place along a continental volcanic arc about 100 million years ago as a result of subduction. The batholith includes varieties of plutonic rocks, including granite, that comprise the basement rocks of the Subbasin and those mapped in the San Ysidro Mountains (Figure 2.2-8). Finally, about 30 million years ago, a complex plate boundary formed as a result of both transform and divergent plate tectonic motions that are responsible for development of the Salton Trough as well as the Elsinore, San Jacinto, and San Andreas fault zones. An overview of the Plate Tectonic History of the Anza-Borrego region by Don Barrie is available on the Anza-Borrego Desert Natural History Association's website: http://www.abdnha.org/anza-borrego-desert-geology.htm

Geologic Units

The granitic and metasedimentary basement complex is the oldest geologic unit underlying the Borrego Valley, and the contact between the low permeability basement complex and the overlying basin fill defines the bottom boundary of the Subbasin (Dibblee 2008, USGS 2015). The rocks of the basement complex crop out in the San Ysidro Mountains, Coyote Mountain, and Borrego Mountain, but are over 3,000 feet below land surface in the center of the Borrego Valley (Dibblee 2008, USGS 2015). Overlying the basement complex is a sequence of older marine and younger continental basin fill deposits. The marine deposits, which range in age from possibly Miocene to possibly Pleistocene, make up the Imperial Formation; whereas, the Pliocene and Pleistocene-age continental deposits make up the Palm Spring and Borrego Formations, as well as the Ocotillo Conglomerate (Dibblee 2008, USGS 1982). The youngest deposit in the Subbasin is the Quaternary alluvium (Figure 2.2-8). The Quaternary alluvium covers the majority of the Borrego Valley floor (Figure 2.2-8). Outcrops of unnamed terrestrial sediments are found in the northern portion of the Borrego Valley, within the boundaries of the Subbasin. Outcrops of the Palm Spring Formation are found in the southern area of the Subbasin, associated with the Desert

---

23 Very large mass of intrusive (plutonic) igneous rock that forms when magma solidifies at depth. A batholith must have greater than 100 square kilometers (40 square miles) of exposed area.

Lodge anticline and a series of synclines and anticlines to the north of San Felipe Creek (Figure 2.2-8).

Imperial Formation

The deepest water bearing rocks in the Subbasin are the marine deposits of the Imperial Formation (USGS 2015). These deposits are composed of late Miocene to early Pliocene gray to yellow gray claystone. The claystone is weakly to moderately consolidated, and has been tilted and folded by motion along the San Andreas and San Jacinto faults (USGS 2015). Age dating of the Imperial Formation is based on fossil oyster shells, other mollusks, and corals. Overall, the fossil record is insufficient to define specific time-stratigraphic units within the Imperial Formation (USGS 2015). The Imperial Formation grades upward into the overlying Palm Spring Formation (Netto 2001). The Imperial Formation is likely not widespread in the Borrego Springs Subbasin, as it has only been identified in two well borings.

Palm Spring Formation

Deposited by the ancestral Colorado River, the Palm Spring Formation consists of thousands of feet of Pliocene- to Pleistocene-age fluvial and deltaic sand, silt, and clay deposits (USGS 2015). Similar to the underlying Imperial Formation, the Palm Spring Formation is weakly to moderately consolidated, and has been tilted and folded by motion along the San Andreas and San Jacinto faults (USGS 2015). In the vicinity of Borrego Valley, the deposits of the Palm Spring Formation are typically interbedded light gray arkosic sandstone and red claystone (Netto 2001). In areas of the Borrego Valley where the Imperial Formation is absent, the Palm Spring Formation directly overlies the basement complex (Netto 2001).

Borrego Formation

The Pliocene- to Pleistocene-age Borrego Formation, which is primarily composed of light-gray lacustrine claystone and siltstone, was deposited in a perennial lake that became tectonically isolated from the Gulf of California (Dorsey 2005; USGS 1982). The Borrego Formation, based on its origin, may locally contain evaporites (e.g., gypsum). Sandstone beds are rare in the Borrego Formation but, where present, are composed of both Colorado River and locally derived material (Dorsey 2005).

Ocotillo Conglomerate

Locally overlying the Borrego Formation in the Borrego and Ocotillo Badlands is the Ocotillo conglomerate (Dorsey 2005). The Pliocene- to Pleistocene-age Ocotillo conglomerate comprises gray alluvial fan and ephemeral stream deposits (Dorsey 2005; USGS 1982). This formation outcrops on the surface at the southwestern margin of the basin.

Quaternary Alluvium

Quaternary alluvium deposits are exposed over most of the Borrego Valley floor (USGS 2015; Figure 2.2-8). These deposits include lacustrine silts and clays that are present at or near the surface of the Borrego Sink, as well as coarse to fine sands derived primarily from Coyote Creek but also the numerous ephemeral stream channels that enter the Subbasin. The Quaternary Alluvium is further described in Section 2.2.1.3.

Soil Units

Overlying the geologic units described above are surface soils mapped by the U.S. Department of Agriculture. Soil types present within the Plan Area are mapped and described in U.S. Department of Agriculture Web Soil Survey of the Anza-Borrego Area, California (CA804), and San Diego County Area, California (CA638) (USDA 2018). The predominant soil units in the Plan Area (i.e., greater than 10% coverage) include the following, from greatest to least coverage:

- Carrizo very gravelly sand, 0%–9% slopes (CeC)
- Rositas fine sand, 0%–2% slopes (RoA)
- Sloping gullied land
- Indio silt loam, saline, 0%–2% slopes (IoA)
- Mecca fine sandy loam, 0%–2% slopes, eroded (MpA2)
- Rositas loamy coarse sand, 0%–2% slopes (RsA)

Figure 2.2-9 presents the soil units mapped within the Plan Area in terms of their predominant texture. Coarser soils occur around the valley edges and along the major stream corridors, whereas the finest soils occur in the valley center and within the Borrego Sink. According to the U.S. Department of Agriculture (USDA 2018), the Carrizo very gravelly sand has a "very high" saturated hydraulic conductivity[24] (Ksat) in the Plan Area (the weighted average of representative values for all soil horizons is 141 micrometers per second (µm/sec)). This soil unit develops over coarse alluvial fan units close to the mountain front, and along Coyote Creek and San Felipe Creek. The Rositas soil units, which underlie the developed community and the agricultural areas of the valley, have a high Ksat (the weighted average of representative values

[24] Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. It is based on soil characteristics observed in the field, particularly structure, porosity, and texture. Ksat are grouped according to standard Ksat class limits. The classes are: Very low (0.00 to 0.01 µm/sec), Low (0.01 to 0.1 µm/sec), moderately low (0.1 to 1.0 µm/sec), Moderately high (1 to 10 µm/sec), High (10 to 100 µm/sec), and Very high (100 to 705 µm/sec).

for all soil horizons is 92 μm/sec). The Mecca soil units also have a high Ksat, but are less permeable than the Rositas soils (the weighted average of representative values for all soil horizons is 28 μm/sec). The Indio soil units, which underlie undeveloped open space areas north of the Borrego Sink, have a "moderately high" Ksat (the weighted average of representative values for all soil horizons is 9 μm/sec). The only soil in the Plan Area with a moderately low Ksat is the playa unit, which underlies the Borrego sink (the weighted average of representative values for all soil horizons is 0.215 μm/sec). Areas mapped as sloping gullied land do not have a Ksat value assigned (USDA 2018).

Geologic Structures

Coyote Creek Fault

The right-lateral Coyote Creek fault, which is one of seven segments of the larger San Jacinto fault zone, defines the eastern boundary of the Subbasin (USGS 2015; Figure 2.2-8). The Coyote Creek segment is approximately 80 kilometers long and has an approximate slip rate of 2–6 millimeters per year (SCEDC 2018). The Coyote Creek fault is mapped by the USGS (2006) as having a well constrained location, and as being "latest Quaternary" in age, meaning its last rupture occurred less than 15,000 years ago. Historical (less than 150 years ago) motion along the San Jacinto fault zone has opened cracks as large as 2 feet wide along the Coyote Creek fault (USGS 2015). These cracks were later observed to infill with low permeability surface sediments (USGS 2015). Groundwater level contours are generally perpendicular to the fault, suggesting that groundwater flow parallels the fault in most places (USGS 2015). It should be noted that because groundwater level data coverage on either side of the fault is poor, groundwater contours are subject to a high degree of interpretation.

Changes in groundwater elevations of 40–50 feet across the fault indicate that the Coyote Creek fault acts as a partial barrier to groundwater flow between the Borrego Springs Subbasin to the west and the Clark Lake Valley to the east (USGS 1982). An electrical resistivity study conducted by San Diego State University students in March 1983 under the direction of Professor David Huntley, along with groundwater level measurements reported by the USGS (1982), were reviewed to evaluate groundwater conditions in the early 1980s on either side of the fault, and to provide a screening assessment of potential flux across the fault using a groundwater flow equation. Given the hydraulic conductivity of the fault zone is not known precisely, a range of flux into the Borrego Springs Subbasin from the Ocotillo-Clark Valley Basin was estimated to be anywhere between 32 and 3,200 AFY (Wiedlin, pers. comm. 2018). Thus, there is a potential that the groundwater flux across the Coyote Creek fault and into the Borrego Springs Subbasin could be significant (Wiedlin, pers. comm. 2018).

Given this assessment is based on limited data, and is inconsistent with the assumption in the BVHM of a no flow boundary across the site, it represents a data gap. The flux into the Borrego Springs

Subbasin from the Ocotillo-Clark Valley Basin could be verified by incorporating existing water wells on either side of the fault into the groundwater monitoring networks, evaluating the salinity of groundwater on the northeast side of the fault, and conducting a groundwater model sensitivity analysis (Wiedlin, pers. comm. 2018). The GSA did not consider this a critical data gap because historical groundwater levels and trends suggest the flux would be into the Subbasin rather than out of the Subbasin (i.e., a potential missing input to the water budget), and because the Coyote Creek Fault is distant from the active pumping centers within the Subbasin. This data gap does not affect the GMP's initial establishment of sustainable management criteria in Chapter 3, or the effectiveness of projects and management actions described in Chapter 4. If inflow from the Ocotillo-Clark Valley Basin is indeed significant, it could contribute to progress towards the GMP's interim milestones and measurable objectives, and/or contribute operational flexibility within the Subbasin.

Borrego Syncline

The Borrego syncline, which developed during the early stages of faulting in the San Jacinto fault zone, forms the deep portion of the Subbasin (Lutz et al. 2006; Kirby et al. 2007; Steely et al. 2009; Janecke et al. 2010; USGS 1982; cross section A-A' on Figure 2.2-10). The deepest part of the Subbasin, where bedrock is buried beneath sediments, is in the vicinity of the Borrego Valley Airport (cross section A-A' on Figure 2.2-10; USGS 1993). The basement rock underlying this area is estimated to be at a depth of 3,800 feet (USGS 2015).

Yaqui Ridge/ San Felipe Anticline

The Yaqui Ridge/San Felipe anticline and San Felipe fault create a basement high in the vicinity south and east of the San Felipe Creek (cross section A-A' on Figure 2.2-10). These structures are also related to deformation in the San Jacinto fault zone (Steely et al. 2009). The basement bedrock underlying the basin sediments drops away southeast of Ocotillo Wells following the southern limb of the San Felipe anticline into the Lower Borrego Valley. These structures effectively offset sediments north of San Felipe Creek from those to the south, forming the boundary between the Borrego Springs Subbasin and the Ocotillo Wells Subbasin (cross section A-A' on Figure 2.2-10). The upper and middle aquifers, described as follows in Section 2.2.1.3, essentially pinch out in the vicinity of the San Felipe anticline, where the lower aquifer drapes down over the basement high. This structure creates a barrier to groundwater flow, which is evidenced by groundwater levels in the Borrego Springs Subbasin that are several hundred feet higher than those in the Ocotillo Wells Subbasin (which are at or near sea level).

2.2.1.3 Principal Aquifers and Aquitards

The USGS (2015) has subdivided the groundwater system within the Borrego Springs Subbasin into upper, middle, and lower aquifers. The differentiation between the three aquifers is based on a textural analysis of driller's lithologic logs and geophysical logs. Differences in overall texture were determined by analyzing the fraction of coarse material like sand and gravel with depth for available logs. Historically, different nomenclatures have been applied to the Quaternary and late Tertiary geologic units (USGS 1982; Henderson 2001). Despite the differences in nomenclature, however, all the lithologic descriptions indicate that the basin fill sediments of the Borrego Valley consist of unconsolidated to poorly consolidated mixtures of gravel, sand, silt, and clay. As a result, the establishment of a purely textural definition for the three aquifers relies on a basin wide analysis of subsurface data rather than previously assigned geologic unit names.

As there are no regionally extensive aquitards (e.g., a thick clay layer), the upper aquifer behaves in a predominantly unconfined manner, and the lower and middle aquifer exhibit leaky confined or semi-confined characteristics based on limited aquifer testing (Netto 2001; Dudek 2014, 2015a, 2015b). The lower aquifer is the most fine-grained unit, containing higher amounts of silt and clay. The Imperial Formation was identified in two borings located in the southern part of the Subbasin, though it is not likely a wide-spread formation within the Subbasin. USGS (2015) notes that,

> hydraulic conductivities generally decrease with depth and with increasing distances from the original source of the sediments in adjacent mountain ranges and stream channels, which is consistent with the fining-down and fining-toward-the-basin-center sequences observed in the aquifer sediments and texture model.

The USGS prepared a cross-section running from Borrego Springs in the northwest to the southeast that illustrates the basement low in the Borrego syncline and the basement high of the San Felipe anticline (cross section A-A' on Figure 2.2-10) (USGS 1982). This cross-section also illustrates that neither saturated portions of the high permeability sediments of the upper aquifer nor saturated sediments of the middle aquifer extend to the area south of the San Felipe anticline. Only the lower permeability sediments of the lower aquifer drape over the San Felipe anticline, and these older sediments are higly folded. This explains why the overdraft resulting from pumping of the upper and middle aquifers has been confined to the Borrego Springs area and has not propagated southeast of the San Felipe Creek area.

The three aquifers are shown on Figure 2.2-10 and are summarized from USGS (2015) as follows:

- **The upper aquifer** consists of coarse sediments (i.e., unconsolidated gravel, sand silt and clay of Holocene to Pleistocene age), primarily sourced from the Coyote Creek Watershed. It represents the unconfined aquifer, which historically has been the main source of water in the valley with well yields as high as 2,000 gallons per minute. The upper aquifer has been extensively dewatered by municipal, agricultural, and recreational pumping. The maximum thickness of the upper aquifer is estimated to be 643 feet where

Coyote Creek enters the Subbasin, thinning to less than 50 feet near the Borrego Sink. The upper aquifer becomes mostly unsaturated south of the Desert Lodge anticline near Rams Hill.

- **The middle aquifer** consists of Pleistocene-age continental deposits of gravel to silt with moderate amounts of consolidation and cementation, and is thought to originate from lower energy sediment sources prior to the initiation of slip along the Coyote Creek fault. The maximum thickness of the middle aquifer is estimated to be 908 feet in the northwestern part of the Subbasin, and like the upper aquifer, thins to less than 50 feet toward the southeastern part of the Subbasin. USGS (1988) indicates that the middle aquifer yields moderate quantities of water to wells, but is considered a nonviable source of water south of San Felipe Creek in the Ocotillo Wells Subbasin because of its diminished thickness.
- **The lower aquifer** consists of partly consolidated continental and lacustrine sediments of the lower Palm Spring and Imperial Formations. The maximum thickness of the lower aquifer is estimated to be 3,831 feet in the eastern part of the basin near the Borrego Airport. The lower aquifer yields smaller quantities of water to wells than the upper and middle aquifers.

USGS (2015) summarized information on the hydrogeologic properties of each aquifer, and aquifer tests have been conducted on multiple wells in the basin (RH-1, RH-2, ID1-8, RH-3, RH-4, RH-5, RH-6, Bauer 1, and Borrego Springs Water Co. Well 5); the range of aquifer values are shown in Table 2.2-3. The highest hydraulic conductivities were defined in the central portion of the valley where sand deposits of Quaternary age were characterized and older fan deposits at the base of the San Ysidro and Vallecito Mountains. Lower hydraulic conductivities were identified in areas characterized with younger fan deposits and consolidated continental deposits (Appendix D). The Borrego Sink was characterized with a uniform hydraulic conductivity of 6 feet per day in all three aquifer units (USGS 2015). The lower hydraulic conductivity in the middle and lower aquifers relative to the upper aquifer are based on a lower energy depositional environment to the Borrego Valley prior to activity along the Coyote Creek fault that opened the northern portion of the valley to sediment deposition from Coyote Creek (Appendix D). USGS (2015) reported that the specific storage defined for each aquifer unit under confined conditions ranged from 5.1×10^{-7} in the upper aquifer to 1.6×10^{-6} in the middle aquifer.

Table 2.2-3
Aquifer Hydraulic Conductivity and Storage Properties

Aquifer	Mean / Maximum Thickness (feet)[1]	Horizontal Hydraulic Conductivity (feet/day)[2]	Average Specific Yield (percent)
Upper	258 / 643	0.3–184	15 (Range: 2–28)
Middle	267 / 908	0.02–10	17 5 (Range: 15–21)
Lower	1,015 / 3,831		3 (Range: 0.7–5.6)

Source: USGS 2015, Dudek 2014, 2015a, 2015b, 2017.
Notes:
1 Based on the sediment texture analysis developed for use in the Borrego Valley Hydrologic Model (BVHM) (USGS 2015).
2 The range of hydraulic conductivities for the middle and lower aquifers are based on aquifer testing in wells screened across both zones, primarily in the South Management Area. The range for the upper aquifer is based on based on the distribution of coarse-grain sediments defined by the textural map created from lithologic and geophysical logs in the BVHM. The Borrego Sink was characterized by U.S. Geological Survey (USGS 2015) with a uniform hydraulic conductivity of 6 feet/day in all three aquifer units.

2.2.1.4 Recharge and Water Deliveries

There are no water deliveries to the Plan Area from external sources, and surface water imports are not available for managed recharge. In addition, there are currently no managed stormwater recharge facilities in the Plan Area. Thus, recharge is limited to natural infiltration of stormwater, and to a lesser degree, return flows of applied irrigation water and septic recharge.

The Coyote Creek Watershed, which drains the Santa Rosa Mountains to the north of the Borrego Springs Subbasin, provides most of the recharge to the Subbasin through infiltration of streamflow into the shallow alluvial sediments. Mountain front recharge that occurs at the interface between surrounding bedrock and unconsolidated sediments is the primary source of recharge along the smaller tributaries that enter the Subbasin, largely comprising the Borrego Valley-Borrego Sink Wash Watershed. These include Borrego Palm Creek, and washes exiting the San Ysidro Mountains, Pinyon Ridge, Yaqui Ridge, Coyote Mountains, and the Borrego Badlands. These areas of recharge are shown on Figure 2.2-11. USGS (2015) reported that "over the 66-year study period, on average, the natural recharge that reaches to the saturated groundwater system is approximately 5,700 acre-ft/yr. Natural recharge fluctuates in the arid climate from less than 1,000 to more than 25,000 acre-ft/yr."

The other, though less voluminous, source of recharge are return flows from agricultural irrigation. USGS (2015) estimated recharge from irrigation return flows to be between 10%–30% agricultural and recreational pumping based on the results of the BVHM. This is consistent with the estimate of irrigation return flow by Netto (2001), who used a chloride mass balance technique at a citrus grove located northwest of the intersection of Di Giorgio Road and Henderson Canyon Road to estimate a return flow of 22%. Netto (2001) used a similar approach to estimate a return flow for golf course irrigation of 14%. As agricultural efficiency increases, this fraction decreases. It can take years to decades for irrigation return flows to pass through the unsaturated zone to the underlying groundwater table, and much of the water that initially infiltrates into the soil is likely lost to evapotranspiration within the root zone, or (past the root zone) remains in storage within the unsaturated zone. However, elevated nitrate concentrations in the northern part of the Plan Area does provide evidence that agricultural return flows from years' past may be reaching the underlying aquifer (see Section 2.2.2.4).

Septic tank treatment and disposal systems also constitute a source of recharge to the basin, but is considered negligible when compared to natural recharge (USGS 2015). Most of the homes in the area utilize septic-tank treatment and disposal systems. The BWD estimates that about 80% of the domestic water deliveries are to homes with septic-tank systems (Dudek 2018). Potential recharge from this water use is difficult to quantify, but is believed to be small. The infiltration from septic tanks was simulated by the USGS (2015) at an application rate of 0.056 AFY per home at land surface into the unsaturated zone. This estimate was based on estimates per home water use of 100 gpd, and a 50% loss rate owing to evaporation and transpiration that was cited in the BWD IRWM Plan (USGS 2015). Septic tank treatment and disposal systems are known to be potential contributors to groundwater quality degradation, particularly when used in high concentrations and built to poor or outdated standards. Recharge sources are quantified in Section 2.2.3.

2.2.2 Current and Historical Groundwater Conditions

The primary sources of existing data for wells and groundwater include the various entities that have been collecting groundwater level and water quality data within the Plan Area since the early 1950s, primarily the BWD, County, DWR, SWRCB, and the USGS. As part of development of this GMP, a data management system (DMS) will be used to display and track groundwater well locations and monitoring data for groundwater levels, water quality, and production. The groundwater monitoring network established for the Plan Area by the Watermaster is intended to support tracking progress toward sustainability goals established in this GMP based in part upon continued reporting of data by those currently reporting to the CASGEM Program and DWR's Water Data Library.

The location and type of monitoring for wells in the Plan Area are shown on Figure 2.2-12 and listed in Table 2.2-4. Water wells included in the groundwater monitoring network were incorporated from previous monitoring networks established by the BWD and consultants, County, DWR, and USGS. In addition to monitored wells in the Plan Area, there are four wells monitored within the Ocotillo Wells Subbasin, which are: "Dr. Nell" Well, "State" Well, SVRA Well, and Split Mountain Road Well. The Borrego Springs Subbasin monitoring network currently consists of 50 groundwater wells owned by BWD, the County, ABDSP, and private parties; some are strictly observation wells (no pumping), while others are used for municipal, recreation (e.g., golf courses and ABDSP), and rural residential purposes. The groundwater level-monitoring network includes 23 dedicated monitoring wells and 27 extraction wells. Of the 50 wells in the network, 46 are monitored for groundwater levels, 30 are monitored for water quality, and 19 are monitored for production. Groundwater levels are measured manually in the majority of the wells in the monitoring network, although the BWD and the Rams Hill Golf Course collectively have 17 wells equipped with pressure transducers that collect groundwater level data at frequencies as high as every 15 minutes. These wells are listed in Table 2.2-5.

The groundwater monitoring network is expected to evolve over time. The Watermaster expects to add additional wells as suitability issues are resolved, and as access permissions are granted from private well owners. The monitoring network currently lacks representation from certain recreational pumpers and agricultural pumpers in the NMA (see Section 2.2.4 for a description of management area). A Groundwater Extraction Facility Registration Form has been prepared for each private well owner to complete in order to expand the inventory of private wells in the Borrego Springs Subbasin. Table 2.2-4 includes the wells' State Well ID, which is a unique well identifier designated by the DWR.[25]

Table 2.2-4
Groundwater Monitoring Network

Common Well Name [a]	State Well Identification (SWID)	Latitude	Longitude	Use	Groundwater Monitoring Networks		
					Elevation	*Quality*	*Production*
North Management Area							
Horse Camp	009S006E31E003S	33.349264	-116.400345	Other	X	X	—
Pnvate Well	010S006E09N001S	33.314535	-116.366688	Residential	X	X	—
ID4-4	010S006E29K002S	33.277136	-116.374327	Public Supply	X	X	X
ID4-18	010S006E18J001S	33.306751	-116.384715	Public Supply	X	X	X
ID4-3	010S006E18R001S	33.298040	-116.384339	Public Supply	X	—	—
MW-1	010S006E21A002S	33.300634	-116.349471	Observation	X	X	—
Evans	010S006E21E01S	33.29429300	-116.36194000	Observation	X	—	—
Central Management Area							
County Yard (SD DOT)	011S006E15G001S	33.220966	-116.337613	Industrial	X	X	X
BSR Well 6	011S006E09B002S	33.23906	-116.35567	Irrigation - Recreation	—	X	X
BSR Well 3	011S006E04P001S	33.24559	-116.35875	Irrigation - Recreation	—	—	X
Hanna (Flowers)	010S006E14G001S	33.306115	-116.323982	Observation	X	—	—
Gabrych No. 2	011S006E01C001S	33.257255	-116.304700	Observation	X	—	—
ID4-1	010S006E32R001S	33.257486	-116.371035	Observation	X	—	—
ID4-5	010S006E33Q001S	33.257428	-116.355899	Observation	X	—	—
Airport 2	010S006E35N001S	33.257385	-116.326102	Observation	X	—	—

25 Wells monitored by the DWR and cooperating agencies are identified according to the State Well Numbering system. The numbering system is based on the public land grid, and includes the township, range, and section in which the well is located. Each section is further subdivided into sixteen 40-acre tracts, which are assigned a letter designation of A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, or R. Within each 40-acre tract, wells are numbered sequentially. The final letter of the State Well Number refers to the base line and meridian of the public land grid in which the well lies. "M" refers to the Mount Diablo base line and meridian; "S" refers to the San Bernardmo base line and meridian; "H" refers to the Humboldt base line and meridian (DWR 2017).

Table 2.2-4
Groundwater Monitoring Network

Common Well Name[a]	State Well Identification (SWID)	Latitude	Longitude	Use	Groundwater Monitoring Networks		
					Elevation	*Quality*	*Production*
MW-4	010S006E35Q001S	33.257561	-116.313108	Observation	X	X	—
ID4-2	011S006E07K003S	33 231602	-116.388737	Observation	X	—	—
Palleson	010S006E33J001S	33.26156287	-116.34875075	Observation	X	—	—
Abandon Motel-1	011S006E10N001S	33.23 359532	-116.34704679	Observation	X	—	—
Abandon Motel-2	011S006E10N004S	33 23048074	-116.34689137	Observation	X	—	—
State Park No. 3	010S005E25R002S	33.27038000	-116.40354600	Other	X	X	X
Anzio/Yaqui Pass	011S006E22E001S	33.206040	-116.347150	Observation	X	—	—
Paddock	011S006E22B001S	33 211593	-116 334036	Observation	X	—	—
Cameron 2	011S006E04F001S	33.249652	-116.357102	Observation	X	—	—
ID5-5	011S006E09E001S	33.237067	-116.364304	Public Supply	—	X	X
ID1-10	011S006E22D001S	33 211790	-116.346813	Public Supply	X	X	X
ID1-16	011S006E16N001S	33.216557	-116.362440	Public Supply	X	X	X
Wilcox	011S006E20A001S	33.210910	-116.364826	Public Supply	X	X	X
ID1-12	011S006E16A002S	33.226030	-116.348317	Public Supply	X	X	X
ID4-10	011S006E18L001S	33 218319	-116.392226	Public Supply	X	—	—
ID4-11	010S006E32D001S	33.267499	-116 383357	Public Supply	—	X	X
White Well	010S006E29A001S	33.280900	-116.367011	Residential	X	—	—
South Management Area							
RH-5	011S006E26B001S	33.195428	-116.319088	Irrigation - Recreation	X	X	X
RH-6	011S006E26H001S	33.194778	-116.314273	Irrigation - Recreation	X	X	X
RH-2	011S006E25C001S	33.195655	-116.304156	Irrigation - Recreation	X	X	X
RH-4	011S006E24Q002S	33.199973	-116.303654	Irrigation - Recreation	X	X	X
RH-1	011S006E25A001S	33.198121	-116.295854	Irrigation - Recreation	X	X	X
RH-3	011006E25C002S	33.197950	-116.307563	Irrigation - Recreation	X	X	X

Table 2.2-4
Groundwater Monitoring Network

Common Well Name[a]	State Well Identification (SWID)	Latitude	Longitude	Use	Groundwater Monitoring Networks		
					Elevation	*Quality*	*Production*
WWTP	011S006E23H001S	33.207400	-116.315199	Observation	X	X	—
MW-5A	011S007E07R001S	33.226557	-116.279352	Observation	X	X	—
MW-5B	011S007E07R002S	33.226557	-116.279352	Observation	X	X	—
Bakko	011S006E22A001S	33.210901	-116.330845	Observation	X	—	—
Army Well	011S006E34A001S	33.184156	-116.332830	Observation	X	X	—
Hayden (32Q1)	011S007E32Q001S	33.173998	-116.264318	Observation	X	—	—
Bing Crosby Well	011S007E20P001S	33.199489	-116.267939	Observation	X	—	—
MW-3	011S006E23J002S	33 203481	-116.314252	Observation	X	X	—
ID1-8	011S006E23J001S	33.203160	-116.314343	Public Supply	X	X	X
Air Ranch Well 4	011S007E30L001S	33.190830	-116.286730	Public Supply	X	X	—
JC Well	011S006E24Q001S	33.201936	-116.303268	Residential	X	X	—
La Casa	011S006E23E001S	33.208044	-116.328359	Unknown	X	X	—

Notes: X = Monitored; — = Not Monitored; SD DOT = San Diego County Department of Transportation; BSR = Borrego Springs Resort.

[a] Common names beginning in "ID" are Borrego Water District (BWD) wells, common names beginning in "RH" area Ram's Hill Country Club Wells, and common names consisting of pronouns refer to the well owner or small water system.

Table 2.2-5
Wells Equipped with Pressure Transducers

Well ID	Period of Record	Frequency of Data Collection (minutes)	Well Owner
Currently Monitored Wells			
RH-1	April 2014 to Present	15	Rams Hill Golf Course
RH-2	April 2014 to Present	15	Rams Hill Golf Course
ID1-8	March 2014 to Present	15	Borrego Water District
RH-3	August 2014 to Present	15	Rams Hill Golf Course
ID1-12	March 2018 to Present	30	Borrego Water District
ID1-16	March 2018 to Present	30	Borrego Water District
ID4-4	March 2018 to Present	30	Borrego Water District
ID4-18	March 2018 to Present	30	Borrego Water District
RH-4	January 2015 to Present	15	Rams Hill Golf Course
RH-5	June 2015 to Present	15	Rams Hill Golf Course
RH-6	November 2015 to Present	15	Rams Hill Golf Course
JC Well	September 2014 to Present	15	Rams Hill Golf Course
MW-1	April 2016 to Present	120	Borrego Water District
MW-3	April 2014 to Present	15	Borrego Water District

Table 2.2-5
Wells Equipped with Pressure Transducers

Well ID	Period of Record	Frequency of Data Collection (minutes)	Well Owner
MW-5A (Lower)	May 2016 to Present	15	Borrego Water District
MW-5B (Upper)	June 2016 to Present	15	Borrego Water District
WWTP	March 2014 to Present	15	Borrego Water District
Previously Monitored Wells			
Air Ranch Well No 4	May 2016 to February 2017	15	Borrego Air Ranch

The following subsections address current and historical conditions related to each of the undesirable results identified under SGMA, including groundwater elevations (Section 2.2.2.1), changes in groundwater storage (Section 2.2.2.2), groundwater quality (Section 2.2.2.4), subsidence (Section 2.2.2.5), and groundwater-surface water interactions and groundwater-dependent ecosystems (Sections 2.2.2.6 and 2.2.2.7) in the Borrego Springs Subbasin.

2.2.2.1 Groundwater Elevation Data

Current Groundwater Levels

Current groundwater levels in the Borrego Springs Subbasin were measured in Spring and Fall 2018, and are shown on Figure 2.2-13A and Figure 2.2-13B, respectively. Measured groundwater elevations in Spring 2018 ranged from a high of 644.76 feet amsl in the northern part of the subbasin (DWR Well No. 009S006E31E003S (Horse Camp Well)) to a low of 377.58 feet amsl north of the intersection of Henderson Canyon Road on Di Giorgio Rd (DWR Well No. 010S006E09N001S), which marks the central area of the primary agriculture area in the valley. Measured groundwater elevations in Fall 2018 were similar to those measured in the spring, showing a similar spatial pattern of static groundwater level elevations. On average, groundwater elevation measurements in Spring 2018 were 12.59 feet lower than Fall 2018, with a maximum rise of 2.48 feet amsl (DWR Well No. 011S006E22E001S (Anzio/Yaqui Pass)), and a maximum fall of 10.51 feet amsl (DWR Well No. 011S006E23J002S (MW-3)). In certain wells and at certain times of the year, particularly the irrigation season, near-by pumping can influence groundwater level elevation in monitored wells.

The predominant direction of groundwater flow within the Subbasin is away from mountain front regions, and away from San Felipe Creek, toward the center of the valley near Palm Canyon Drive about 2 miles north of Borrego Sink. The steepest groundwater gradient measured in Spring 2018 occurred across the cultivated areas of the northern part of the basin. In this area (between the ABDSP Horse Camp Well and DWR Well No. 010S006E09N001S), the groundwater gradient in Spring 2018 was 0.016. The groundwater gradients in the central and eastern parts of the Plan Area were relatively flat.

Two pumping-related depressions were exhibited in the data collected, one centered on the agricultural areas north of Henderson Canyon Road, and possibly another centered around a cluster of wells north of the Ram's Hill Country Club. Groundwater levels in terms of depth from the surface tend to shallow towards the Borrego Sink and tend to deepen around the northern, western and southern margins of the Subbasin, as shown on Figure 2.2-10.

Historical Groundwater Levels

Historical groundwater levels in the Borrego Springs Subbasin are shown on Figure 2.2-13C for 2010 and Figure 2.2-13D for 1945. In 2010, groundwater contours indicate that groundwater elevations ranged from a high of over 500 feet amsl in the southern part of the Subbasin near San Felipe Creek to a low of about 340 feet amsl about 3 miles east of the Borrego Sink (Figure 2.2-13C). The 2010 contours show two pumping depressions. One appears as an elongated zone centered north of Henderson Canyon Road extending south toward Christmas Circle within the 400-foot groundwater contour. The other is centered just north of the intersection of Borrego Springs Road and Anzio Drive, extending further west towards the mouths of Culp Canyon and Dry Canyon, also within the 400-foot groundwater contour.

In 1945, prior to development in the Plan Area, the direction of groundwater flow was predominantly from the northwest to the southeast (Figure 2.2-13D). Groundwater elevations ranged from more than 600 feet amsl near Coyote Creek in the northwestern part of Borrego Valley to about 460 feet amsl in the southeastern part. The lowest groundwater-level elevations occurred east of the Borrego Sink, an area of natural drainage in the middle of the valley that is currently dry most of the time. According to the USGS (2015), the Borrego Sink was historically the site of about 450 acres of honey mesquite (*Prosopis glandulosa*) and other native phreatophytes, indicating that shallow groundwater and occasional accumulations of surface water was sufficient to support a GDE. Old Borrego Spring, located about 1 mile east of the Borrego Sink, was flowing in 1945, but ran dry as agricultural uses began in the following decade. In 1945, the groundwater flowed parallel to Coyote Creek in an easterly to southeasterly direction.

Groundwater Level Trends

Since the early 1950s, groundwater extraction has exceeded recharge, and the direction of flow has been altered in all areas of the valley to the current period. The human influence on groundwater levels within the Plan Area is most pronounced in the northern part of the basin, generally decreasing in intensity towards the southeast. One exception to this general trend is that municipal and recreational well clusters, generally located east and south of the Borrego Sink do show more intense pumping than the areas north of the Borrego Sink within the central part of the Subbasin.

As shown on Figure 2.2-13E, groundwater levels between 1953 and 2018 declined by as much as 133 feet in the northern part of the Plan Area (Northern Management Area (NMA)), equivalent to an average rate of 2.05 feet per year. The rate of groundwater level decline in the northern area was greatest prior to 1965, which is around the time that irrigation of grape crops in the Plan Area ceased. During grape cultivation, groundwater levels were dropping by as much as 3.4 feet per year (USGS 2015). Groundwater levels briefly stabilized and slightly rebounded from the mid-1960s until the early 1970s, at which point groundwater levels began dropping again, albeit at a lower rate than in the 1950s and early 1960s. Starting in the late 1970s, cultivation of citrus crops began in earnest, and groundwater levels in the northern part of the Plan Area have been dropping at a relatively constant rate since that time. Figure 2.2-13E includes key wells with a long-running record, however, hydrographs for every well in the current monitoring network is included in Appendix D.

Also shown on Figure 2.2-13E is a second, smaller area of groundwater-level depression in the west-central part of the basin (Central Management Area (CMA)), which is associated with pumping for municipal and recreational purposes. The magnitude of the groundwater level decline is smaller, dropping by about 88 feet between 1953 and 2018, or an average rate of 1.35 feet per year. In the southeastern part of the valley (South Management Area (SMA)), where less groundwater has been pumped, the groundwater-level has remained about the same in the historical record, remaining at an elevation of about 500 amsl (approximately 10 feet) at DWR well Nos. 011S007E20P001S and 011S007E32Q001S. An exception to this observed trend in the SMA is the resumption of pumping for the Rams Hill golf course starting in 2014, and shown in the groundwater level record for DWR well No. 011S006E23J002S on Figure 2.2-13E.

To visualize the recent rate of groundwater decline across the Subbasin, Figure 2.2-13F shows the difference between the 2010 and Fall 2018 groundwater elevation contours. Furthermore, Chapter 3 Figures 3.2-1, 3.2-2, and 3.2-3 depict the remaining saturated thickness of each aquifer in the upper, middle and lower aquifers, respectively. The upper aquifer currently hosts the most accessible (i.e., shallowest) and highest-yielding wells within the Subbasin as a whole. As shown on Figure 3.2-1, the groundwater table has dropped below the base of the upper aquifer in some parts of the Subbasin, particularly within the southwestern half of the CMA, which overlies the more developed portion of Borrego Springs that is served by the BWD with wells located in the CMA (Figure 3.2-1). Up to 175 feet of the upper aquifer remains saturated in the east central part of the CMA, and roughly 50 feet, on average, of the upper aquifer remains saturated within portions of the SMA and CMA. The middle aquifer maintains much of its saturated thickness over much of the Subbasin, except where the aquifer unit pinches out in the southwest part of the Subbasin (Figure 3.2-2). The lower aquifer is the thickest aquifer underlying the Plan Area (Figure 3.2-3).

Data Gaps

Review of existing groundwater elevation data within the Plan Area suggests that although three distinct aquifers are delineated in varying thickness across the Subbasin, the effect of well screen lengths and intervals is potentially negligible with respect to measured depths to groundwater (i.e., potentiometric surface). An example includes MW-5A/5B with dual nested wells screened across the upper/middle aquifers and middle/lower aquifers. Variation of groundwater depths between these wells averages less than 0.01 foot. Therefore, although the Subbasin may not include data for groundwater monitoring wells screened solely in each of the three aquifer units for each of the three management areas, these data gaps are not considered significant with regard to groundwater levels. As such, for the purposes of the GMP, the need for wells screened solely in each vertical aquifer unit independently does not appear to be necessary to achieve adequate spatial representation of groundwater elevations in the Subbasin. Spatial (vertical) distribution suggests that the existing well infrastructure may be adequate to determine the minimum threshold for chronic groundwater lowering.

Lateral distribution suggests that existing wells are adequate to meet SGMA requirements; however, elevation data from some critical monitoring points have yet to be received from sources such as the DWR. The adequacy of the lateral distribution of monitoring wells in the NMA, CMA, and SMA is described as follows.

- *North Management Area*: The well distribution in the NMA appears adequate to meet SGMA requirements; however, groundwater elevation data from agricultural pumpers are limited. The compiled data currently includes existing well data from four wells in the NMA, but historical data from additional wells would be beneficial to establish the minimum threshold. Developing a better understanding of groundwater elevations and quality in the future is a goal for this portion of the Borrego Springs Subbasin.
- *Central Management Area*: The well distribution in the CMA appears adequate to meet SGMA requirements, and because this area has been well studied historically, sufficient groundwater elevation data has been obtained to establish the minimum threshold.
- *South Management Area*: The well distribution in the SMA appears adequate to meet SGMA requirements. This area includes wells that are routinely monitored by the BWD, in addition to several wells that are routinely monitored under the CASGEM program.

Significant data gaps have been identified associated with access to the DWR and private well information in the Plan Area, which are primarily agricultural wells. Specifically, this includes an area north of the Borrego Sink, which results in the 2018 groundwater level contours that may obscure finer details on groundwater flow direction and gradient in the area. This area consists of undeveloped open space and a lack of production wells. In addition, additional groundwater level data on either side of the Coyote Creek fault would aid in verifying the degree to which the fault acts as a partial barrier to groundwater flow (Wiedlin, pers. comm. 2018). As previously discussed, these data gaps will be addressed by identifying additional monitoring locations. The Borrego Springs Subbasin Monitoring Plan developed by the GSA (described in Chapter 3, Section 3.5) will be updated periodically by the Watermaster, through the Technical Advisory Committee process under the Judgment, to address these data gaps and to monitor groundwater levels and water quality against the sustainability indicators defined and outlined in Chapter 3 of this GMP and the Judgment.

2.2.2.2 Estimate of Groundwater in Storage

The storage capacity based on stable groundwater levels before groundwater development began in the basin is estimated to have been about 5,500,000 AF (USGS 1982). Based upon subsequent study by Dr. David Huntley, the majority of readily available water to existing well users in the Borrego Valley exists in the upper and middle aquifer. The amount of groundwater within these two aquifers was estimated to be approximately 2,131,000 AF in 1945 and 1,900,500 AF in 1980 (Huntley 1993). The remaining water located within the lower aquifer is more difficult and costly to extract due to its low specific yield (estimated to be approximately 3%), its depth, and low specific capacity (estimated to be 5 gallons per minute/foot of drawdown or less) (County of San Diego 2010). As discussed in the following Section 2.2.3.3, it is estimated that 520,000 AF of water has been removed from storage over the period of model simulation, which begins in the pre-development period. The BVHM estimates that total storage loss from water year 1980 through water year 2016 is 334,293 AF. Therefore as of 2016, the volume of groundwater in storage within the upper and middle aquifers of the Subbasin is approximately 1,566,207 AF. It should be noted that the extent of the BVGB analyzed by the USGS (1982) was about 12% larger than the Plan Area, due to differences in the southeastern boundary of the study area along San Felipe Creek.

2.2.2.3 Seawater Intrusion

As an inland basin, the Borrego Springs Subbasin has no hydraulic connection to the Pacific Ocean. The Subbasin is more than 50 miles from the Pacific Ocean, more than 130 miles from the Gulf of California, and 15 miles from the Salton Sea, which is an inwardly draining sink. Additionally, the Salton Sea is geologically separated from the Subbasin by the Coyote Creek fault and Coyote Mountains. Therefore, sufficient data appears to demonstrate that seawater intrusion is not an applicable sustainability indicator[26] in the Plan Area.

2.2.2.4 Groundwater Quality

The most extensive water quality monitoring data within the Borrego Springs Subbasin comes from reporting by public water supply systems to the SWRCB Division of Drinking Water for the purpose of ensuring adequate drinking water quality. For example, the BWD routinely monitors approximately 12 wells to test groundwater for general minerals, aggregate properties, solids, metals, and nutrients at least every 3 years. In addition to historical water quality data available within the Subbasin, Table 2.2-4 shows the wells included in the monitoring network for groundwater quality. Constituents to be monitored have been selected based on the results of prior monitoring activities in the Subbasin conducted primarily by DWR, USGS, and BWD. These monitoring activities along with USGS publications (USGS 2014, 2015) have summarized groundwater quality conditions in sufficient detail to identify arsenic, nitrate, sulfate, fluoride, TDS, and radionuclides as the Subbasin's main constituents of concern (COCs).

To provide some context for the groundwater quality results, concentrations of constituents measured in the untreated groundwater are compared with regulatory and non-regulatory health-based benchmarks established by the U.S. Environmental Protection Agency and SWRCB Division of Drinking Water. The primary metric for identifying undesirable results[27] related to groundwater quality within the Subbasin are exceedances of State of California Maximum Contaminant Limits (MCLs)[28] (Title 17 CCR and Title 22 CCR). It should be noted that these regulatory benchmarks apply to water that is delivered to the consumer, not to untreated groundwater. Exceedances of MCLs within raw groundwater indicate potential threats to human health in untreated groundwater and the potential need for additional treatment steps to make groundwater suitable for potable use. All BWD wells currently have water quality adequate for non-potable use (i.e., Title 22 CCR) without treatment. Monitoring wells identified in Table 2.2-4 are also used for comparison to potable water quality standards (i.e., Title 17 CCR) and/or those identified as having irrigation/recreation use. Though the current water quality of non-potable wells does not limit beneficial use for irrigation, the monitoring network in place will monitor and track trends for water quality constituents throughout the Subbasin.

26 "Sustainability indicator" refers to any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results (California Water Code Section 10721(x)). Sustainability indicators as they relate to the Plan Area are discussed in Chapter 3.

27 Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators defined by SGMA are caused by groundwater conditions occurring in one of the Subbasin's three management areas, or throughout the Subbasin. Undesirable results as they relate to the Plan Area are discussed in Chapter 3.

28 MCLs are standards that are set by the U.S. Environmental Protection Agency and SWRCB for drinking water quality. An MCL is the legal threshold limit on the amount of a substance that is allowed in public water systems under the Safe Drinking Water Act (Federal and State).

There are both anthropogenic and natural sources of the COCs in the Borrego Springs Subbasin. Anthropogenic sources that may contribute to degradation of the current water quality in the Subbasin include agricultural use of pesticides and fertilizers, salt accumulation resulting from agricultural irrigation practices, and household septic system return flows. Natural sources of COCs in the Subbasin include the rocks and minerals that comprise the aquifer matrix material. These naturally occurring COCs contain evaporite minerals, which can dissolve and increase TDS concentration in the aquifer; silicate minerals, which can contribute arsenic to the groundwater; and sulfate minerals, which can contribute sulfate to the groundwater. All are found in differing amounts in the upper, middle, and lower aquifers. Differences in the mineralogical composition of the aquifers can result in groundwater quality differences between the aquifers. Current and historical data was reviewed for COC concentrations exceeding applicable MCLs, and the Mann-Kendall test was applied in wells with sufficient data[29] to assess temporal trends in groundwater quality. Development and implementation of this GMP will further the goal of continuing to deepen the understanding of groundwater elevations and quality in the Subbasin.

Nitrate

Sources of nitrate in groundwater are commonly associated with fertilizers and septic tanks; however, nitrate can also be naturally occurring. Fertilizers and septic tanks are common anthropogenic sources of nitrate detected in groundwater. Potential natural sources of nitrate in groundwater may result from leaching of soil nitrate, which occurs by atmospheric deposition, and dissolution of evaporative minerals, igneous rocks, and deep geothermal fluids. In desert groundwater basins, the largest source of naturally occurring nitrates in groundwater occurs from incomplete utilization of nitrate by sparse vegetation. This nitrate accumulates in the unsaturated zone and may become mobile when surficial recharge percolates through the unsaturated zone (Walvoord et al. 2003). In arid environments, nitrate stored in the unsaturated zone may become mobilized by artificial recharge from irrigation return flow, septic effluent, and infiltration basins. Because the Borrego Springs Subbasin lacks appreciable evaporitic deposits (other than near the area of the Borrego Sink), anthropogenic sources (irrigation and wastewater return flows) are likely the main contributors of nitrates to groundwater. The California drinking water MCL is 10 mg/L for nitrate as (N) and can be expressed as 45 mg/L for nitrate (NO_3).

Figure 2.2-14A presents wellheads sampled for nitrate concentrations by aquifer, in terms of whether samples analyzed exceeded MCLs. Although there are no exceedances shown on Figure 2.2-14A, historical exceedances of nitrate concentration have occurred in five wells in the

[29] A minimum of four data points are required to calculate trend. Insufficient data indicates wells where no trend was established because either four data points were not available, or because the data reported was less than laboratory reporting limits.

vicinity of Henderson Canyon Road in the northern part of the valley, adjacent to areas of agricultural use (USGS 2015). Nitrate concentrations in these wells ranged from above the MCL of 10 mg/L to 155 mg/L. The existing groundwater network also indicates elevated nitrate at the State well ID 010S006E09N001S in the NMA and at the BWD's WWTP monitoring well.

Historical nitrate trends in the Subbasin show decreasing, increasing and neutral trends, depending on the well sampled. Wells exhibiting an increasing trend include BWD Wells ID4-11 and ID4-18 in the NMA, Well ID1-10 in the CMA, and Well ID1-8 in the SMA, though the concentration of nitrate in these wells remain substantially below one-half of the MCL. The Fall 2018 monitoring data indicates the nitrate concentration of Wells ID4-11, ID4-18, ID1-10, and ID1-8 are 0.82 mg/L, 0.67 mg/L, 1.2 mg/L, and 1.8 mg/L, respectively. All other wells that are currently monitored have a neutral or declining trend, or have insufficient historical data to establish a trend. Spatial concentration patterns of nitrate indicate the agricultural fields, golf courses, and the percolation ponds at the Rams Hill WWTP may represent anthropogenic sources of nitrate in groundwater. In the past, the BWD improvement district 4 (ID4) wells 1 and 4, Borrego Springs Water Company Well No. 1 (located at the BWD office), the Roadrunner Mobile Home Park and Santiago Estates wells had to be taken out of potable service due to elevated nitrate. The latter two developments were connected to municipal wells operated by the BWD as an alternative source of supply. Well ID4-4 was re-drilled and screened deeper at the same location and successfully accessed good water quality not impacted by nitrates. The Di Giorgio wells 11, 14 and 15 located north of Henderson Road have historical detections of nitrate and TDS above drinking water standards (BWD 2002).

Total Dissolved Solids

TDS is a measure of all dissolved solids in water including organic and suspended particles. Sources of TDS in groundwater include interaction of groundwater with the minerals that comprise the aquifer matrix material. Over time, TDS will increase as more minerals in contact with groundwater dissolve. In desert basins, evaporative enrichment near dry lake beds (playas) is known to naturally increase TDS in groundwater. This process also occurs in plants, both in agriculture and natural systems. Anthropogenic sources include synthetic fertilizers, manure, wastewater treatment facilities, and septic effluent. Repeated irrigation is also a known cause of elevated TDS, as minerals concentrate in the soil column with repeated evaporation. These increased concentrations can then be mobilized into the underlying groundwater table. The California drinking water secondary MCL for TDS is recommended at 500 mg/L with upper and short-term limits of 1,000 mg/L and 1,500 mg/L, respectively. TDS have been historically detected above the secondary MCL in some wells in the Subbasin. There is no primary MCL established for TDS.

Figure 2.2-14B presents wellheads sampled for TDS concentrations by aquifer, in terms of whether samples analyzed exceeded MCLs. The majority of wells sampled have TDS concentrations less than half the secondary MCL, of 500 mg/L. However, RH-1 and MW-5A/B have TDS concentrations that exceed the secondary MCL. TDS concentrations in the Subbasin have historically ranged from less than 500 mg/L to 2,330 mg/L, and elevated TDS has occurred in wells that also have elevated nitrate concentrations (USGS 2015). The TDS concentrations are generally highest in the shallow aquifer and in the northern part of the Borrego Valley (USGS 2015). Historical TDS trends in the Subbasin show both decreasing, increasing and neutral trends, depending on the well sampled. Wells exhibiting an increasing trend include an irrigation well, RH-1, and BWD Well ID1-8 in the SMA. All other wells that are monitored have no trend, or have insufficient historical data to determine a trend.

Drilling of a dual screened monitoring well by DWR in the southern portion of Borrego Valley (northeast of Borrego Sink) shows poor water quality in shallow groundwater deteriorating with depth (DWR 2007). Groundwater samples collected from a dual screen monitoring well drilled by DWR (MW-5A and MW-5B) in the southern portion of the Borrego Valley (northeast of Borrego Sink) were analyzed for TDS and sulfate. The concentration of TDS in water collected from the upper completion (45 to 155 feet below ground surface) was 1,300 mg/L while the concentration of water collected from the lower completion (200–345 feet below ground surface) was 2,300 mg/L (DWR 2007). The measured concentrations of TDS and sulfate in these samples (MW-5A and MW-5B) are too high for drinking water supply without additional treatment. Elevated TDS appears to be associated with poorer water quality near the Borrego Sink, likely due to concentration of dissolved solids as a result of evaporation of water in the Borrego Sink and later leaching of naturally occurring evaporites (sediments formed by the evaporation of water). Furthermore, the differing TDS values provides supporting evidence that salinity increases with depth, and that treatment requirements may increase as users draw a higher percentage of water from the lower aquifer.

Sulfate

Natural sulfate sources include atmospheric deposition, sulfate mineral dissolution, and sulfide mineral oxidation of sulfur. Gypsum is an important source of natural sulfate near localized economically important deposits such as in the Ocotillo Wells Subbasin near Fish Creek Mountains in Imperial County. Fertilizers can also be a source of sulfate in groundwater but typically do not result in exceedance of drinking water standards. The California drinking water secondary MCL for sulfate is recommended at 250 mg/L, with upper and short-term limits of 500 mg/L and 600 mg/L, respectively.

Figure 2.2-14C presents wellheads sampled for sulfate by aquifer, in terms of whether samples analyzed exceeded MCLs. Although none of the samples analyzed as part of the USGS study had concentration of sulfate that exceeded the California secondary MCL for sulfate (USGS 2015), wells MW-4, MW-5A, MW-5B, and RH1-1 have had sulfate detected above the secondary MCL with concentrations of 330 mg/L, 1,300 mg/L, 2,300 mg/L, and 650 mg/L, respectively. Historical sulfate trends in the Subbasin show both decreasing, increasing and neutral trends, depending on the well sampled. Wells exhibiting an increasing trend include BWD Wells RH-1 and ID1-8 in the SMA. All other wells that are monitored have no trend, or have insufficient historical data to determine a trend. Based on the available data, it appears that elevated sulfate concentrations go hand in hand with elevated TDS concentrations around the Borrego Sink in the SMA as previously explained for dissolved solids.

Arsenic

Arsenic is naturally occurring, and concentrations of arsenic in Southern California groundwater basins commonly exceed California's drinking water MCL of 10 micrograms per liter (µg/L) (Anning et al. 2012; Welch et al. 2000). In semi-arid and arid groundwater basins, groundwater recharge is limited due to low precipitation and the residence time of the groundwater in the basin is high. The long residence time of the groundwater in the basin allows for more interaction between the groundwater and the minerals that comprise the aquifer matrix material. With time, arsenic desorbs from sediments and enters the groundwater. This process is more efficient in groundwater with higher pH. The groundwater in the Subbasin has a pH of 7.5 to 9.0, a range that is conducive for this transfer of arsenic from the sediment to the water. Arsenic concentrations have been demonstrated to increase as groundwater levels decrease for wells located in the SMA, and have been historically detected above laboratory reporting limits in some wells in the Borrego Springs Subbasin.

Figure 2.2-14D presents wellheads sampled for arsenic by aquifer, in terms of whether samples analyzed exceeded MCLs. Arsenic concentrations have been detected above laboratory reporting limits at several wells in the Borrego Springs Subbasin since the 1980s.[30] Arsenic has been detected in non-potable wells up to 22 µg/L in Rams Hill Golf Course well RH-4 (Dudek 2015a). Arsenic concentrations for wells located in the NMA were less than half the MCL (<5 µg/L) for wells screened in the upper, middle, and lower aquifers. Arsenic concentrations for wells located in the CMA were less than half the MCL (<5 µg/L) for wells predominantly screened in the middle aquifer and less than the MCL (<10 µg/L) for wells predominantly screened in the lower aquifer. Arsenic concentrations for wells located in the SMA ranged from less than half the MCL (<5 µg/L) to greater than the MCL (>10 µg/L). The screen intervals of wells in the SMA predominantly intercept the lower aquifer though most wells are partially screened in the middle aquifer as well.

[30] Prior to the 1980s, laboratory detection limits for arsenic where often established at 10 µg/L or 50 µg/L and results were reported as below the laboratory detection limit.

Historical arsenic trends in the Subbasin show decreasing, increasing and neutral trends, depending on the well sampled. The only well exhibiting an increasing trend is Well RH-2, which is an irrigation well in the SMA. All other wells that are monitored have no trend, or have insufficient historical data to determine a trend. Trends for most wells that have concentrations below the MCL were not determined due to results being below the laboratory reporting limits.

Fluoride

Fluoride is a naturally occurring element in groundwater resulting from the dissolution of fluoride-bearing minerals from the aquifer sediments and surrounding bedrock. Brown staining or mottling of teeth and resistance to tooth decay as a result of drinking water with high concentrations of fluoride has been known since the 1930s. While drinking fluoridated water at low concentrations (i.e., 0.7 parts per million) is beneficial to prevent tooth decay, excessive exposure to fluoride can result in dental and skeletal fluorosis. The California drinking water MCL for fluoride is 2 mg/L, and fluoride has historically been detected in some wells above this level in the Subbasin.

The USGS identified three wells with fluoride concentrations that exceed the California drinking water primary MCL of 2 µg/L. Fluoride concentrations in these wells ranged from 2.69 to 4.87 mg/L (USGS 2015). The Cocopah Well tested above the California drinking water standard at concentration of 2.2 mg/L (USGS 2015). Otherwise, fluoride concentrations within the Subbasin are typically below one-half the MCL. For wells with adequate data to analyze trends one well shows an increasing trend (Wilcox Well); for Wells RH-1, RH-2, and ID1-8, no trend is indicated.

Radionuclides

Radionuclides occur naturally in the mineralogy of sediment particles and become dissolved in groundwater as groundwater flows through the porous sediment matrix that contains trace levels of radioactive isotopes. Gross alpha and beta measurements are screening tools for quantification of radioactivity in groundwater, which is measured as activity units of picocuries per liter (pCi/L). The California drinking water primary MCL for gross alpha is 15 pCi/L based on a four-quarter average. Other radionuclides with California drinking water primary MCLs include radium-226 + radium-228 (5 pCi/L), strontium-90 (8 pCi/L), tritium (20,000 pCi/L) and uranium (20 pCi/L).

Limited radionuclide data is available for the Subbasin; however, gross alpha concentrations will be tracked to document and evaluate progress toward sustainability throughout development and implementation of the GSP. Gross alpha and gross beta results available for BWD indicate concentrations detected are below primary MCLs. Gross Alpha for Well ID4-11 was measured in Fall 2017 as being 5.24 pCi/L ± 1.68. Gross Alpha for Well ID1-16 was measured in Fall 2017 as being 0.751 pCi/L ± 0.872. Gross Alpha for Wilcox Well was measured in Fall 2017 as being

0.489 pCi/L ± 0.739. Gross Alpha for ID1-10 was measured in Fall 2017 as being 0.614 pCi/L ± 1.39. Gross Alpha for ID1-8 was measured in Fall 2017 as being 4.12 pCi/L ± 2.13.

Constituents of Concern Point Sources (Release Cases or Oil/Gas Wells)

Petroleum hydrocarbons and other contaminants can be released to the groundwater system as a result of leaking underground fuel tanks, disposal facilities, or poor management of activities on industrial sites and/or service commercial uses. The SWRCB's "Geotracker" database and the Department of Toxics Substances Control "Envirostor" database were reviewed to identify current and historical cleanup cases within the Subbasin. These case locations are shown on Figure 2.2-15. The potential media of concern for all the cases shown on Figure 2.2-15 is soil rather than groundwater, and all but two of the cases are identified as closed status, which indicates that the contamination issue has been verified to either be remediated or contained (i.e., prevented from migrating greater distances or to other media). The open cases include the Borrego Sites/Carrizo Impact Site (DOD100031200) and the Borrego Springs Landfill Class III Solid Waste Disposal Site (L10003017008). The Borrego Springs Landfill is in the Geotracker database as a solid waste facility subject to a WDR, and there is no contaminant release case associated with it. The landfill conducts semi-annual monitoring to ensure compliance with the terms of the WDR, developed to protect basin plan objectives for surface and groundwater (see Section 2.1.2).

The Borrego Sites/Carrizo Impact Site is a former military site used between 1942 and 1959 to train combat troops for desert warfare, to train mechanized artillery service units and staff, anti-aircraft training, and practice bombing training. Although the site is indicated on Figure 2.2-15 as a point location, it actually encompasses approximately 400 square miles (256,000 acres) of desert terrain and dry lakes, mostly outside of the Plan Area (in the Clark Valley and Ocotillo Wells area). The historic areas of activities within the Plan Area is Camp Ensign, a 1,918-acre site overlapping and south of the Borrego Springs Resort and Circle Club Resort. This site was used between 1942 to 1944 as a headquarters and bivouac/cantonment area in support of various training activities (ACOE 2011). The main issues of concern come from munitions debris and a historic dump site within the soil matrix. Soil sample sites were selected for testing of explosives, pH, and select metals (aluminum, antimony, copper, lead, and zinc) based on historical review of site activities. The site inspection report summarizing the testing results and risk assessment indicates the COC concentrations in soil do not present unacceptable human health or ecological risks and no further DOD was recommended (ACOE 2011). Since these activities occurred in the soil and no unacceptable concentrations of explosives or munitions-related metals were found, this site is not considered a current or potential future groundwater quality risk for the Borrego Springs Subbasin.

The SGMA GSP regulations also require identification of oil and gas wells within the groundwater basin. Such wells could be a concern if different aquifer units are cross contaminated. Information about oil and gas wells from the California Department of Oil, Gas, and Geothermal Resources was reviewed to identify whether the Subbasin has oil and/or gas resources. As shown on Figure 2.2-16, the closest oil and gas wells are located outside the Subbasin in and north of Ocotillo Wells. Note that there are no active oil extraction wells in the map extent; the well shown as active on Figure 2.2-16 refers solely to the permit status as recorded in the California Department of Oil, Gas, and Geothermal Resources database.

Summary

In general, water quality has historically been good within BWD's wells with TDS at concentrations of less than 500 mg/L. The high proportion of sulfate in the surface water of Coyote Creek appears to dominate the character of groundwater in the northern and eastern parts of the basin (DWR 2014). The more bicarbonate waters of Borrego Palm Canyon and Big Spring influence the groundwater along the western and southern parts of the basin. Historical issues with elevated nitrate concentrations have been noted as evidenced by wells either taken out of production or drilled deeper including BWD Wells ID4-1 and ID4-4, and the Roadrunner Mobile Home Park well. ID4-4 was abandoned and drilled deeper at the same location to avoid nitrates in the upper aquifer. High salinity, poor-quality connate water is thought to occur in deeper formational materials in select areas of the aquifer as well as shallow groundwater in the vicinity of the Borrego Sink in the southern portion of the Plan Area.

Based on historical and contemporary water quality sampling, the trend of historical data, current concentration and background water quality concentrations for the identified COCs are listed by management area in Table 2.2-6.

Table 2.2-6
Management Area Background Water Quality

Constituent	Trend of Historical Data[a]	Current Concentration (2018)[b]	Background Concentration[c]
North Management Area			
Arsenic	No Trend	1.5 µg/L and 2.2 µg/L	0.0 µg/L (Range: 0.0–3.0 µg/L)
Fluoride	No Trend	0.66 mg/L (Range: 0.16–0.87 mg/L)	0.63 mg/L (Range: 0.11–1.3 mg/L)
Nitrate (as N)	Increasing	0.52 mg/L (Range: 0.1–15 mg/L)	0 63 mg/L (Range: 0–15 mg/L)
Sulfate	Decreasing	285 mg/L (Range: 110–440 mg/L)	147 mg/L (Range: 99–440 mg/L)
TDS	No Trend	675 mg/L (Range: 330–1,100 mg/L)	562 mg/L (Range: 295–1,100 mg/L)
Central Management Area			
Arsenic	No trend	2.1 µg/L (Range: 1.2–3.8 µg/L)	2 2 µg/L (Range: 0.0–12.2ug/L)
Fluoride	No Trend	0 46 mg/L (Range: 0.23–0.81 mg/L)	0.50 mg/L (Range: 0.00–1.40 mg/L)
Nitrate (as N)	No Trend	0.37 mg/L (Range: 0.1–1.3 mg/L)	0.97 mg/L (Range: 0.00–8.40 mg/L)

Table 2.2-6
Management Area Background Water Quality

Constituent	Trend of Historical Data[a]	Current Concentration (2018)[b]	Background Concentration[c]
Sulfate	Decreasing	98 mg/L (Range: 19–300 mg/L)	89 mg/L (Range: 14–330 mg/L)
TDS	No trend	335 mg/L (Range: 230–610 mg/L)	325 mg/L (Range: 200–699 mg/L)
South Management Area			
Arsenic	No Trend	4.1 µg/L (Range: 1.6–15 µg/L)	4.8 µg/L (Range: 0.0–22.0 µg/L)
Fluoride	No Trend	0.51 mg/L (Range: 0.18–2.1 mg/L)	0.61 mg/L (Range: 0 00–2.10 mg/L)
Nitrate (as N)	No Trend	1.0 mg/L (Range: 0.1–20.0 mg/L)	1.2 mg/L (Range: 0.0–29.0 mg/L)
Sulfate	Increasing	105 mg/L (Range: 24–700 mg/L)	86 mg/L (Range: 14–1,200 mg/L)
TDS	Increasing	640 mg/L (Range: 310–1,600 mg/L)	520 mg/L (Range· 230–1,600 mg/L)

Notes: µg/L = micrograms per liter; mg/L= milligrams per liter; N = nitrogen, TDS = total dissolved solids.

[a] Mann-Kendall analysis was used to determine trend in individual wells at the selected significance level of 0.05. For trend in management area, the trend in the majority of wells in the management area is reported.

[b] Median concentration and range from all samples collected within a management area in 2018

[c] Median concentration and range from all samples collected within a management area on record in the data management system.

As indicated in the preceding discussion, water quality impacts may occur as decreased groundwater levels could induce flow of poor quality water (i.e., unsuitable for municipal uses) found in select deeper formational materials of the aquifer. This may eventually necessitate additional expensive treatment of groundwater to make the water suitable as a drinking water supply. Further, the preceding discussion indicated that water quality issues appear to be most extensive in the SMA. Well ID1-8 displays an increasing concentration trend from 1972 to present for nitrate, TDS, and sulfate; however, the current concentration is below the MCL for each constituent. It should be noted that well ID1-8 is down gradient from the Rams Hill golf course, which is a probable anthropogenic source of nitrates in the SMA in addition to the percolation ponds at the wastewater treatment plant. Rams Hill Wells RH-5 and RH-6, located on the old golf course, indicate nitrate as N concentrations at 3.8 mg/L and 3.2 mg/L, which are elevated compared to background concentrations (Dudek 2015b). Rams Hill currently monitors groundwater quality annually from its wells.

Data Gaps

The lateral distribution of the wells in the monitoring network that measure groundwater quality is limited, and does not extend to the outer portions of each management area. However, there is sufficient distribution to make reasonable interpretations of trends in groundwater elevations and groundwater quality in each of the three management areas. Vertical coverage of the BWD well network is similarly limited, as most of the wells are cross-screened in more than one aquifer. Deficiencies of this particular program as it relates to SGMA include limited vertical and horizontal spatial coverage and temporal deficiencies, since historical analytical data was only collected at approximately 3-year intervals for BWD wells. Of the more than 120 wells located in the Subbasin, approximately 12 were routinely monitored and sampled over multiple years prior to development of the GSA monitoring network. Based on the inconsistent analytical suites between wells and monitoring periods, this variability represents a significant data gap.

Additional routine analytical groundwater quality sampling is needed to establish long-term trends. As part of the draft final GSP monitoring program (further described in Chapter 3, Section 3.5), the GSA proposed sampling wells semi-annually rather than every 3 years as required by the Division of Drinking Water, at least for wells that indicate detections of COCs above one-half the drinking water MCL or where increasing concentration trend is indicated. In addition to conducting more frequent groundwater quality sampling, the GSA has standardized the analytical sampling suite and methods in accordance with the *Sampling and Analysis Plan and Quality Assurance Project Plan* included as part of Appendix E. The selection of which wells to monitor for groundwater quality represent a combination of factors, including the well's geographic location, the screen interval relative to three principal aquifers, accessibility, anticipated well longevity, and continuity of historical data. The Watermaster will continue groundwater quality sampling as required by the Physical Solution.

As previously discussed, the GSA worked to close these data gaps by identifying additional monitoring locations. Pursuant to the DWR's *BMPs for Sustainable Management of Groundwater, Monitoring Networks, and Identification of Data Gaps*, the GSA developed the Borrego Springs Subbasin Monitoring Plan (described in Chapter 3, Section 3.5), to be updated periodically, in order to address these data gaps and to monitor groundwater levels and water quality against the sustainability indicators outlined in Chapter 3 of this GMP. The Monitoring Plan includes monitoring objectives and recommendations for collecting data that demonstrate short- and long-term trends in groundwater, and progress toward achieving measurable objectives. The Monitoring Plan is also designed to monitor impacts to beneficial uses of groundwater, and to quantify annual changes in water budget components.

2.2.2.5 Land Subsidence

Land subsidence can occur when long-term groundwater extractions result in the lowering of the groundwater table, which in turn increases the effective stress in the overlying aquifer matrix. This can cause the collapse of pore space within the matrix. Land subsidence can be either reversible (elastic), or irreversible (inelastic), depending on the soil characteristics of the aquifer. The USGS (2015) used two methods to evaluate land subsidence within the Plan Area. First, repeat GPS surveys were conducted over time, using 25 geodetic monuments as GPS stations. In addition to geodetic monuments, the USGS collected high-precision GPS elevation data from 79 groundwater wells in December 2008 and March 2009 to augment the evaluation of land subsidence. Second, interferometric synthetic aperture radar (InSAR) satellite data collected between 2003 and 2007 were reviewed. The difference between the two methods is that GPS is generally available over a longer period of time but has less spatial resolution, whereas InSAR has high spatial resolution but is only available for the recent past.

Land surface elevations from 1978 were compared with those collected in 2009 to estimate the degree of land subsidence in the Plan Area (USGS 2015). Analysis of the sources of error in the measured elevations indicated that the resolution of the data collected was approximately plus or minus 0.54 feet. This analysis included potential errors in the measurements associated with the GPS survey instrument, the error in the geoid, and the assumed errors associated with historical data. Land surface elevation changes within the Plan Area between 1978 and 2009 were found to be less than 0.54 feet, and included both increases and decreases (USGS 2015). Based on these observations, measurable land subsidence did not occur in the Plan Area between 1978 and 2009. InSAR was used to analyze data at a greater temporal and spatial scale, but over a shorter time period. Data from the European Space Agency's Earth Remote Sensing 1 and 2 (ERS-1 and ERS-2) and ENVISAT satellites were used to detect changes in land surface elevations. Based on these data, the average maximum annual subsidence rate between 2003 and 2007 was found to be 0.2 inches per year, which is consistent with the subsidence findings using GPS data (USGS 2015). Analysis of the InSAR data revealed a small but consistent and seasonal pattern of elastic subsidence, in which land surface elevations decrease in the summer with increased pumping, and recover about half the decrease by the end of the year. The greatest area of subsidence detected between 2003 and 2007 is concentrated southeast of the agricultural fields in the Plan Area and amounts to 15 millimeters (or 0.59 inches), or 3.75 millimeters per year (or 0.15 inches per year).

Additional subsidence data for the Subbasin between 2015 and 2018 is provided by DWR's provision of vertical ground surface displacement in more than 200 of the high-use and populated groundwater basins across the state.[31] Vertical displacement estimates are derived from InSAR data that are collected by the European Space Agency Sentinel-1A satellite and processed by TRE ALTAMIRA Inc., under contract with the DWR as part of DWR's SGMA technical assistance to provide important SGMA-relevant data to GSAs for GSP development and implementation. Figure 2.2-17 provides total vertical displacement for the Subbasin between June 2015 and June 2018. The total maximum vertical decrease in land surface (i.e., subsidence) in the Subbasin between 2015 and 2018 was measured to be 0.023 feet, in an area approximately 1.5 miles east of Borrego Springs Resort. This is equivalent to less than 0.1 inches/year, and it should be noted a greater area of the Subbasin had an increase in elevation than a decrease (Figure 2.2-17). Based on this information, the rate of subsidence, which was already minor, appears to be decreasing.

[31] Full dataset is available at https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub.

The degree of land subsidence occurring in the Plan Area is minimal, has not substantially interfered with surface land uses in the past, and is not anticipated to substantially interfere with surface land uses in the foreseeable future. The minor amount of subsidence that has occurred when compared to over a hundred feet of groundwater level decline in the northern parts of the Plan Area indicate that the subsurface strata may be less sensitive to land subsidence due to its coarse-grained nature. There is sufficient data to qualify the subsidence criterion as insignificant, and not currently an undesirable result of groundwater overdraft (USGS 2015). Given the low sensitivity of subsurface strata to land subsidence in response to historical groundwater level declines, along with the lack of infrastructure in the Plan Area that may be sensitive to subsidence (i.e., linear infrastructure such as canals and high hazard pipelines), subsidence is also not expected to become an undesirable result over the planning and implementation horizon.

2.2.2.6 Identification of Interconnected Surface Water Systems

Streams interact with groundwater in three basic ways; streams gain water from inflow of groundwater through the streambed (gaining stream), they lose water to groundwater by outflow (losing stream), or they do both, gaining in some reaches and losing in other reaches. Streams or stream segments may also not interact at all with groundwater (disconnected stream). As shown on Figure 2.2-18, the only springs identified within the Subbasin are Old Borrego Spring and Pup Fish Pond Spring. Old Borrego Spring dried up sometime before 1963, as described below, and the artificial Pup Fish Pond (in addition to the pupfish pond near the Palm Canyon Trailhead in Borrego Palm Canyon Campground) is sustained by ABDSP's public water system, not a spring. Perennial[32] surface waters (e.g., Coyote Creek and Borrego Palm Creek) have been mapped as extending for a short distance into the Subbasin. These creeks are sustained by surface runoff and springs/seeps originating from the bedrock portions of their contributing watersheds outside the Plan Area (Appendix D4).

The environment that contributes to perennial flows in the region is that of springs and seeps emanating out of the basement rock in narrow stream valleys (outside the Plan Area), where the alluvium is both narrow and shallow, allowing at least some groundwater from the basement rock outside the boundaries of the Borrego Springs Subbasin to surface. The streams within the Plan Area are predominantly disconnected from the underlying groundwater table. This is because, when present, stream flows of moderate magnitude and short duration do not tend to percolate deeply enough to reach the underlying aquifer. Instead, water flowing upon and within the saturated alluvium beneath the stream bed is quickly lost to evaporation or transpiration. This is the case for most of the streams and washes in the Plan Area, and is typical of an arid desert environment.

[32] A perennial stream typically flows continuously in all or part of its streambed during all of the calendar year as a result of groundwater discharge or surface runoff. However, during unusually dry years, a normally perennial stream may cease flowing, becoming intermittent until precipitation falls on the watershed.

Old Borrego Spring, shown on Figure 2.2-18, is no longer flowing. In 1963 (referring to Borrego Spring about 1 mile west of the Borrego Sink), Lester Reed wrote in *Old Time Cattlemen and Other Pioneers of the Anza-Borrego Area,*

> Since so much recent pumping of water in the Borrego Valley, the old spring no longer flows. This spring was one of the watering places upon which the Indians, and the old-timers could depend, although the water was of poor quality. The first time I visited Old Borrego Spring was just two or three days before Christmas 1913 when my brother Gilbert (Gib), and I were riding though on horseback from Imperial Valley to spend the holidays with our parents at the Mud Spring Ranch about fifteen miles southeast of Hemet. Since early boyhood, I heard old-timers talk about Borrego Springs water; so I thought I would try it. As I have said many times before, I found it to taste but very little better than the treated water we are expected to drink today.

Storm flows may occasionally be adequate in intensity and duration for recharge to be initiated through deep percolation of storm runoff. Figure 2.2-19 shows the Federal Emergency Management Agency mapping of the 100-year floodplain as an extreme scenario, where most of the valley north of Borrego Sink would be inundated by shallow floodwater (Zone AO), and a narrower portion of the valley along Borrego Palm Creek would have deep, higher velocity flooding (Zone A). The zones shown on Figure 2.2-19 are more accurately referred to as a flood with a 1% annual chance of occurring. It is peak rain events such as the 2-year or higher flood flows, or a prolonged series of storms, which contribute to the vast majority of recharge to the underlying aquifer, as further discussed in Section 2.2.3. However, not since the beginning of large-scale pumping in the Plan Area has groundwater (i.e., seeps, springs or gaining streams) been observed discharging onto the valley floor. The perennial portions of streams at the fringes of the Subbasin are derived from springs, groundwater discharge from the basement rock and residual storm runoff outside the boundaries of the Borrego Springs Subbasin.

Table 2.2-7 summarizes the watersheds and subwatersheds that overlap the Plan Area, as mapped by the USGS's watershed boundary dataset. The USGS National Hydrography Dataset, as well as mapping provided by ABDSP, were used to identify additional springs and the approximate extent of perennial creeks (commonly referred to as "blue-line" streams) versus those that are intermittent or ephemeral (Figure 2.2-18).[33] The perennial creeks in the Plan Area consist of a 1,000-foot section of Borrego Palm Creek as it exits the mountains and enters the Plan Area Boundary, as well as an approximately 2,000-foot portion of Coyote Creek in the northern part of the Subbasin. The GSA investigated the blue-line stream mapped for Coyote Creek by the USGS National Hydrography Dataset, to validate whether it indeed represents a

[33] Intermittent streams flow only seasonally or in response to runoff-generating precipitation.

perennial stream. Field investigation found that grading of the creek bed near Seley Ranch causes stormwater to pond, resulting in the appearance that the reach has perennial flow.

Once they exit the mountains and enter the Borrego Springs Subbasin, the creeks and washes become disconnected from the alluvial groundwater table (i.e., their flow is not affected by fluctuations in the underlying groundwater table). However, for creek segments to be mapped as perennial in such an arid environment means at least some of the flow is likely attributable to groundwater discharge higher up in the watershed, outside the Subbasin's boundaries. SGMA defines interconnected surface water as surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. Although there is a groundwater connection to the ephemeral streams entering the Subbasin, that connection occurs in the bedrock aquifer outside the Plan Area. Therefore, groundwater pumping within the Subbasin has not and will not lead to undesirable results associated with depletion of surface water.

Table 2.2-7
U.S. Geological Survey Watersheds and Subwatersheds Overlapping the Plan Area

Watershed (size)	Subwatershed	Subwatershed Size (acres)	Acres in Plan Area (percent of subwatershed)	Primary Hydrologic Features within Plan Area
Coyote Creek (179 square miles)	Upper Coyote Creek	13,521	21 (0.2%)	Coyote Creek, Perrenial Sections; potential GDEs
	Lower Coyote Creek	21,197	10,541 (50%)	Coyote Creek, Primarily Ephemeral; Historical Mesquite Bosque Habitat
Borrego Valley – Borrego Sink Wash (158 square miles)	Borrego Valley	15,858	14,916 (94%)	Unnamed dry washes only; Historical Mesquite Bosque Habitat
	Borrego Sink Wash	36,565	25,657 (70%)	Unnamed dry washes and Borrego Sink (dry); Historical Mesquite Bosque Habitat; Old Borrego Spring
	Dry Canyon	12,082	2,222 (18%)	Unnamed dry washes
	Borrego Palm Canyon	36,875	7,449 (20%)	Borrego Palm Creek, partly perennial; Pup Fish Spring; potential GDEs
Upper San Felipe Creek (194 square miles)	Mine Wash – San Felipe Creek	31,560	1,922 (6%)	San Felipe Creek, ephemeral

Source: USGS 2017.
Notes: GDE = groundwater dependent ecosystem.

2.2.2.7 Identification of Groundwater Dependent Ecosystems

A GDE is a plant and animal community that requires groundwater to meet some or all water needs (TNC 2018). GDEs are defined under the SGMA as "ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" (Title 23 CCR Section 351(m)). Based on groundwater monitoring closest to creek segments that enter the northern and western margins of the Plan Area, there is a separation of hundreds of feet between the creek beds and the Subbasin's groundwater table. Although the perennial streams are partially supported by springs and/or seeps located outside the Subbasin, they become disconnected streams as soon as they exit the mountain front. Groundwater level trends within the Subbasin's alluvial aquifer have no appreciable connection to the water sources supporting ephemeral streams, because the bedrock aquifer is so much higher in elevation and receives recharge from elevations hundreds of feet higher than the Subbasin's aquifer within the mountainous areas outside the Plan Area.

Groundwater is critical to sustaining springs, wetlands, and perennial flow (baseflow) in streams as well as to sustaining vegetation such as phreatophytes that directly tap groundwater. In response to SGMA, the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset was provided by DWR and The Nature Conservancy (TNC) as a reference dataset and starting point for GSA's to review and validate the mapped features and supplement the dataset as necessary with the GSA's understanding of local surface water hydrology, groundwater conditions, and geology within the groundwater basin (TNC 2018). The Natural Communities dataset is comprised of 48 publicly available state and federal agency mapping datasets including but not limited to the following: VegCAMP – The Vegetation Classification and Mapping Program, California Department of Fish and Wildlife; CALVEG – Classification and Assessment with Landsat Of Visible Ecological Groupings, U.S. Department of Agriculture Forest Service; NWI V 2.0 – National Wetlands Inventory (Version 2.0), U.S. Fish and Wildlife Service; FVEG – California Department of Forestry and Fire Protection, Fire and Resources Assessment Program; USGS National Hydrography Dataset; and Mojave Desert Springs and Waterholes (Mojave Desert Spring Survey). After the previously described vegetation, wetland, seeps, and springs data were compiled into the Natural Communities dataset, data were screened to exclude vegetation and wetland types less likely to be associated with groundwater and retain types commonly associated with groundwater (TNC 2018).

The mapped vegetation types in the Plan Area considered to be potential GDEs are wetland and honey mesquite bosque (Figure 2.2-20). Because TNC's method for identifying potential GDEs does not assess or incorporate local groundwater conditions, the GSA has conducted a review, evaluation, and validation of the NCCAG dataset specific to the Subbasin and has evaluated whether there is a significant nexus between the regional groundwater aquifer and the potential GDEs identified in the NCCAG. Appendix D4 contains a detailed evaluation of the mapped GDEs, the local hydrology, geology and groundwater conditions that surround them, and a HCM to illustrate how the NCCAG are sustained.

The potential GDEs have been categorized into three discrete geographic units, described as follows. Additional details are provided in Appendix D4.

GDE Unit 1 (Coyote Creek)

GDE Unit 1 occurs along the perennial section of Coyote Creek at the northern end of the Subbasin as shown in the inset map on Figure 2.2-20 (TNC 2010; ABDSP 2017). Both NCCAG wetlands and vegetation are mapped in this unit and are narrowly focused within the riparian corridors associated with Coyote Creek. GDE plant type mapped in association with Coyote Creek are desert willow (*Chilopsis linearis ssp. arcuata*), narrowleaf willow (*Salix exigua var. exigua*), honey mesquite, and catclaw acacia (*Senegalia greggii*) (drought deciduous, which lack leaves for most of the year). The nearest water well in the Subbasin to the mapped GDEs is the Horse Camp well owned by the ABDSP. The depth to groundwater at the Horse Camp well is 285.59 feet below top of casing (666.86 feet amsl) as measured in Fall 2018 (Figure 2.2-20).

Coyote Creek Watershed encompasses approximately 180 square miles, as shown on Figure 2.2-20. The watershed is located almost entirely within the boundary of the Anza-Borrego Desert State Park and streamflow in the Coyote Creek Watershed has been documented by USGS as the number one source of recharge to the Subbasin via streamflow leakage (i.e., infiltration of surface water runoff). Approximately 65% of the surface water inflow to the Borrego Valley comes from Coyote Creek (USGS 1982). There are two streamgages along Coyote Creek located at the northernmost boundary of the Subbasin, one of which stopped recording streamflow in 1983, and the other stopped recording flow in 1993. USGS Station Number 1025580 (Upper–Northern) recorded daily discharge data from 1951–1983; at this station, annual average streamflow was measured to be 1,831 AFY (USGS 2017). USGS Station Number 10255805 (Lower–Southern) recorded daily discharge data from 1983–1993; at this station, annual average streamflow was measured to be 1,774 AFY (USGS 2017). Annual variability over the period measured ranges from 326 acre-feet to 10,715 acre-feet. This large annual variability is a function of large annual variability of precipitation falling on the Coyote Creek Watershed.

To begin to evaluate the GDEs associated with Coyote Creek, the GSA investigated whether the perennial and ephemeral creek segments are gaining water or losing water to the underlying aquifer system. To complete this analysis, the GSA began to map the perennial extent of flow in to the Subbasin on a semi-annual basis (spring and fall). The upper historical streamgage is the manual monitoring point for Coyote Creek. At this location, the GSA manually measured an instantaneous streamflow of 0.46 cubic feet per second in Spring 2018, which converts to 206.5 gallons per minute. At that time, the former lower historical USGS stream gage station was observed to be dry.

In Spring 2018, the perennial extent of flow in Coyote Creek was documented to occur downstream of the third-crossing and upstream of the second crossing. No flow was observed in Spring 2018 at the lower inactive USGS stream gage, which is one of the permanent locations for manual flow readings. In Fall 2017, streamflow extended almost half-way from the second crossing to the first crossing. The crossings refer to where an unimproved road crosses the creek bed. In Fall 2017, there was a precipitation event in the Coyote Creek Watershed that produced runoff in Coyote Creek; however, no streamflow measurements are available for this event. Flow in the stream was observed to decrease incrementally from the upper inactive USGS stream gage to two locations measured downstream.

Furthermore, as described in Appendix D4, comparison of aerial photography and evaluation of trends in satellite-derived vegetation metrics indicated that there have been no significant changes in the extent of the GDE since 1954 and no significant change in the health of the GDE since 1985. Small fluctuations in vegetation metrics were determined to be moderately correlated to precipitation (Appendix D4). The evidence gathered indicates that the reach of Coyote Creek that was mapped by DWR and TNC as potential GDE is actually a "losing" stream, and that this habitat, where it occurs, is supported by intermittent storm events and/or flows emanating from the upland watersheds and basins, rather than local discharge of groundwater from the Subbasin to the stream reach.

GDE Unit 2 (Palm Canyon)

GDE Unit 2 occurs along the perennial section of Borrego Palm Creek at the western boundary of the Plan Area (Figure 2.2-20) (TNC 2010; ABDSP 2017). The nearest water well in the Subbasin to GDE Unit 2 is the Anza-Borrego Desert State Park Well No. 3, owned by the ABDSP. The depth to groundwater at the State Park Well No. 3 is 347.84 feet below top of casing as measured in Spring 2018 (Figure 2.2-20). Furthermore, as described in Appendix D4, comparison of aerial photography and evaluation of trends in satellite-derived vegetation metrics indicated that there have been no significant changes in the extent of the GDE since 1954 and no significant change in the health of the GDE since 1985. Small fluctuations in vegetation metrics were determined to be moderately correlated to precipitation (Appendix D4). This indicates that GDE Unit 2 is supported by surface water flows originating outside the Subbasin (which can be storm fed and/or spring-fed) and entering the Subbasin through Borrego Palm Creek. Given the depth to groundwater within the Subbasin, there is no substantial nexus between pumping and GDE Unit 2.

GDE Unit 3 (Mesquite Bosque)

According to the USGS (2015), the Borrego Sink, a topographic low where the groundwater table was within 10 feet of land surface, was the site of about 450 acres of honey mesquite bosque and other native phreatophytes[34], indicating that shallow groundwater and occasional accumulations of surface water was historically sufficient to support a GDE (Figure 2.2-20). Prior to development, honey mesquite (*Prosopis glandulosa*), salt grass (*Distichlis spicata*), willow (*Salix*), and rushes were reported to be abundant in the valley (Mendenhall 1909 as cited in USGS 2015). Today, the dominant species is honey mesquite.

Honey mesquite are an adaptable species characterized by a dimorphic root system capable of opportunistically utilizing both surface water and groundwater resources. Honey mesquite exhibit mechanisms of drought tolerance, including seasonally changing stomatal sensitivity and osmotic adjustment. Sharifi et al. (1982) stated that "[d]esert phreatophytes are a complex group of species with varied adaptive mechanisms to tolerate or avoid drought and should not be considered simply as a group of species that avoid desert water stress by utilizing deep ground water unavailable to other desert species of drought tolerance and avoidance." Similarly, Ansley et al. (1991) stated, "in regions where accessible groundwater is minimal, honey mesquite often appear to be less than fully phreatophytic. [...] These plants have developed an extensive system of lateral roots and respond rapidly to precipitation." Thus, with a sufficiently rapid and large decline in groundwater levels, honey mesquite can transition to a less-than-phreatophytic state, retaining the ability to utilize surface water and/or localized pockets of soil moisture perched above the groundwater table.

As stated in General Plan Update Groundwater Study completed by San Diego County (2010): "The mesquite bosque, a rare and sensitive groundwater-dependent habitat, is believed by many experts to be desiccating in portions of Borrego Valley, even though their taproots can reach down to 150 feet for water." The habitat covered an approximate four-square mile area. However, while mesquite bosque can have extremely deep taproots, the best available information does not support the occurrence of extremely deep taproots in the Subbasin (Appendix D4). Recent groundwater levels from wells adjacent to the main mapped habitat range from approximately 55 to 134 feet below the ground surface. The USGS (1988) and others estimated that prior to 1946, about 4,300 acre-feet of water was discharged from phreatophytes annually by evapotranspiration.

The honey mesquite bosque, shown as purple on Figure 2.2-20 north of the Borrego Sink, is considered a pre-2015 impact. Groundwater levels have long since declined below a level which can support the estimated rooting depth of the habitat, which is estimated to be approximately 20 feet, based on observation of honey mesquite root depth at Harper's Well, located 20 miles to the southeast (Appendix D4). Natural discharge determined from the BVHM attributable to evapotranspiration was approximately 6,500 AFY prior to development, but has been virtually zero in the last several decades (1990–2010) (USGS 2015). The green area on Figure 2.2-20

[34] Phreatophytes are long-rooted water loving plants that obtain water supply from groundwater or the capillary fringe just above the water table.

depicts the pre-pumping mapped historical extent of phreatophytes in the Subbasin by USGS (USGS 2015). The pink area depicts the mapped pre-January 1, 2015, extent of potential GDEs; (SANGIS 2017) and the orange area depicts the extent of mapped GDEs by the natural communities dataset (DWR 2018).

Pumping in the Subbasin has resulted in a groundwater level decline of about 44.1 feet over the last 65 years in the vicinity of the Borrego Sink. The average rate of decline over this 65-year period is approximately 0.67 feet per year. Because of the long-term imbalance of pumping with available natural recharge, an irreversible impact has occurred to the honey mesquite bosque, which was mostly desiccated prior to January 1, 2015. MW-5 is a multicompletion well that was constructed with BWD and DWR oversight. MW-5B is screened from 45 to 155 feet below ground surface and appears to sufficiently represent the depth of the groundwater table in the vicinity of the Borrego Sink, though it is possible that it represents a semi-confined potentiometric surface rather than the unconfined groundwater table. MW-5A is screed from 200 to 340 feet and has a similar groundwater level to the shallower MW-5B suggesting potentially unconfined conditions in this part of the Subbasin; however, it is uncertain whether a good well seal was obtained during installation of the multicompletion monitoring well. The "Sink" wells shown on Figure 2.2-20 (i.e., 12G1 and 7N1) have become dry based on measurements recently performed by DWR. The overlap of a groundwater level measurement in 2009 of Sink Well 12G1 with MW-5B, which has a similar groundwater level elevation suggests that well MW-5B is sufficiently representative of depth to the groundwater table in the area of the Borrego Sink.

As indicated earlier, Old Borrego Spring located about 1 mile east of the Borrego Sink historically provided water to cattle prior to 1963. The Borrego Spring was located in the vicinity of the Desert Lodge anticline, which is evidenced by fold axes running perpendicular to the Veggie Line fault, the Coyote Creek fault and the Yaqui Ridge/San Felipe anticline associated with the San Jacinto fault zone (Steely et al. 2009). The faulting and folding effectively compartmentalize the deep sediments of the Borrego Springs Groundwater Subbasin and likely once resulted in 'daylighting' of groundwater at the Borrego Sink prior to interception of groundwater flow by pumping.

As described in Appendix D4, evaluation of trends in satellite-derived vegetation metrics indicated that there have been no significant changes in the health of the GDE since 1985. Small fluctuations in vegetation metrics were determined to be moderately correlated to precipitation and not correlated to declining groundwater levels (Appendix D4). The precipitous drop in groundwater levels in the Subbasin following the onset of pumping in the Subbasin has significantly reduced the extent and health of the ecosystem, as it eliminated a readily available source of water for seedlings and immature plants, leaving the regeneration process dependent on brief and highly intermittent surface water flows.

Other Potential GDEs

Other potential GDEs include Hellhole Palms, Tubb Canyon, Glorietta Canyon, and other minor or unnamed stream segments entering the Subbasin. Similar to Coyote Creek and Borrego Palm Canyon, these other potential GDEs are supported by surface water flows originating outside the Subbasin (which can be storm fed and/or spring-fed) as further described in Appendix D4.

2.2.3 Water Budget

The water budget for the Subbasin provides an accounting and assessment of the average annual volume of groundwater and surface water entering and leaving the Subbasin. This section includes information on the historical and current water budget conditions, as well as the change in the volume of groundwater stored. The water budget provides detail sufficient to build local understanding of how historical changes to supply, demand, hydrology, population, land use, and climatic conditions have affected the applicable sustainability indicators in the Subbasin. This information is used to predict how these same variables may affect or guide future management actions. Building a coordinated understanding of the interrelationship between changing water budget components and aquifer response will allow the Watermaster to effectively identify future management actions and projects most likely to achieve and maintain the sustainability goal for the basin (DWR 2016).

In order to estimate the groundwater budget for Borrego Valley, the GSA leveraged the public domain numerical groundwater model produced by the USGS in 2015 (USGS 2015), also referred to as the BVHM.

The BVHM has a period of simulation of 1945 through 2010. The USGS calibrated the model to groundwater levels that were measured throughout the period of simulation, but no model validation was completed as part of the original modeling process. In order to comply with GSP requirements, the GSA updated the model to simulate water budget components up through Water Year 2016[35] and conducted a model validation. The 6-year period of measured groundwater level data including 2011 through 2016 was used to validate the model. As part of model validation, simulated groundwater levels were compared to measured groundwater levels including 2011 through 2016, with the resulting errors in groundwater levels being used to assess model uncertainty and support potential model revisions necessary to refine the water budget calculations. It should be noted that the results of the BVHM are subject to change as new data become available.

The model domain is defined by a finite-difference grid of uniform cells, or nodes, with each cell being 2,000-feet by 2,000-feet, or approximately 92 acres in area. The model domain includes 30 rows and 75 columns with 2,250 active cells (Figure 2.2-21). The total area simulated in the

[35] See footnote 17. All references to years in this section are water years.

model is 73,876 acres, which is greater than the Plan Area, extending further southeast into the northwestern portion of the Ocotillo Wells Subbasin. Due to the resolution of the model grid, certain parts of the Borrego Springs Subbasin, namely its northern tip and small fringe areas of the Subbasin's southeastern boundary were not included in the model grid. This spatial discrepancy between the model grid and the Plan Area boundary is expected to have minimal effect on the water budget because the areas in question have minimal if any pumping. However, it should be noted that all references to the Borrego Springs Subbasin within this subsection refer specifically to the model domain rather than the Plan Area. The model was divided vertically into three layers, corresponding to the upper, middle and lower aquifers described in Section 2.2.1.3. A technical report—*Update to the United States Geological Survey Borrego Valley Hydrologic Model for the Borrego Valley Sustainability Agency*—goes into detail on the specific methods of analysis and model inputs and outputs, and is included in Appendix D1 of the draft GSP.

The following sections break down the water budget into components of inflow and outflow and summarizes the results of the BVHM update. The USGS' Groundwater Model is based on an overall long-term water budget consisting of all inflows and outflows that contribute to developing the sustainable yield. Overall, the average annual water budget can be expressed in terms of three inflow values and three outflow values summarized in Table 2.2-8 and discussed further below.

Table 2.2-8
Summarized Historical Water Budget

Water Budget Components (Units in Acre-Feet per Year)	Original USGS Model (1945–2010)	Model Update (1945–2016)	Most Recent 20 Years (1997–2016)	Most Recent 10 Years (2007–2016)
Inflows				
Stream Recharge	4,028	3,905	2,749	1,865
Unsaturated Zone Recharge [a]	1,486	1,497	1,635	1,505
Underflow (Inflow from Adjacent Basins)	1,367	1,367	1,367	1,367
Total Average Annual Inflow	**6,881**	**6,770**	**5,751**	**4,737**
Outflows				
Pumping	10,128	10,597	16,466	16,856
Evapotranspiration [b]	3,032	2,815	759	498
Underflow (Flow out of Southern End)	522	522	520	523
Total Average Annual Outflow	**13,682**	**13,934**	**17,745**	**17,877**
Average Annual Deficit				
Change in Storage	**-6,801**	**-7,164**	**-11,994**	**-13,140**

Source: USGS 2015; Appendix D1.
Notes: USGS = U.S. Geological Survey.

a Consists of flow from the unsaturated zone into groundwater. Includes direct precipitation recharge (negligible), leakage from some streams within the model domain, and irrigation return flows (Distributed Recharge).

b. Consumptive use of water calculated by the Farm Process Package for all land use type; primarily represents evapotranspiration.

2.2.3.1 . Inflow to Groundwater System

Stream Recharge

Stream recharge is the primary source of groundwater recharge. It comes from surface water that flows into the valley from adjacent watersheds and infiltrates within stream channels.

Infiltration from the ephemeral stream and washes entering the Borrego Valley from the adjacent mountains is the major component of recharge in the groundwater budget in the Plan Area. Within the Borrego Springs Subbasin, the natural recharge of underflow and surface water runoff from the adjoining watersheds was estimated from data obtained from the regional-scale USGS Basin Characterization Model (BCM). There are no known existing streamgages within the boundaries of the numerical groundwater model. There are three historical USGS streamgages located outside of the numerical model boundaries but within the boundaries of regional scale BCM, the most complete of which is the streamgage record on Borrego Palm Creek (USGS gage no. 10255810). Flows from streams into the model domain were estimated using the modeled streamflow from the BCM, which were calibrated using the USGS streamgages for the periods when data are available from the streamgages. The BVHM includes 84 stream segments where multiple segments were joined to represent streamflow in Coyote Creek, San Felipe Creek, Borrego Palm Creek, and other minor tributaries. The streams received inflow at 24 entry points that represented runoff from the adjoining upstream watersheds in the San Ysidro and Vallecitos Mountains, the general locations of which are shown on Figure 2.2-21.

Typically, there was little to no perennial streamflow into the Borrego Springs Subbasin from 1945 to 2016. Only after major wet seasons or large individual rainfall events did runoff to the Subbasin exceed 10,000 AFY or more. Stream recharge only occurred during 7 years in the 1945 to 2016 period (on average roughly once per decade). Runoff into the Subbasin from the 24 entry points modeled ranged from less than 10 AFY to 44,000 AFY with an average annual rate of 3,600 AFY. The BVHM includes perennial flow entering Coyote Creek at 0.014 cubic feet per second and an unnamed tributary at 0.002 cubic feet per second from a minor watershed to the southwest of the Subbasin. It should be noted that the BVHM also models runoff produced within the basin (as opposed to the 24 entry points) from direct precipitation in the unsaturated zone recharge component.

Stream recharge ranged from 112 AF in 1947 to 22,500 AF in 1978. The annual average recharge rate from stream leakage between 1945 and 2016 was 3,905 AFY with a standard deviation of 4,965 AFY.

Unsaturated Zone Recharge

Unsaturated zone recharge is water that infiltrates through soils within the valley and is primarily associated with irrigation return flows. Rainfall within the valley does little to contribute to groundwater recharge. USGS (2015) estimated recharge from irrigation return flows to be between 10%–30% agricultural and recreational pumping based on the results of the BVHM. This is consistent with the estimate of irrigation return flow by Netto (2001), who used a chloride mass balance technique at a citrus grove located northwest of the intersection of Di Giorgio Road and Henderson Canyon Road to estimate a return flow of 22%. Netto (2001) used a similar approach to estimate a return flow for golf course irrigation of 14%.

The BVHM calculated the amount of water from applied irrigation returning to the aquifer using the Farm Process (FMP) and Unsaturated Zone Package (UZP). The volume of applied water in excess of losses to evapotranspiration, irrigation inefficiencies, and surface runoff was simulated as infiltrating below the root zone and entering the unsaturated zone. An important update from earlier versions of the BVHM is that the Farm Process links to information on unsaturated flow, so that the considerable thickness of unsaturated sediment in the valley can be considered. This allows for a more realistic simulation of the years to decades it can take for irrigation return flow to pass through the unsaturated zone. Earlier versions of MODFLOW simulated an instantaneous contribution of infiltrating water from land surface to the groundwater table.

Because irrigation efficiency has improved over the BVHM model period, the 10%–30% range for irrigation return flows cited by the USGS (2015) has both narrowed and decreased in the more recent past. By comparing model components that simulate return flows in the FMP and the UZF in the last 10 years, the UZF flows are approximately 10% of total pumping, and range from 7% to 13% (ENSI 2018). Combined agricultural and golf course irrigation represent approximately 80% of total pumping so these rates correspond to irrigation-specific return flow rates of approximately 9% to 16% (ENSI 2018).

Unsaturated zone recharge ranged from 572 AF in 1961 to 3,706 AF in 1978. The annual average recharge rate from irrigation return flows between 1945 and 2016 was 1,497 AFY with a standard deviation of 683 AFY.

Underflow

Underflow is groundwater that enters or leaves the valley aquifer system as subsurface flow at the edges of the groundwater model. Underflow entering the Borrego Valley Subbasin from the adjoining upstream watersheds was simulated using the Flow Head Boundary package. Underflow from these watersheds was distributed over 44 cells aligned at the model domain boundaries with the San Ysidro and Vallecitos Mountains. The USGS defined an average rate of underflow at each cell to the model domain and held these rates constant throughout the simulation. The total underflow to the model domain was 3.7 acre-feet per day, or 1,367 AFY, and essentially held constant through the simulation period.

Henderson (2001) and Netto (2001) examined groundwater flow through bedrock in the surrounding watershed utilizing the computer program Recharg2, and found that on average between 1945 and the year 2000, bedrock recharge to the BVGB averaged 1,790 AFY (with a range of 0–19,860 AFY). Henderson (2001) found that 6 of the 15 drainage areas were expected to drain to the valley as surface flow rather than bedrock underflow due to the geologic stratigraphy and topography, which for some watersheds meant that the majority of bedrock groundwater was carried as surface flow to stream valleys of the adjoining watersheds. It should be noted that the study area for Henderson and Netto's Masters' theses was larger and encompassed the whole BVGB as opposed to the Borrego Springs Subbasin.

The USGS's BVHM treatment of subsurface inflow as a constant rate of 1,367 AFY is reasonable when compared to the Master's thesis findings (of an average of 1,790 AFY) and when considering their study areas were larger.

Other Inflows

Other inflows considered to be a negligible contribution to the water budget include septic system return flows and Rams Hill WWTF discharges. The USGS (2015) cited a previous study that estimated an average use of 100 gpd per household and assumed that 50% of the water used was lost to evaporation and transpiration. Therefore, the USGS estimated that return flow from septic tank systems in the valley was constant at 0.056 AFY per home, or $5.14e^{-7}$ cubic meters per day. The USGS identified residential and/or developed areas in the valley and estimated a number of septic tank systems associated with those land use types on a per node basis in the numerical model. The number of septic tank systems were periodically defined in the model and used for subsequent monthly stress periods until the next count. The last count of septic tank systems defined in the numerical model was based on development identified in 2009. The USGS (2015) reported that "the infiltration from irrigation of municipal lawns and treated and untreated wastewater was assumed to be negligible."

The Rams Hill WWTF may also contribute to recharge of the basin, and though unquantified, the amount is thought to be limited. The BWD operates the facility under a waste discharge permit (Order No. R7-2007-0053) issued by the California RWQCB, Region 7 – Colorado River Basin. The WWTF is a 250,000-gallons-per-day (gpd) extended aeration (oxidation ditch) plant with evaporation/percolation ponds for disposal. The WWTF serves approximately 20% of the community of Borrego Springs, specifically the Rams Hill residential community and the Town Center area, which includes hotels, a motel and small businesses along Palm Canyon Drive. The WWTF currently treats an annual average of flowrate of 74,000 gpd with low season (summer) flows down to approximately 20,000 gpd. Treated effluent from the Rams Hill WWTF is discharged into evaporation-percolation ponds. Given the desert location and dry, hot conditions a portion of the treated effluent is evaporated and a portion percolates into the aquifer. Groundwater level monitoring at a 15-minute frequency using a pressure transducer installed in the WWTP-1 monitoring well indicates that treated effluent discharged into the percolation ponds does recharge the basin, however the volume has not been quantified. Discharge to the evaporation-percolation ponds is approximately 50 AFY, with recharge evidenced by mounding that shows water is reaching the groundwater table.

2.2.3.2 Outflows from Groundwater System

Groundwater Pumping

The BVHM simulated municipal pumping using metered data obtained from BWD, and simulated agricultural and recreational pumping using the FMP. Before 1944, groundwater pumping in the basin averaged less than 300 AFY, which was used mostly for domestic purposes (USGS 2015). No pumping was simulated in the BVHM from 1929 to 1943. Population growth in Borrego Valley after World War II led to increasing groundwater production with the majority of water produced for irrigation purposes. Figure 2.2-22A and Figure 2.2-22B show simulated groundwater pumping by aquifer and by sector (i.e., agricultural municipal and recreational), respectively, for the period from 1945 to 2016. Groundwater production ramped up from essentially 0 AFY in 1943 to over 10,000 AFY in 1955 (Figure 2.2-22A). Annual production declined to less than 7,000 AFY beginning in 1965 but began increasing again in the mid-1970s with a peak production of almost 20,000 AFY in 2006. USGS (2015) reported that, "about 70 percent of the groundwater used each year has been for agriculture, about 20 percent for golf courses and other recreational uses, and about 10 percent for municipal and domestic use (residential, commercial, and the Anza-Borrego Desert State Park)" (Figure 2.2-22B).

Outflow from groundwater pumping within the Subbasin ranged from a low of 996 AF in 1945 to a high of 19,909 AF in 2006. As shown on Figure 2.2-22A, the lower and middle aquifers have become utilized to a higher degree since the early 1990s, likely as a result of problems accessing available water or suitable water quality within the upper aquifer. As shown on Figure 2.2-22B, there has been a trend towards decreased municipal pumping in recent years relative to recreational and agricultural uses.

Evapotranspiration Losses

Evapotranspiration refers to water losses from non-irrigated plants. Monthly potential evapotranspiration (PET) data were obtained from the BCM and included as part of the water-balance calculations in the FMP. Direct evapotranspiration from groundwater was estimated in the FMP by calculating the monthly PET values by monthly crop coefficients assigned to each land-use type (e.g., phreatophytes, citrus, golf courses, native), the rooting depths defined for each land-use type, the depth to groundwater and height of capillary fringe. Phreatophytes, found mostly around the Borrego Sink, were responsible for most of the groundwater losses from the basin prior to the mid-1940s. Prior to development, mesquite trees, salt grass, willow and rushes were reported to be abundant in the valley (Mendenhall 1909). The USGS (1988) reported that approximately 4,300 AFY was lost via evapotranspiration from phreatophytes before 1946. The amount of water extracted by pumping from the basin surpassed losses by evapotranspiration by 1954 (USGS 2015). This was attributed to declining groundwater levels in the basin, which reduced the amount of water available for transpiration. Evapotranspiration losses were less than 2,000 AFY by 1990 and less than 1,000 AFY by 2000.

Outflow as a result of evapotranspiration has steadily decreased as the groundwater level decreased below the root zone of native phreatophytes. Evapotranspiration losses within the Subbasin ranged from a low of 364 AF in 2014 to a high of 9,998 AF in 1945. Additionally, evapotranspiration decreased from an average of 3,032 AFY for the period 1945 to 2010 to 498 AFY for the most recent 10-year period (Table 2.2-8). The 498 AFY includes evapotranspiration from both native and non-native vegetation in the Subbasin, most of which is currently comprised of non-native tamarisk that were traditionally used as wind breaks throughout the Subbasin.

Subsurface Outflow

A constant-head boundary condition was assigned to three cells marking the southern boundary of the BVHM model domain. This boundary was identified by the USGS based on groundwater level data from other sources that indicated this area was not influenced by groundwater level fluctuations and hydraulic conditions to the north. The average outflow at this boundary throughout the simulation was 1.4 acre-feet per day or 520 AFY. No water flowed into the model domain at this boundary.

Annual outflow from the Subbasin at the southern boundary of the model domain fluctuated slightly around 520 AFY between 1945 and 2016.

2.2.3.3 Change in Annual Volume of Groundwater in Storage

Annual and cumulative changes in storage for the BVHM model domain were estimated using the USGS groundwater numerical model, and shown on Figure 2.2-23A and Figure 2.2-23B, respectively. The numerical model treats groundwater in storage as a separate reservoir from which water can be added or removed to satisfy the groundwater balance equation. For each period of model calculation, water may be added to storage in one part of the model and removed from storage in another part of the model. Therefore, change in storage values reported for the model represent the net change in storage over the entire model grid.

For the period of model simulation, including the model update (1945–2016), the annual change in storage ranged from a decrease in storage of approximately 18,000 AF in 2006 to an increase in storage of approximately 18,100 AF in 1978 (Figure 2.2-23B). On average, the Subbasin lost approximately 7,300 AFY from storage for the period between 1945 and 2016. When considering the average over the last 10 years only, the average loss increases to 13,137 AFY. Water was removed from storage in 63 of the 71 years simulated, with water generally being added to storage in years in which the frequency, intensity and/or duration of runoff events were sufficient to initiate substantial stream recharge (e.g., water years 1967, 1977, 1979, and 1992). As a result, a cumulative amount of approximately 520,000 acre-feet of water was removed from storage over the period of model simulation (Figure 2.2-23B).

Each year in the period of simulation has been assigned one of three water year types: wet, average or dry. Water year types were assigned by the USGS during model development based on the amount of precipitation in each year relative to the average over the period of model simulation (USGS 2015).

2.2.3.4 Discussion of Model Validation, Uncertainties, and Recommendations for Improvement

The sensitivity analysis conducted by the USGS indicated the greatest uncertainty in the numerical model was in agricultural pumping, streamflow leakage, and storage. The FMP estimates agricultural pumping using precipitation and evapotranspiration data obtained from the BCM, assumptions about soil types and their associated soil moisture characteristics, rooting depths, crop coefficients, overland runoff, and estimated efficiencies of applied irrigation. Additionally, the coarse uniform grid of the model domain may overstate the water demands of certain land-use types, like golf courses, and, consequently, overestimate the amount of groundwater pumped to meet the water demand.

The simulated hydraulic heads compared to observed hydraulic heads indicated a slight bias of the model in underestimating hydraulic heads. This may be the result of the model simulating too much pumping compared to actual usage, or underestimating storage values like specific yield for the upper aquifer, or underestimating the amount of recharge to the BVGB, or a combination of all three. To improve the accuracy of the BVHM in simulating actual conditions and provide greater confidence in predictive simulations, the following actions will be undertaken to obtain additional data and further study the hydrogeology of the Subbasin:

- No later than March 31, 2020 agricultural and golf course wells will be metered. This will allow collection of actual agricultural pumping data via existing or new flow meters at farm wells. The pumping data will be incorporated in the BVHM to calibrate the FMP to more accurately estimate the water demands for the various crops and golf courses being irrigated.
- At GMP implementation, periodic manual streamflow measurements will be taken at major drainages that convey most of the surface water runoff to the valley, either from

perennial flows or flash flows from major precipitation events. Collection of this information will be used to further verify the accuracy of the BCM used in the BVHM, and ultimately to provide a more accurate estimate of stream leakage.

- As future funding allows, the Watermaster intends to conduct aquifer tests at wells screened only in the upper aquifer and only in the middle aquifer to obtain site-specific estimates of hydraulic conductivity and specific yield for each aquifer unit. This information will be used to enhance the calibration of the BVHM to these hydraulic properties and our understanding of storage in the BVGB.

It should be noted that the results of the BVHM are subject to change as new data become available and sources of uncertainty are reduced. The Watermaster will consider these uncertainties in addition to the model uncertainties listed by USGS (2015) and will consider prioritization of the items that could improve the accuracy and reduce uncertainty of the BVHM. Section 3.5.4 provides additional information on steps the Watermaster will take to fill data gaps. . The Watermaster will use the BVHM model runs as described in the Judgment, including the model improvements, to simulate the future Water Budget components.

2.2.3.5 Quantification of Overdraft

The average groundwater extraction calculated by the model for the 1945 though 2016 period of simulation was 10,750 AFY. This is approximately 5,000 AFY more than the natural surface water recharge estimated by the USGS using the model (5,700 AFY; USGS 2015). The average groundwater extraction calculated by the model since 1980 is 14,130 AFY, approximately 8,400 AFY more than the estimated natural surface water recharge. As shown in Figure 2.2-23A, since 2007, the amount of groundwater pumped from the Subbasin has been in decline, due to a combination of water conservation efforts by BWD and agricultural irrigators, economic factors, and limited agricultural land fallowing.

Because groundwater is the sole source of water for the Subbasin, the inflows, outflows, and cumulative change in groundwater storage described in Sections 2.2.3.1 through 2.2.3.4, as well as Table 2.2-8 represent past and current water supply and demand conditions. Future water supply conditions are anticipated to mirror the pumping reduction program, meaning that water supply will be incrementally reduced from the estimated current (2018) level of pumping (inclusive of all beneficial uses) of 19,725 acre-feet to the sustainable yield (initially estimated at 5,700 acre-feet per year) by 2040.

2.2.3.6 Sustainable Yield Estimate

The average annual natural recharge of surface water reaching the saturated zone, which includes stream leakage and infiltrating water through the unsaturated zone, was 5,700 AFY for the USGS pre-development model simulation scenario with a period from 1945 to 2010 (USGS 2015). The USGS water budget developed using the BVHM for the years 1945 through 2010 and updated by Dudek for the years 2011 through 2016 indicated that the average total inflow, which includes groundwater subsurface inflow (specified flows), stream leakage, and unsaturated zone recharge (UZF recharge), is 6,900 AFY (rounded) for the period 1945 to 2010 and 6,800 AFY (rounded) for the period 1945 to 2016 (Table 2.2-8). The 20-year and 10-year averages for the most recent periods are 5,800 AF (rounded) and 4,700 AFY (rounded), respectively. These recent periods were comprised mostly of a drier climatic period compared to the longer scenarios beginning in 1945 that included both wet and dry periods. Future recharge from the unsaturated zone is likely to be less than historical estimates because of diminishing irrigation return flows due to pumping ramp down following Physical Solution implementation and/or the potential effects of climate change on recharge within the Subbasin.

Historical inflows from 1945 to 2016 were compared to recent (past 10 years) groundwater outflows from the BHVM model update to estimate the initial sustainable yield of the Subbasin. Average inflows from the entire run of the model update provide a reasonable estimate of potential basin inflows because they capture a wide variety of climatic conditions. Outflows from the most recent 10 years were considered to be more representative of potential Subbasin outflows than the entire historical model period because the loss of native phreatophytes has decreased outflow from evapotranspiration in the Subbasin. Using these assumptions, the surplus of 1945 to 2016 inflows over the most recent 10 years outflows in the Subbasin is estimated to be approximately 5,750 AF (rounded; Table 2.2-9). These results are in line with the initial 5,700 AFY estimate of sustainable yield based on the USGS' pre-development scenario, which estimated natural inflows to the boundaries of the Borrego Valley Hydrologic Model (BVHM) for the period 1945 through 2010 (USGS 2015).

Table 2.2-9
Estimated Surplus of Inflows Over Outflows

Water Budget Components (Units in Acre-Feet per Year)	Acre-Feet/Year
INFLOWS (Model Update 1945–2016)	
INFLOWS	
Stream Recharge	3,905
Unsaturated Zone Recharge	1,497
Underflow (Inflow from Adjacent Basins)	1,367
Total Inflows	**6,770**
OUTFLOWS BESIDES PUMPING (Most Recent 10 Years, 2007–2016)	
Evapotranspiration	498
Underflow (Flow out of Southern End)	523
Total Outflows	**1,021**

Table 2.2-9
Estimated Surplus of Inflows Over Outflows

Water Budget Components (Units in Acre-Feet per Year)	Acre-Feet/Year
Surplus of Inflows over Outflows	5,749

Source: USGS 2015, Dudek 2018, 2019.

The use of 5,700 AFY as the initial estimate of sustainable yield for the Borrego Springs Subbasin is a reasonable approach recognizing the iterative and adaptive nature of SGMA to identify data gaps, acquire new data, and update the estimate of sustainable yield using BVHM model runs at each 5-year check-in during Physical Solution implementation.

2.2.3.7 Quantification of Current, Historical, and Projected Water Budget

The highest levels of uncertainty in the model were from agricultural pumping, specific yield, and streamflow entering the valley. Agricultural pumping (and to a lesser extent recreational pumping) was estimated using the FMP package, which calculates a water demand on a cell-by-cell basis for each land-use type. The water demand is based on an estimated water consumption factoring in evapotranspiration, applied water (via irrigation or rainfall), efficiencies of applied irrigation water, soil moisture content, rooting depth, and potential runoff. The following measures could be taken to improve the uncertainty in the model: (1) information on actual pumping for agricultural and recreational uses can be used to improve the accuracy of the FMP in estimating pumping, (2) long-term constant-rate aquifer tests would improve the estimates of specific yield, and (3) the installation of stream gaging stations or manual streamflow measurements in Coyote Creek and other major drainages to the valley would improve the estimates of runoff to the basin.

2.2.3.8 Surface Water Available for Groundwater Recharge or In-Lieu Use

Traditional projects and management actions to physically supplement groundwater supply have been determined to be generally infeasible. Specific examples are summarized as follows:

- *Imported water*: The importation of groundwater from outside the boundary of the Subbasin is not considered feasible at this time. The U.S. Bureau of Reclamation's *Summary Report—Southeast California Regional Basin Study* found that the structural alternatives evaluated did not produce benefits in excess of their costs (USBR 2015). Therefore, the U.S. Bureau of Reclamation found that importing water was not economically viable at the time of the study, in 2012, and did not recommend additional studies at that time. Additionally, BWD evaluated the feasibility of importing groundwater from the Clark Dry Lake, Ocotillo Wells Subbasin and Allegretti Farms (Ocotillo-Clark Valley Groundwater Basin) (Burzell 2006). The BWD evaluation found these projects to be economically infeasible, because the estimated project cost of $6,480,000 (2006 dollars) did not justify the estimated production of 1,900 AF.

- *Wastewater Treatment Plant Upgrades*: In some basins wastewater treatment plants can be upgraded or additional service connections can be added to increase effluent volumes usable for producing recycled water or effluent for groundwater recharge. However, the nature of the Borrego Springs community and distribution of potential service connections is such that the upgrades would not result in an appreciable increase in groundwater recharge due to the insufficient scale of the system. The Final Tertiary Treatment Project Feasibility Study concluded that the production of recycled water within the BWD is not feasible at this time, and the No Project Alternative is recommended (Dudek 2018).
- *Stormwater Capture and Infiltration*: The infrequent occurrence of rainfall in the region results in extended periods of zero-recharge. Additionally, design criteria for capturing and infiltrating desert flood events, as well as removal and disposition of accumulated sediment from large storm events, is costly (USBR 2015). Therefore, while this potential supply-side project requires additional analysis, the costs to construct this as a stand-alone project outweigh the benefits at this time. Stormwater retention will be evaluated on a case-by-case basis in conjunction with future development in the Subbasin.

Feasible and effective projects and management actions needed to achieve sustainability by 2040 are discussed in GSP Chapter 4.

2.2.4 Management Areas

The depth, elevation and quality of groundwater resources in the Plan Area appears to vary geographically from north to south and with depth in the aquifer based on present and historical data discussed in Section 2.2-1. Three Subbasin management areas (the NMA, CMA, and SMA) are proposed to contextualize baseline conditions, monitor the status of groundwater quality, and measure progress toward achieving sustainability goals pertaining to groundwater quality (Figure 2.2-24).

The boundaries of these areas are based on the distribution of the three aquifers underlying the Subbasin, geologic controls on groundwater movement, and differences in overlying land uses and associated groundwater pumping depressions. The two primary features that define the boundaries between Subbasin management areas are the West Salton detachment fault (between the NMA and the CMA) and the Desert Lodge anticline (between the CMA and SMA), shown on Figure 2.2-24. The shape and thickness of the aquifers and subsurface geological features such as the Desert Lodge anticline and the West Salton detachment fault appear to influence hydrologic communication between the northern, central, and southern parts of the Subbasin. Due to the variable thickness of the individual aquifers, extraction wells are predominantly cross-screened in the upper, middle, and lower aquifers in the northern part of the Subbasin, cross-screened in the middle and lower aquifers in the central part of the Subbasin, and cross-screened in the middle and lower aquifers in the southern part of the Subbasin. The justification for use of these three areas has been covered in earlier sections, which differentiate aquifer geometry, groundwater levels and groundwater quality laterally across the three management areas (Sections 2.2.1 and 2.2.2, previously outlined).

The use of management areas is optional under SGMA, and in this GMP, the definition of the three management areas are primarily for the purpose of groundwater quality management, since the end uses of groundwater differs substantially across the three management areas. Wells in the NMA serve primarily agricultural use, whereas wells in the CMA serve municipal and recreational use, and wells in the SMA primarily serve recreational use which means there may be different thresholds for undesirable results for potable versus non-potable uses. These are discussed in Chapter 3.

2.2.4.1 North Management Area

In terms of sustainability indicators, this management area is differentiated from the others primarily on the basis of water quality, but also incorporates differences in historical groundwater level declines and changes in predominant land use. The main land use in the NMA is agriculture but also includes domestic uses in the northwestern part of Borrego Springs (Figure 2.2-24). Accordingly, it has the greatest overall groundwater level declines when compared to the CMA and SMA.

2.2.4.2 Central Management Area

In terms of sustainability indicators, this management area is differentiated from the others primarily on the basis of water quality, but also incorporates differences in historical groundwater level declines and changes in predominant land use. The main land uses in the CMA are municipal and recreational (golf courses) but also include substantial undeveloped areas to the northeast. Like the NMA, water quality is generally good, and historical groundwater level declines are also high. The main differentiating factor between the NMA and CMA is the predominant beneficial use of groundwater.

2.2.4.3 South Management Area

The geological basis for differentiating the management areas are previously described (Section 2.2.4). In terms of sustainability indicators, this management area is differentiated from the others primarily on the basis of water quality, but also incorporates differences in historical groundwater level declines and changes in predominant land use. Additionally, the Desert Lodge anticline effectively compartmentalizes the SMA from the CMA (USGS 2015). The land use in the SMA is undeveloped open space, with the exception of the Rams Hill Country Club and Air

Ranch. Unlike the NMA and CMA, arsenic is a water quality COC in groundwater and wells in this area tap the lower groundwater aquifer.

The minimum thresholds and measurable objectives for indicator wells within each management area, the rationale for selecting those thresholds, and the levels of monitoring and analysis for each management area are described in Chapter 3. The three management areas are shown in Figure 2.2-24 as well as included on the figure in in Chapter 3.

2.3 REFERENCES CITED

ABDSP (Anza Borrego Desert State Park) 2017. GIS Package of Hydrologic Feature Data. Received 10/17/2017.

ABF (Anza Borrego Foundation). 2018. "Our Work." Website accessed at http://theabf.org/our-work, on 2/20/2018.

ACOE (U.S. Army Corps of Engineers). 2011. *Final Site Inspection Report, Borrego Springs - Camp Ensign San Diego County, California*. FUDS Project No. J09CA701102. September 22, 2011.

Anning, D.W., A.P. Paul, T.S. McKinney, J.M. Huntington, L.M. Bexfield, and S.A. Thiros. 2012. *Predicted Nitrate and Arsenic Concentrations in Basin-Fill Aquifers of the Southwestern United States*. U.S. Geological Survey Scientific Investigations Report 2012–5065.

Barrie, Don. 2018. "Anza-Borrego Geology." Anza-Borrego Desert Natural History Association. Website accessed at http://www.abdnha.org/anza-borrego-desert-geology.htm, on 2/20/2018.

BBC (BBC Research & Consulting). 2012. *Potential Impacts of Wind Farm Development Near Anza-Borrego Desert State Park: Reconnaissance Level Evaluation*. Prepared for The Anza-Borrego Foundation, with financial support from the California State Parks Foundation.

Burzell, L.R. 2006. Consideration of drilling production wells on the 240 acre District property near Clark Lake and other areas nearby which are on the northeast side of the Coyote Canyon Fault. Memorandum to BWD Board of Directors. October 12, 2016.

BWD (Borrego Water District). 2002. *Groundwater Management Plan*. Adopted October 18, 2002.

BWD. 2009a. *Borrego Valley Water Resources Investigation*. Submitted for grant funding under the Bureau of Reclamation Basin Study Program. Final. June 26, 2009.

BWD. 2009b. *Integrated Water Resources Management Plan.* Final report. Prepared by William R. Mills. March 2009.

BWD. 2015. *Demand Offset Mitigation Water Credits Policy.* Adopted January 30, 2013, as amended through May 19, 2015.

BWD and County of San Diego. 2013. *Memorandum of Agreement Between the Borrego Water District and the County of San Diego Regarding Water Credits.* February 4, 2013.

CDPR (California Department of Parks and Recreation). 2015. *Anza-Borrego Desert State Park Interpretation Master Plan.* Prepared by The Acorn Group Inc. September 2015.

CGS (California Geological Survey). 2002. *California Geomorphic Provinces.* CGS Note 36, revised December 2002.

CIMIS (California Irrigation Management Information System). 2018. Daily Evapotranspiration Data for CIMIS Station 207 - 2008 through 2018. Compiled 9/4/2018. http://www.cimis.water.ca.gov/cimis/cimiSatEtoZones.jsp.

County of San Diego. 2007. *DPLU Policy Regarding CEQA Cumulative Impact Analyses for Borrego Valley Groundwater Use.* Adopted October 5 2004, revised through January 17, 2007.

County of San Diego. 2010. *Evaluation of Groundwater Conditions in Borrego Valley.* General Plan Update, Appendix A. April 2010.

County of San Diego. 2011. *Borrego Springs Community Plan.* Adopted August 3, 2011. Amended May 15, 2013.

County of San Diego. 2013. *San Diego Groundwater Ordinance – An Excerpt From The San Diego County Code Of Regulatory Ordinances.* San Diego County Code Title 6, Division 7, Chapter 7. Amendments effective 3/01/2013.

County of San Diego. 2016. Sealing Materials for Water Wells, Monitoring Wells, Cathodic Protection Wells, Geothermal Heat Exchange Wells, and other Permitted Wells. Department of Environmental Health Well Sealing Materials Policy. November 13, 2016.

County of San Diego. 2018. Development Tracker Map#3 (Existing Dwelling Units), Map #11 (Dwelling Units – Completed Building Permits [2011 General Plan Forward]). Published October 8, 2018.

CPAD (California Protected Areas Database). 2017. California Protected Areas Data Portal. Accessed 10/5/2017. http://www.calands.org/.

Dibblee, T.W. 2008. Geologic Map of the Borrego & Borrego Mountain 15 Minute Quadrangles, San Diego and Imperial Counties. September 2008.

Dorsey, Rebecca. 2005. Stratigraphy, Tectonics, and Basin Evolution in the Anza-Borrego Desert Region. Geology. Unpublished Paper. Accessed at https://pages.uoregon.edu /rdorsey/Downloads/DorseyChaperNov05.pdf, on 2/20/2018

Dudek. 2014. Aquifer Test Report for Wells ID1-1 and ID1-2. Prepared for Borrego Water District and T2 Borrego LLC. August 2014.

Dudek. 2015a. Draft Rams Hill Golf Course Water Supply Application for Wells RH-4. Prepared for Borrego Water District and T2 Borrego LLC. February 2015.

Dudek. 2015b. Draft Rams Hill Golf Course Water Supply Application for Wells RH-5 and RH-6. Prepared for Borrego Water District and T2 Borrego LLC. October 2015.

Dudek. 2018. Final Tertiary Treatment Conversion Project Study Preapred for Borrego Water District. March 2018.

DWR (California Department of Water Resources). 1981. *Water Well Standards - State of California*. DWR Bulletin 74-81. December 1981

DWR. 1983a. *Preliminary Evaluation of Annual Recharge to the Borrego Valley Ground Water Basin*. Study No. 1335-11-B-1. Prepared by Kenneth Hatai. March 1983.

DWR. 1983b. *A Preliminary Evaluation of Historical and Projected Water Demand for Borrego Valley. Draft*. Study No. 1335-11-C-1. Prepared by Kenneth Hatai. March 1983.

DWR. 1984. *Borrego Valley Water Management Plan*. June 1984.

DWR. 1991. *California Well Standards*. DWR Bulletin 74-90 (Supplement to Bulletin 74-81). June 1991.

DWR. 2007. *An Interpretation of Geologic Materials Encountered in the Boring of Borrego Water District Monitoring Well MW-5*. Technical Information Record SD-07-02. April 2007.

DWR. 2014. *Groundwater Quality Information for Borrego Valley*. PowerPoint slides. May 2014. Presented by Tim Ross.

DWR. 2016. California's Groundwater, Working Toward Sustainability. Bulletin 118 Interim Update. December 22, 2016.

DWR. 2017. Water Management Planning Tool. Disadvantaged Communities Places Layer.

DWR. 2018. Natural Communities Commonly Associated with Groundwater (NCCAG) Dataset. April 2018.

DWR. 2019. Sustainable Groundwater Management Act 2018 Basin Prioritization Process and Results. January 2019.

ENSI. 2018. RE: Methodology To Examine Future Groundwater Overdraft In Terms Of The Overall Hydrologic Water Balance Considering Recharge Variability And Parameter Uncertainty. Memorandum. Prepared for Borrego Water District. September 12, 2018.

ENSI (Environmental Navigation Services Inc.). 2019. SDAC Impact/Vulnerability Analysis (Task 2 Report). Prepared for the Borrego Water District. April 15, 2019.

Henderson, T.W. 2001. ""Hydrogeology and Numerical Modeling of the Borrego Valley Aquifer System."" Master's thesis; San Diego State University.

Huntley. 1993. Letters from Professor David Huntley, San Diego State University to John Peterson, San Diego County Department of Planning, and to Brian Billbray, San Diego County Board of Supervisors. Dated January 26, 1993.

Janecke, S.U., R.J. Dorsey, D. Forand, A.N. Steely, S.M. Kirby, A.T. Lutz, B.A. Housen, B. Belgarde, V.E. Langenheim, and T.M. Rittenour. 2010. "High Geologic Slip Rates since Early Pleistocene Initiation of the San Jacinto and San Felipe Fault Zones in the San Andreas Fault System, Southern California, USA." Special Paper 475. Boulder, Colorado: The Geological Society of America.

Kirby S.M., S.U. Janecke, R.J. Dorsey, B.A. Housen, and V.E. Langenheim. 2007. "Pleistocene Brawley and Ocotillo Formations: Evidence for Initial Strike-Slip Deformation along the San Felipe and San Jacinto Fault Zones, Southern California." *The Journal of Geology*115:43–62.

Lutz, A.T., R.J. Dorsey, B.A. Housen, and S.U. Janecke. 2006. "Stratigraphic Record of Pleistocene Faulting and Basin Evolution in the Borrego Badlands, San Jacinto Fault Zone, Southern California." Geological Society of America Bulletin, November/December 2006: 1377–1397. DOI: 10.1130/B25946.1.

Netto, S.P. 2001. "Water Resources of Borrego Valley, San Diego, California." Master's thesis; San Diego State University.

SDCFCD (San Diego County Flood Control District) 2004. *San Diego County Rainfall 30 - Year Annual Average Period of Record: July, 1971 to June, 2001*. Map. Dated July 14, 2004.

SANGIS. 2017. SanGIS/SANDAG GIS Data Warehouse. Accessed July 20, 2017. http://www.sangis.org/download/index.html.

Steely, A.N., S.U. Janecke, R.J. Dorsey, and G.J. Axen. 2009. "Early Pleistocene Initiation of the San Felipe Fault Zone, SW Salton Trough, during Reorganization of the San Andreas Fault System." Geological Society of American Bulletin (121): 663–687. DOI: 10.1130/B26239.1.

SCEDC (Southern California Earthquale Data Center). 2018. "Significant Earthquakes and Faults." Webpage. http://scedc.caltech.edu/significant/sanjacinto.html. Accessed March 14, 2018.

SWRCB (State Water Resources Control Board). 2018. Water Boards Storm Water Multiple Application and Report Tracking System (SMARTS). Public User search for Notice of Intents within San Diego County and RWQCB Region 7. Available at https://smarts.waterboards.ca.gov/smarts/faces/PublicDataAccess/PublicNoiSearch.xhtm, Accessed 4/11/18.

TNC (The Nature Conservancy). 2010. Groundwater Dependent Ecosystems in California - GIS Package. June 2010. Site accessed September 7, 2017: http://scienceforconservation.org/downloads/groundwater_dependent_ecosystems_in_california_gis_package.

TNC. 2018. Groundwater Dependent Ecosystems Under the Sustainable Groundwater Management Act. Guidance for Preparing Sustainability Plans. January 2018.

UCI (University of California, at Irvine) 2018. Steele/Burnand Anza-Borrego Desert Research Center. Website. Accessed at http://anzaborrego.ucnrs.org/, on 2/20/2018.

USBR (U.S. Bureau of Reclamation). 1972. *Inland Basins Projects California – Nevada Summary Report: Reconnaissance Investigations*. June 1972.

USBR. 2013. *Proposed Imported Water Pipeline Routes for Borrego Water District Apprasial Analysis.* Technical memorandum. Southeast California Regional Study, Lower Colorado Region. Prepared by Douglas Blatchford. December 2013.

USBR. 2015. *Southeast California Regional Basin Study Summary Report*. September 2015.

U.S. Census Bureau. 2010. 2010 Census Count. https://www.census.gov/data.html.

U.S. Census Bureau. 2018. 2012–2016 American Community Survey 5-Year Estimates. Accessed February 13, 2018 at https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk.

USDA (U.S. Department of Agriculture). 2018. "Custom Soil Resource Report for Anza-Borrego Area, California (CA804) and San Diego County Area, California (CA638). BVGB GSP." Web Soil Survey. USDA Natural Resources Conservation Service, Soil Survey Staff. Accessed March 23, 2018. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

USGS (U.S. Geological Survey). 1982. *Water Resources of Borrego Valley and Vicinity, California: Phase 1–Definition of Geologic and Hydrologic Characteristics of Basin.* Open-File Report 82-855. Prepared by W.R. Moyle Jr. in cooperation with the County of San Diego.

USGS. 1988. *Water Resources of Borrego Valley and Vicinity, San Diego County, California: Phase 2 – Development of a Ground-Water Flow Model.* Water-Resources Investigations Report 87-4199. Prepared by Hugh T. Mitten, Gregory C. Lines, Charles Berenbrock, and Timothy J. Durbin in cooperation with the County of San Diego and the California Department of Water Resources. Sacramento, California: USGS. 1988.

USGS. 1993. "Isostatic Residual Gravity Map of the Borrego Valley" [map]. 1:100,000. USGS Open File Report 93-246. By Langenhiem, V.E., and R.C. Jachens. U.S. Department of the Interior, U.S. Geological Survey.

USGS. 2006. Quaternary Fault and Fold Database for the United States. Accessed November 12, 2018. http//earthquakes.usgs.gov/hazards/qfaults/.

USGS. 2014. *Status of Groundwater Quality in the Borrego Valley, Central Desert, and Low-Use Basins of the Mojave and Sonoran Deserts Study Unit, 2008–2010: California GAMA Priority Basin Project.* By Mary C. Parsons, Tracy Connell Hancock, Justin T. Kulongoski, and Kenneth Belitz. Groundwater Ambient Monitoring Program. USGS Scientific Investigations Report 2014–5001. 2014.

USGS. 2015. *Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California.* Scientific Investigations Report 2015–5150. Prepared by Claudia C. Faunt, Christina L. Stamos, Lorraine E. Flint, Michael T. Wright, Matthew K. Burgess, Michelle Sneed, Justin Brandt, Peter Martin, and Alissa L. Coes in cooperation with the Borrego Water District. DOI: 10.3133/sir20155150.

USGS. 2017. The National Map. Watershed Boundary Dataset. Web Map Viewer. Accessed at https://viewer.nationalmap.gov/advanced-viewer/. Accessed December 2017.

Walvoord, M.A., F.M. Phillips, D.A. Stonestrom, R.D. Evans, P.C. Hartsough, B.D. Newman, and R.G. Strieg. 2003. "A Reservoir of Nitrate Beneath Desert Soils." *Science* 302(5647):1021–1024.

Welch, A.H., D.B. Westhohn, D.R. Helsel, and R.B. Wanty. 2000. "Arsenic in Groundwater of the United States—Occurrence and Geochemistry." *Groundwater* 38(4):589–604.

Wiedlin, M. 2018. Review of Existing Data on Groundwater Flow Boundary Type across Coyote Creek Fault. Phone conversation between M. Wiedlin (Wiedlin & Associates) and Trey Driscoll (Dudek). June 5, 2018.

INTENTIONALLY LEFT BLANK

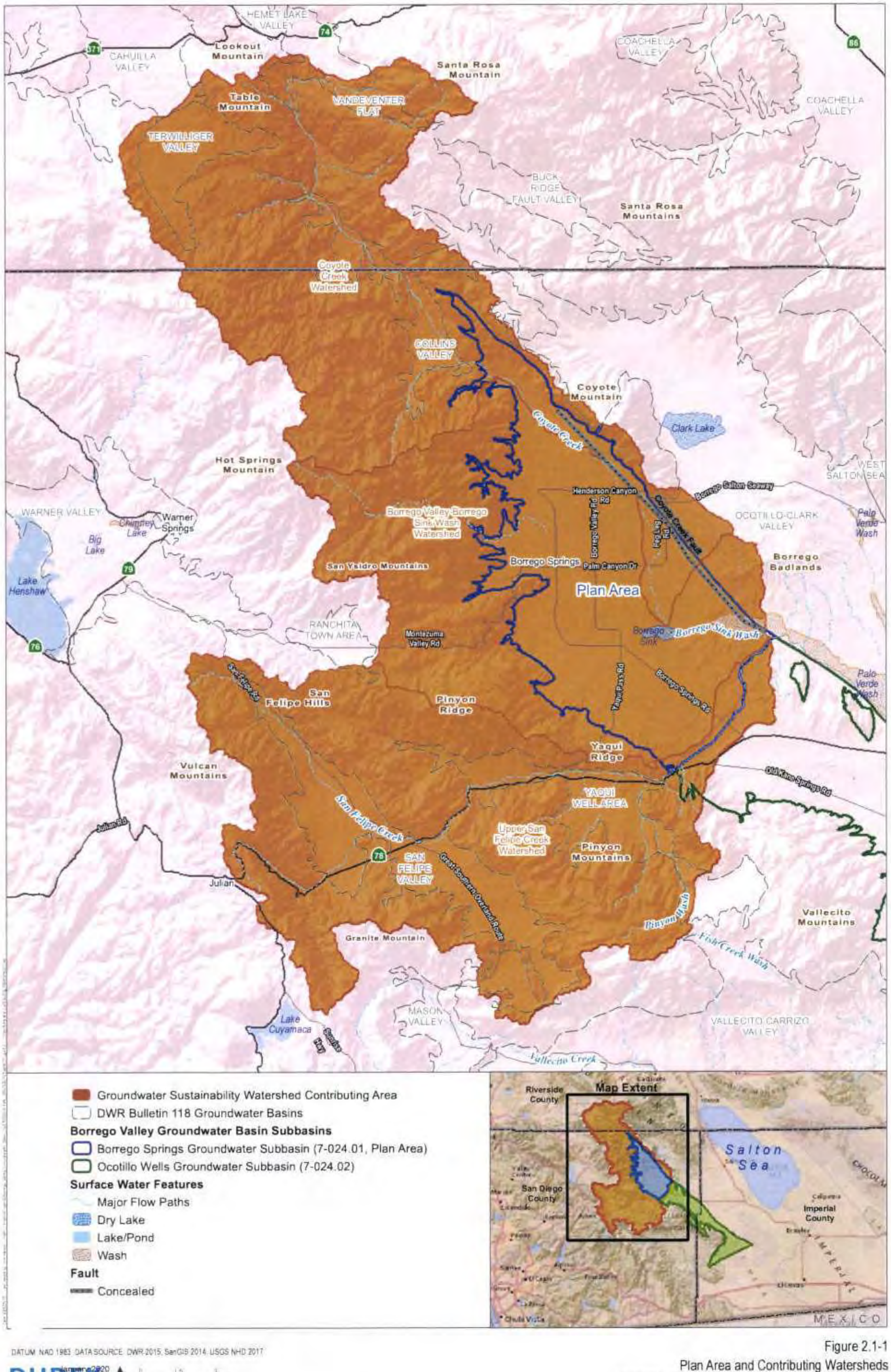
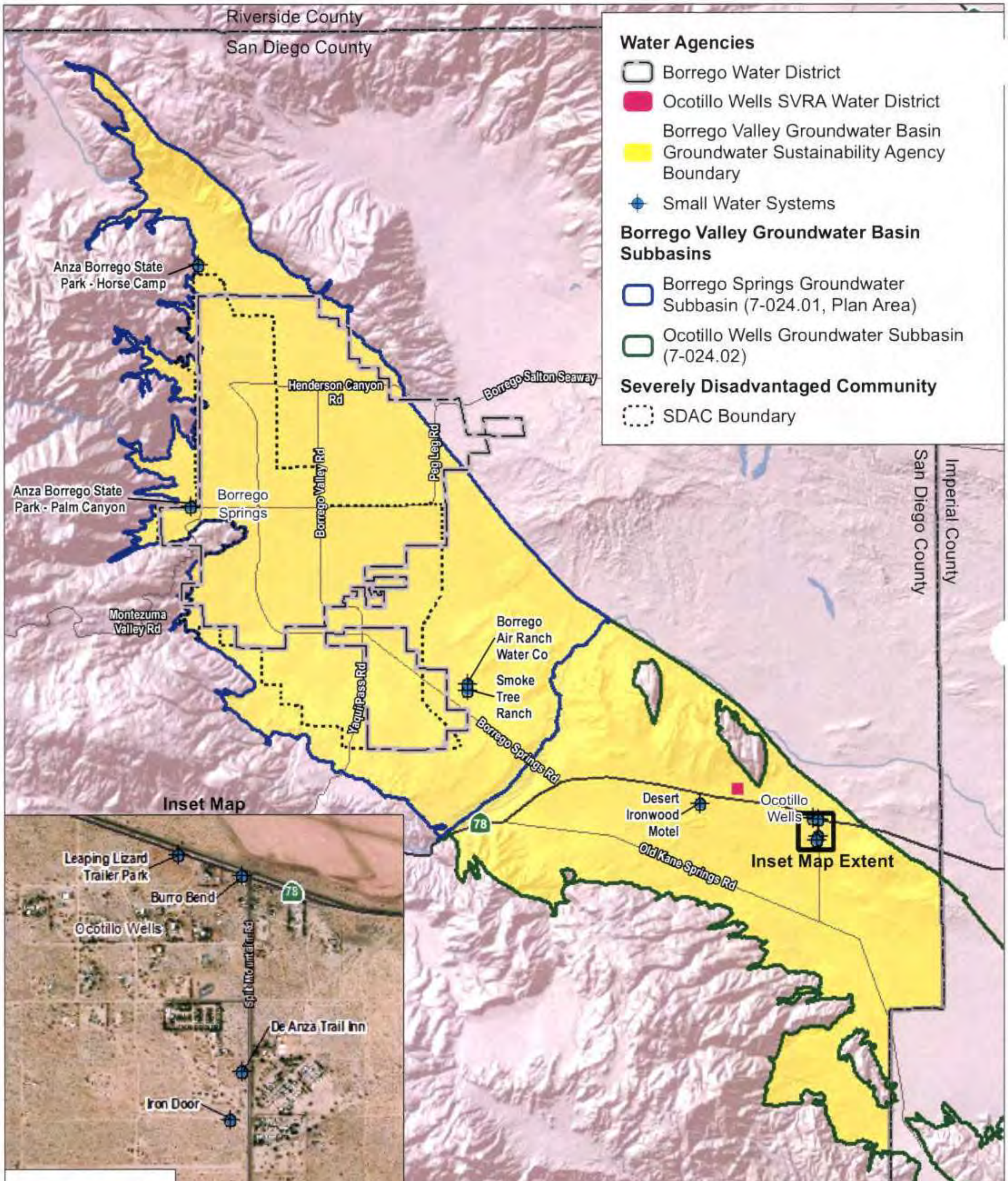


Figure 2.1-1
Plan Area and Contributing Watersheds
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983. DATA SOURCE: DWR 2015; San Diego County

DUDEK January 2020

0 1.5 3 Miles

Figure 2.1-2

Water Purveyors within the Groundwater Sustainability Agency Boundary

INTENTIONALLY LEFT BLANK

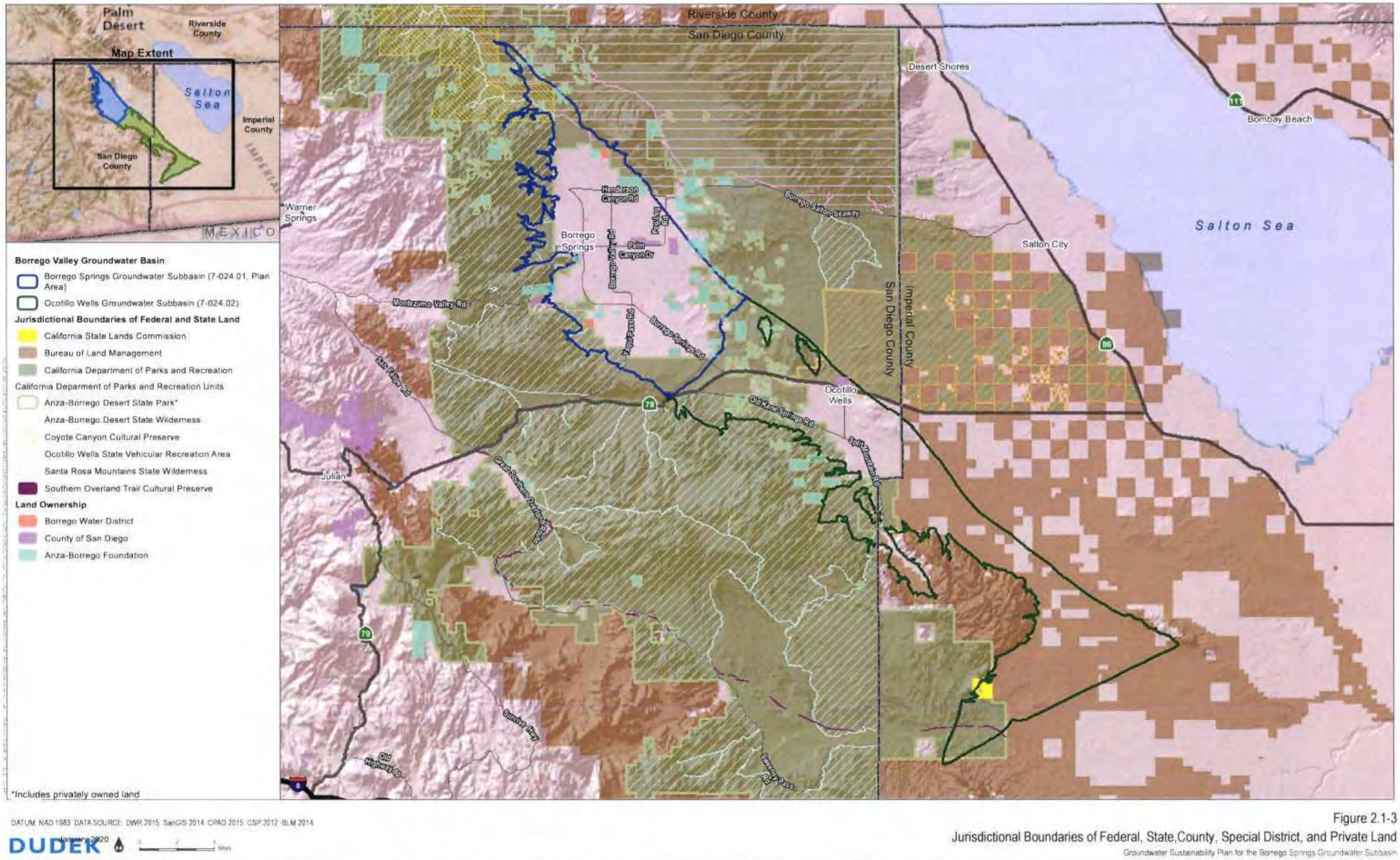
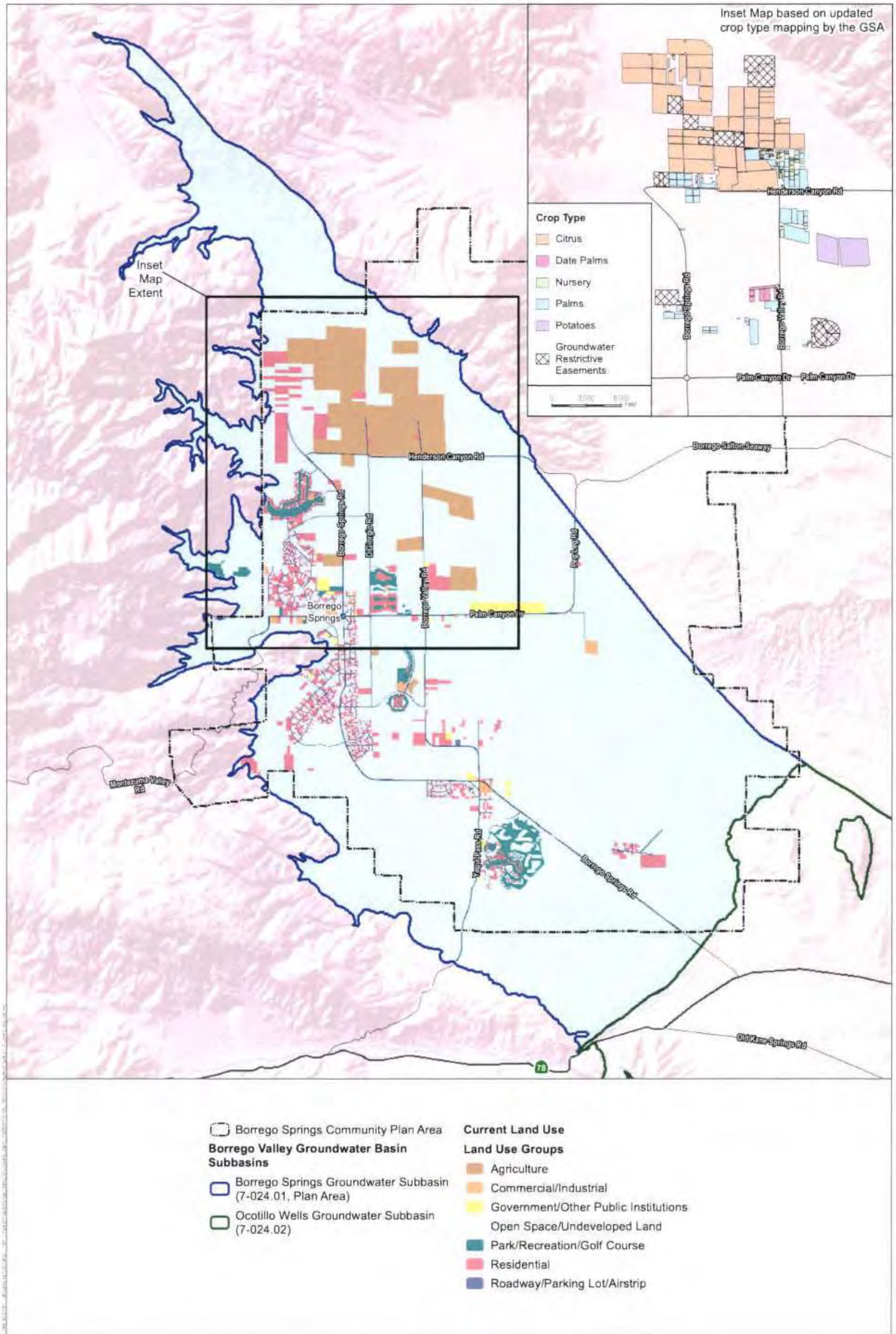


Figure 2.1-3

Jurisdictional Boundaries of Federal, State,County, Special District, and Private Land

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK

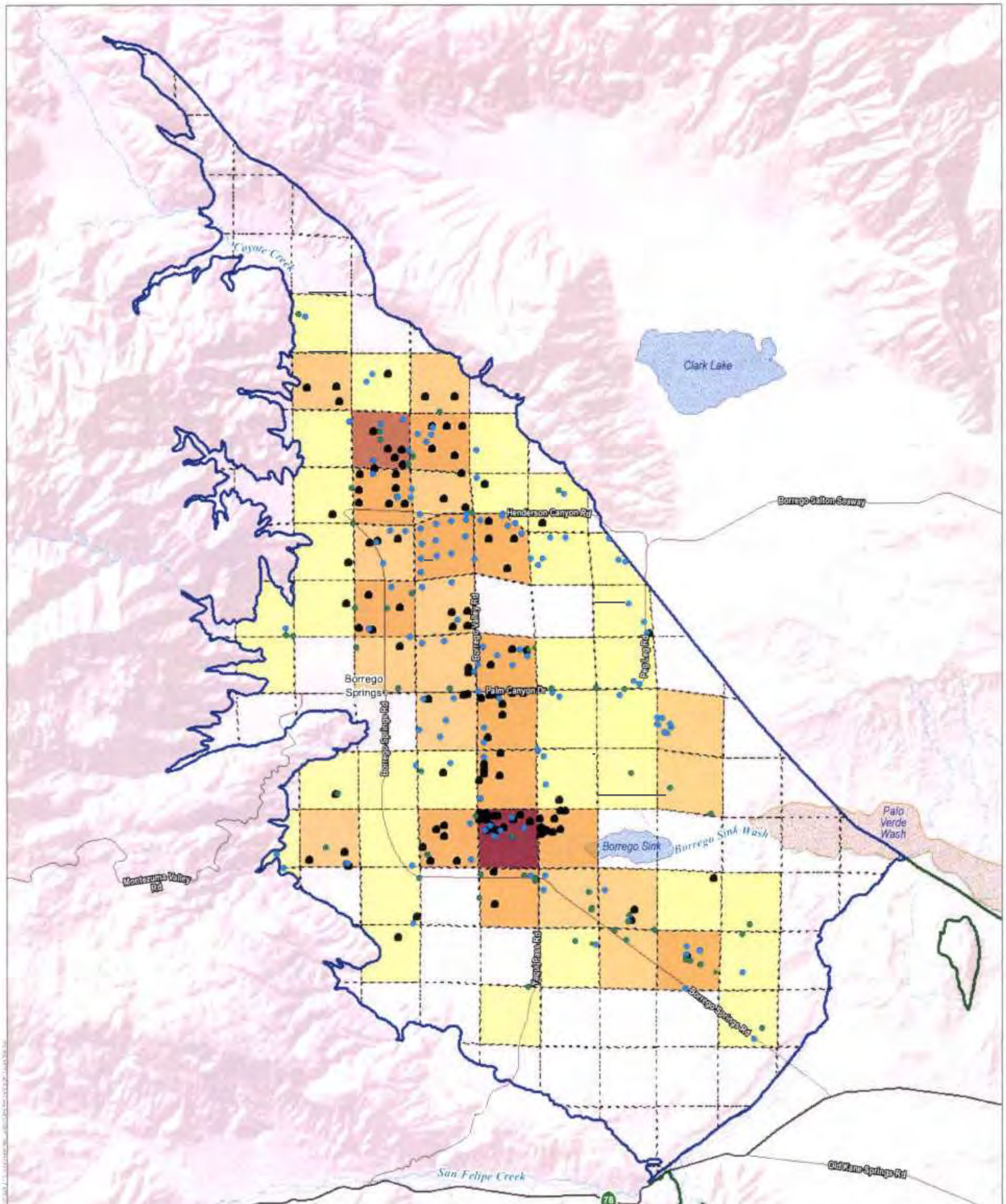


DATUM: NAD 1983 DATA SOURCE: SanGIS 2017; Inset Map Source: GSA 2018

DUDEK January 2020

Figure 2.1-4
Current Land Use

INTENTIONALLY LEFT BLANK



Borrego Valley Groundwater Basin Subbasins

- Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
- Ocotillo Wells Groundwater Subbasin (7-024.02)

Groundwater Well Locations

- Department of Water Resources Well Logs
- County of San Diego Well Permits
- Groundwater Sustainability Plan Wells

One Square Mile Sections

Well Density Per Square Mile

- 1 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- 21 - 25

Surface Water Features

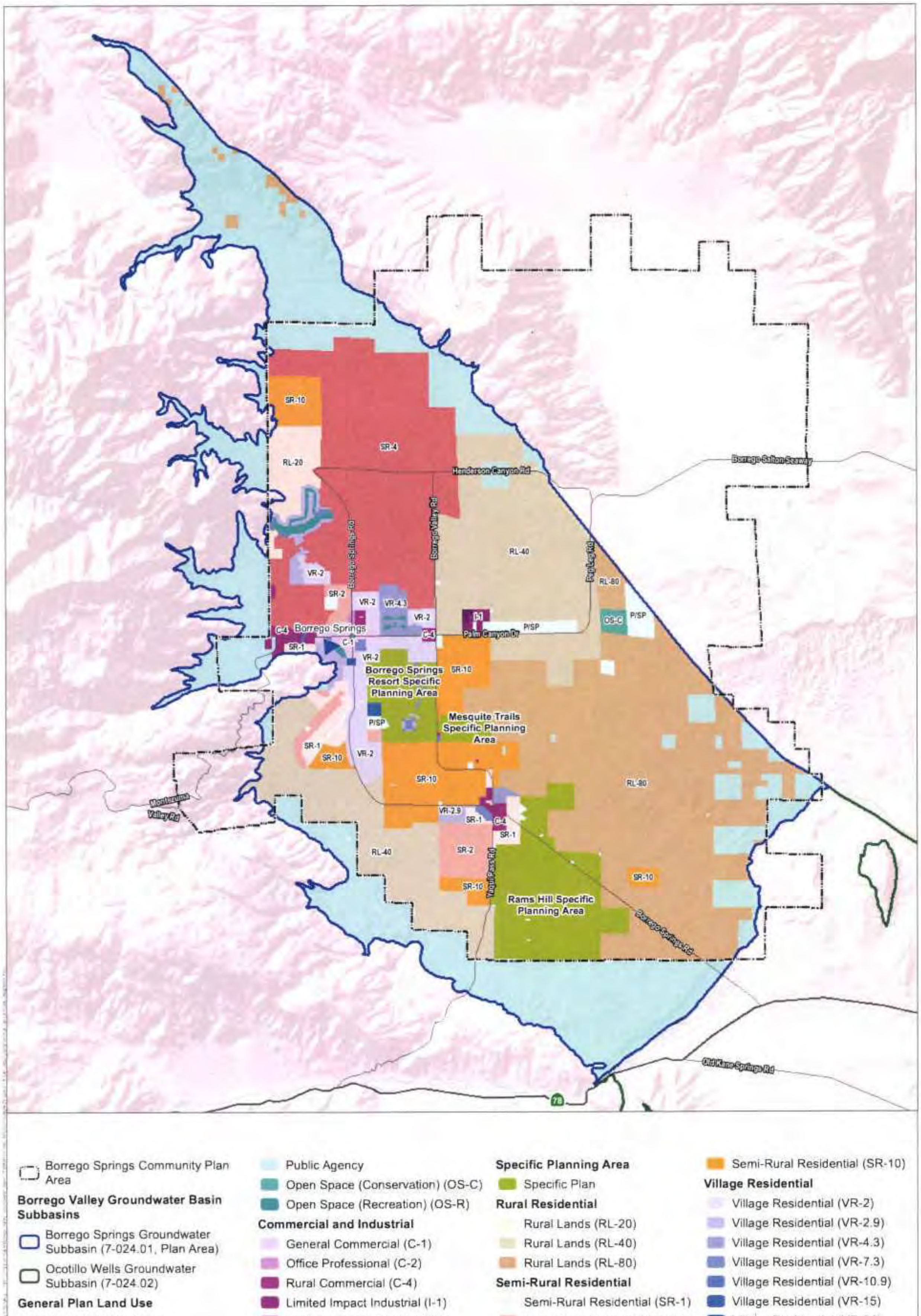
- Major Flow Paths
- Dry Lake
- Wash

DATUM: NAD 1983 DATA SOURCE: SanGIS 2017

DUDEK January 2020

Figure 2.1-5
Groundwater Well Locations and Well Density per Square Mile

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983, DATA SOURCE: SanGIS 2011

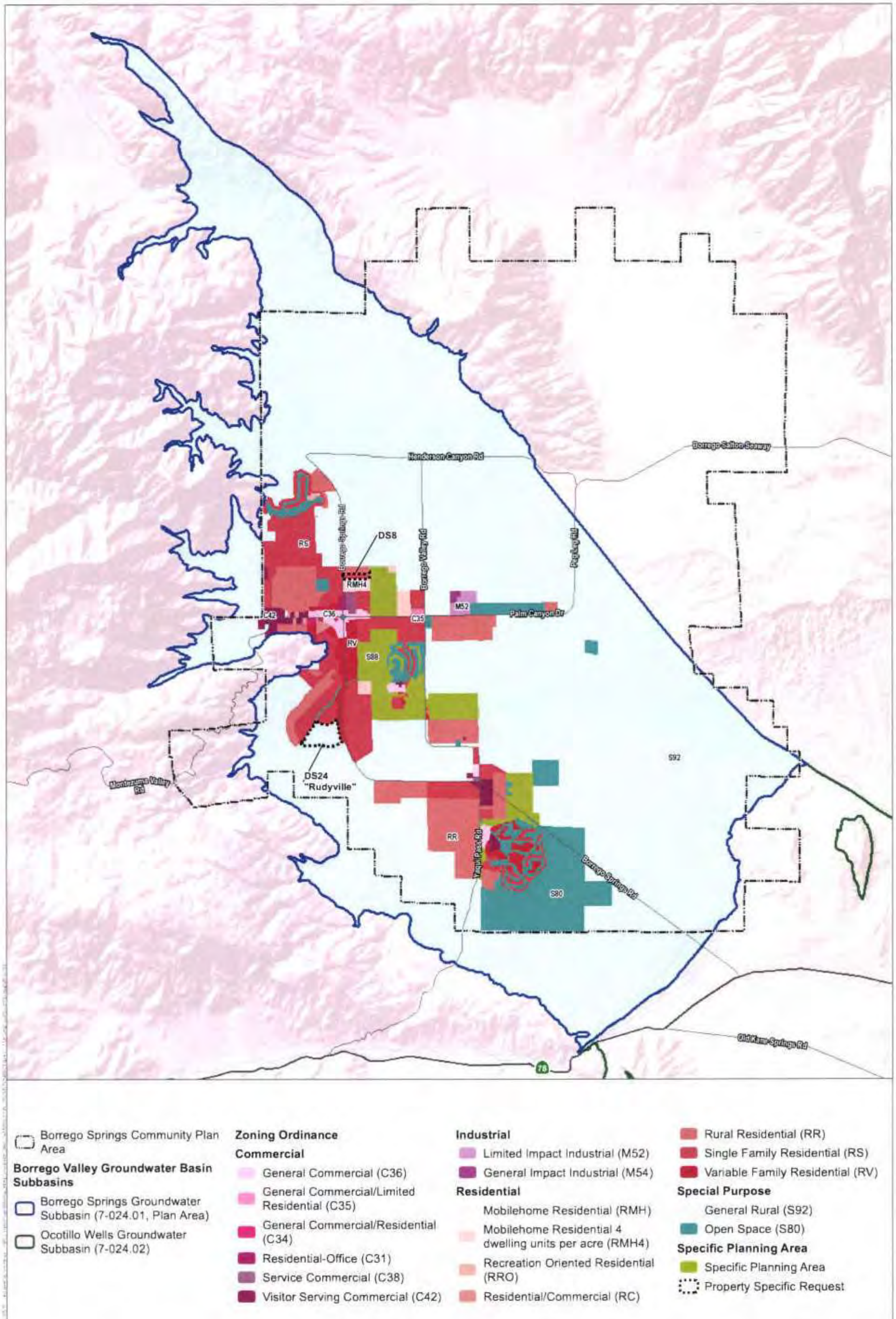
DUDEK

Figure 2.1-6

San Diego County General Plan Land Use Designations

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983 DATA SOURCE: SanGIS 2017

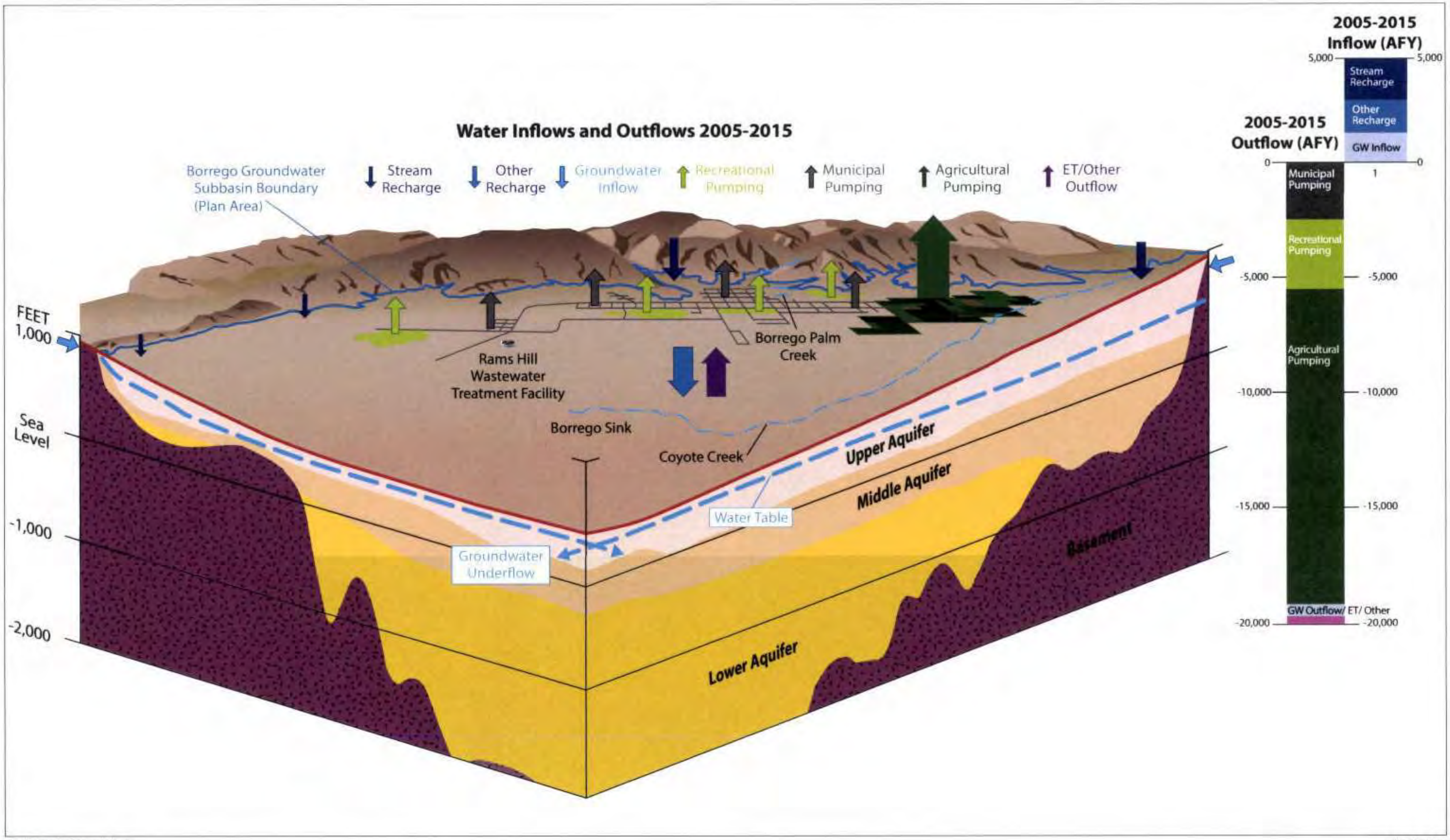
DUDEK January 2020

Figure 2.1-7

San Diego County Zoning Designations

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



SOURCE: USGS 1982 and USGS 2015

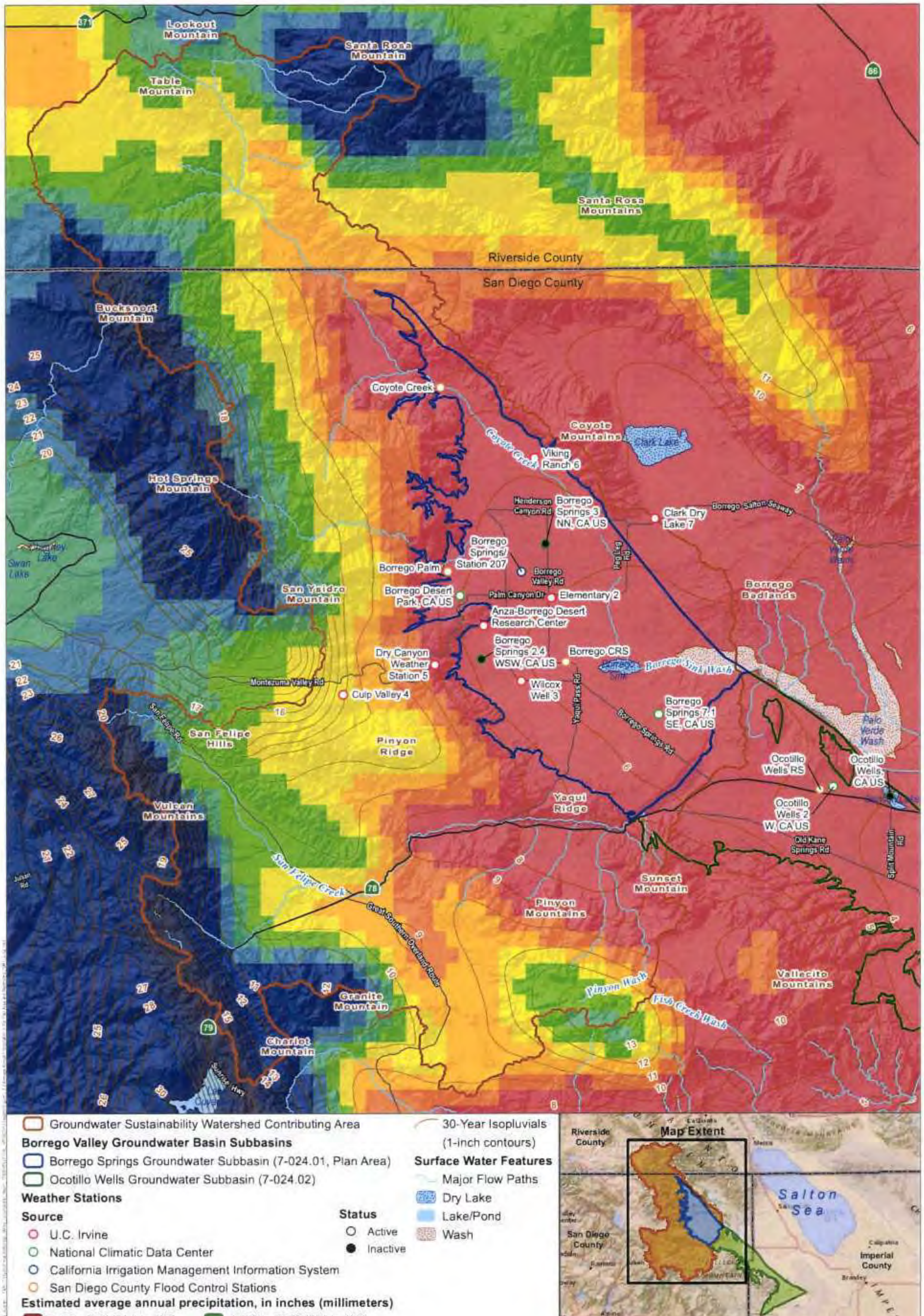
DUDEK January 2020

FIGURE 2.2-1

Hydrogeological Conceptual Model of the Plan Area

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK

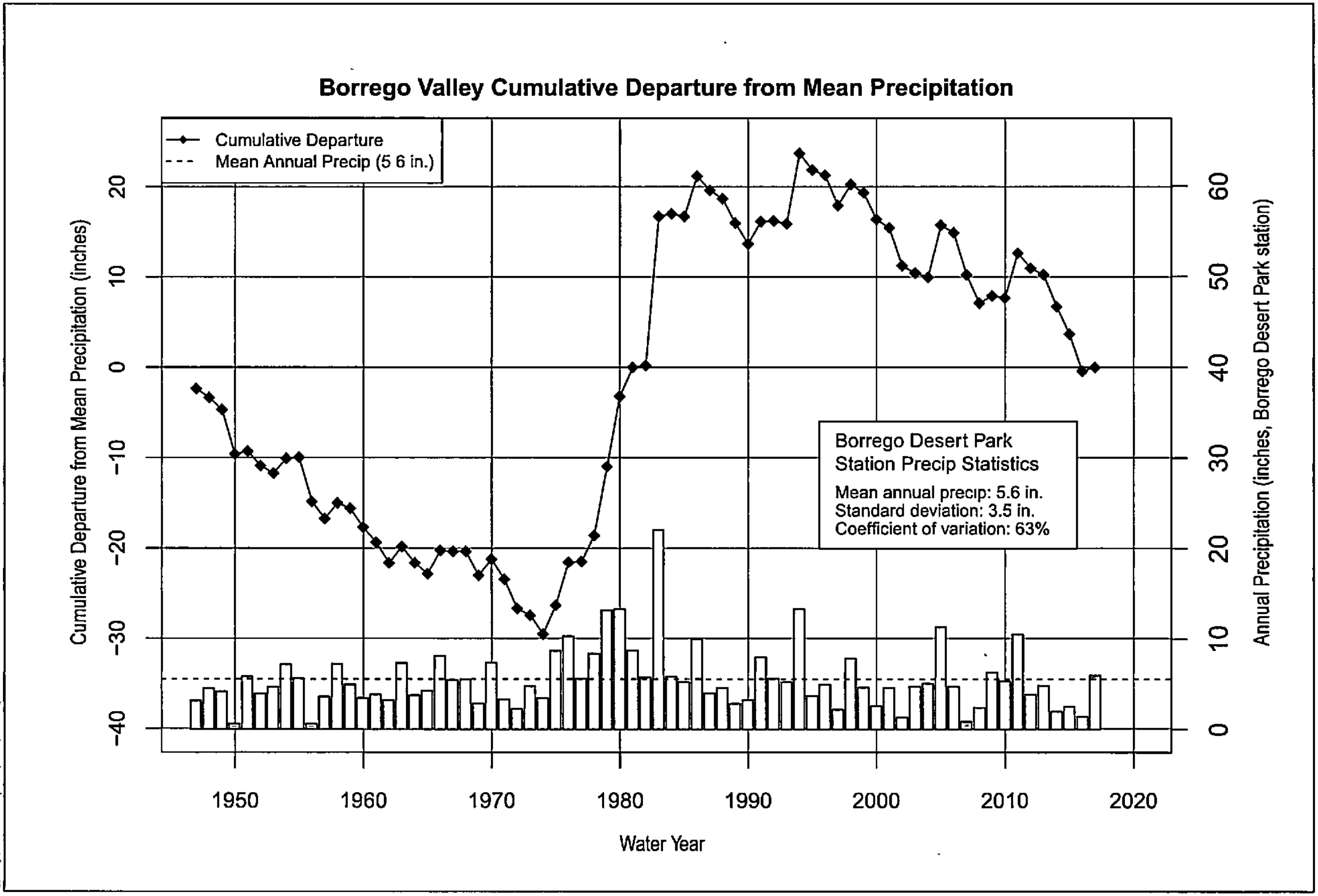


DATUM: NAD 1983 DATA SOURCE: PRISM Climate Group 2017

DUDEK January 2020

Figure 2.2-2
Average Annual Precipitation in the Plan Area and Watershed (1981-2010)
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



SOURCE NOAA 2017

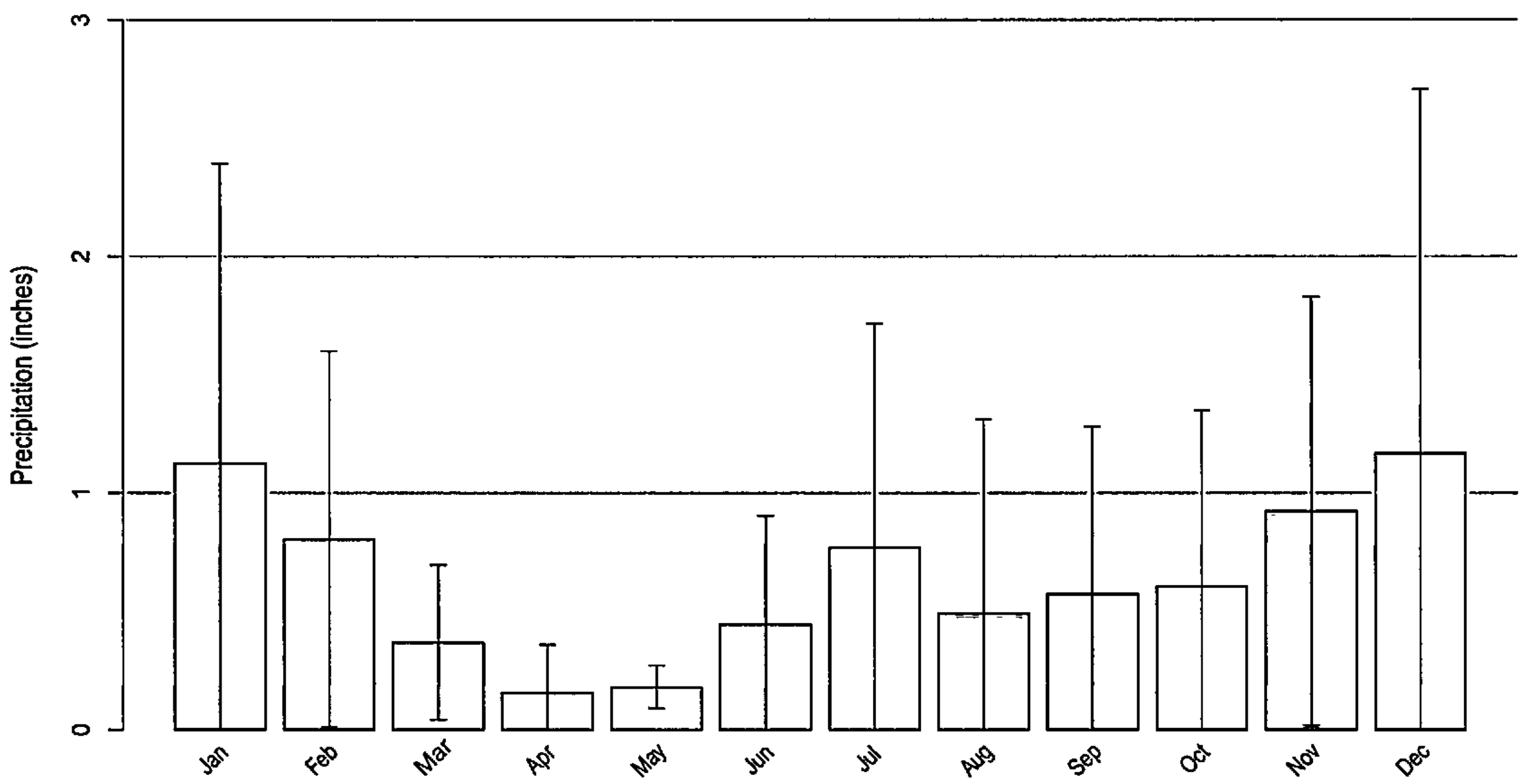
FIGURE 2.2-3

Precipitation Record for the Borrego Desert Park Station by Water Year (1947 - 2017)

INTENTIONALLY LEFT BLANK

The standard deviation is based on the concept of a bell curve. One standard deviation give an estimate of the range of values around the average that occurs about 67% of the time. This means that 67% of the time, monthly precipitation will vary by one standard deviation from the long-term average.

The standard deviation provides a statistical estimate of precipitation variability. A larger standard deviation indicates a larger variability in precipitation from long-term average.



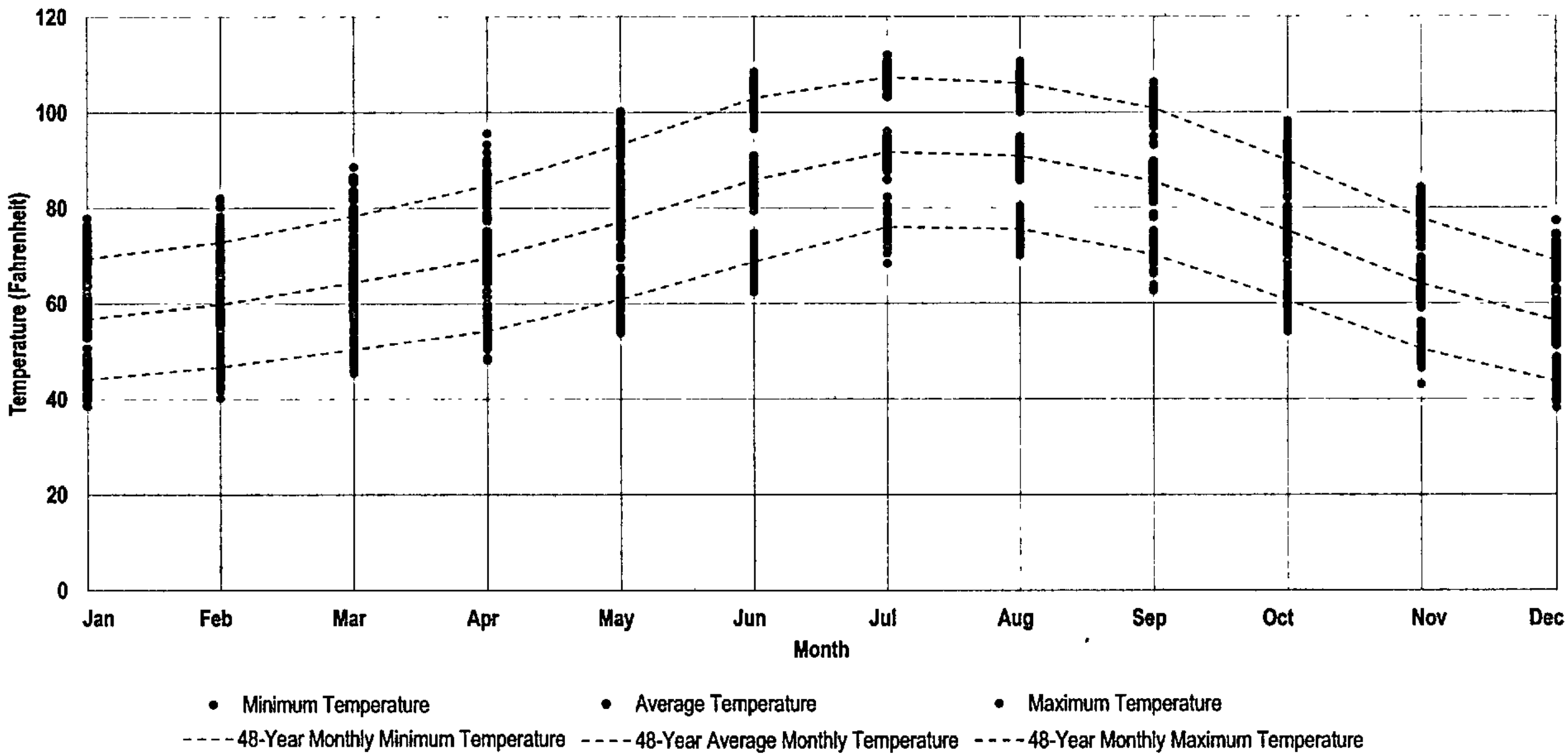
Average Monthly Precipitation at Borrego Desert Park Station (1947 - 2017)

Tickmarks show one standard deviation above and below the mean monthly precipitation. Where a bottom tickmark is not shown, the standard deviation is greater than the mean for that month in the period of record.

FIGURE 2.2-4

Average Monthly Precipitation at Borrego Desert Park Station (1947 - 2017)

INTENTIONALLY LEFT BLANK

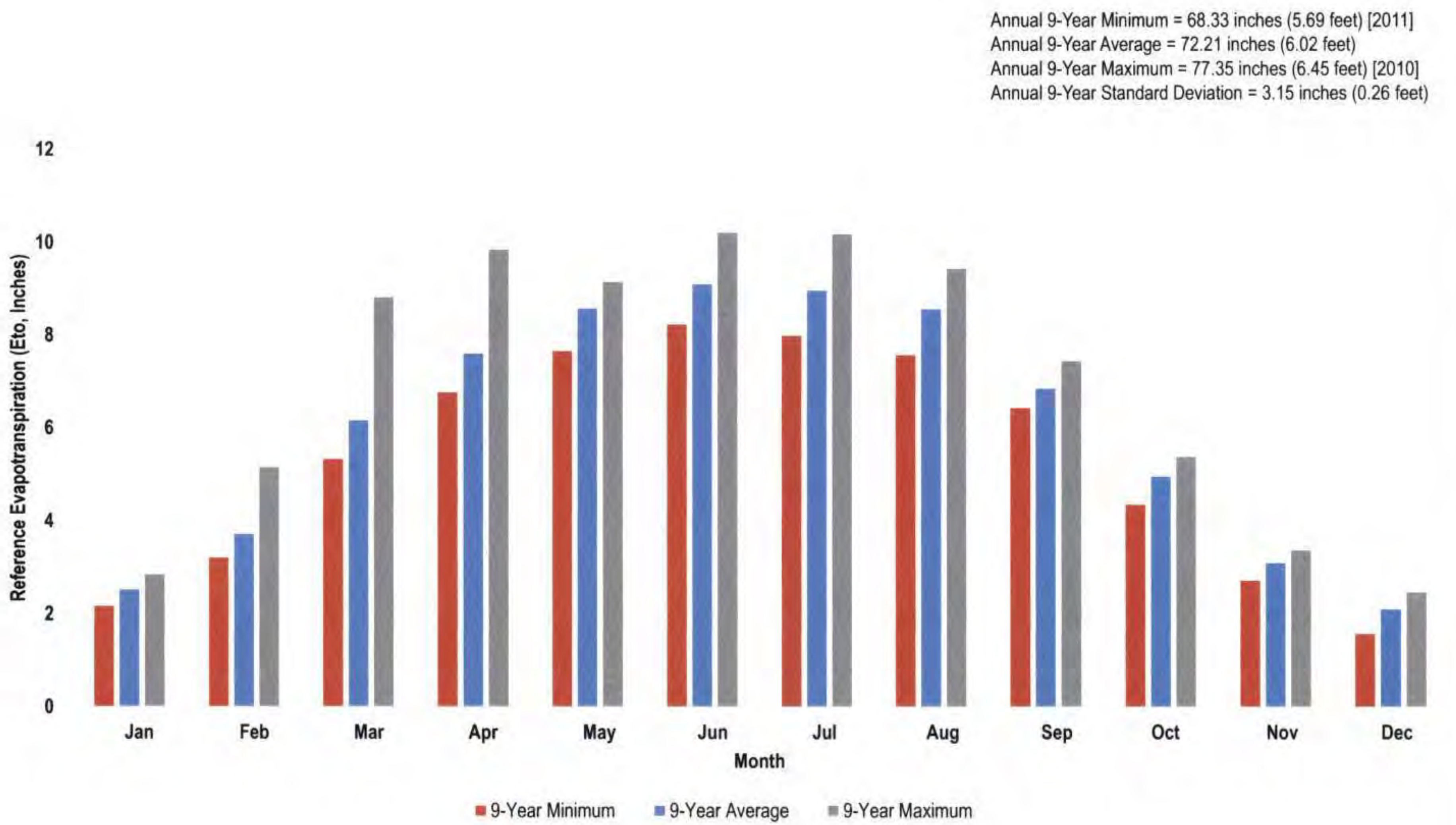


SOURCE: NOAA 2017

FIGURE 2.2-5

Average Minimum and Maximum Air Temperatures at the Borrego Desert Park Station by Month (1968 - 2017)

INTENTIONALLY LEFT BLANK



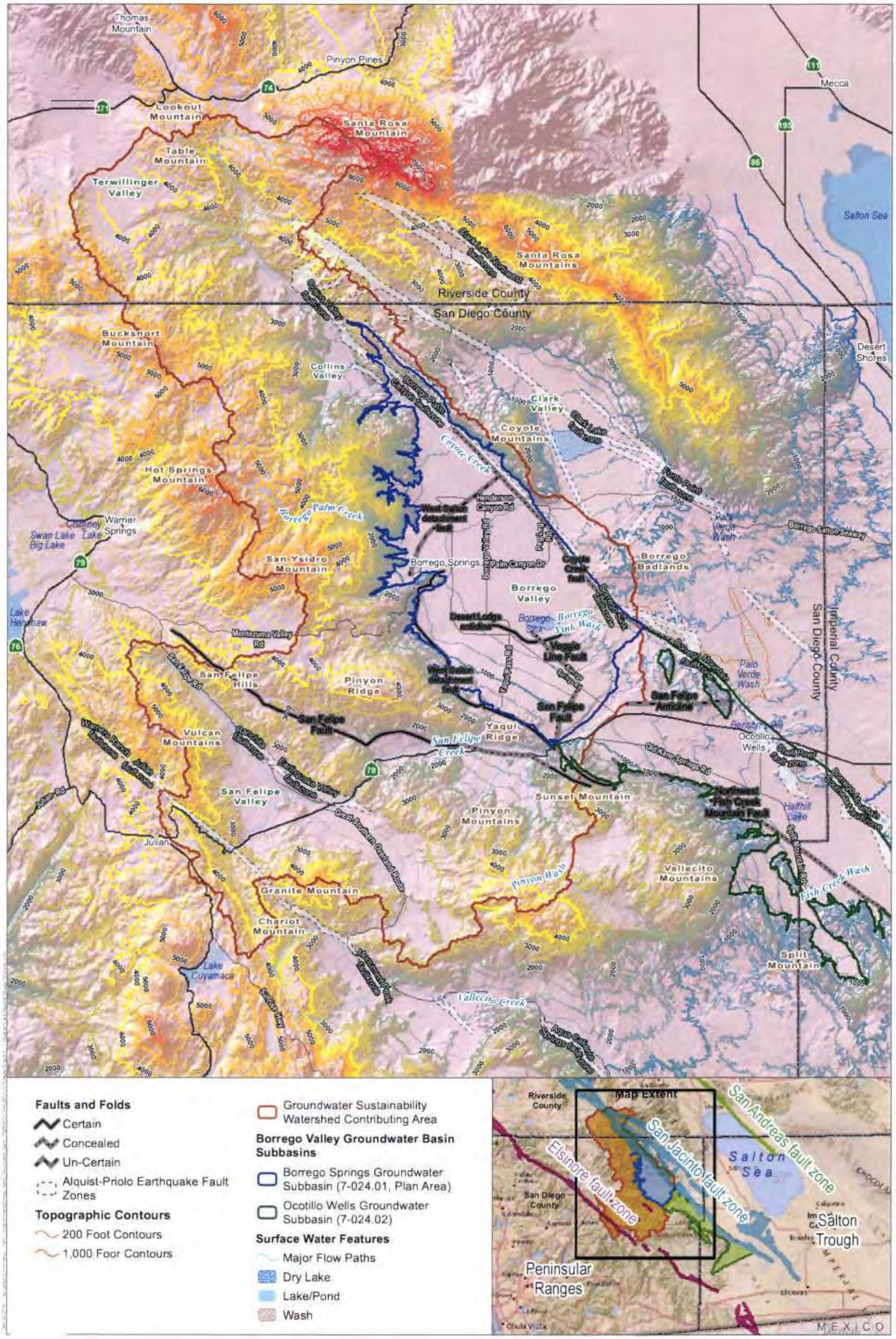
Note: Data is from Borrego Springs CIMIS Station # 207 from available record 2008 - 2017. Monthly Eto from 2008 is excluded from the average as the record for that year is not complete.

SOURCE: CIMIS 2018

FIGURE 2.2-6

Average Minimum and Maximum Evapotranspiration at CIMIS Station 207 by Month (2009 - 2017)

INTENTIONALLY LEFT BLANK

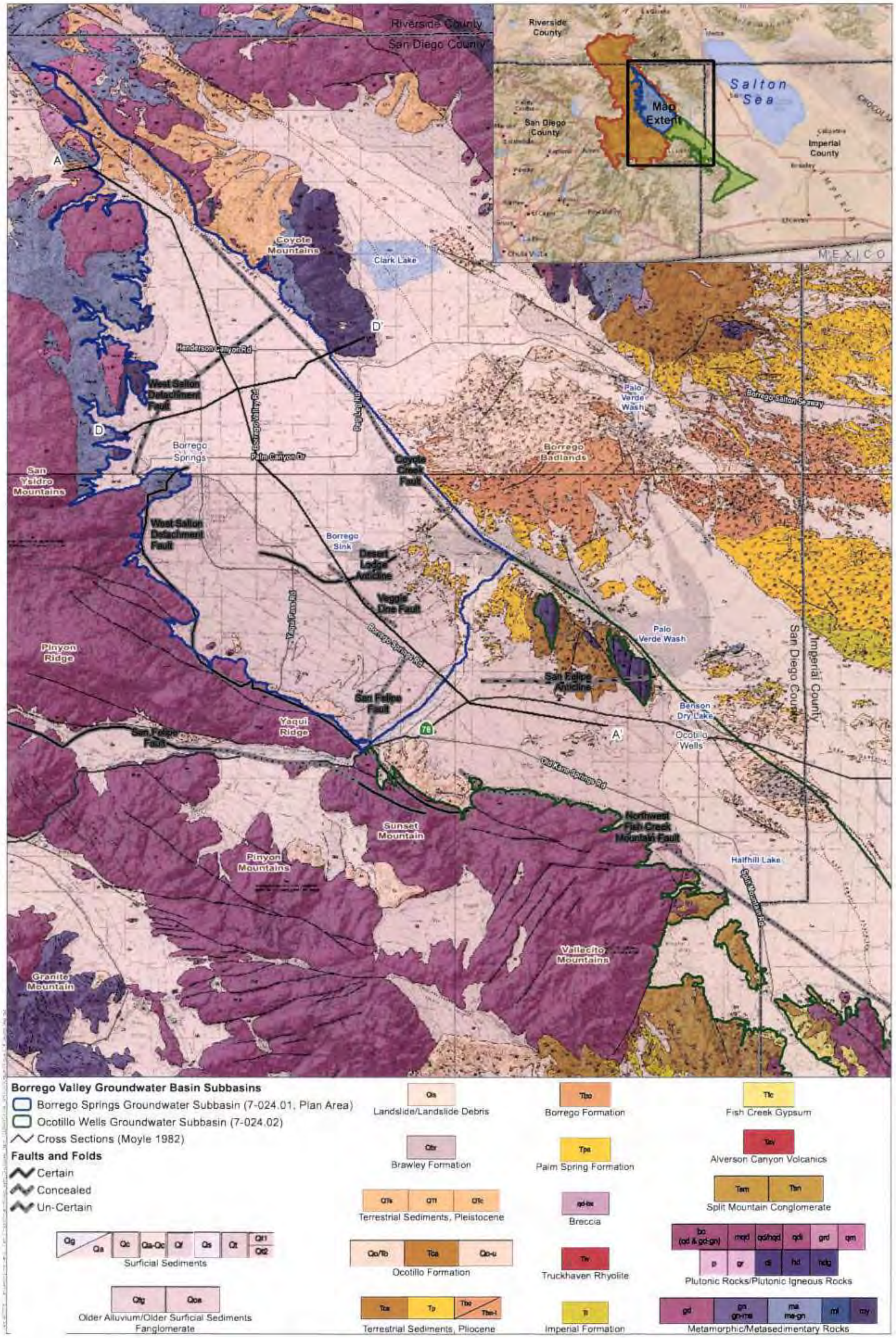


DATUM: NAD 1983 DATA SOURCE: DWR 2016, USGS NHD 2017, USGS 2015, Steely et al 2009, CGS 2012

DUDEK January 2020

Figure 2.2-7
Topography and Regional Geologic Structures
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



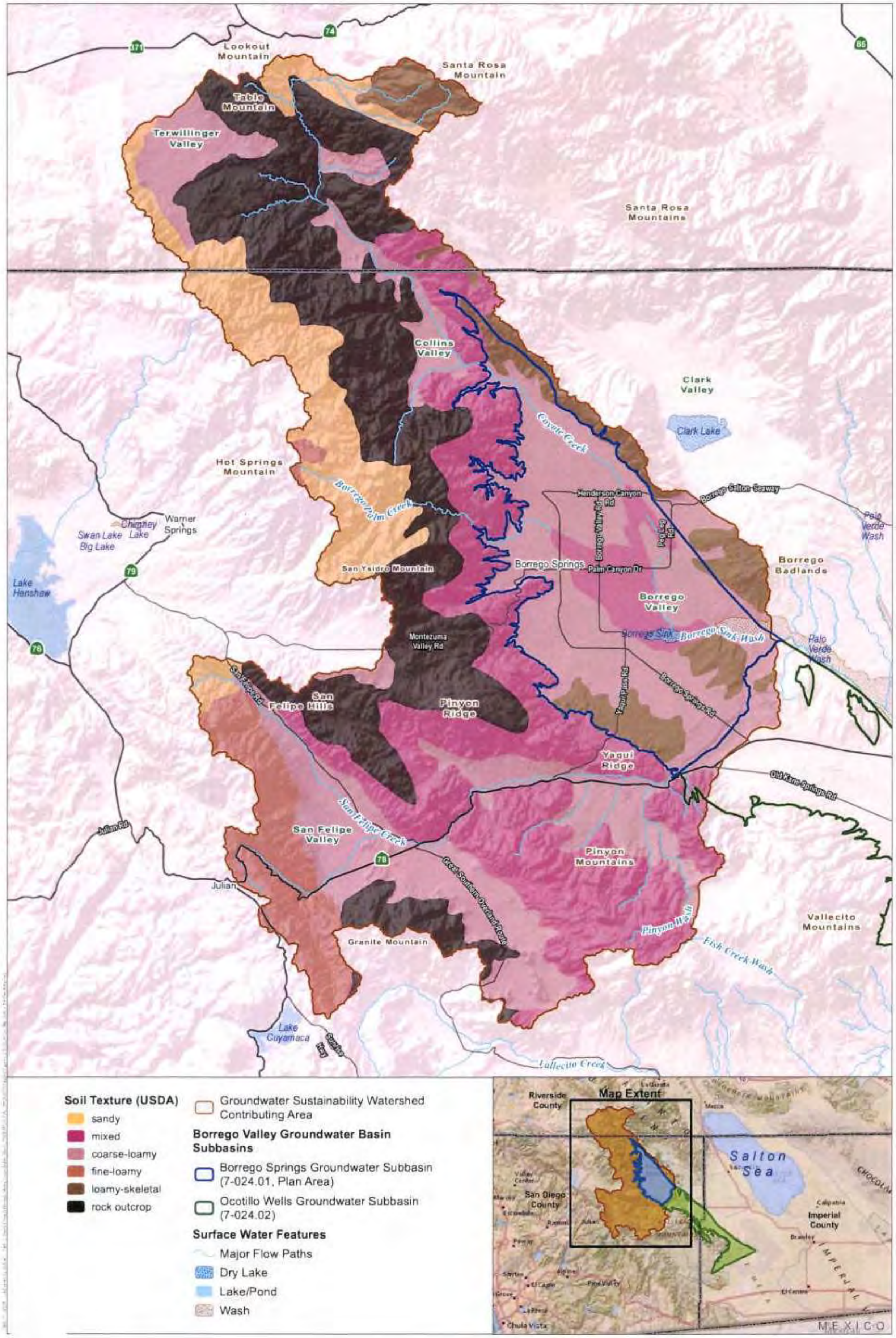
DATUM: NAD 1983. DATA SOURCE: Dibblee 2008, USGS 2015, Steely et al 2009, CGS 2012

DUDEK January 2020

Figure 2.2-8
Geologic Map

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983 DATASOURCE: DWR 2015, SanGIS 2014, USGS NHD 2017, USDA STATSGO 2

January 2020

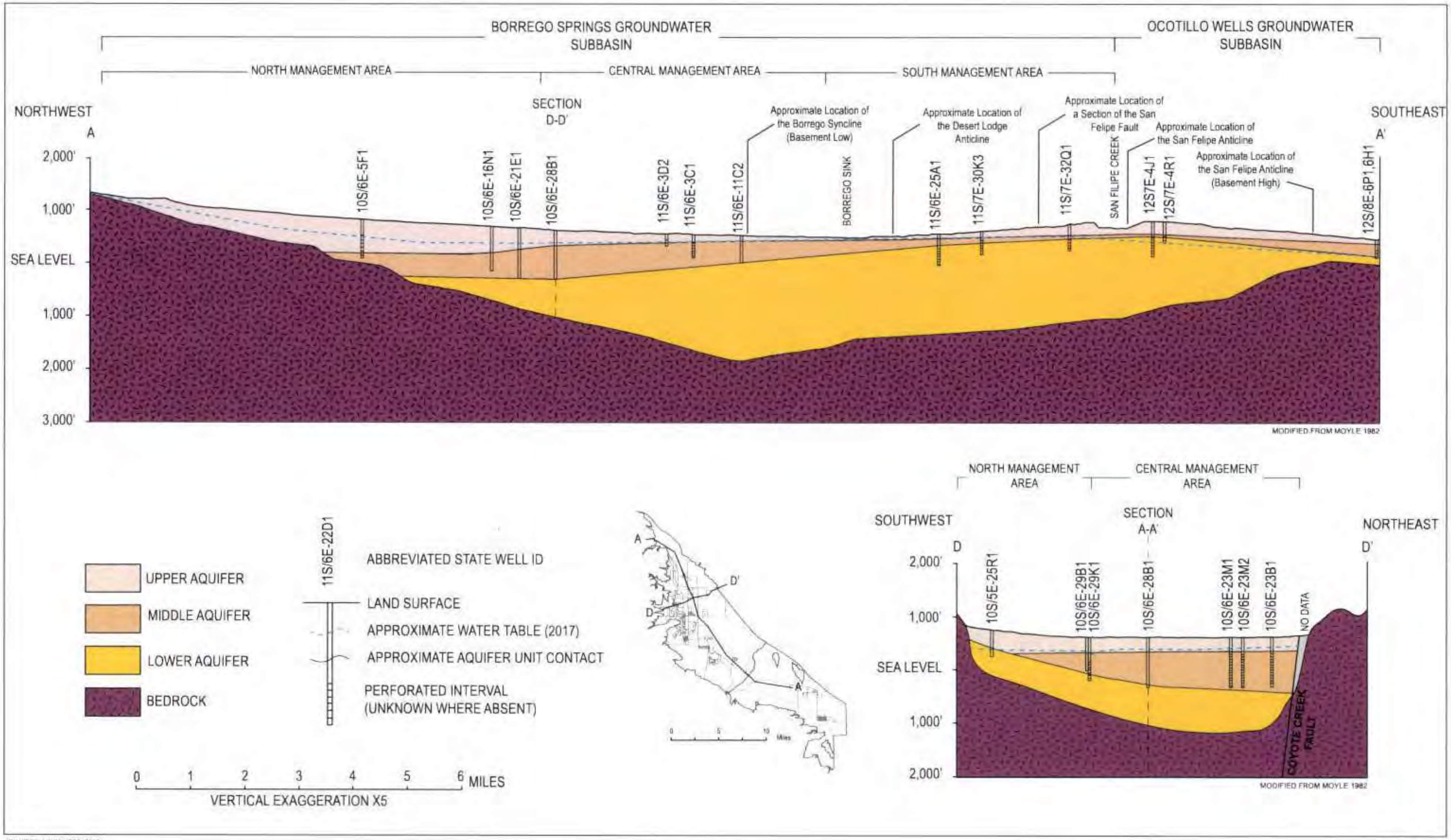
DUDEK

Figure 2.2-9

USDA Soil Map Units in the Plan Area

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



SOURCE: USGS 1982, 2015

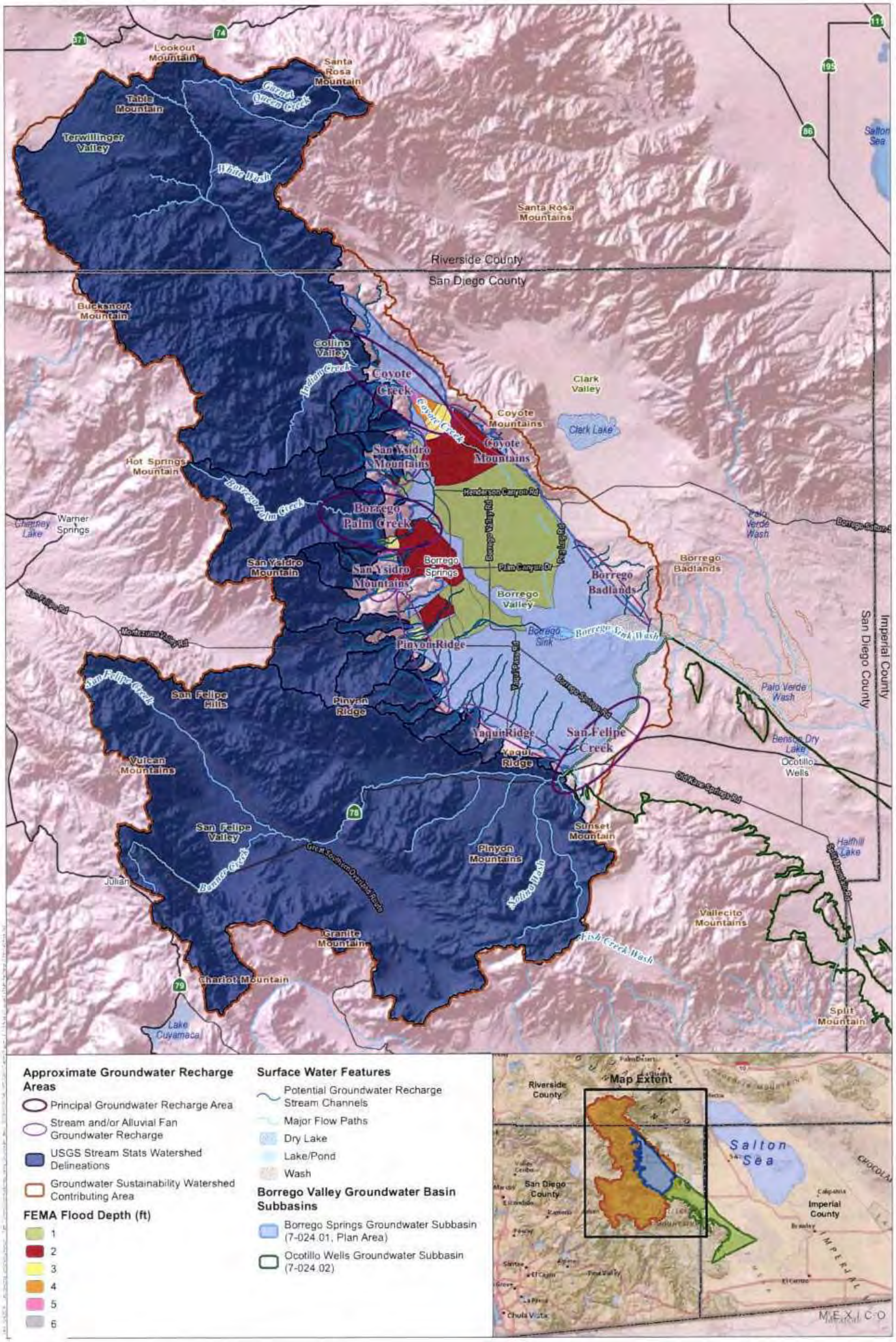
DUDEK January 2020

FIGURE 2.2-10

Hydrogeologic Cross Sections of the Plan Area

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983; DATA SOURCE: DWR 2015; USGS NHD 2017; USGS 2018; FEMA 2017

DUDEK

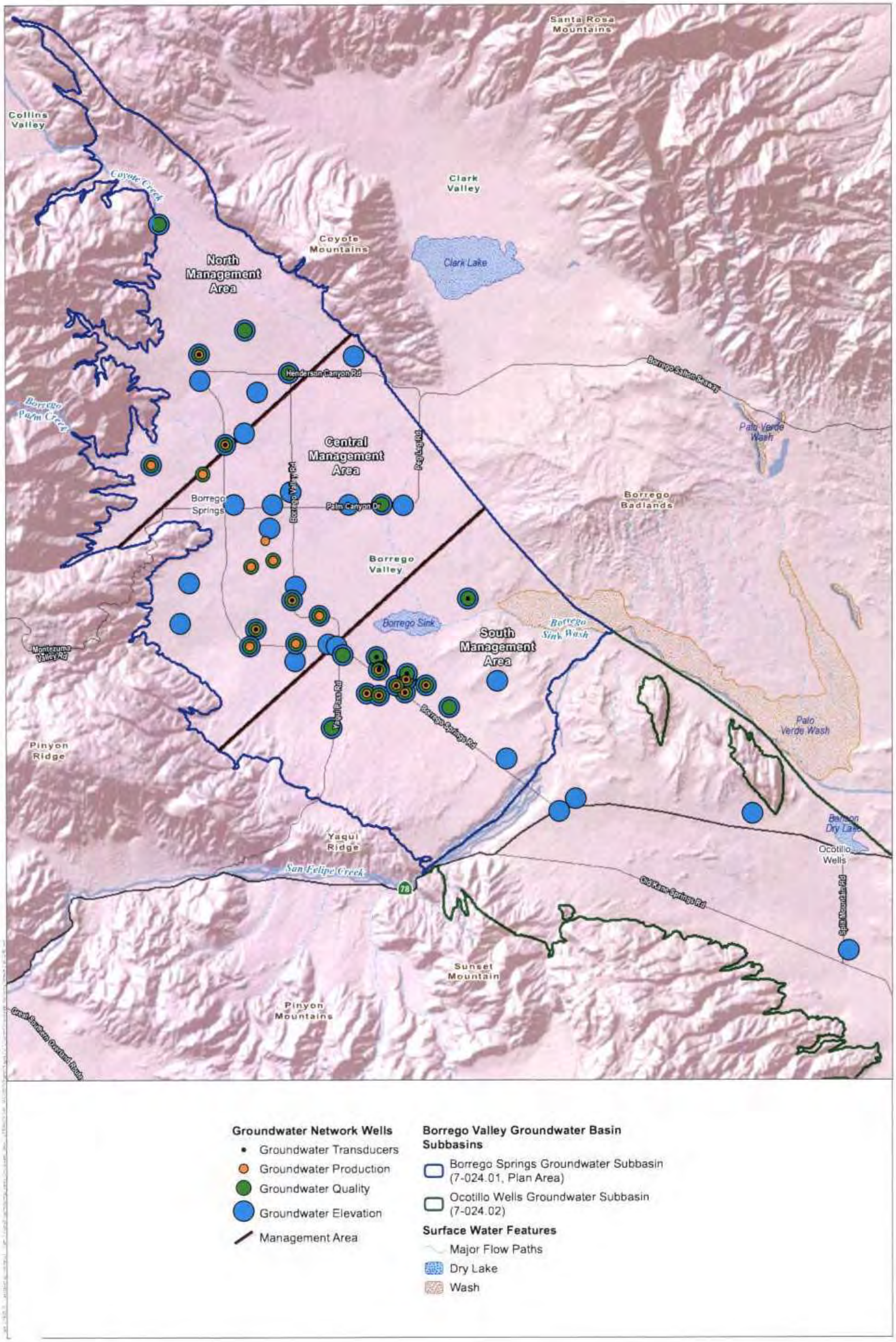
January 2020

Figure 2.2-11

Areas of Focused Stream Recharge in the Plan Area

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM NAD 1983

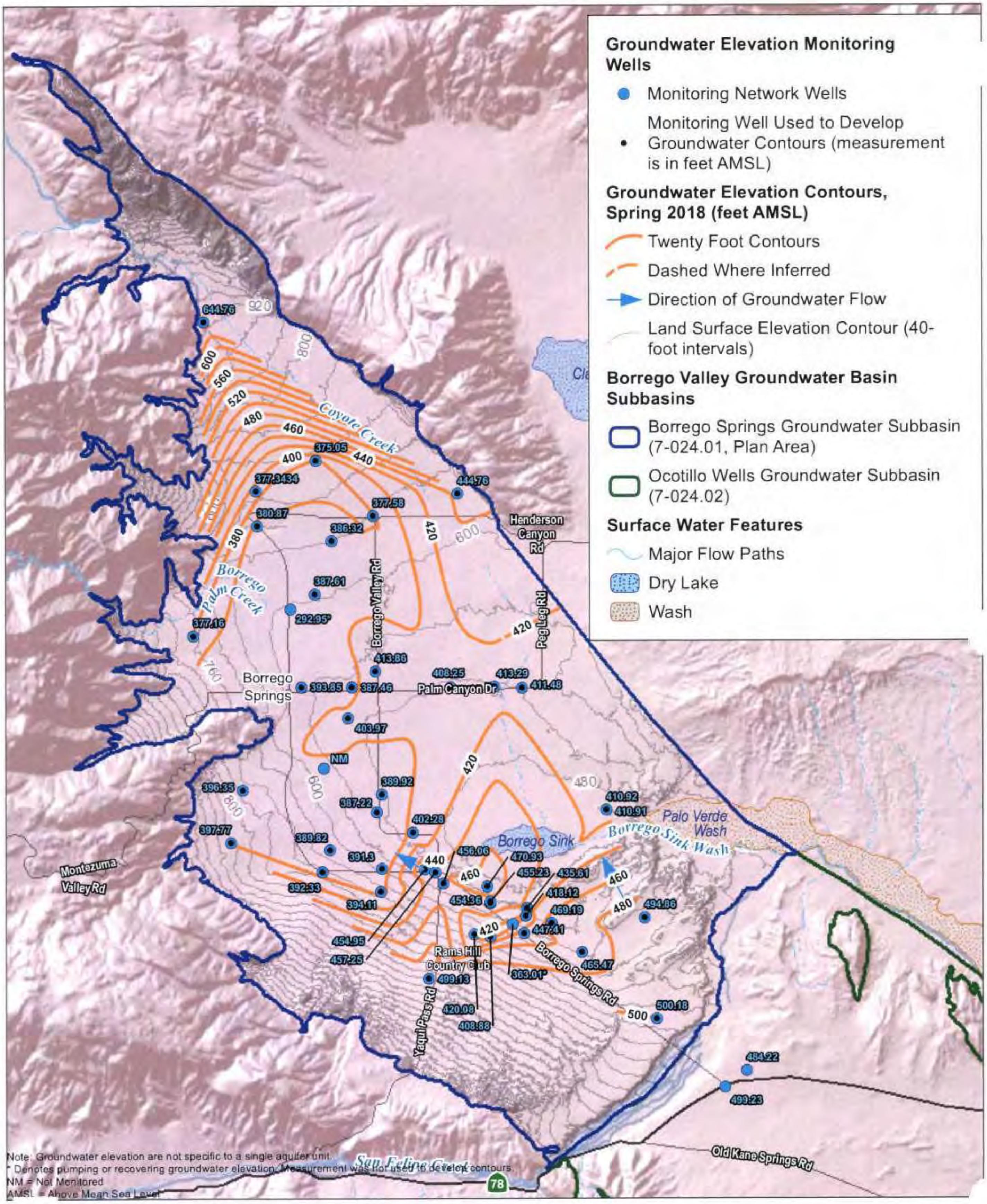
DUDEK January 2020

Figure 2.2-12

Groundwater Monitoring Network (Fall 2018)

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



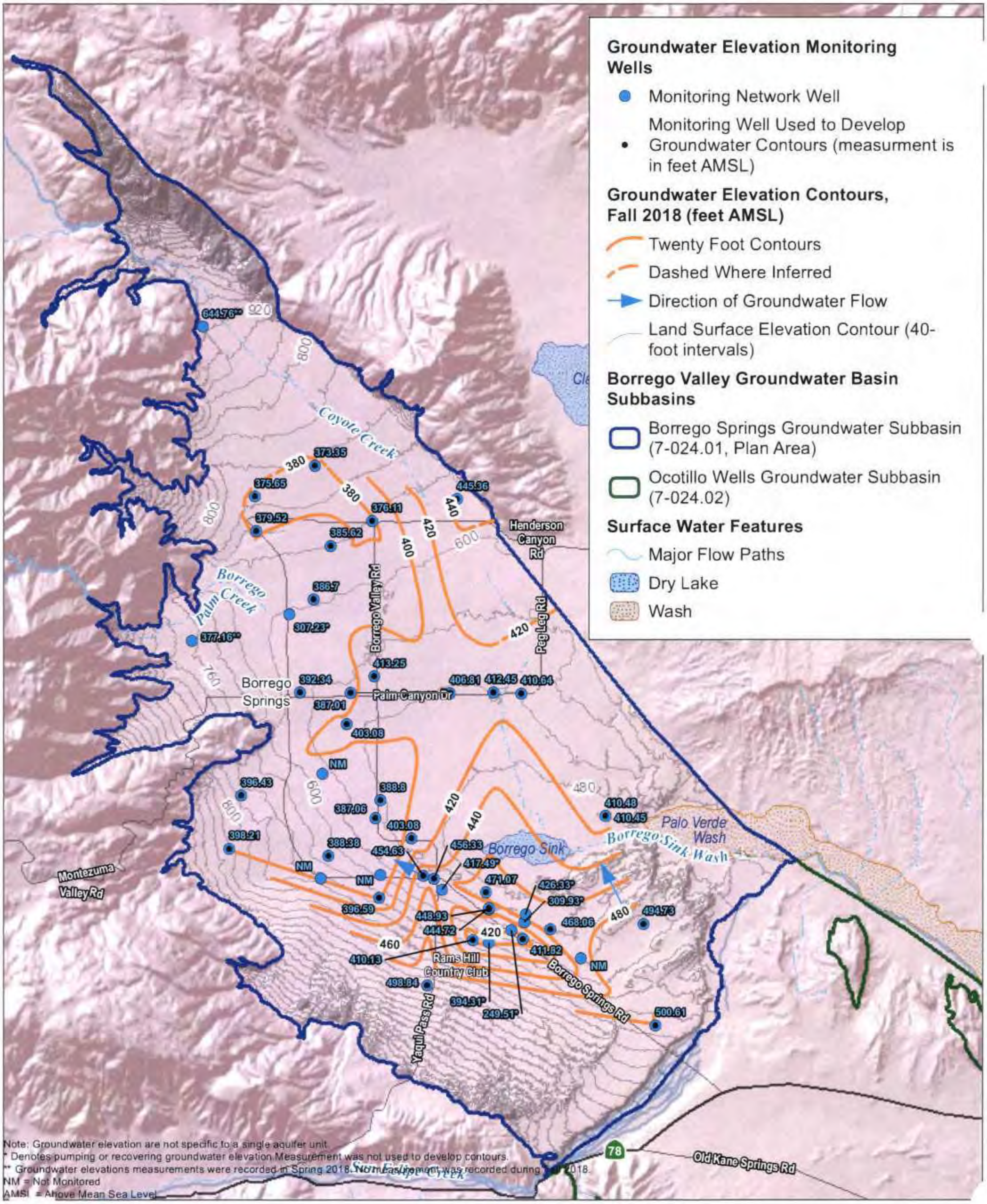
DATUM: NAD 1983. DATA SOURCE: Dudek 2018; SanGIS

DUDEK January 2020 0 1 2 Miles

Figure 2.2-13A

Groundwater Levels in the Plan Area (Spring 2018)

INTENTIONALLY LEFT BLANK



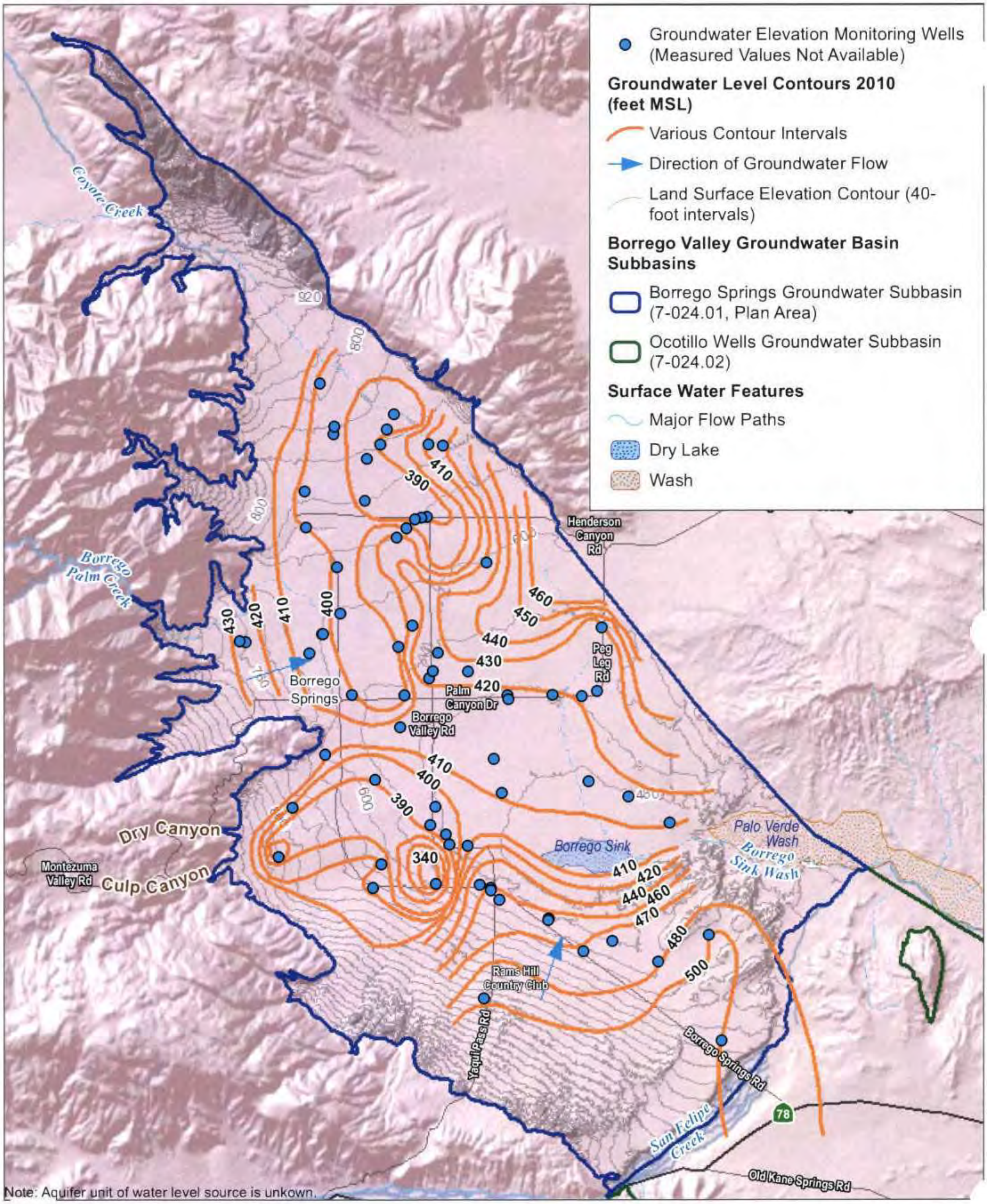
DATUM: NAD 1983. DATA SOURCE: Dudek 2018; SanGIS

DUDEK January 2020

0 1 2 Miles

Figure 2.2-13b
Groundwater Levels in the Plan Area (Fall 2018)

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983; DATA SOURCE: USGS 2015; SanGIS

DUDEK January 2020

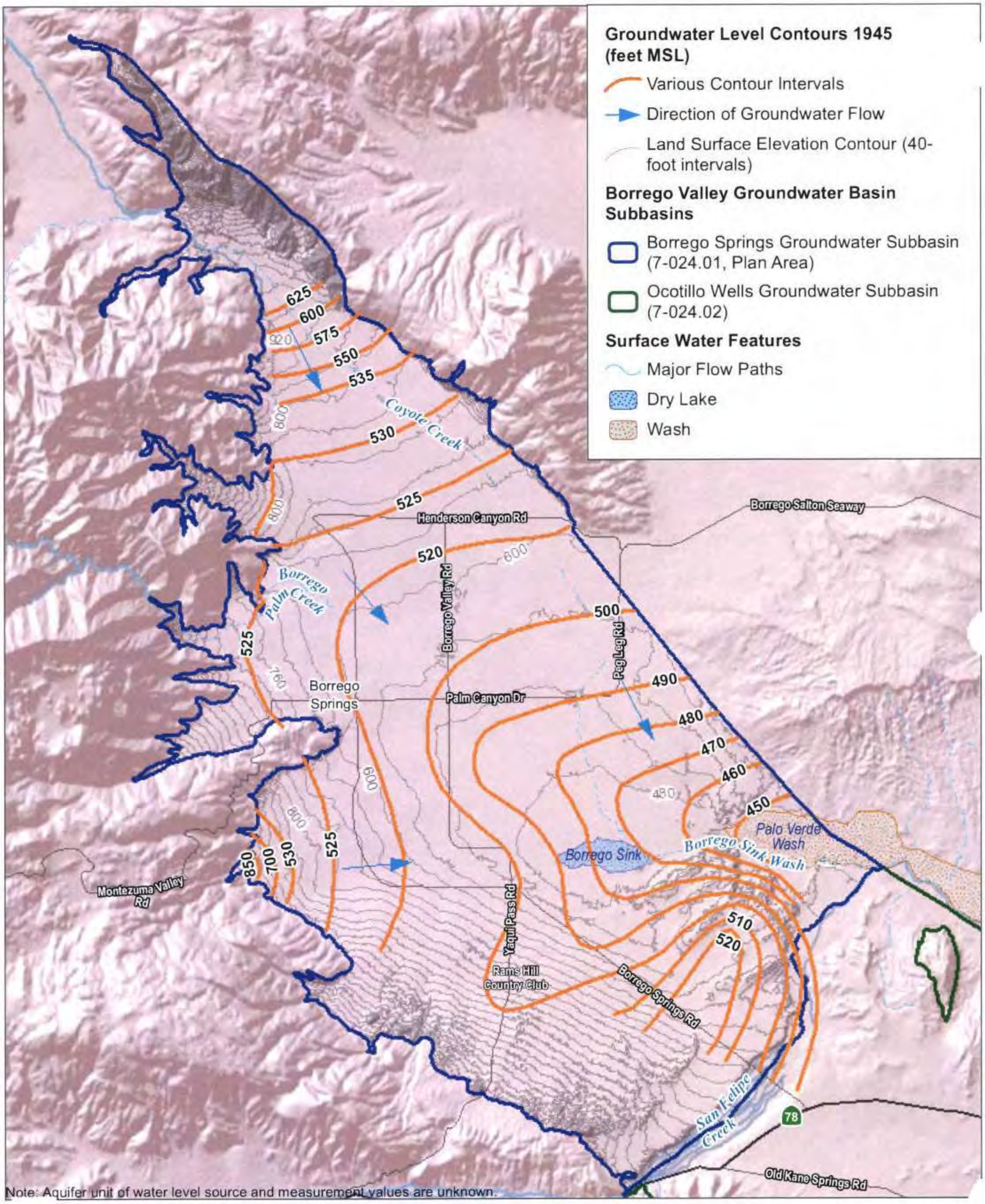
0 1 2 Miles

Figure 2.2-13C

Historical Groundwater Levels in the Plan Area (2010)

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983, DATA SOURCE: USGS 2015; SanGIS

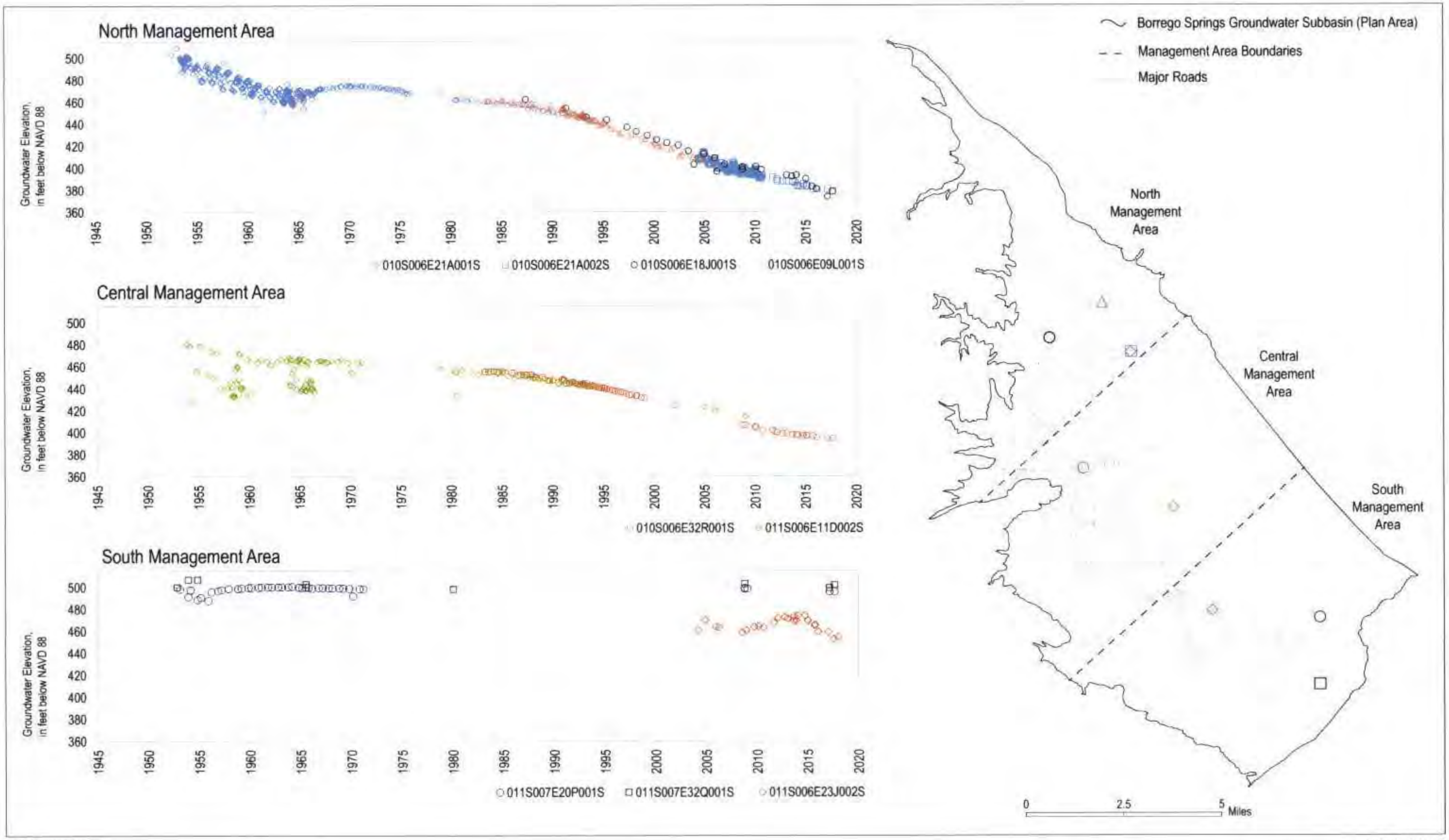
DUDEK January 2020

0 1 2 Miles

Figure 2.2-13D

Historical Groundwater Levels in the Plan Area (1945)

INTENTIONALLY LEFT BLANK

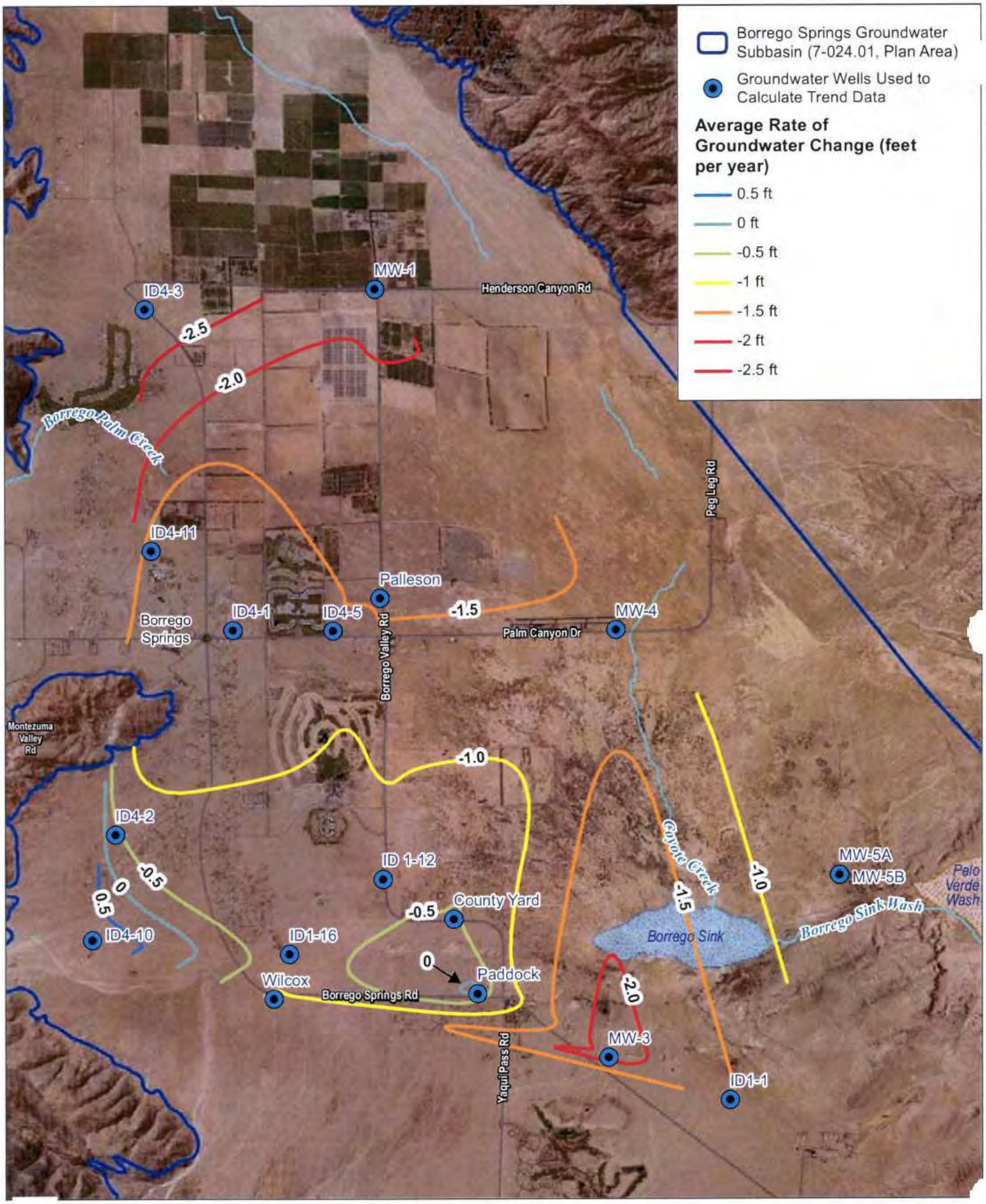


SOURCE: USGS 2015

FIGURE 2.2-13E

Groundwater Levels in Selected Wells in Parts of the Plan Area, 1952 - 2018

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983. DATA SOURCE: Dudek 2018

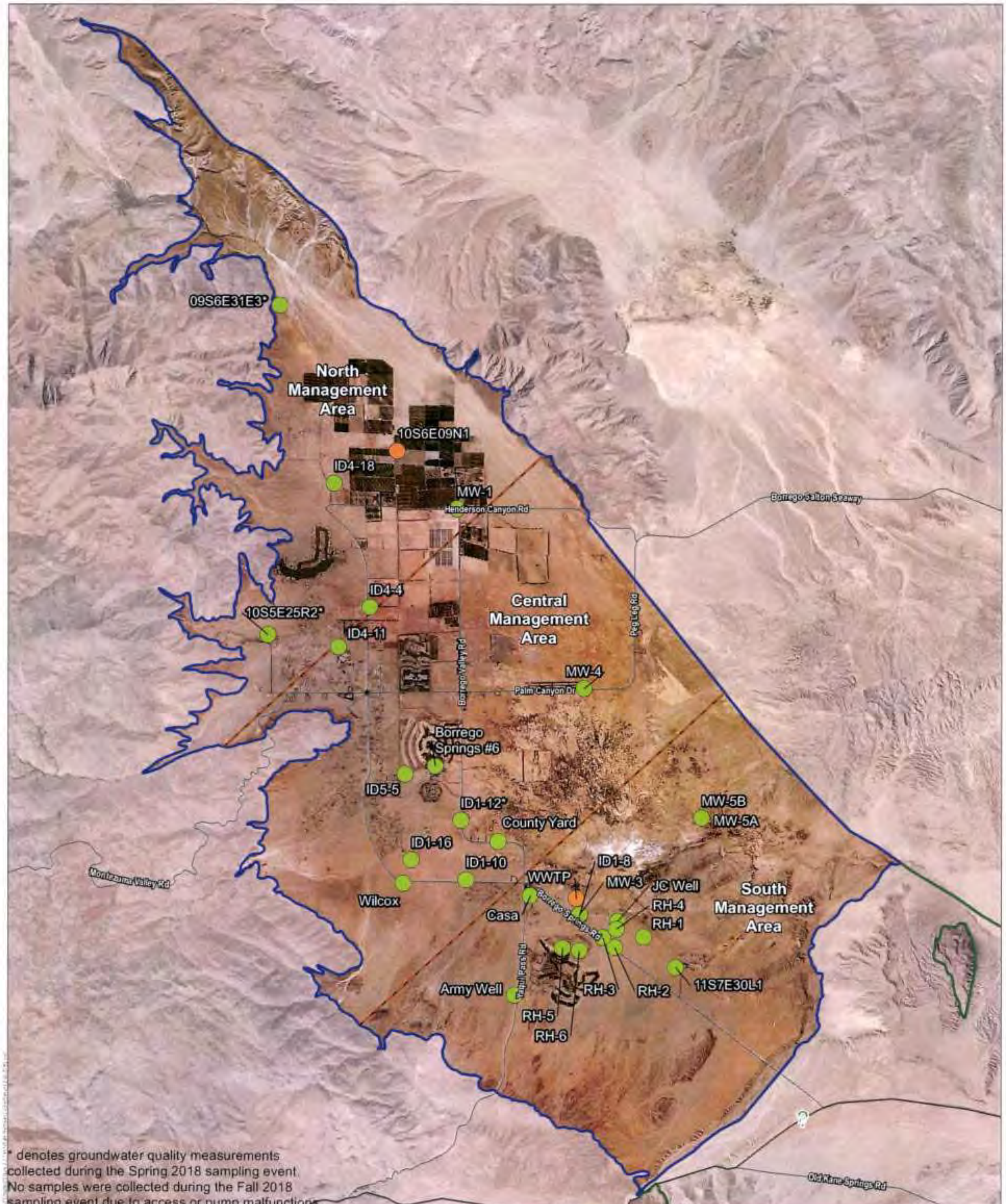
DUDEK January 2020

0 0.5 1 Miles

Figure 2.2-13F

Contour Map of Average Rate of Groundwater Change (2010-2018)

INTENTIONALLY LEFT BLANK



Nitrate as Nitrogen (N) Wellhead Concentrations (Fall 2018)

- Less than 1/2 the MCL (5 mg/L)
- Greater than the MCL (10 mg/L)

Borrego Valley Groundwater Basin Subbasins

- Borrego Springs Groundwater Subbasin (7-024.01, Plan
- Ocotillo Wells Groundwater Subbasin (7-024.02)
- Management Area Divisions

DATUM: NAD 1983 DATA SOURCE: Dudek & Geosyntec 2018

January 2020

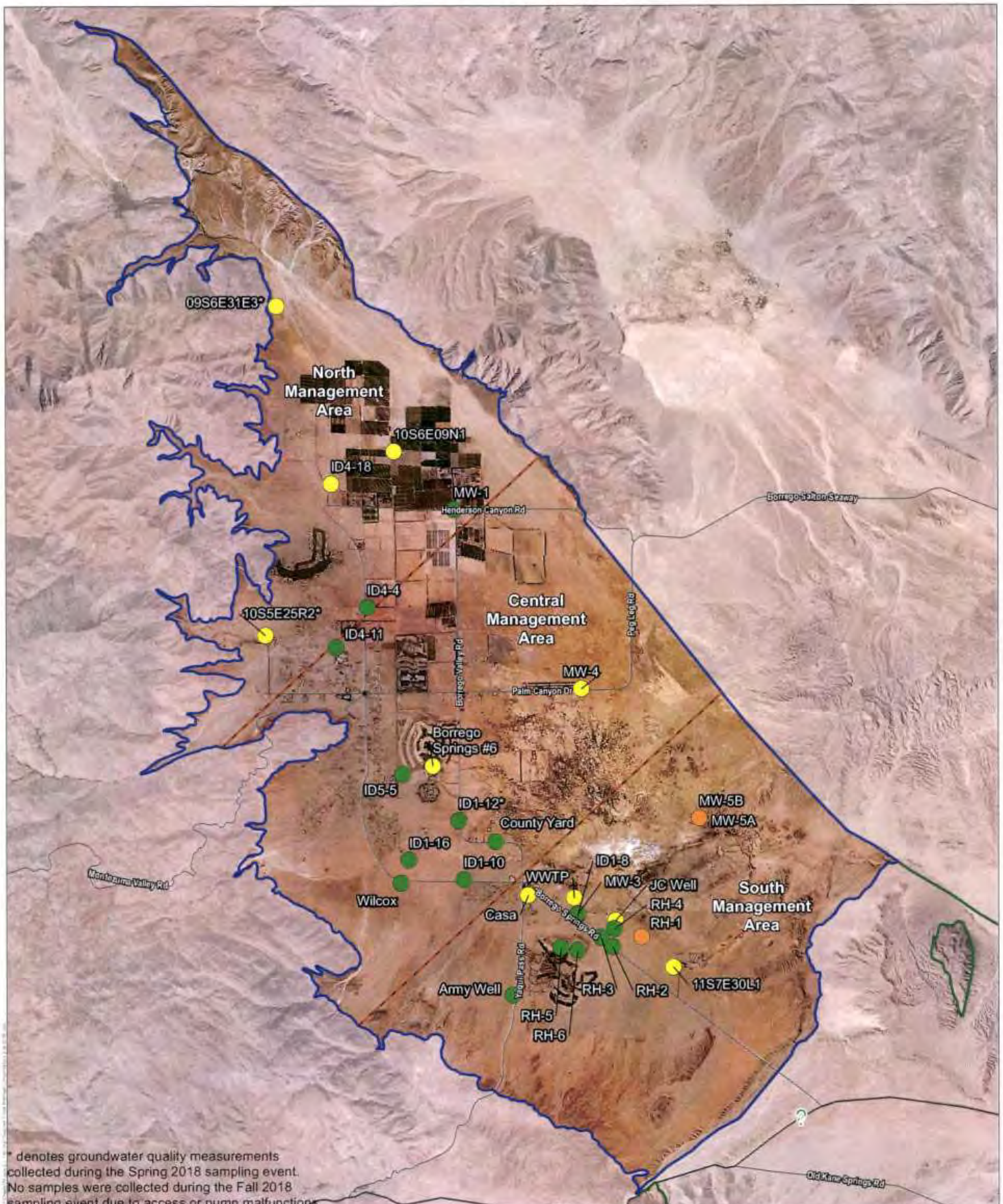
DUDEK

Figure 2.2-14A

Nitrate Wellhead Concentrations

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



Total Dissolved Solids (TDS) Wellhead Concentrations (Fall 2018)

- Less than 1/2 the secondary MCL (500 mg/L)
- Less than the secondary MCL (1,000 mg/L)
- Greater than the secondary MCL (1,000 mg/L)

Borrego Valley Groundwater Basin Subbasins

- Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
- Ocotillo Wells Groundwater Subbasin (7-024.02)
- Management Area Divisions

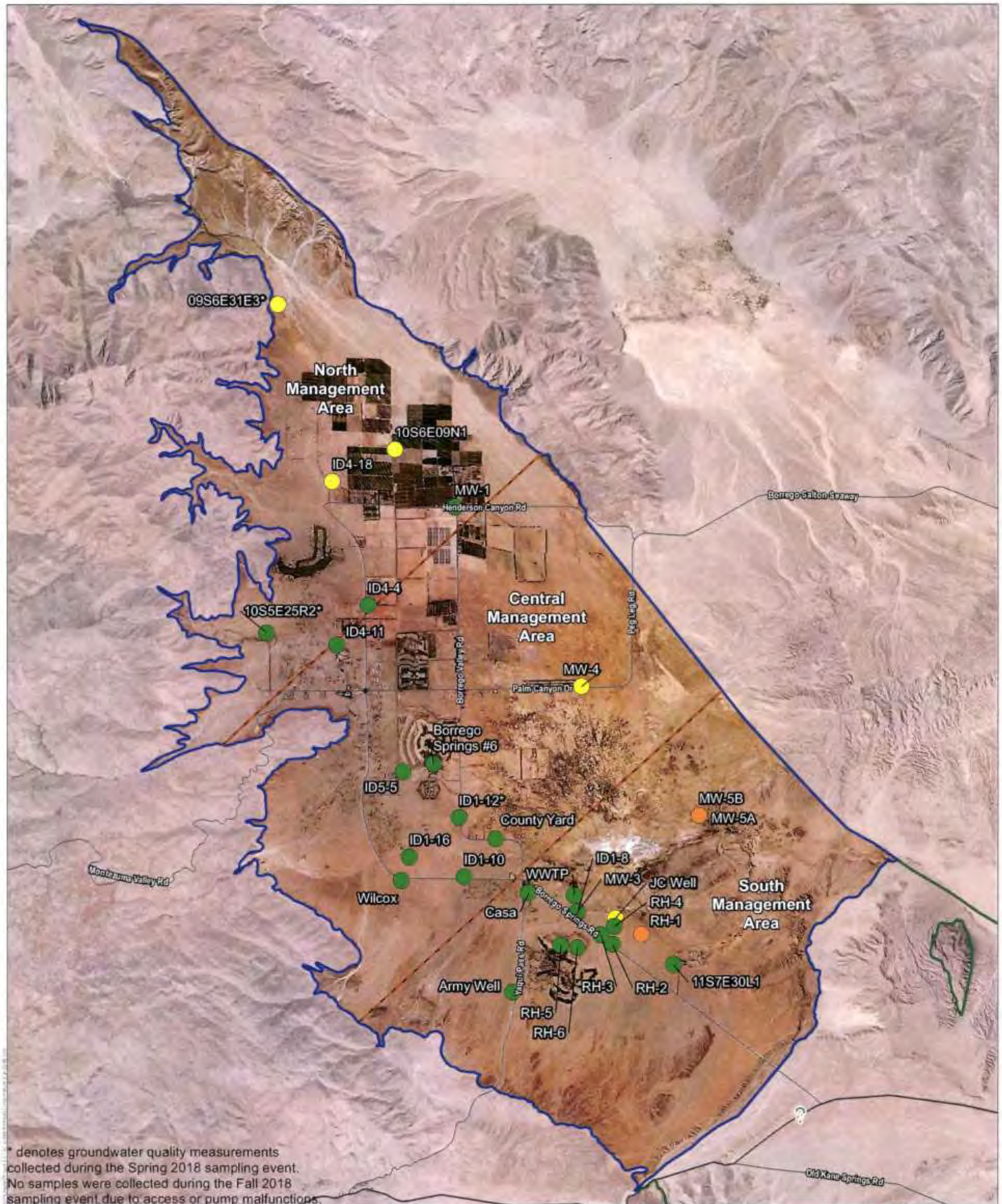
DATUM: NAD 1983 DATA SOURCE: Dudek & Geosyntec 2018

DUDEK January 2020

Figure 2.2-14B

Total Dissolved Solids Wellhead Concentrations

INTENTIONALLY LEFT BLANK



Sulfate Wellhead Concentration (Fall 2018)

- Less than 1/2 the Secondary MCL (250 mg/L)
- Less than the Secondary MCL (500 mg/L)
- Greater than the Secondary MCL (500 mg/L)

Borrego Valley Groundwater Basin Subbasins

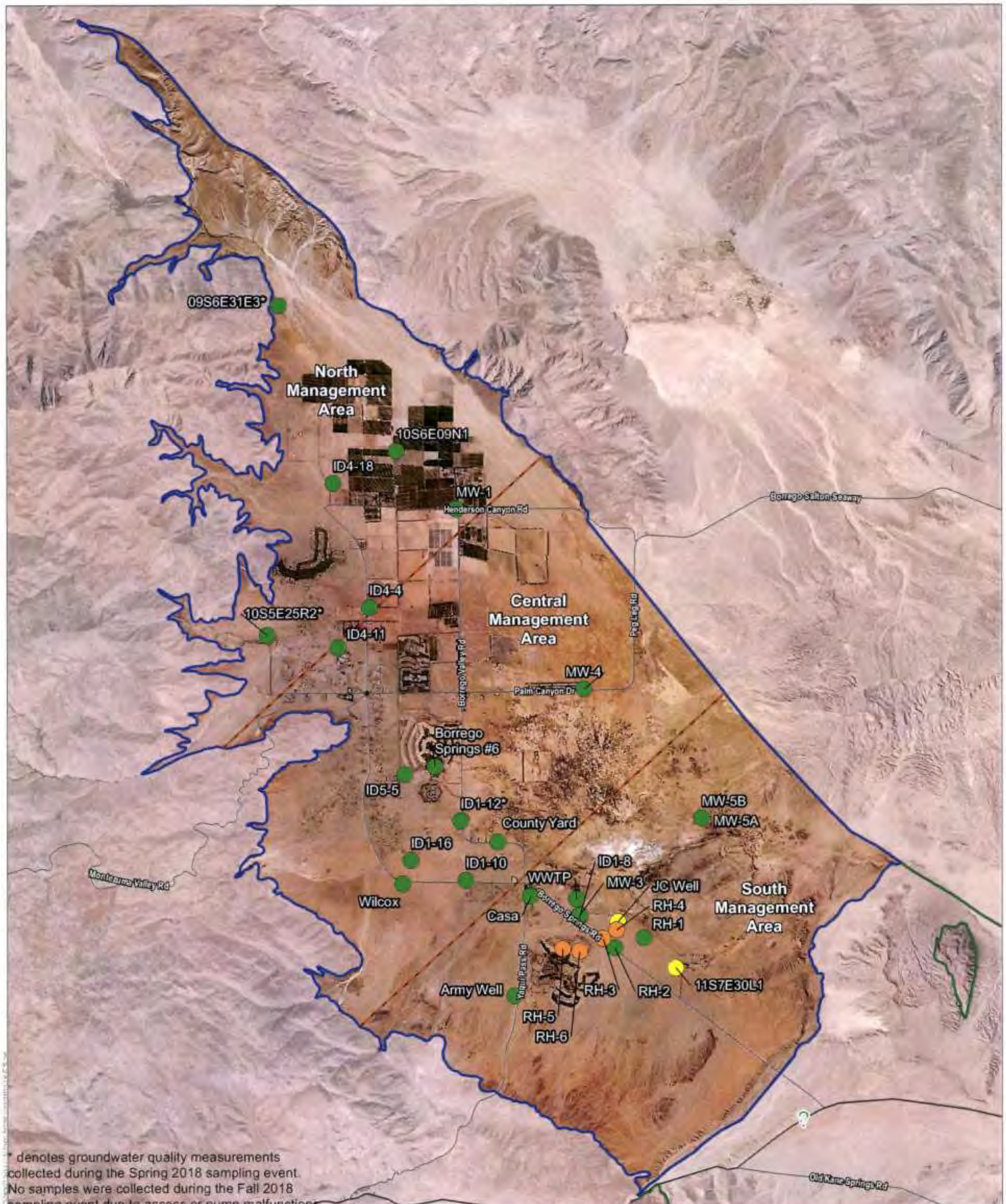
- Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
- Ocotillo Wells Groundwater Subbasin (7-024.02)
- Management Area Divisions

DATUM: NAD 1983 DATA SOURCE: Dudek & Geosyntec 2018

DUDEK January 2020

Figure 2.2-14C
Sulfate Wellhead Concentrations

INTENTIONALLY LEFT BLANK



Arsenic Wellhead Concentration (Fall 2018)

- Less than 1/2 the MCL (5 ug/L)
- Less than the MCL (10 ug/L)
- Greater than the MCL (10 ug/L)

Borrego Valley Groundwater Basin Subbasins

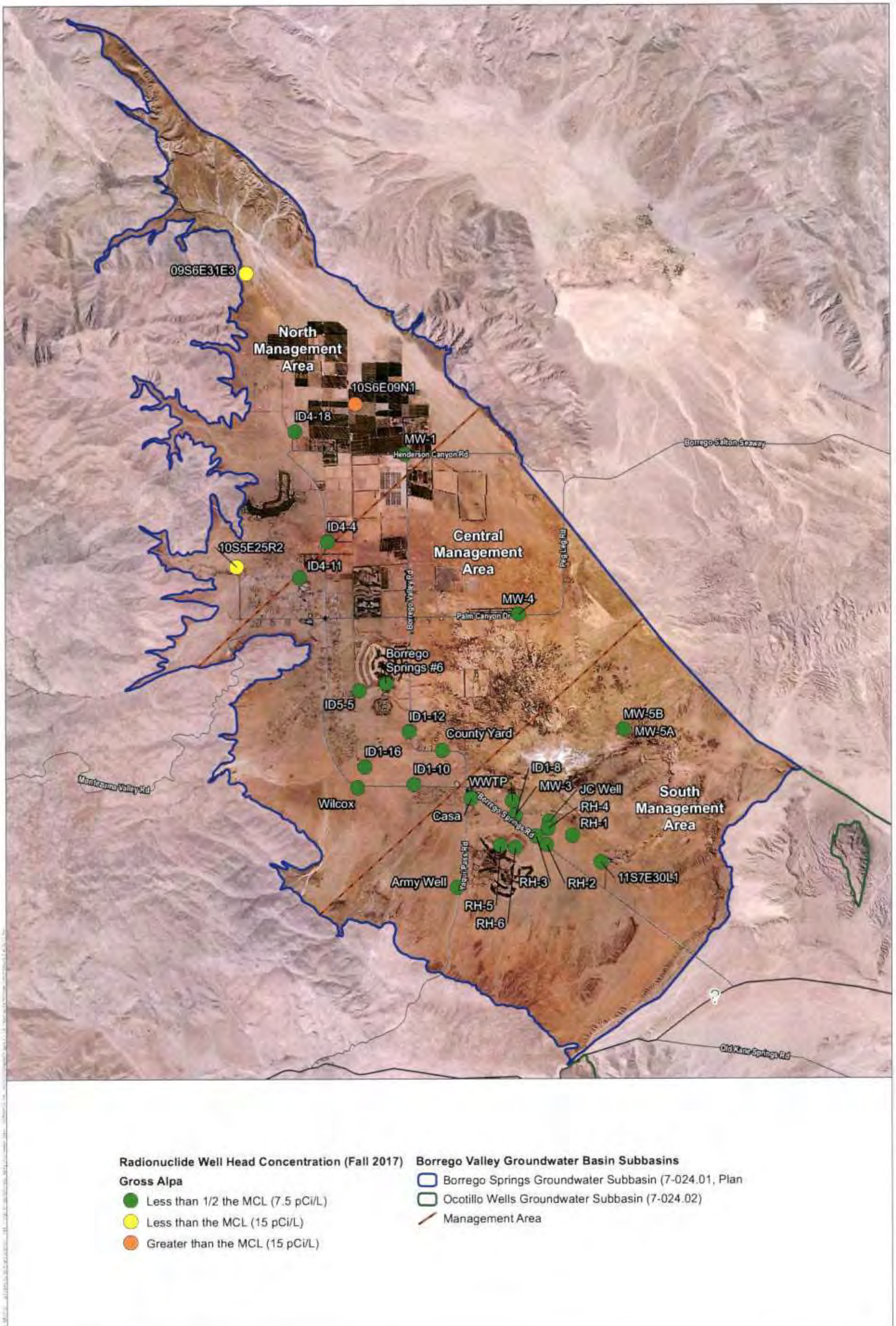
- Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
- Ocotillo Wells Groundwater Subbasin (7-024.02)
- Management Area Divisions

DATUM: NAD 1983 DATA SOURCE: Dudek & Geosyntec 2018

DUDEK January 2020 0 0.75 1.5 Miles

Figure 2.2-14D
Arsenic Wellhead Concentrations

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983 DATA SOURCE: Dudek & Geosyntec 2017

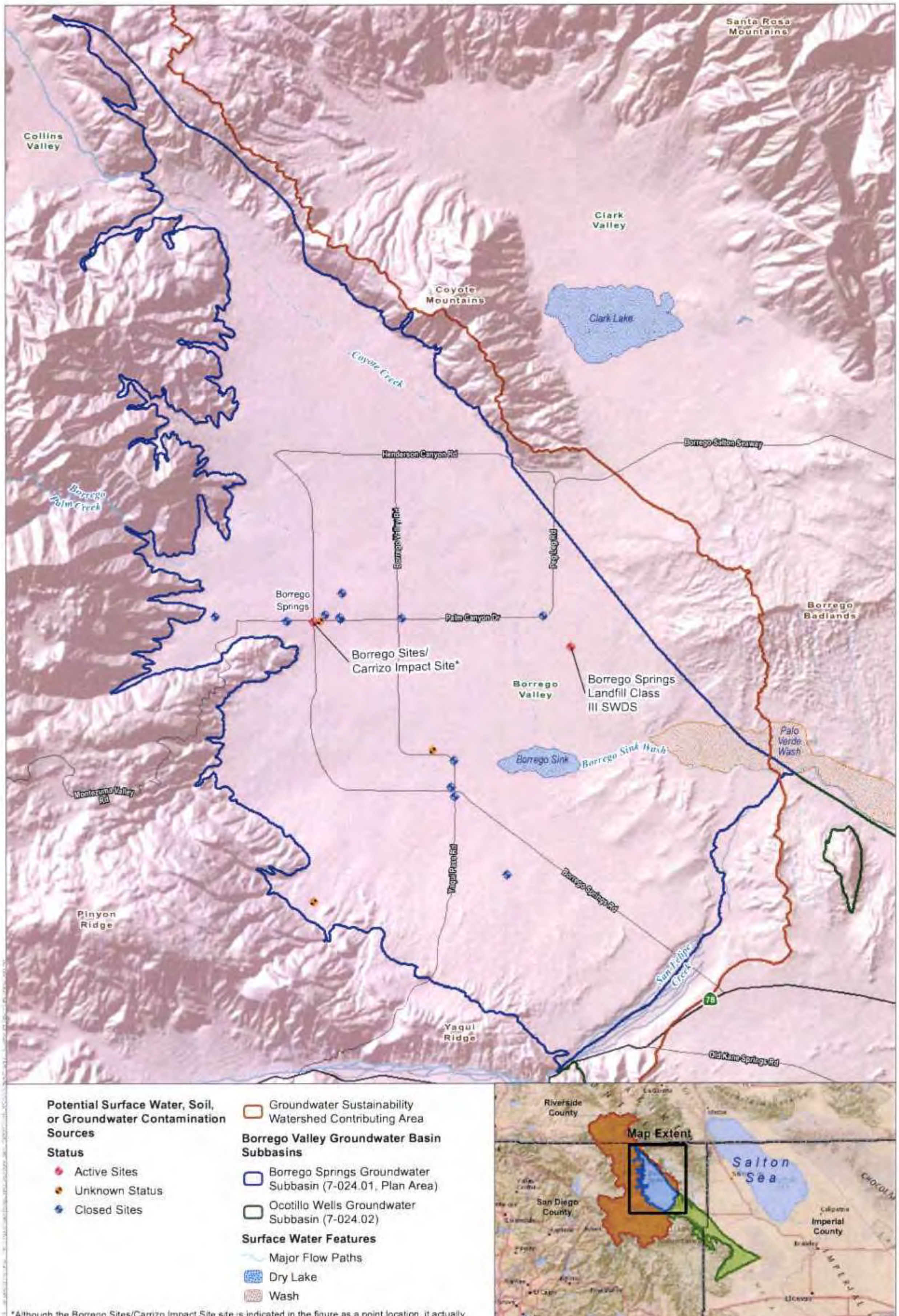
DUDEK January 2020

Figure 2.2-14E

Radionuclide Wellhead Concentrations

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



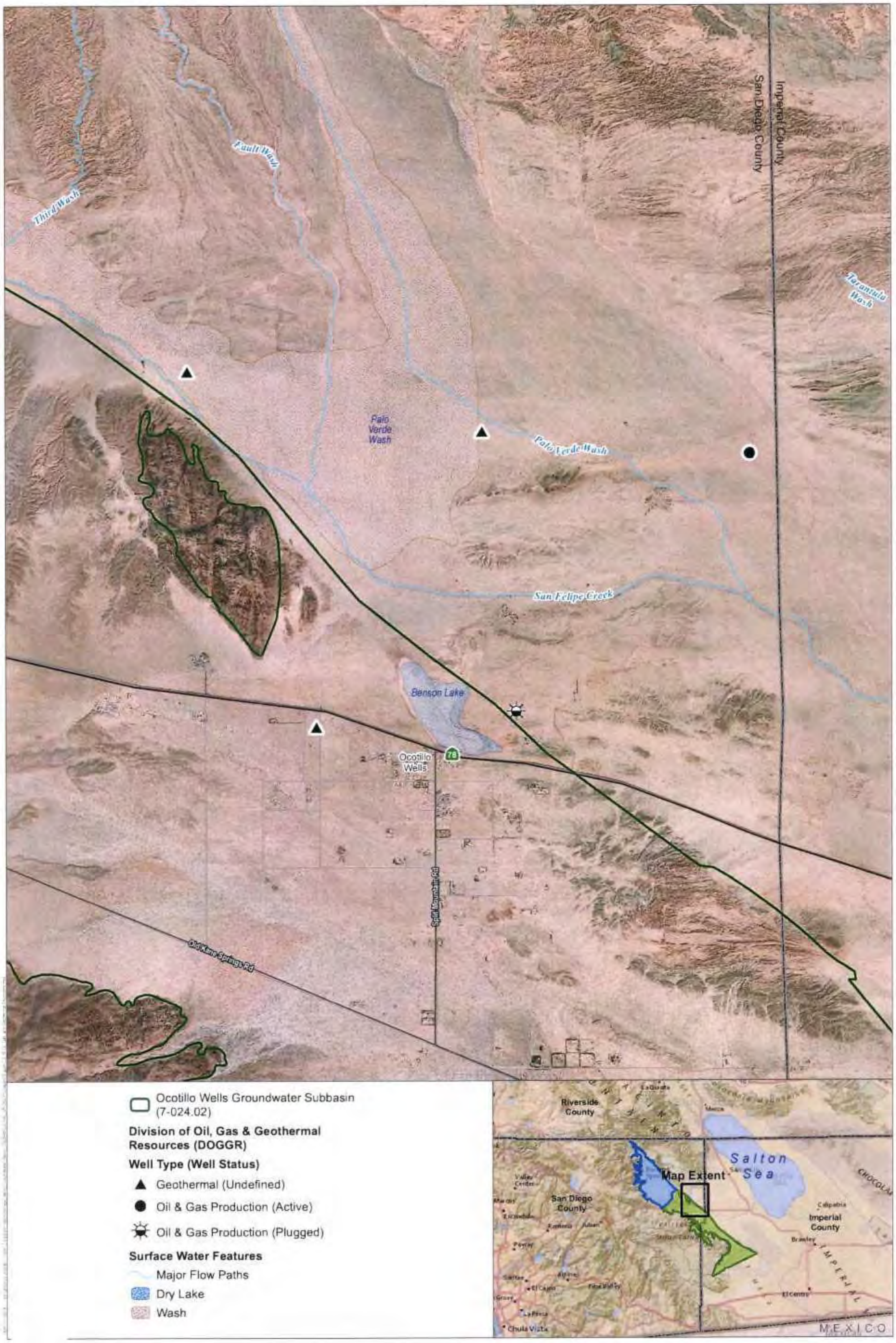
*Although the Borrego Sites/Carrizo Impact Site site is indicated in the figure as a point location, it actually encompasses approximately 400 squaremiles (256,000 acres) of desert terrain and dry lakes, mostly outside of the Plan Area (in the Clark Valley and Ocotillo Wells area).

DATUM: NAD 1983 DATA SOURCE: DWR 2016, GeoTracker 2017

DUDEK January 2020

Figure 2.2-15
Location and Status of State Cleanup Cases
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983. DATA SOURCE: DOGGR 2017

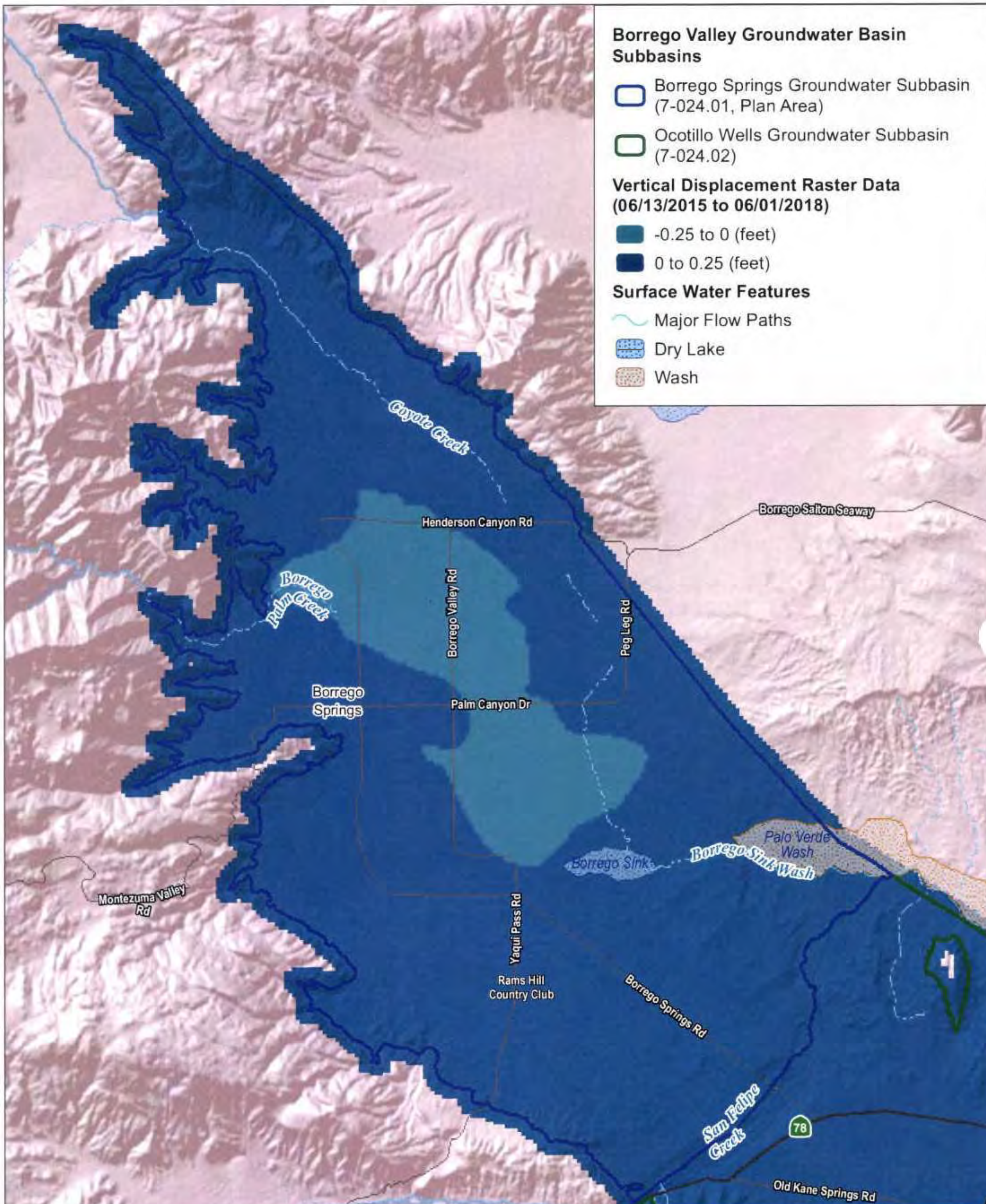
DUDEK January 2020

Figure 2.2-16

Oil, Gas, and Geothermal Resources

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK

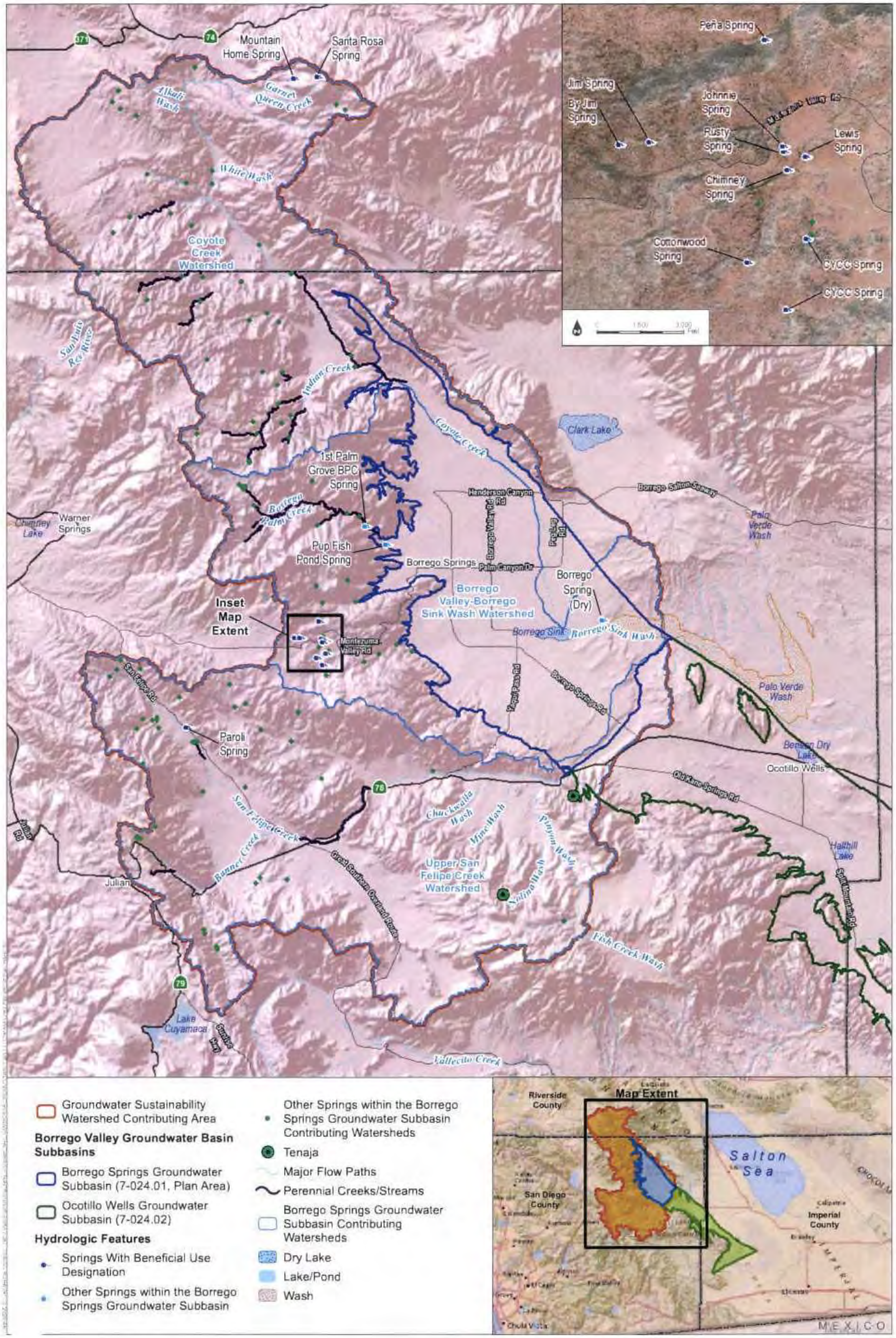


DATUM: NAD 1983. DATA SOURCE: TRE Altamira InSAR Dataset

DUDEK January 2020 0 1 2 Miles

Figure 2.2-17
Land Subsidence

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983 DATA SOURCE: DWR 2015, USGS NHD 2017, State Parks 2017

DUDEK

Figure 2.2-18
Plan Area Surface Water and Hydrologic Features

INTENTIONALLY LEFT BLANK

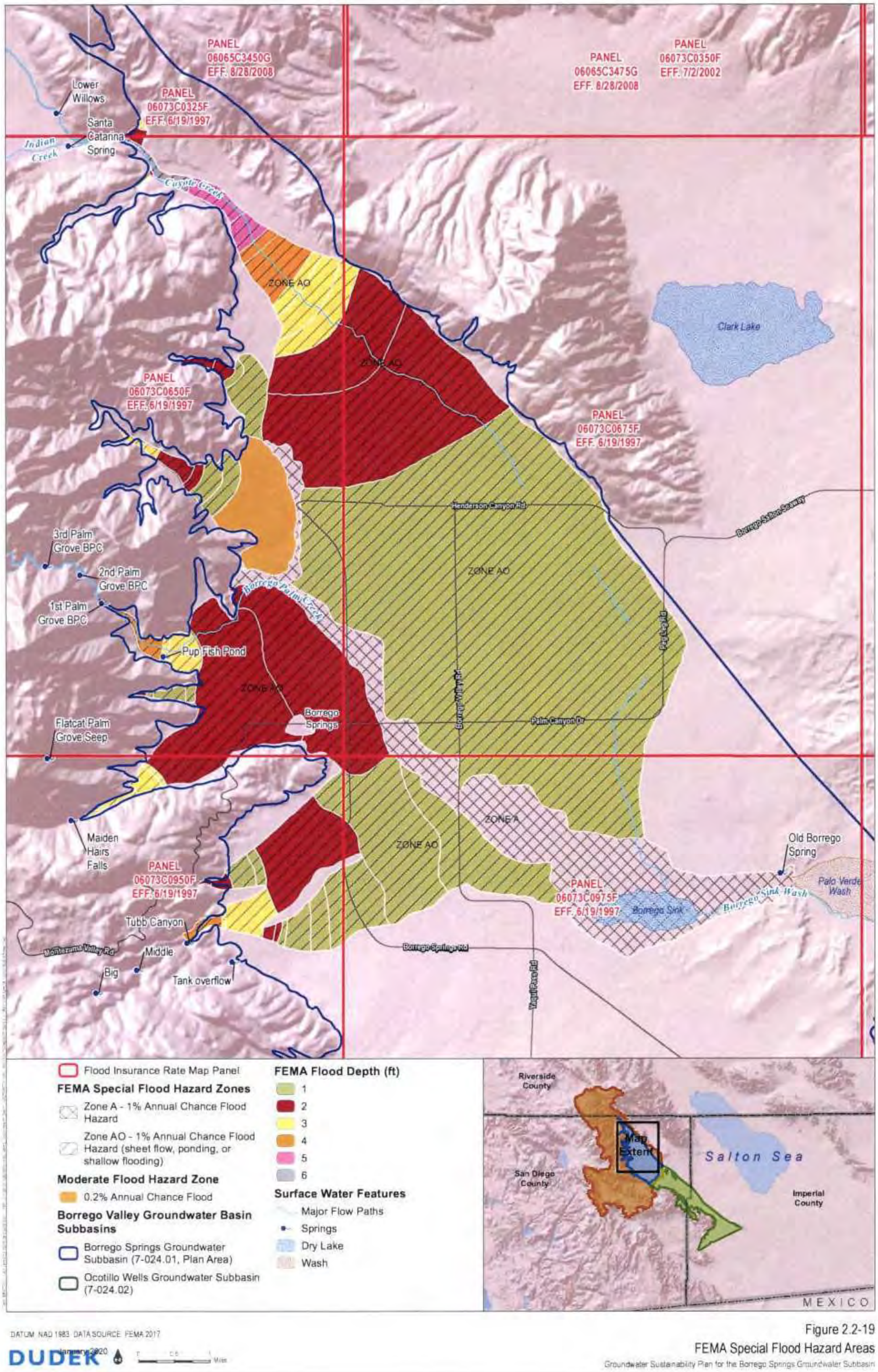
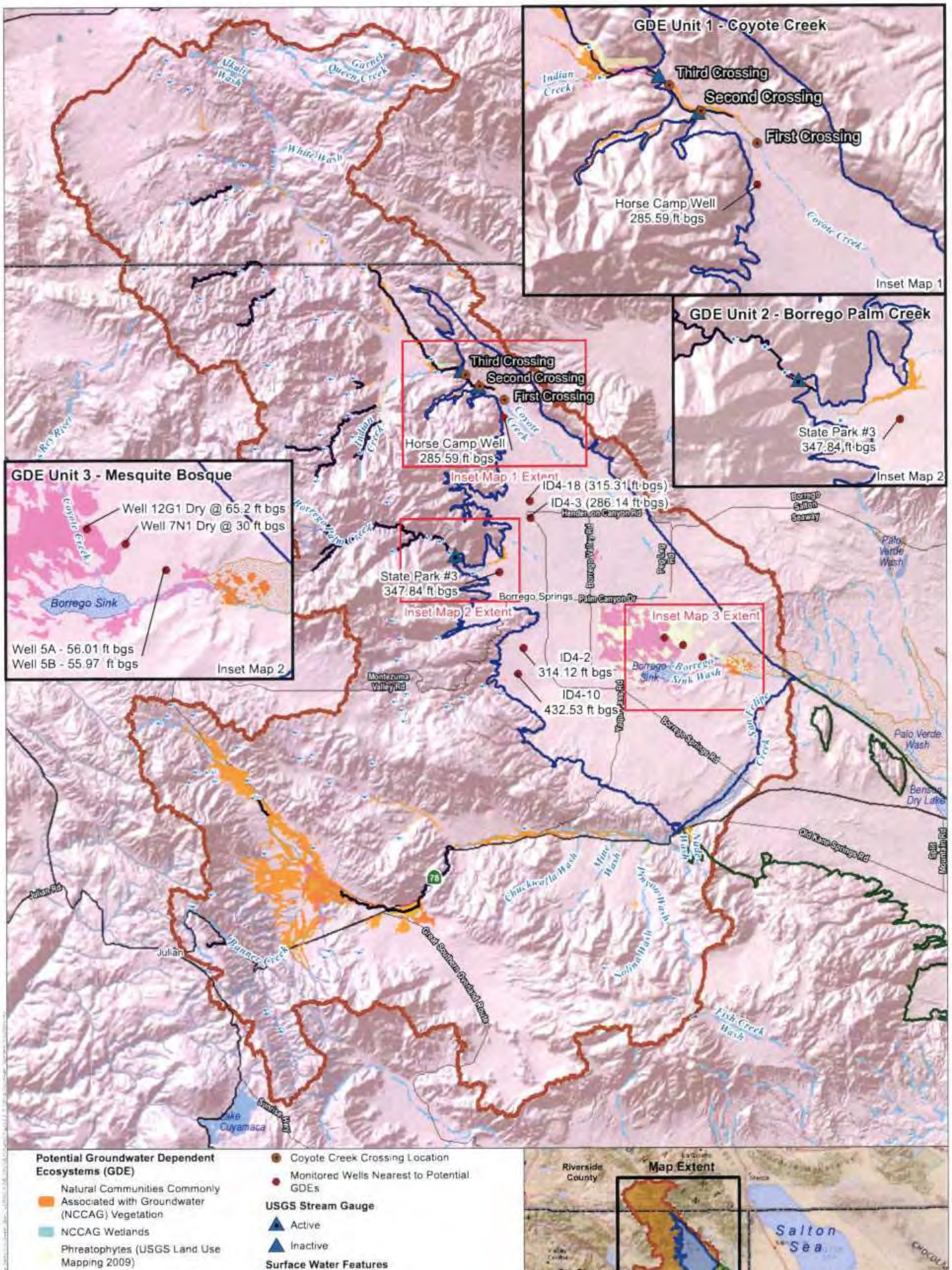


Figure 2.2-19
FEMA Special Flood Hazard Areas
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK

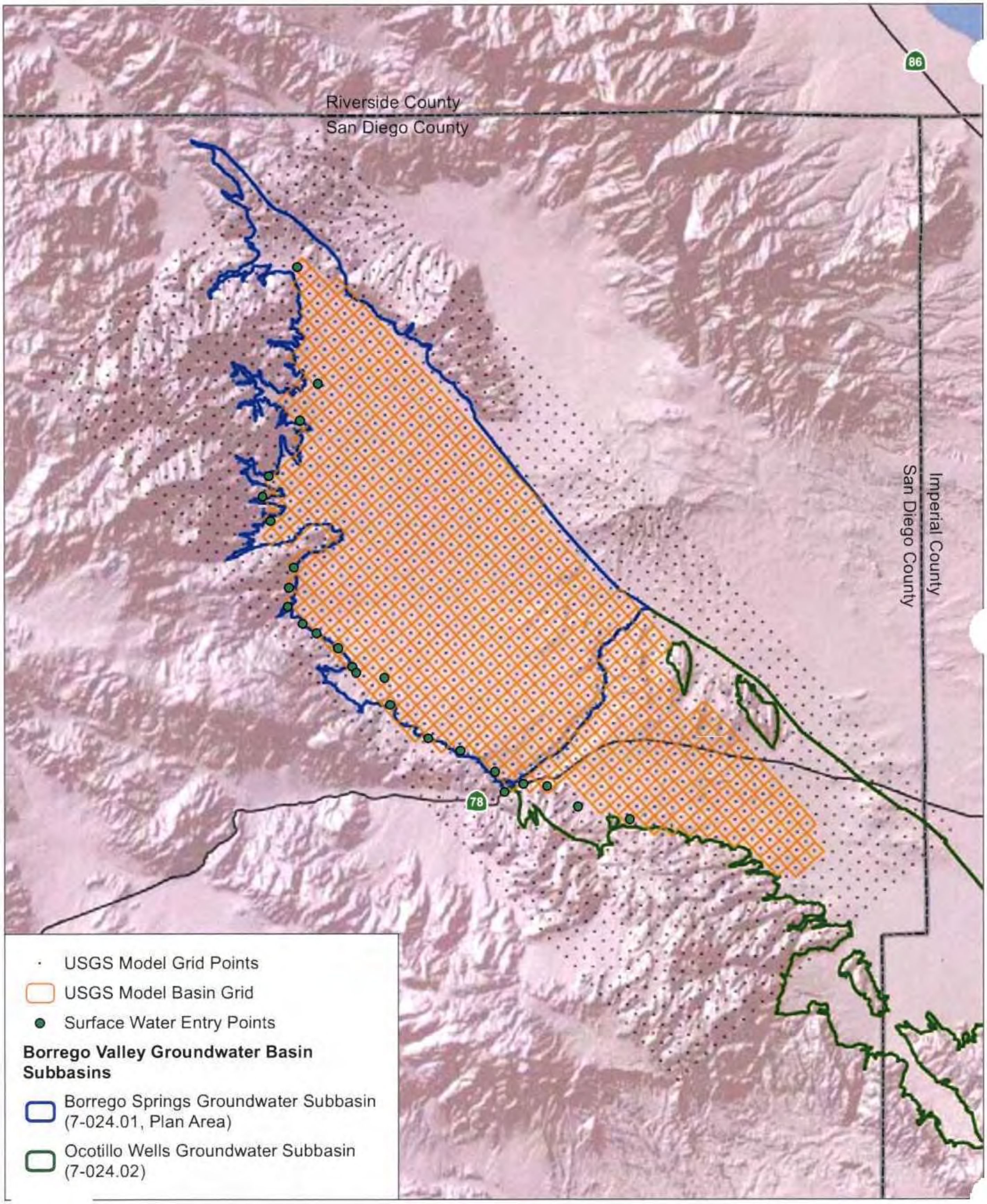


DATUM: NAD 1983 DATA SOURCE: DWR 2018, USGS NHD 2017, State Parks 2017, SanGIS 2017

DUDEK January 2020

Figure 2.2-20
Potential Groundwater Dependent Ecosystems
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

INTENTIONALLY LEFT BLANK

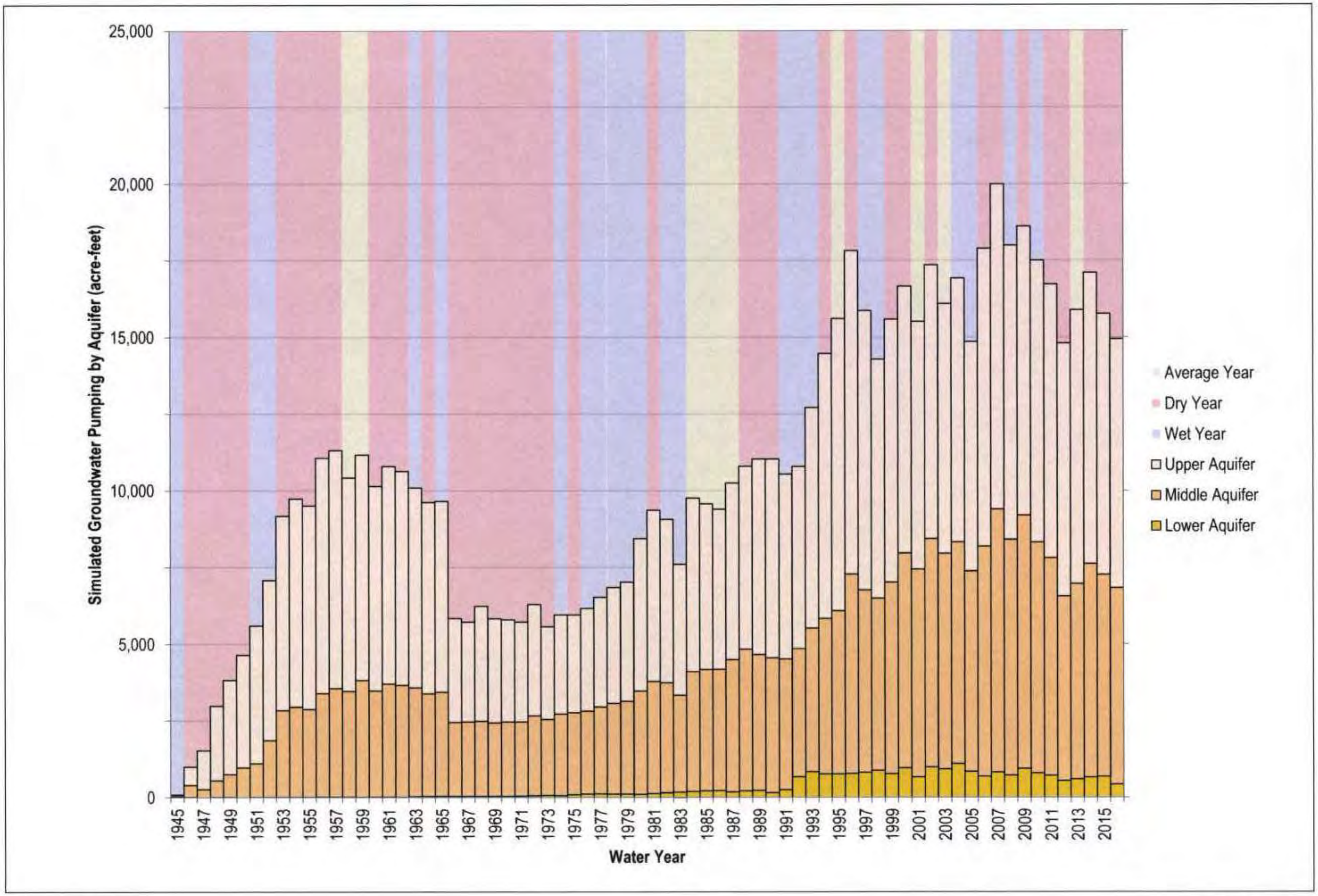


DATUM: NAD 1983 DATA SOURCE: DWR 2015, USGS 2015

DUDEK January 2020 0 1.75 3.5 Miles

Figure 2.2-21
Model Grid

INTENTIONALLY LEFT BLAN

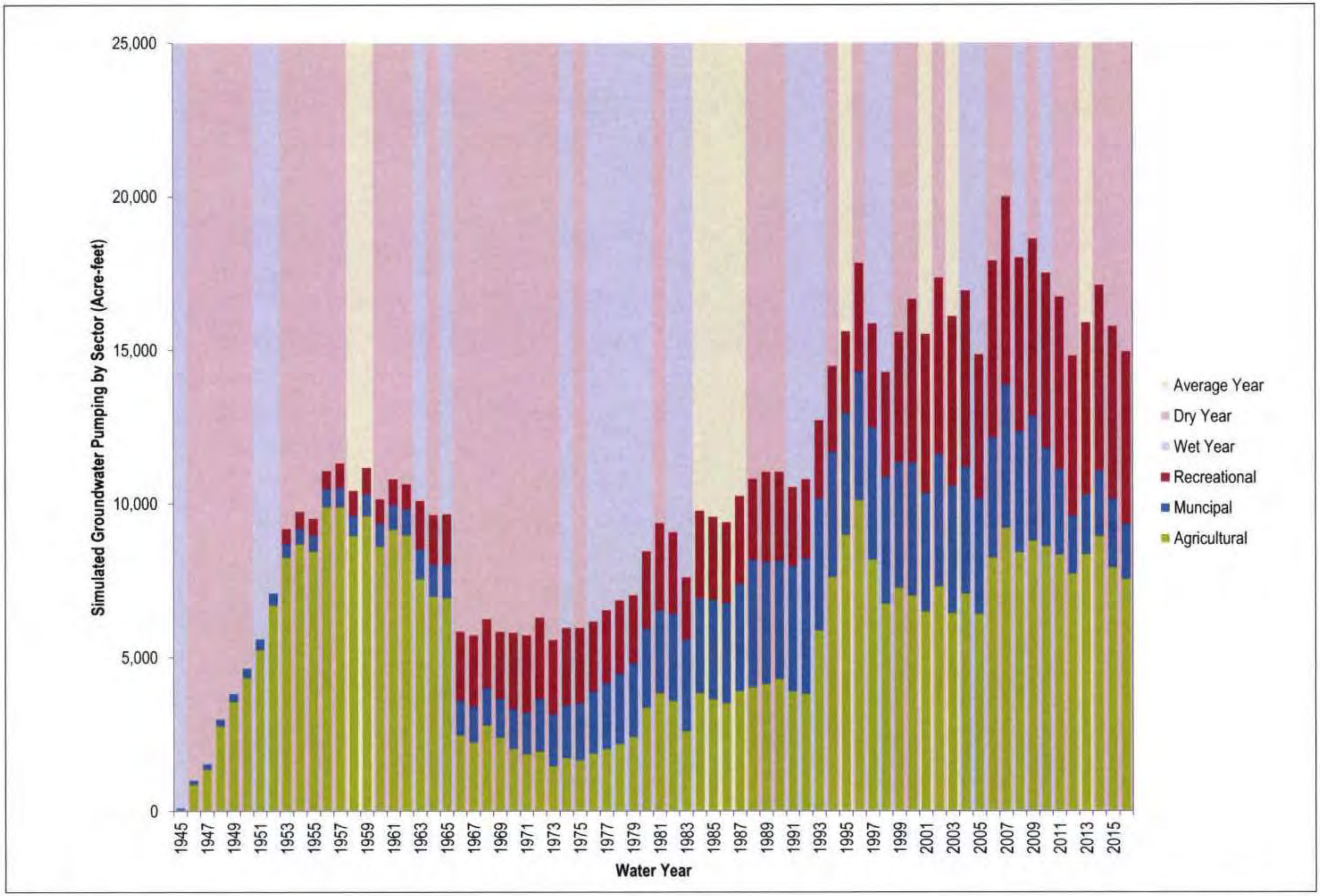


SOURCE: Modified from USGS 2015

FIGURE 2.2-22A

Simulated Groundwater Pumpage by Aquifer (1945-2016)

INTENTIONALLY LEFT BLANK

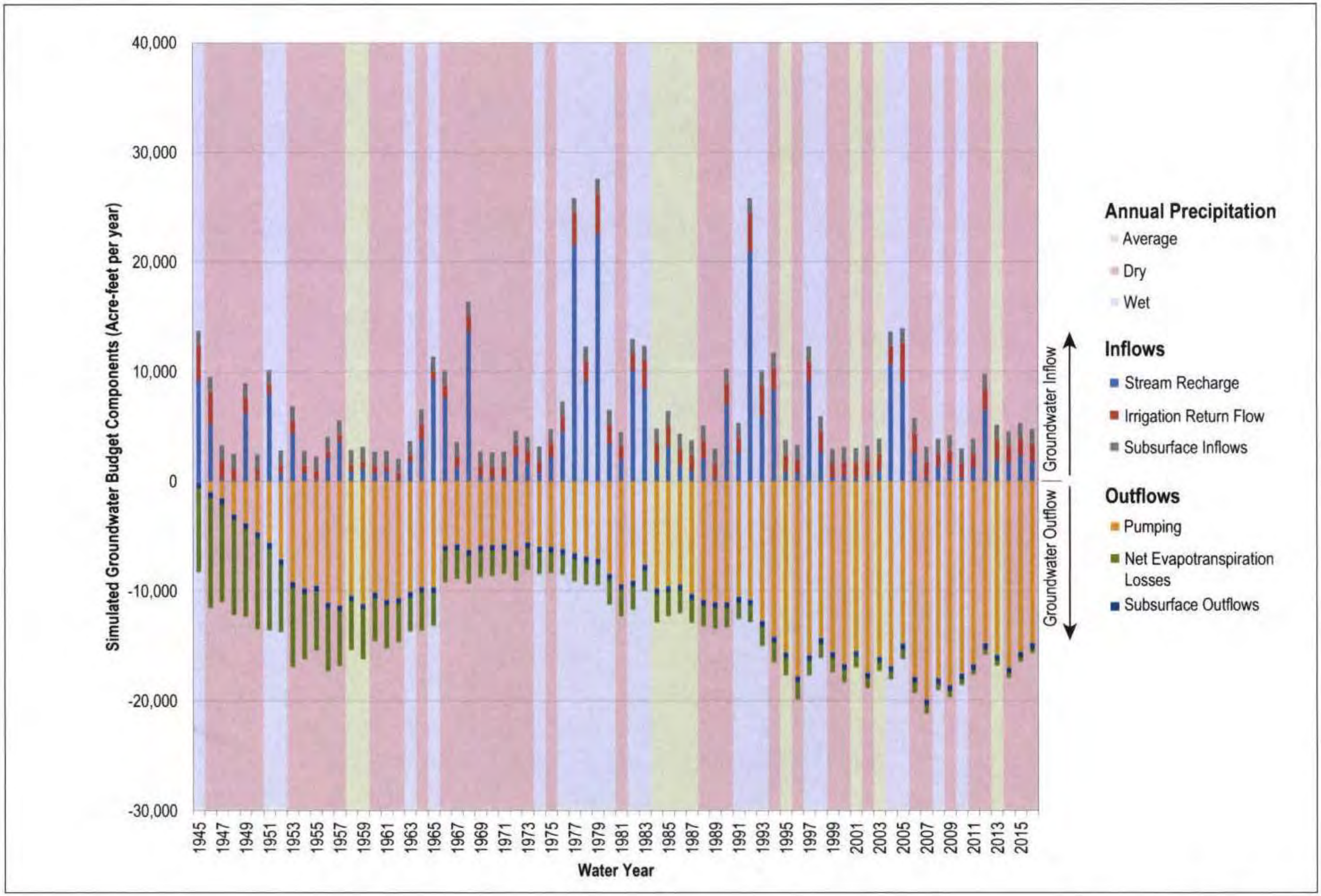


SOURCE: USGS 2015

FIGURE 2.2-22B

Estimated Water Use by Sector (1945 - 2016)

INTENTIONALLY LEFT BLANK

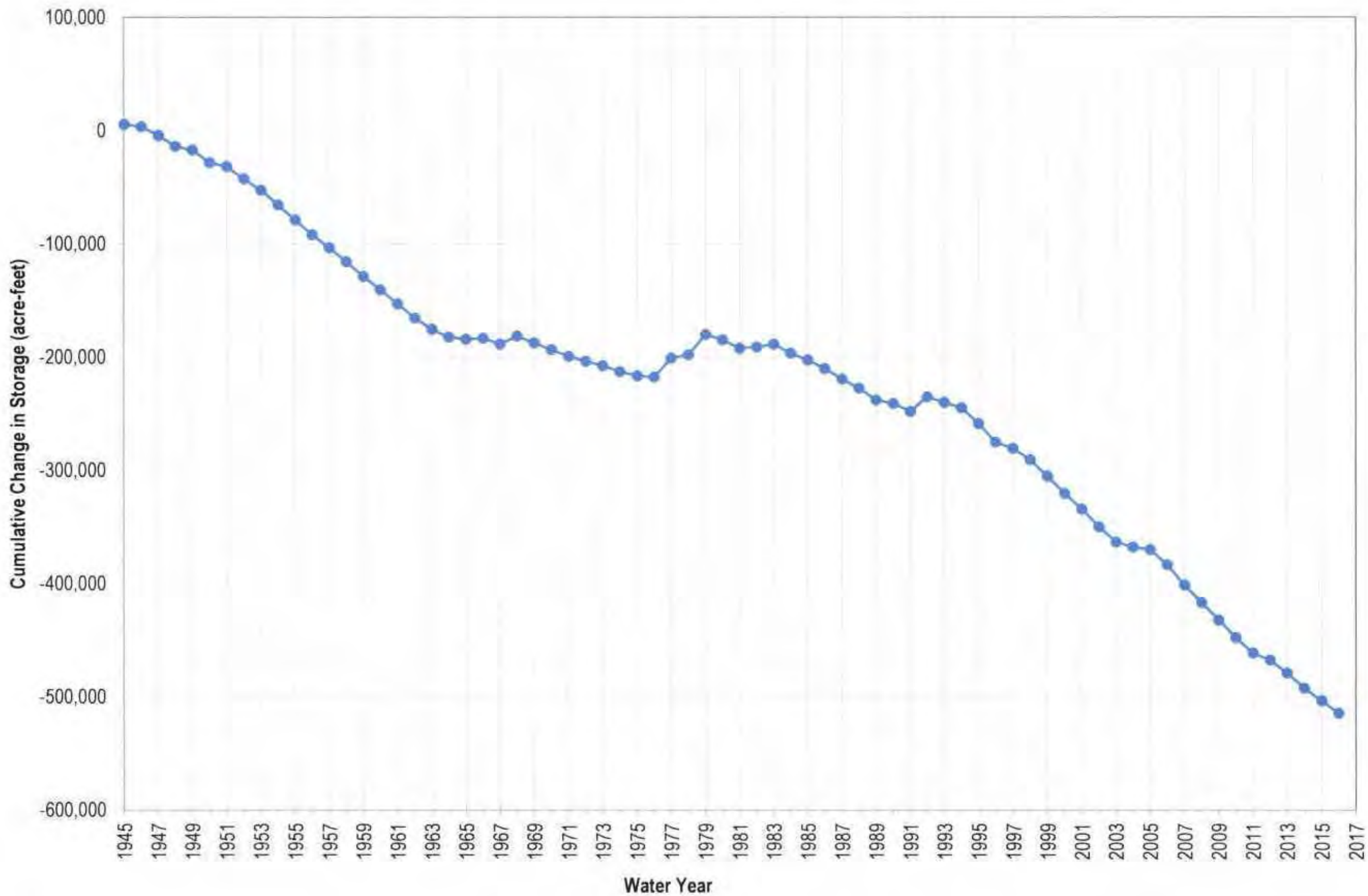


SOURCE: USGS 2015, Dudek 2017

FIGURE 2.2-23A

Groundwater Inflows and Outflows by Year (1945 - 2016)

INTENTIONALLY LEFT BLANK

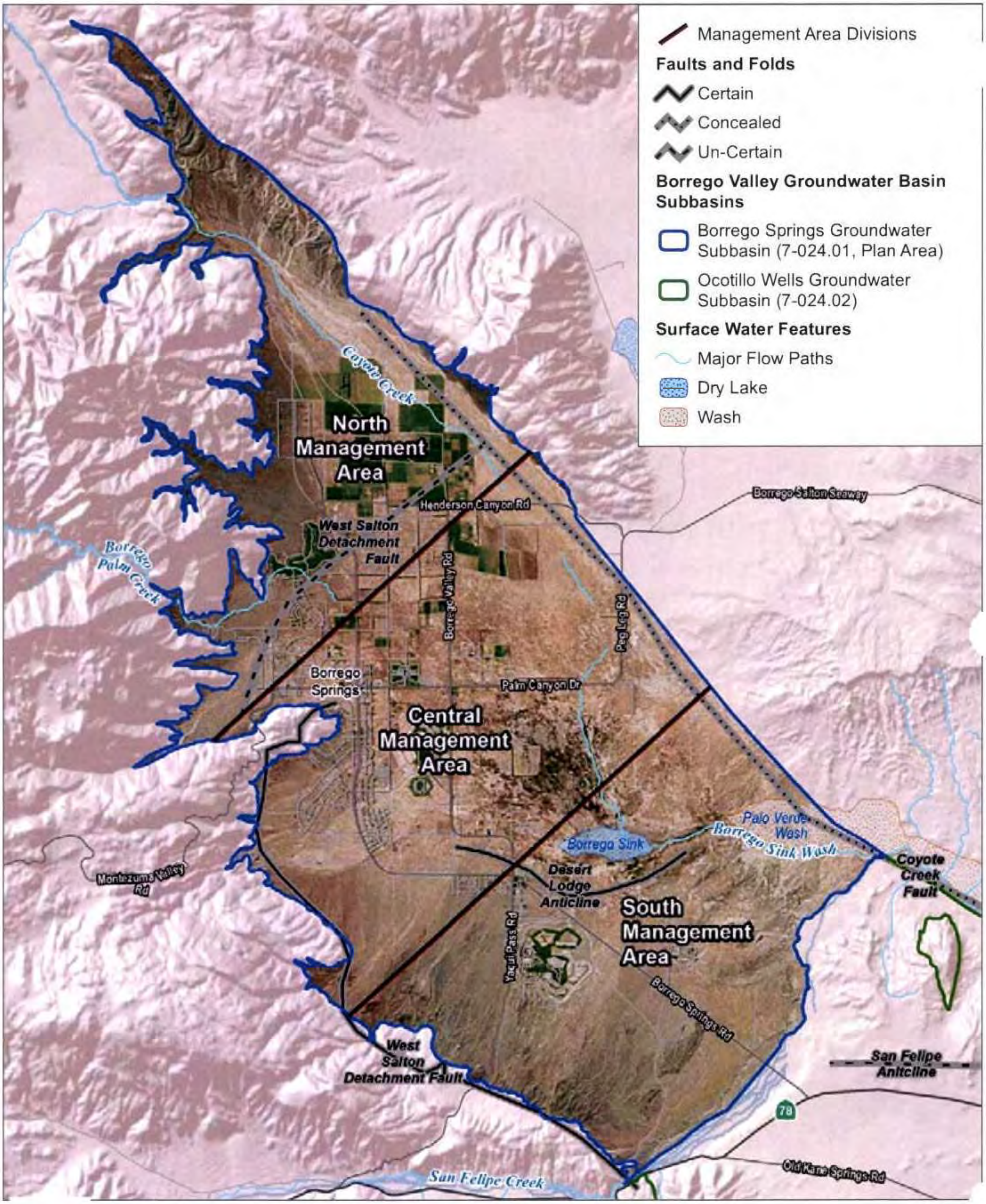


SOURCE: USGS 2015

FIGURE 2.2-23B

Cumulative Change in Storage by Year (1945 - 2016)

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983 DATA SOURCE: USGS; Steely et. al. 2009

DUDEK January 2020 0 1 2 Miles

Figure 2.2-24
Groundwater Management Areas

INTENTIONALLY LEFT BLANK

CHAPTER 3
SUSTAINABLE MANAGEMENT CRITERIA

This chapter of the Groundwater Management Plan (GMP, Plan) provides a discussion of the sustainability goal (Section 3.1), undesirable results (Section 3.2), minimum thresholds (Section 3.3), and the measurable objectives to avoid undesirable results (Section 3.4) applicable to the Borrego Springs Groundwater Subbasin (Subbasin, Plan Area).[1] Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators[2] defined by the Sustainable Groundwater Management Act (SGMA) are caused by groundwater conditions occurring in one of the Subbasin's three management areas, or throughout the Subbasin. This chapter describes the criteria by which the GMP defines undesirable results within the Subbasin, and identifies what constitutes sustainable groundwater management for the Subbasin, including the process by which the GMP establishes minimum thresholds[3] and measurable objectives[4] for each applicable sustainability indicator (Title 23 California Code of Regulations [CCR] Section 354.22). Accordingly, the following Sections 3.2, 3.3, and 3.4 are subdivided to address each groundwater sustainability indicator. Undesirable results can vary for each management area of the Subbasin, and the beneficial uses and users supported by the Subbasin's aquifers. Section 3.5 provides a description of the monitoring network to measure each applicable sustainability indicator.

The Watermaster will periodically evaluate this GMP, assess changing conditions in the Subbasin that may warrant modification of the Plan or management objectives, and may adjust components accordingly. The Watermaster will focus its evaluation on determining whether the actions under the Physical Solution are meeting the Plan's management objectives and whether those objectives are meeting the sustainability goal in the Subbasin.

3.1 SUSTAINABILITY GOAL

3.1.1 Standards for Establishing the Sustainability Goal

A sustainability goal means the existence and implementation of one or more GSP's "that achieve sustainable groundwater management by identifying and causing the implementation of measures

1 A basin is a groundwater basin *or subbasin* [emphasis added] identified and defined in Bulletin 118 or as modified pursuant to a basin boundary modification approved by the Department of Water Resources (CWC Section 10721). In the context of this GSP, the word "basin" means the Borrego Springs Subbasin, unless otherwise specified.

2 A sustainability indicator refers to "any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results" (Title 23 CCR Section 351(ah)).

3 A minimum threshold means "a numeric value for each sustainability indicator used to define undesirable results" (Title 23 CCR Section 351(t)).

4 A measurable objective means "specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin" (Title 23 CCR Section 351(s)).

targeted to ensure the . . . basin is operated within its sustainable yield[5]" (California Water Code [CWC] Section 10721(u))." "Sustainable groundwater management" means the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results" (CWC Section 10721(v)). Undesirable results include chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply, significant and unreasonable reduction of groundwater storage, significant and unreasonable degraded water quality, and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water (CWC Section 10721(x)).

The California Department of Water Resources (DWR) SGMA GSP regulations (Title 23 CCR Section 350, et seq.) provide supplemental information about the sustainability goal. For example, the regulations state: "Each Agency shall establish in its Plan a sustainability goal for the basin that culminates in the absence of undesirable results within 20 years of the applicable statutory deadline. The Plan shall include a description of the sustainability goal, including:

- information from the basin setting used to establish the sustainability goal,
- a discussion of the measures that will be implemented to ensure that the basin will be operated within its sustainable yield, and
- an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation and is likely to be maintained through the planning and implementation horizon" (Title 23 CCR Section 354.24).

3.1.2 Background

The Borrego Springs community overlying the Subbasin relies on local groundwater resources as the sole source of municipal drinking water, domestic supply, and agricultural irrigation. Recreational water use in the Subbasin is entirely supported by groundwater. Groundwater also supports other beneficial uses, as described in Chapter 2, Plan Area and Basin Setting, of this GMP, including those set forth in the *Water Quality Control Plan for the Colorado River Basin* (Basin Plan). The current rate of groundwater production from the Subbasin is not sustainable and, if not moderated, threatens to impact the beneficial uses and users of groundwater in the Plan Area. Impacts to beneficial uses and users may include decreased well production rate, increased pumping costs, dry wells, and/or increasingly poor water quality. Without action, groundwater could become much more challenging and expensive to access and potentially

[5] "Sustainable yield" means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result [CWC Section 10721(w)].

insufficient in quantity and quality to support beneficial uses. The community of Borrego Springs is a small and severely disadvantaged community (DWR 2018a).[6] The continued overdraft of the basin at its present rate of pumping could cause severe economic hardship for the community.

Annual natural recharge to the Subbasin is small compared to the volume of groundwater available in storage. Since inception of large-scale pumping in the Subbasin in the 1940s, an imbalance of groundwater extraction exceeding recharge has occurred. In other words, annual groundwater extraction from the Subbasin has exceeded recharge over multiple decades resulting in a depletion or "mining" of the groundwater resource. According to the results of the Borrego Valley Hydrologic Model (BVHM) described in Section 2.2.3, Water Budget, the cumulative volume of storage lost from the Subbasin between 1945 and 2016 is approximately 520,000 acre-feet (AF), which is a sum of the annual differences between Subbasin inflows and outflows. The storage capacity of the Borrego Valley Groundwater Basin (which includes the Ocotillo Wells Subbasin), based on stable groundwater levels before groundwater development began, is estimated to have been about 5,500,000 AF (USGS 1982). Based upon subsequent study by Dr. David Huntley, the majority of readily available water to existing well users in the Borrego Valley exists in the upper and middle aquifers. The amount of groundwater within these two aquifers within the Subbasin was estimated to be approximately 2,131,000 AF in 1945 and 1,900,500 AF in 1979 (Huntley 1993). The remaining water located within the lower aquifer is more difficult and costly to extract due to its low specific yield (estimated to be approximately 3%), its depth, and low specific capacity (estimated to be 5 gallons per minute/foot of drawdown or less) (County of San Diego 2010). Furthermore, as groundwater levels continue to drop in the Subbasin, an increasing percentage of water will be pumped from the lower aquifer, which has a lower yield, but is also likely to yield lower quality water (elevated total dissolved solids (TDS), sulfates, and arsenic), as discussed in Section 2.2.2.4. The BVHM estimates that total storage loss from water year 1980 through water year 2016 is 334,293 AF. Therefore, as of 2016, the volume of groundwater in storage within the upper and middle aquifers of the Subbasin is approximately 1,566,207 AF.

Outright depletion (dewatering) of a groundwater resource is a serious condition for a community that is totally reliant on groundwater supply. Depletion also means that the groundwater resource has been effectively permanently removed, from storage without the ability to recover under current climate conditions and pumping volumes. In order to begin to bring the Subbasin back into balance, it is estimated that approximately 75% of the maximum baseline pumping in the Subbasin, on average, will

[6] Severely disadvantaged communities are those census geographies with an annual median household income that is less than 60 percent of the Statewide annual median household income. The statewide median household income for 2012–2016 (the current dataset) is $63,783; therefore, the calculated severely disadvantaged community threshold is $38,270.

need to be reduced over the GMP implementation period and through the planning an implementation horizon.

3.1.3 Sustainability Goal

The Physical Solution's sustainability goal is to ensure that by 2040, and thereafter within the planning and implementation horizon of this GMP (50 years), the Subbasin is operated within its sustainable yield and does not exhibit undesirable results.

Meeting this goal requires achieving a balance of water demand with available water supply, while protecting water quality, by the end of the GMP implementation timeframe, carrying through the SGMA planning and implementation horizon. A good analogy is a prudent financial routine of "balancing the books" whereby the totals of debit (groundwater withdrawal) and credits (recharge) are brought into agreement to determine the profit or loss (change in groundwater storage) made during a period of time (annually or over a longer period of time such as a hydrologic cycle). Central to achieving this goal is a strong understanding of the local setting of the Subbasin described in Chapter 2. The Subbasin is totally groundwater dependent with no immediately viable alternative sources of water supply such as imported water, recycled water or groundwater from adjacent basins/subbasins (USBR 2015; Dudek 2018; BWD 2000, 2002).

Conditions within the Subbasin will be considered sustainable when the following sustainability goals are met:

- Long-term, aggregate groundwater use is less than or equal to the Subbasin's estimated sustainable yield, as defined by SGMA (Section 2.2.3.6, Sustainable Yield Estimate);
- The rate of groundwater level change within the Subbasin, averaged across indicator wells in the previous reporting period, is generally stable or increasing when compared to the contemporary groundwater level trend (i.e., 10-year trend 2010–2020 or trend based on available data) (Section 2.2.2.1, Groundwater Elevation Data);
- Groundwater levels are maintained at elevations necessary to avoid undesirable results. Lowering of groundwater levels potentially leading to significant and unreasonable depletions of available water supply for beneficial use could occur if groundwater levels fall below the top of screened intervals for key municipal water wells, or result in the loss of water availability for domestic well users (Section 2.2.2.1, Groundwater Elevation Data);
- Groundwater quality, as measured in municipal and domestic water wells, generally exhibits a stable and/or improving trend for identified contaminants of concern: arsenic, nitrate, sulfate, and TDS (Section 2.2.2.4, Groundwater Quality); and

- Groundwater quality is suitable for existing and future beneficial uses (Section 2.2.2.4, Groundwater Quality).

3.1.4 Sustainability Strategy

To ensure the Subbasin meets its sustainability goal by 2040, the Physical Solution includes several projects and management actions (PMAs) detailed in Chapter 4, Projects and Management Actions, to address undesirable results. The PMAs expected to be implemented are: (1) Water Trading Program, (2) Water Conservation Program, (3) Pumping Reduction Program, (4) Voluntary Fallowing of Agricultural Land, (5) Water Quality Optimization, and (6) Intra-Subbasin Water Transfers. The overarching sustainability goal as well as the absence of undesirable results are expected to be achieved by 2040 through implementation of the PMAs. The sustainability goals will be maintained through proactive monitoring and management by the Watermaster as described in this and the following chapters.

Table 3-1 summarizes whether each of the six undesirable results has occurred, is occurring, or is expected to occur in the future in the Subbasin without GMP implementation, and shows the PMAs that have been developed to address each of the undesirable results presently occurring. The community of Borrego Springs has been acutely aware of its water problems for over 25 years, and the major drought period from 2012 through 2016 led to further heightened public awareness. Because supply augmentation through local and/or imported surface water is not a feasible option for the Subbasin at this time, the only tool available to the Watermaster to achieve groundwater sustainability is through demand reduction. The Borrego Water District (BWD) already implements a water conservation (shortage) policy, some golf courses have already implemented technologies and landscape practices that save water, and agricultural users have implemented increasingly efficient irrigation systems over the years. It is important to continue to implement and strengthen water conservation practices, as proposed in the water conservation PMA, because opportunity remains for further water savings, particularly with regard to the outdoor water use of BWD customers.

Considering the water conservation already achieved, and the diminishing returns in the volume of water that can be saved through conservation alone, the most critical PMAs to realize the pumping/water use reductions needed to achieve the Physical Solution's sustainability goal are the voluntary fallowing of agricultural land, and the pumping reduction program. The pumping reduction program caps water use at the beginning of the implementation period (a total pumping allowance of 22,600 acre-feet per year (AFY)) and gradually reduces the cap to a level that matches the sustainable yield of the Subbasin (initially 5,700 AFY) by 2040. Because agriculture accounts for approximately 70% of groundwater used in the Subbasin, such a drastic reduction cannot be achieved without continuing the permanent fallowing of agricultural land or conversion to substantially lower water demand uses on agricultural land. The Water Trading

Program is a PMA expected to replace the existing water credit program that assigned a water allocation for fallowing of primarily agricultural land based on crop or turf type and allowed for water credits to be transferred to new development to offset water demand. The water trading PMA ties into the pumping reduction program and voluntary fallowing of agricultural land by preserving the economic value of water as its availability is capped and reduced over time, and by providing for flexibility in the types of economic development or redevelopment that can occur, where consistent with water availability, general plan and zoning designations, and land use regulations.

Table 3-1
Summary of Undesirable Results Applicable to the Plan Area

Sustainability Indicator	Historical (Pre-2015)	Existing Conditions	Future Conditions Without GMP Implementation	PMAs Implemented to Meet the GMP's Sustainability Goal
Chronic Lowering of Groundwater Levels	Significant and Unreasonable	Significant and Unreasonable	Significant and Unreasonable	Water Trading Program, Water Conservation, Pumping Reduction Program, Voluntary Fallowing of Agricultural Land, Intra-Subbasin Water Transfers
Reduction of Groundwater Storage	Significant and Unreasonable	Significant and Unreasonable	Significant and Unreasonable	
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Degraded Water Quality	Not Significant	Not Significant	Significant and Unreasonable	Pumping Reduction Program, Voluntary Fallowing of Agricultural Land, Water Quality Optimization, Intra-Subbasin Water Transfers
Land Subsidence	Not Significant	Not Significant	Not Significant	Not Applicable
Interconnected Surface Water	Significant and Unreasonable	Not Applicable*	Not Applicable*	Not Applicable

Notes: GMP = Groundwater Management Plan; PMA = Projects and Management Action
* See following Sections 3.2.6 and 3.2.7

3.2 UNDESIRABLE RESULTS

Standards for the Description of Undesirable Results

According to GSP Regulations, the GSP's description of undesirable results is to include the following:

1. The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.
2. The criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be

based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

3. Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results (Title 23 CCR Section 354.26(b)).

Under SGMA, undesirable results occur when the effects caused by groundwater conditions occurring throughout the basin cause significant and unreasonable impacts to any of the six sustainability indicators. That is, the "significant and unreasonable occurrence of any of the six sustainability indicators constitutes an undesirable result" (DWR, Draft Sustainable Management Criteria, Best Management Practice, Section 4, p. 5). These sustainability indicators are:

- Chronic lowering of groundwater levels
- Reduction of groundwater storage
- Seawater intrusion
- Degraded water quality
- Land subsidence
- Depletions of interconnected surface water

Application of Standards in the Borrego Subbasin

Each of the sustainability indicators for the Subbasin is discussed as follows, in the context of undesirable results.

3.2.1 Chronic Lowering of Groundwater Levels – Undesirable Results

Chronic lowering of groundwater levels in the Subbasin's aquifers has historically occurred and is ongoing due to groundwater production for agricultural, municipal, recreational and domestic use that exceeds the long-term sustainable yield of the Subbasin and the absence of any viable alternative source of water supply. The existing beneficial uses and users of Subbasin water are described in Section 2.1.4, Beneficial Uses and Users. The beneficial uses for groundwater for the Anza Borrego Hydrologic Unit are defined in the Basin Plan as Municipal and Domestic Supply (MUN), Industrial Service Supply (IND), and Agriculture Supply (AGR) as described in Section 2.1.2,Water Resources Monitoring and Management Programs. SGMA requires that all beneficial uses and users of groundwater, including groundwater dependent ecosystems (GDEs), be considered in GSPs (CWC Section 10723.2). The honey mesquite in the vicinity of the Borrego

Sink is the primary GDE identified within the Plan Area that has historically been affected by pumping as described in Section 2.2.2.7, Identification of Groundwater Dependent Ecosystems.

Undesirable results associated with chronic (i.e., persistent and long-term) lowering of groundwater levels are most directly indicated by loss of access to adequate water resources for support of current and/or potential future beneficial uses and users. As discussed in Section 2.2.2.1, Groundwater Elevation Data, the rate of groundwater level decline within the Subbasin is variable across the Plan Area, generally decreasing in magnitude from north to south. The North Management Area (NMA) exhibits the steepest groundwater level declines since 1945 (average rate of 1.95 feet per year) due to pumping for primarily agricultural uses; the Central Management Area (CMA) exhibits substantial but somewhat less severe declines (average rate of 1.33 feet per year) due to pumping for primarily municipal, domestic and recreational uses; and the South Management Area (SMA) has up until 2014 exhibited minimal if any decline, though the resumption of groundwater pumping to support recreation at Rams Hill Golf Club resulted in a localized decline in groundwater levels, as shown by MW-3 in Figure 2.2-13F. Domestic users of groundwater, including customers of the BWD, are predominantly supplied groundwater produced from wells located within CMA, and to a lesser degree the SMA and NMA. Failure to address and reverse the current rate of groundwater level decline could put domestic, agricultural, recreational and water supply availability for other beneficial uses at risk.

Groundwater level declines indicating a significant and unreasonable depletion of supply, if continued over the SGMA planning and implementation horizon, can occur in several ways in the Subbasin. Depletions leading to a complete dewatering of the Subbasin's upper aquifer in the CMA would be considered significant and unreasonable because beneficial users rely on this aquifer for water supply. Groundwater level declines would be significant and unreasonable if they are sufficient in magnitude to lower the rate of production of pre-existing groundwater extraction wells below that needed to meet the minimum required to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. To the extent lowering groundwater levels impact *de minimis*[7] pumpers, significant and unreasonable impacts to those pumpers could be avoided. For example, alternative means of obtaining water for *de minimis* and domestic pumpers who can no longer pump may include connection to the municipal water system (i.e., BWD), groundwater well maintenance or rehabilitation (e.g., well pump lowering), or for some beneficial users, well redevelopment or deepening. However, use of these alternative means of supply, by themselves, do not necessarily offset undesirable results for lowering groundwater levels in the context of the Subbasin as a whole (as opposed to individual uses or users),

[7] SGMA defines a de minimis extractor as "a person who extracts, for domestic purposes, two acre-feet or less (of groundwater) per year."

because the ultimate source of supply remains groundwater pumped from the Subbasin, even if from another location.

Undertaking an evaluation for one particular use or user depends on the overlying beneficial use(s), the location within the Subbasin, and the characteristics of the well(s) currently in use. Should a groundwater level decline cause the production rate of pre-existing groundwater wells to be insufficient for the applicable beneficial use, an undesirable result may be avoided for that particular user through the alternative means shown in Table 3-2. Table 3-2 acknowledges that certain beneficial users have greater flexibility and financial capacity to address lowering groundwater levels than others. For example, the BWD, as the municipal water system, has the ability to manage production from multiple extraction wells across its service area, normally distributes the cost for well maintenance and development to its pool of customers, and can obtain grants for such work, if available. In contrast, domestic and *de minimis* users can have geographic and financial constraints that may make well redevelopment and/or new well construction infeasible. Given the considerations previously outlined, domestic well users who are not in close proximity to existing BWD water service lines have the greatest sensitivity to and are consequently the most likely to experience the adverse effects of continued declining groundwater levels.

Table 3-2
Means of Addressing Decreasing Well Production by Use

	Municipal Uses	Agricultural Uses	Recreational Uses	Domestic/*De Minimis* Uses
Connection to Municipal Water System	N/A		✓	*
Well Maintenance (e.g., brushing and bailing, pump lowering, repair or replacement)	✓	✓	✓	✓
Well Redevelopment/Deepening	✓	✓	✓	*
Well Abandonment/New Well Development	✓	✓	✓	*

Notes: N/A = not applicable.
* Domestic and *de minimis* users may have geographic, financial, and technical constraints that limit the ability to modify or deepen wells Furthermore, based on Borrego Water District's (BWD's) water supply pipeline distribution system, some – but not all – domestic and *de minimis* users can be hooked into the BWD system.

The upper aquifer currently hosts the most accessible (i.e., shallowest) and highest-yielding wells within the Subbasin as a whole. Figure 3.2-1 shows the extent of the upper aquifer, and a representation of the percentage of the aquifer that remains saturated, based on the update of the BVHM discussed in Section 2.2.3, Water Budget. Also shown is the saturated thickness, in feet of the aquifer. The upper aquifer does not occur in the southern fringe of the CMA, nor in the southwestern portion of the SMA; in these areas, the middle or lower aquifers begin near the ground surface. The water table has dropped below the base of this aquifer in some parts of the Subbasin, particularly within the southwestern half of the CMA, which overlies the more developed portion of Borrego Springs that is served by the BWD with wells located in the CMA (Figure 3.2-1).

Up to 200 feet of the upper aquifer remains saturated in the east central part of the CMA, and roughly 50 feet, on average, of the upper aquifer remains saturated within portions of the SMA and CMA. Figure 3.2-2 and Figure 3.2-3 show the same information for the middle, and lower aquifers, respectively. Groundwater level declines, based on the percentage of the aquifer thickness that is saturated, have begun to drop below the top of the middle aquifer in the southwestern part of the NMA, and the western part of the CMA. Groundwater levels have also dropped below the top of the lower aquifer along the western fringes of the CMA, and SMA, where the upper aquifer boundary is much closer to the ground surface.

Because many of the domestic groundwater users not connected to BWD rely on continued access to the upper aquifer or upper portions of the middle aquifer, an important objective in this GSP is that access to the upper aquifer or upper middle aquifer be maintained, as much is practicable, in areas with *de minimis* and other domestic wells not currently served by municipal supply (Figure 3.2-1 and Figure 3.2-2). The lower aquifer is an important source of water supply to irrigation wells, municipal wells and some domestic wells mostly in the SMA. The lower aquifer is the thickest aquifer underlying the Plan Area (Figure 3.2-3). Figure 3.2-4 shows a map of township and range sections where well completion reports indicate domestic wells occur, along with an estimate of the average remaining water column, based on statistics gathered by DWR on well depths, and the results of the BVHM regarding depth to water as of September 2016.

The groundwater levels simulated by the BVHM were attached to township and range sections by averaging the groundwater levels of the overlapping model grid cells. Also shown in Figure 3.2-4 is BWD's water distribution system, because the feasibility of connecting domestic well users to the municipal water system, if needed, is related to the distance from BWD's existing infrastructure. Overall, there are 77 domestic wells in DWR's well completion report database. As shown Figure 3.2-4, four of the township and range sections have water levels estimated to be below the bottom of the well in the section. Furthermore, the difference between the average well depth and the average groundwater level is less than 50 feet in seven township and range sections, representing 20 domestic wells, which indicates a high likelihood that some may lack access to adequate water in existing wells. With groundwater levels expected to continue to decline early in the Physical Solution implementation, domestic users are currently experiencing undesirable results, which will be alleviated by 2040. The majority of the wells in this situation are close to the BWD water distribution system.

The undesirable results of chronic lowering of groundwater levels is expected to continue to occur absent management action to counteract the current trend, until the Subbasin water budget is brought into balance. BWD has had to abandon and re-drill wells in the past and expects to continue to do so during the Physical Solution's implementation to continue to provide adequate groundwater access. For example, BWD well ID1-10 is being replaced and relocated in 2019 due to declining groundwater levels and production rate loss. The exact number of agricultural and domestic wells that have been abandoned and re-drilled deeper and/or relocated due to production rate loss from declining groundwater levels is not known. However, anecdotal information and field observations have confirmed that inactive wells exist throughout the Plan Area.

As discussed in Section 3.3, Minimum Thresholds, this GMP establishes thresholds for each Subbasin management area that would generally indicate the occurrence (or absence) of an undesirable result. These thresholds relate to known elevations that current and future groundwater levels can be compared against, such as the subsurface boundaries between the upper, middle and lower aquifers, and the prevailing elevations of the perforated intervals of groundwater wells in use, where known. The pumping reduction plan, the voluntary fallowing of agricultural land, and other PMAs described in this GMP are intended to limit production to meet all present beneficial uses and users of groundwater including the existing footprint of water intensive agriculture in the Subbasin. The proposed PMAs to mitigate potential effects to beneficial use and users are discussed in Chapter 4, Projects and Management Actions.

3.2.2 Reduction of Groundwater Storage – Undesirable Results

Reduction of groundwater storage in the Plan Area has the potential to impact the beneficial uses and users of groundwater in the Subbasin by limiting the volume of groundwater available for agricultural, municipal, recreational, industrial, and domestic use. In essence, the undesirable results of reductions in groundwater in storage are the same as those previously described for chronic lowering of groundwater levels, because within this Subbasin, these impacts go hand-in-hand. Continuing the current rate of loss of groundwater in storage could also impact other sustainability indicators, namely groundwater quality.

The primary cause of groundwater conditions in the Plan Area that would lead to reduction in groundwater storage is the ongoing groundwater production in excess of the estimated long-term sustainable yield of the Subbasin. Significant and unreasonable impacts with respect to groundwater in storage are indicated by a long-term deficit in the groundwater budget, which is described in Section 2.2.3, Water Budget. The usable quantity of groundwater in storage is large compared to average annual natural recharge to the Subbasin. On average, the Subbasin lost approximately 7,300 AFY from storage for the period between 1945 and 2015. Over the last 10 years, the Subbasin lost 13,137 AFY, based on the BVHM model results as described in Section 2.2.3. It is estimated from the BVHM that the cumulative volume of stored water lost from the Subbasin between 1945 and 2016 was approximately 520,000 AF. This volume is the cumulative difference between Subbasin inflows (e.g., natural recharge) and outflows (e.g., pumping) calculated by the BVHM over the 71-year timeframe.

An important concept relevant to the Subbasin is the high variability and the decadal periodicity of wet versus dry periods in the climatic record. A clear example of the variability inherent in the recharge values is that the 20-year period from 1955 to 1974 was one of the 'driest' on record and it immediately preceded one of the 'wettest' periods from 1975 to 1994 (ENSI 2018). The average annual recharge rates for these two periods of 'dry' and 'wet' precipitation were 3,975 and 11,907 AFY, respectively (ENSI 2018). The long-term groundwater supply highly depends on 'wet' years with high recharge rates; however, these occur on a decadal scale and may not coincide with the 20-year initial sustainability period.

Reduction in groundwater storage is significant and unreasonable if it is sufficient in magnitude to lower the rate of production of pre-existing groundwater wells below that needed to meet the minimum required to support the overlying beneficial use(s), and where means of obtaining sufficient groundwater or imported resources are not technically or financially feasible for the well owner to absorb, either independently or with assistance from the Watermaster, or other available assistance/grant program(s). Additionally, historical reductions in groundwater storage have desiccated GDEs (honey mesquite) in the Subbasin prior to the effective date of SGMA, January 1, 2015 (USGS 1982, 2015; County of San Diego 2009). GDEs are discussed in more detail in Section 3.2.6, Depletions of Interconnected Surface Water.

Under the fixed pumping reduction plan described in Chapter 4 of this GMP, which would ramp down existing levels of pumping to meet the sustainable yield by 2040, it is estimated that an additional 72,000 AF of water would be removed from storage for the period 2020 through 2040. This estimate assumes that the historical climate from 1960 through 2010 repeats for the 50-year planning horizon from 2020 to 2070. Depending on the actual timing and magnitude of pumping reductions and the location and magnitude of future groundwater recharge, the amount of groundwater removed from storage will vary. The implementation of pumping reductions will limit water supply availability such that the present extent of water-intensive agriculture in the Subbasin will be substantially reduced (i.e., the existing trend of agricultural land fallowing will need to be maintained and likely accelerated). The proposed PMAs to mitigate potential effects to beneficial use and users are discussed in Chapter 4.

3.2.3 Seawater Intrusion – Undesirable Results

Undesirable results from seawater intrusion are not considered to be applicable to the Subbasin due to geographic isolation from the ocean. The Subbasin is more than 50 miles from the Pacific Ocean and more than 130 miles from the Gulf of California. As a result, this GMP does not establish criteria for seawater intrusion (Title 23 CCR Section 354.26(d)).

3.2.4 Degraded Water Quality – Undesirable Results

In general, the groundwater quality in the Subbasin meets California drinking water maximum contaminant levels (MCLs) without the need for treatment. As documented in Section 2.2.2.4, Groundwater Quality, naturally occurring poor water quality has been identified in specific areas: near the margins of the Subbasin where unconsolidated sediments are in contact with fractured bedrock; in parts of the SMA where certain wells that tap the lower aquifer have concentrations of arsenic above the drinking water MCL; and near the Borrego Sink where elevated sulfate and TDS are likely associated with dissolution of evaporites from the dry lake. Historical groundwater quality impairment for nitrates is noted for select portions of the Plan Area predominantly in the upper aquifer of the NMA underling the agricultural areas and near high density septic point sources. The source of nitrates is likely associated with either fertilizer applications or septic return flows. In desert environments artificial irrigation of the previously undisturbed desert floor can result in leaching of built up soil nitrate deposits (Walvoord et al. 2003). As discussed in Section 2.2.2.4, several potable wells in the Plan Area have been abandoned because of elevated nitrate above the drinking water MCL.

Degradation of groundwater quality in the upper aquifer has occurred as recharge to the aquifer has mobilized natural and anthropogenic sources of nitrate. The groundwater impacted by nitrate has the potential to migrate laterally as a result of pumping. One strategy successfully implemented to produce potable water in several areas of the Subbasin is to only screen the deeper sediments of the middle and lower aquifer to avoid nitrate that is likely concentrated in the upper aquifer. It should be noted that abandoned wells have the potential to provide a migration pathway of nitrate contaminants from the upper aquifer to the middle and lower aquifers. Hence, the Watermaster's proactive cooperation with San Diego County in the enforcement of the County's ordinance governing abandonment of inactive wells will be considered by the Watermaster in order to preserve the existing potable water quality, especially where poor water quality has been identified.

Naturally occurring arsenic above the drinking water MCL has been detected in a subset of wells primarily screened in the lower aquifer of the SMA. Arsenic has not been detected at elevated concentrations in the NMA or CMA; however, semi-annual monitoring will track arsenic trends over time.

Degraded water quality is significant and unreasonable if the magnitude of degradation at pre-existing groundwater wells precludes the use of groundwater for existing beneficial use(s), including through migration of contaminant plumes that impair water supplies, where alternative means of treating or otherwise obtaining sufficient alternative groundwater resources are not technically or financially feasible. At a minimum, for municipal and domestic wells, water quality must meet potable drinking water standards specified in Title 17 and Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. The majority of groundwater pumped in the Plan Area is used for recreational and agricultural irrigation and thus does not have to meet potable drinking water standards to be put to beneficial use. The Basin Plan has not established numerical objectives for groundwater quality in the Plan Area but recognizes that in most cases irrigation return flows return to the aquifer with an increase in mineral concentrations such as TDS and nitrate (Colorado River RWQCB 2017). The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater and irrigation/fertilizer use best management practices.

Alternative means of obtaining water may consist of connection to the municipal water system (i.e., BWD), wellhead treatment, or for some beneficial users, well abandonment and new well development. Table 3-3 evaluates potential alternative means for addressing degraded water quality for each beneficial user type.

In summary, degradation of groundwater quality in the Plan Area has occurred for certain constituents (e.g., nitrate, sulfate, arsenic) and locally within the certain aquifers. However, groundwater quality has continued to be suitable for beneficial use throughout the Plan Area, when considering reasonable adaptation strategies such as screening wells in the lower and/or middle aquifer or selective well abandonment. However, undesirable results related to groundwater quality may become significant and unreasonable if conditions worsen to the point where beneficial uses are impaired (e.g., if adaptation strategies or required treatment methods becomes technically and/or financially infeasible). Continued reduction of groundwater in storage and chronic lowering of groundwater levels are intricately linked to undesirable effects on groundwater quality because these conditions increasingly limit the effectiveness of existing mitigation strategies. Therefore, significant and unreasonable impacts on groundwater quality are a potential outcome in the future if groundwater overdraft is not halted.

The proposed PMAs, including the Groundwater Quality Optimization Program are discussed in Chapter 4.

Table 3-3
Means of Addressing Degraded Water Quality

	Municipal Uses	Agricultural Uses	Recreational Uses	Domestic/*De Minimis* Uses
Connection to Municipal Water System	N/A		✓	✓
Wellhead Treatment	✓	✓	✓	*
Blending Sources	✓	✓	✓	*
Well Abandonment/New Well Construction	✓	✓	✓	*

Notes: N/A = not applicable.
* Depending on water quality degradation, wellhead treatment for domestic/*de minimis* uses may not be financially feasible in a severely disadvantaged community. Furthermore, domestic and *de minimis* users may not have the flexibility, nor the technical or financial means to blend sources or drill new wells

3.2.5 Land Subsidence – Undesirable Results

The undesirable result of land subsidence includes an irreversible reduction in groundwater storage, and differential settlement of the land surface that substantially interferes with surface land uses. As discussed in Section 2.2.2.5, Land Subsidence, the degree of land subsidence occurring in the Plan Area is minimal, has not substantially interfered with surface land uses in the past, and is not anticipated to substantially interfere with surface land uses in the foreseeable future, including within the GMP's planning and implementation horizon. Therefore, this GMP does not propose minimum thresholds or measurable objectives specific to this sustainability indicator. If during the GMP implementation timeline, it becomes evident that minimum thresholds and measurable objectives for lowering of groundwater levels and groundwater in storage are not being met, the degree to which land subsidence may become an undesirable result will be re-evaluated.

3.2.6 Depletions of Interconnected Surface Water – Undesirable Results

Under SGMA, depletions of surface waters interconnected with water in the Subbasin that have significant and adverse impacts on beneficial uses of surface waters constitute an undesirable result (CWC Section 10721(x)(6)). As described in Section 2.2.2.6, Identification of Interconnected Surface Water, surface waters have been disconnected from the underlying Subbasin aquifer for many decades. Though pre-development groundwater conditions supported a flowing spring east of the Borrego Sink (Old Borrego Spring), the spring became dry early in the Subbasin's history due to groundwater decline that cannot be feasibly reversed under current or expected future conditions. Furthermore, for the reasons described in Section 2.2.2.6 and Appendix D4, pumping within the Subbasin has no significant nexus to the seeps and/or springs that contribute flow to mapped creeks that enter the margins of the Subbasin such as Coyote Creek and Borrego Palm Creek. Therefore, there are no undesirable results as defined in SGMA currently occurring, or expected to occur, as a result of depletion of interconnected surface water. Therefore, this GMP does not propose minimum thresholds or measurable objectives related to this sustainability indicator.

3.2.7 Groundwater Dependent Ecosystems – Undesirable Results

Appendix D4 provides a complete review of available pertinent spatial datasets, historical data (e.g., stream flow and groundwater levels), satellite-derived vegetation metrics, and geology to develop a robust hydrogeological conceptual model to evaluate nexus of mapped GDEs with regional groundwater levels within the Subbasin. As described in Section 2.2.2.7, Identification of Groundwater Dependent Ecosystems, and Appendix D4, because of the long-term imbalance of pumping with available natural recharge, an irreversible impact has likely occurred on the honey mesquite community from a decline in groundwater levels, an impact which, based on the best available science, was completed and likely became permanent sometime prior to 1985. The comprehensive assessment revealed potential GDEs identified within the Subbasin no longer have direct reliance on groundwater emerging from aquifers or on groundwater occurring near the ground surface, and instead are sustained by periodic stormwater flows, soil moisture, and potentially perched groundwater where present. These findings indicate that based on best available data, undesirable results on GDEs occurred prior to 1985 and are not presently occurring or anticipated to occur in the future. Therefore, this GMP does not propose minimum thresholds or measurable objectives related to this sustainability indicator.

3.3 MINIMUM THRESHOLDS

A minimum threshold refers to a numeric value for each sustainability indicator used to define undesirable results (Title 23 CCR Section 351(t)). A GSP must establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results (Title 23 CCR Section 354.28(a)).

A GSA may establish a representative minimum threshold for groundwater elevation (GWE) to serve as the value for multiple sustainability indicators, where the GSA can demonstrate the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence (Title 23 CCR Section 354.28(d)). Minimum thresholds are not required for sustainability indicators that are not present and not likely to occur in the Subbasin (Title 23 CCR Section 354.28(e)).

Per Title 23 CCR Section 354.28(b), the description of minimum thresholds shall include the following:

4. The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.
5. The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.

6. How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.
7. How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.
8. How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.
9. How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in [the GSP Regulations].

The following sections address minimum thresholds for each of SGMA's sustainability indicators.

3.3.1 Chronic Lowering of Groundwater Levels – Minimum Thresholds

3.3.1.1 Minimum Threshold Justification

The GSP regulations provide that the "minimum threshold for chronic lowering of groundwater levels shall be the groundwater level indicating a depletion of supply at a given location that may lead to undesirable results" (Title 23 CCR Section 354.28(c)(2)).

Chronic lowering of groundwater levels in the Subbasin, as discussed in Section 3.2.1, Chronic Lowering of Groundwater Levels – Undesirable Results, cause significant and unreasonable declines if they are sufficient in magnitude to lower the rate of production of pre-existing groundwater wells below that necessary to meet the minimum required to support the overlying beneficial use(s), where alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. In addition, GWEs will be managed under the minimum thresholds to ensure the several aquifers in the Subbasin are not depleted in a manner to cause significant and unreasonable impacts to other sustainability indicators. At the same time, the Physical Solution acknowledges that groundwater levels are anticipated to fall below 2015 levels before they are stabilized by 2040. Thus, the minimum thresholds have been designed with that circumstance in mind.

Maintaining groundwater levels above saturated screen intervals for pre-existing municipal wells during an anticipated multi-year drought circumstance was selected as the minimum desired threshold for GWEs that would be protective of beneficial uses in the Subbasin. This minimum threshold in most cases would also be protective of non-potable irrigation beneficial uses.

Explained as follows, these minimum thresholds are also intended to protect against significant and unreasonable impacts to groundwater storage volumes and water quality. The development of the minimum thresholds for chronic lowering of groundwater levels included review of the hydrogeologic conceptual model, climate, current and historical groundwater conditions including groundwater level trends and groundwater quality, land subsidence data, interconnected surface water and the water budget as discussed in various sections of Chapter 2.

The minimum thresholds for chronic lowering of groundwater levels are based principally on the documented screen intervals of key municipal water wells and domestic/*de minimis* wells located in the Subbasin. Municipal wells are listed in Table 3-4 along with minimum thresholds corresponding to the top screened interval. Key indicator wells are also shown in Figure 3.3-1. Minimum thresholds are not considered applicable for BWD wells that require replacement, or are not relied upon for a significant source of supply. These wells are as follows: (1) Well ID1-10 well is planned for replacement in 2019; (2) the Wilcox well is an emergency back-up well with no power supply (diesel generator only); (3) ID1-16 will continue to be used but is planned to be replaced during the 20-year SGMA initial sustainability period; (4) ID4-18 is proposed for replacement in the future; and (5) ID1-8 is seldom used by BWD, and is not anticipated to continue to serve BWD customers over the SGMA initial sustainability period. Although the aforementioned wells are not key municipal wells and thus do not have an accompanying minimum threshold, they are included in Table 3-4 for informational purposes. Table 3-4 also lists the year drilled, well depth, recent static depth to groundwater, surface elevation, GWE, aquifers screened, and management area for the BWD wells.

Table 3-4
Borrego Water District Well Screened Intervals and Key Municipal Well Minimum Thresholds

Well	Year Drilled	Well Depth (feet)	Screen Intervals (feet; bgs)	Minimum Threshold / Top of Well Screen (feet; bgs)	Depth to Groundwater (feet; bgs)*	Surface Elevation / Groundwater Elevation (feet MSL)*	Aquifer	Management Area	Existing Minimum Threshold Exceedance
Improvement District (ID) No. 1									
ID1-8	1972	830	72–240 260–830	72	77.76	526.69 / 448.93	Middle/ Lower	SMA	N/A
ID1-10	1972	392	162–372	N/A	204.2	595.14 / 390.94	Middle	CMA	N/A
ID1-12	1984	580	248–568	248	146.14	533.2 / 387.06	Middle/ Lower	CMA	No
ID1-16	1989	550	160–540	N/A	231.77	620.15 / 388.38	Middle/ Lower	CMA	N/A
Wilcox	1981	502	252–502	N/A	309.78	702.13 / 392.35	Lower	CMA	N/A
Improvement District (ID) No. 4									
ID4-4	1979	802	470–500 532–570 586–786	470	290.88	598.11 / 307.23	Middle/ Lower	NMA	No
ID4-11	1995	770	450–750	450	223.2	613.72 / 390.52	Middle/ Lower	NMA/CMA	No
ID4-18	1982	570	240–300 310–385 395–405 425–440 460–475 490–560	N/A	315.31	690.96 / 375.65	Upper/ Middle	NMA	N/A
Improvement District (ID) No. 5									
ID5-5	2000	700	400–700	400	182.1	576.8 / 394.7	Middle/ Lower	CMA	No

Notes: bgs = below ground surface; MSL = above mean sea level; SMA = South Management Area, N/A = not applicable; CMA = Central Management Area; NMA = North Management Area.

* Fall 2018 measured value, except ID4-11 and Wilcox, which are Spring 2018 measurements (due to active pumping or lack of access at time of Fall 2018 visit)

In Section 3.4, Measurable Objectives, this GMP establishes measurable objectives and interim milestones at the same locations as the minimum thresholds as required by the GSP Regulations (Title 23 CCR Sections 351(g) and 354.30) based on the assumption that the historical climate from 1960 through 2010 repeats for the period 2020 through 2070. A linear reduction in pumping from current levels to an initial target of 5,700 AFY between 2020 and 2040 was applied in the BVHM to forecast change in Subbasin groundwater storage (Figure 3.3-2). Figure 3.3-2 shows the cumulative change in storage for the entire Borrego Basin for several model runs including the cumulative change in storage from the original USGS model run (1945 through 2010) and the cumulative change in storage for the model update (2011 through 2016). In addition, the model was run to address six different future scenarios. Future scenarios can be divided into two groups:

10. Pumping remains the same as current levels, and
11. A linear reduction in pumping from current levels to an initial target of 5,700 AFY between 2020 and 2040. Three potential climate scenarios were run for each of the scenarios:
    a. Historical climate from 1960 through 2010 was repeated for the period 2020 through 2070,
    b. California DWR change factors for projected climate conditions in 2030 were applied to the historical period from 1960 through 2010 following the procedures outlined in the DWR climate guidance for GSPs, and
    c. DWR change factors for projected climate conditions in 2070 were applied to the historical period from 1960 through 2010 following the procedures outlined in the DWR climate guidance for GSPs (DWR 2018c).

Applying DWR climate change factors for projected climate conditions in 2030 and 2070 result in an estimated 79,000 AF and 87,000 AF of groundwater removed from storage or an increase of 9.7% and 20.8%, respectively as compared to assuming a repeat of the historical climate scenario. The results indicate that 5,700 AFY of sustainable yield appears to be an acceptable initial target for sustainable annual withdrawals from the Subbasin, and that changes in future climate conditions are just as likely as not to produce a small impact on storage in the Subbasin when compared to changes in pumping and historical climate variability.

Because water years in which significant natural recharge occurs are infrequent and unpredictable, identifying the degree of climate variability in the Subbasin is a more informative and consequential factor in understanding future conditions than the application of DWR climate change factors to a repeat of historical climate. Although Figure 3.3-2 shows that the difference between a repeat of past climate and the application of DWR climate change factors is notable, the range in future outcomes produced by climate variability is much more significant.

Therefore, the GSA evaluated the potential future variability in recharge to the Subbasin over the 20-year SGMA initial sustainability period based on the effect of time-varying recharge using a Monte Carlo Simulation (MCS) uncertainty analysis (ENSI 2018). The BVHM recharge values produced over the model period from 1945 to 2010 served as the basis of the analysis. All of the simulations are based on the initial target pumping rate of 5,700 AFY being achieved in year 20 of GSP implementation. The MCS uncertainty analysis selected 20-year periods at random from the historical time series from 1945 to 2010. Alternatively, annual data could be randomly selected based on the distribution of values, but this was not done because review of the recharge values shows that there is periodicity within the time series (i.e., decadal dry, wet, and normal climatic periods).

The MCS uncertainty analysis provides for a series of 'what if' analyses where a 20-year SGMA attainment period could occur for any historical 20-year period modeled by the BVHM and thus examine the potential variability in the water balance as exhibited by the model. A total of 53 20-year periods from 1945 to 2016 are evaluated using the MCS uncertainty analysis. Figure 3.3-3 shows the MCS uncertainty analysis simulations in terms of the average and percentiles. Shown are the 20th through 80th percentiles. The 20th percentile line on Figure 3.3-3 indicates the value of the cumulative change in storage. The 20th percentile line represents a result which is higher than 20% of the simulations and lower than 80% of the simulations.

Since the simulations are looking at different time periods, the values translate to rate of occurrence. For example, values below the 20th percentile occur 20% of the time. The change in groundwater in storage, and corresponding change in groundwater level, associated with the 20th percentile was selected as the proposed minimum threshold for the Subbasin meaning that based on 53 20-year periods evaluated, values below the minimum threshold occur 20% of the time and values above the threshold occur 80% of the time. The uncertainty analysis demonstrates that variability in the historical climate and associated recharge is a critical factor to establish minimum thresholds.

In addition to minimum thresholds for BWD key indicator wells, the GMP has minimum thresholds for key indicator wells throughout the Subbasin which are intended to be protective of beneficial uses and users of groundwater (Table 3-5). As previously mentioned, the climate in the Subbasin is both highly variable and has a decadal periodicity (ENSI 2018). A MCS uncertainty analysis was performed to estimate the effects of reaching a pumping target of 5,700 AFY through incremental reductions by 2040 under a wide range of potential climate scenarios (ENSI 2018). The minimum threshold is based on the estimated degree of groundwater level decline that would occur in each indicator well if the 20th percentile scenario for groundwater recharge were to be realized. It should be noted that the minimum thresholds in Table 3-5 were determined based on groundwater reductions occurring uniformly across all production wells in the BVHM and do not account for differential reductions that may be possible between and across different sectors and/or groundwater management areas.

The Watermaster will evaluate the minimum thresholds, interim milestones, and measurable objectives at least every 5 years based on the BVHM as revised to include additional data such as the preceding GMP implementation period climate and actual realized pumping reductions to determine the likelihood that the Plan will attain sustainability goals. The Watermaster will adjust the rate of pumping reduction, revisit minimum thresholds, and/or evaluate additional PMAs if the minimum thresholds in Table 3-4 or Table 3-5, as updated are exceeded or if the interim milestones in Table 3-7, as updated are not being achieved. Furthermore, key wells could be added or replaced for the purpose of minimum threshold compliance monitoring as new data become available.

As described in Section 3.5, the GMP establishes a monitoring network in the Subbasin of 50 monitoring sites; however, only those representative sites listed in Table 3-4, Key Municipal Well Minimum Thresholds, and Table 3-5, Key Indicator Wells in Each Management Area, will be used to monitor compliance with the sustainability indicators for each management area, per Title 23 CCR Section 354.36(a). The thresholds in Table 3-4 are intended to establish groundwater level thresholds for municipal water system, whereas those in Table 3-5 are intended to be representative of Subbasin management areas, and reflect domestic, recreational and agricultural beneficial users not connected to the BWD system.

Table 3-5
Minimum Thresholds for Key Indicator Wells in Each Management Area

Management Area	Representative Monitoring Point Well ID	2018 Observed Groundwater Elevation (feet MSL)	Minimum Threshold Maximum allowable decline in groundwater levels as measured at the beginning of GMP implementation through 2040
NMA	MW-1	377.91	-39
	ID4-3	381.4	-42
	SWID 010S006E09N001S	375.05	-46
	ID4-18	377 94	-44
CMA	ID4-1	393.88	-33
	Airport 2	407.51	-25
	ID1-16	389.75	-33
SMA	MW-5A	409 61	-14
	MW-5B	409.6	
	MW-3	454.38	-12
	Air Ranch	465.47	-9
	RH-1	468.13	-9

Notes: MSL = above mean sea level; GMP = Groundwater Management Plan; NMA = North Management Area; CMA = Central Management Area; SMA = South Management Area.

3.3.1.2 Relationship between the Established Minimum Thresholds and Sustainability Indicator(s)

d. Relationship between the established minimum thresholds and the Chronic Lowering of Groundwater Sustainability Indicator

The wells described in Table 3-4 and Table 3-5 are in locations that reflect a wide cross section of Subbasin conditions. These locations are representative of overall Subbasin conditions and conditions in each management area because they are spatially distributed throughout the Subbasin both vertically (across aquifers), and laterally. The GSA determined that use of the minimum elevation thresholds at each of the listed monitoring site locations will help avoid the undesirable results of chronic lowering of groundwater levels because it will minimize the chance that access to adequate water resources for beneficial users within the Subbasin will be compromised.

e. Relationship between the established minimum thresholds and the three other sustainability indicators applicable to the Borrego Subbasin

In addition, and as described more fully as follows, use of GWEs at the cross section of wells outlined in Table 3-4 and Table 3-5, are also appropriate minimum thresholds for the following sustainability indicators: groundwater storage, and groundwater quality degradation. As established in Chapter 2, there are no regionally extensive aquitards, so lowering groundwater levels can reasonably be considered a proxy for decreases in groundwater in storage. Furthermore, the mechanism by which the Physical Solution intends to address undesirable results is an incremental pumping reduction plan to reach the sustainable yield (initially 5,700 AFY) by 2040. This measure would also minimize the degree of overdraft. The relationship between the chronic lowering of groundwater levels and water quality is not direct, but deeper groundwater may be the source of elevated arsenic concentrations in the SMA. Chronic lowering of groundwater levels may, therefore, result in the need to treat groundwater for municipal and domestic uses.

3.3.1.3 Minimum Threshold Impacts to Adjacent Basins

As described in the hydrogeologic conceptual model in Section 2.2.1, Hydrogeologic Conceptual Model, subsurface outflow from the Subbasin is minor (estimated at 511 AFY in the southern end of the BVHM model domain). The Coyote Creek fault is interpreted to act as a boundary to groundwater flow between the Subbasin and the Ocotillo-Clark Valley Groundwater Basin (USGS 2015). The adjacent Ocotillo-Clark Valley Groundwater Basin and Ocotillo Wells Subbasin are both "very low" priority basins not required to prepare GSPs. As such, they are not expected to develop descriptive undesirable results or quantitative minimum thresholds and measurable objectives. Thus, the minimum threshold of GWE selected to prevent chronic lowering of groundwater levels and to avoid triggering the other two applicable sustainability indicators in the Subbasin are not expected to cause undesirable results in adjacent basins or adversely affect the ability of adjacent basins to achieve sustainability goals.

3.3.1.4 Minimum Threshold Impact on Beneficial Uses

Beneficial uses and users of groundwater in the Subbasin are discussed in Section 2.1.4, Beneficial Uses and Users, and generally include three primary sets of pumpers: agriculture, municipal and recreation. Other Subbasin pumpers include small water systems and *de minimis* users. The minimum thresholds developed represent points in the Subbasin that, if exceeded, may cause undesirable results (Title 23 CCR Section 354.28(a)). It is expected that, if GWEs fall below the established minimum thresholds, water supplies available to beneficial uses and users in the Subbasin will be limited or challenging to produce, and significant and unreasonable water quality and other adverse impacts to sustainability indicators may occur.

As a result, the PMA Section of the GMP (Chapter 4) describes the plan to establish: (1) Baseline Pumping Allocations for each non-*de minimis* pumper of groundwater in the Subbasin, and (2) a ramp down schedule using a linear reduction in pumping to reach the planning sustainability target (initially 5,700 AFY). Once implemented, the latter is expected to require an approximate 19% reduction in pumping every 5 years from the Baseline Pumping Allocation of 24,215 AFY for a total estimated reduction of about 76% under the initial sustainable yield. Baseline Pumping Allocations were determined based on the maximum water use by individual (non-*de minimis*) pumpers over the 5-year baseline period of January 1, 2010, to January 1, 2015. The Baseline Pumping Allocation also includes municipal water use previously reduced through end use efficiency and conservation efforts, and recreation use curtailed prior to GMP adoption. The estimated water use by sector is 70% for agriculture, 18% for recreation, 12% for municipal, and less than 1% for other users based on the total Baseline Pumping Allocation.[8] Agricultural water use occurs over approximately 2,624 acres (according to updated estimates by the GSA in 2018), municipal water use includes 2,059 residential and commercial connections, and recreational water use includes six golf courses with approximately over 400 acres of irrigated turf.

As described in Chapter 4, the Physical Solution includes water transfers , water conservation and efficiency, land fallowing, and pumping reduction programs to mitigate the impacts of mandated pumping reductions. These programs will be designed to maximize beneficial uses while recognizing the finite availability of groundwater resources in the Subbasin. The Physical Solution's currently contemplated aggregate pumping allowance at each 5-year milestone and for achieving the initial Subbasin sustainability is presented in Table 3-6.

[8] Water credits are included in the Baseline Pumping Allocation.

Table 3-6
Potential Aggregate Pumping Assuming Initial Sustainable Yield Target of 5,700 AFY

Year	Baseline Pumping Allocation (AFY)	Percent Reduced	Pumping Allowance (Percent)	Pumping Allowance (AFY)
0	[24,215]	0.0%	100%	[24,215]
5		25%	75%	[18,616]
10		50%	50%	[12,108]
15		64%	36%	[8,717]
20		76.5%	23.5%	[5,700]

Notes: AFY = acre-feet per year Baseline Pumping Allocation and Pumping Allowances must be updated to represent numbers in the Judgment. Aggregate Pumping amounts and percentages may change based on adaptive management updates to BVHM. [AFY amounts are in brackets until finalized]

3.3.1.5 Comparison between Minimum Threshold and Relevant State, Federal, or Local Standards

The GSA was not aware at the time it prepared the Plan of any other state, federal, or local standards specific to addressing the lowering of groundwater levels in the Subbasin. As part of the implementation of PMAs, additional biological analysis may be required in some circumstances and may have relevance to future iterations of the minimum thresholds.

With regard to local standards, there are no quantitative standards that define or limit specific GWEs or amount of allowable groundwater level decline. As further described in Chapter 2, when the County prepares a general plan (including community plan) update process, the Physical Solution will be a key consideration with respect to related goals and policies. The implementation of the Physical Solution and the County's general plan update process are separate but related processes. Future general plan and community plan updates should consider the sustainability goals of the Physical Solution. The Physical Solution may be referred to by reference within future general plan and community plan updates.

3.3.1.6 Minimum Threshold Measurement Method

The static groundwater level will be provided to the Watermaster (for wells with radio/cellular transmit flow meters) or measured (for wells with manual read meters) at each identified minimum threshold well (key indicator wells) at least two times per year to evaluate groundwater level elevation trends at anticipated seasonal low and seasonal high groundwater conditions. All measurements will comply with the Sampling and Analysis Plan and Quality Assurance Project Plan (Appendix E1) and will be entered in to the Watermaster's data management system. The monitoring network is described in further detail in Section 3.5, Monitoring Network.

3.3.2 Reduction of Groundwater Storage – Minimum Thresholds

3.3.2.1 Minimum Threshold Justification

Reduction of groundwater in storage in the Subbasin as discussed in Section 3.2.2, Reduction of Groundwater Storage – Undesirable Results, is significant and unreasonable if it is sufficient in magnitude to lower the rate of production of active groundwater wells below the minimum required to support the overlying beneficial use(s), where an alternative means of obtaining sufficient groundwater resources is not technically or financially feasible. As discussed in Section 3.3.1, Chronic Lowering of Groundwater Levels – Minimum Thresholds, domestic wells are generally located in areas that have a groundwater level substantially above the average depth of wells, with some exceptions shown in Figure 3.2-4. Furthermore, in most cases it would be technically and financially feasible to connect domestic and *de minimis* users to the municipal water system, should they experience a significant loss in production rate attributable to groundwater level declines.

As discussed in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use, neither imported nor recycled water is economically viable for alternative water supply. Stormwater capture and infiltration has limited potential in the Subbasin due to the arid environment and infrequent availability of stormwater runoff. The usable quantity of groundwater in storage is large compared to average annual natural recharge to the Subbasin. On average, the Subbasin lost approximately 7,300 AFY from storage for the period between 1945 and 2015. Over the last 10 years, the Subbasin lost approximately 13,137 AFY, based on the BVHM model results as described in Section 2.2.3, Water Budget. The long-term deficits in the groundwater budget resulted in an estimated 520,000 AF of water removed from storage from 1945 to 2016.

In order to reach the initial target sustainability of 5,700 AFY, a non-linear pumping reduction is proposed to bring the basin into sustainability by 2040. The estimated pumping reduction over the applicable period is 76% from the Baseline Pumping Allocation. The Baseline Pumping Allocation is based on maximum annual groundwater extraction by each non-*de minimis* pumper in the Subbasin during the period from January 1, 2010, to January 1, 2015. Hence, some pumping reductions, such as those for municipal end-use efficiency and water credits sites, have already been realized.

BVHM simulations that include an initial target pumping rate of 5,700 AFY in 2040, non-linear reduction in pumping, and an assumption that the historical climate from 1960 through 2010 was repeated for the period 2020 through 2070 to simulate future conditions, indicate a net deficit of 72,000 AF for groundwater in storage over the 20-year Plan implementation period. As discussed in Section 3.3.1.1, the change in groundwater in storage associated with the 20th percentile was selected as the proposed minimum threshold for the Subbasin meaning that based on fifty-three 20-year periods evaluated, values below the minimum threshold occur 20% of the time and values above the threshold occur 80% of the time (Figure 3.3-3).

The overdraft 'curve' that assumes a 5,700 AFY average annual recharge is approximately equal to the 55th percentile of the MCS analysis, meaning target sustainability occurs in 45% of the simulations. The GSA will evaluate the interim milestones and measurable objective at least every 5 years based on the BVHM as revised to include additional data such as the preceding GSP implementation period climate and realized pumping reductions to determine the likelihood that the Plan will attain sustainability goals. If necessary, the Watermaster will adjust the rate of pumping reduction or evaluate additional PMAs if the minimum threshold is exceeded or the interim milestone is not being achieved.

3.3.2.2 Relationship between Minimum Threshold and Sustainability Indicator(s)

The minimum threshold for reduction of groundwater storage is related to the other applicable sustainability indicators, including chronic lowering of groundwater levels and degraded groundwater quality. The minimum threshold for reduction in groundwater storage, which will be directly correlated with the minimum threshold for chronic lowering of groundwater levels, will protect against losses of groundwater in storage sufficient to lower the rate of production of pre-existing groundwater wells below the minimum required to support the overlying beneficial use(s), as further described in Section 3.2.2.1, Minimum Threshold Justification.

3.3.2.3 Minimum Threshold Impacts to Adjacent Basins

As described in Section 3.3.1.3, Chronic Lowering of Groundwater Levels – Minimum Threshold, the minimum threshold selected for reduction of storage avoids causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.

3.3.2.4 Minimum Threshold Impact on Beneficial Uses

The minimum thresholds developed will limit the availability of water supply to beneficial uses and users in the Subbasin as discussed in Section 3.3.1.4, Chronic Lowering of Groundwater Levels – Minimum Threshold. The minimum threshold impact on beneficial uses for both chronic lowering of groundwater level and reduction of groundwater storage is the same.

3.3.2.5 Comparison between Minimum Threshold and Relevant State, Federal, or Local Standards

The comparison between minimum threshold and relevant state, federal, or local standards is generally the same as previously discussed for Section 3.3.1.4, Chronic Lowering of Groundwater Levels – Minimum Threshold. The only difference is that San Diego County currently has cumulative analysis and mitigation standards for permitting discretionary projects with water demands in the Borrego Valley Exemption area, in which adequate water availability must be determined in consideration of surrounding uses and users. It is anticipated these standards will be updated to ensure consistency with the Physical Solution.

3.3.2.6 Minimum Threshold Measurement Method

Reduction in groundwater storage is not a parameter that can be directly measured; rather, change in storage will be regularly estimated based on either the Subbasin water budget or monitoring results derived from analysis of GWEs and aquifer properties as discussed in Section 3.5.2, Monitoring Protocols for Data Collection and Monitoring. To monitor the changes in storage to the Subbasin, the generalized water budget equation is as follows:

Sum of inflows – Sum of outflows = Change in storage

The water budget is an accounting framework used to quantify all inflows and outflows from the Subbasin over a given period of time, with the difference equating to the change in storage. The BVHM is used to estimate the water budget. The simulated water budget included water inputs from underflow, infiltrating rainfall, applied irrigation, and infiltrating surface water flows in creeks (i.e., losing streams); the water outputs included evapotranspiration, pumping, and subsurface flow out of the Subbasin. The water budget developed using the USGS model is an important tool to manage water resources and will be updated at least every 5 years to document progress toward achieving Subbasin sustainability.

On at least an annual basis, change in groundwater storage will be estimated based on change in GWEs. This involves documenting change in measured GWEs at all monitoring program wells in the Subbasin over a given period of time. The GWE change is then multiplied by the overlying Subbasin area and estimated specific yield of the aquifer sediments to determine the change in groundwater storage. Changes in storage in the Subbasin are determined from the generalized GWE and aquifer properties equation:

Overlying Area x $(GWE_{t0} - GWE_{t1})$ ***x Specific Yield = Change in Storage***

Groundwater elevation surfaces will be created from measured GWE data using a geographic information system (GIS) for specific time periods (e.g., Spring 2020 and Spring 2021). Each surface represents a specific elevation of the groundwater table. The difference between the two surfaces multiplied by the surface area of the Subbasin represents the change in saturated volume of aquifer material between the two periods. This difference will be calculated using GIS and multiplied by the specific yield to estimate the change in groundwater storage. The reduction in groundwater storage will be calculated annually and reported by Watermaster to document progress toward the sustainability goal.

Monitoring parameters for this sustainability indicator/minimum threshold include routine groundwater level measurements. Additionally, the hydrogeologic properties of the aquifer will be updated as additional pump test data becomes available.

3.3.3 Seawater Intrusion – Minimum Thresholds

As described in Section 3.2.3, Seawater Intrusion – Undesirable Results, seawater intrusion is not an applicable undesirable result in the Subbasin and a minimum threshold is not warranted.

3.3.4 Degraded Water Quality – Minimum Thresholds

Degraded water quality in the Subbasin, as discussed in Section 3.2.4, Degraded Water Quality – Undesirable Results, is significant and unreasonable if it is sufficient in magnitude to affect use of pre-existing groundwater wells such that the water quality precludes the use of groundwater to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. For municipal and domestic wells, this means water quality that meets potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. As indicated in the Basin Plan, irrigation return flows and septic recharge returns to the aquifer with an increase in mineral concentrations such as TDS and nitrate. The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater best management practices. A PMA to optimize water quality is discussed in Chapter 4.

3.3.4.1 Minimum Threshold Justification

The minimum threshold for degraded water quality is protective of existing and potential beneficial uses and users in the Subbasin. Alternative means of addressing degraded water quality such as wellhead treatment may also be technically and financially achievable.

3.3.4.2 Relationship between Minimum Threshold and Sustainability Indicator(s)

Degraded water quality is related to the sustainability indicators: chronic lowering of groundwater levels and reduction in groundwater storage. As groundwater levels decline and storage decreases there exists the potential for increased concentration of constituents of concern (COCs) as a result of poorer water quality identified in parts of the lower aquifer. Additionally, poor water quality associated with irrigation return flow and septic recharge that has percolated to the aquifer has the potential to migrate laterally as a result of pumping. Degraded water quality is not a predictor of other sustainability indicators. Rather, it is a potential response. As such, it is sufficient to establish the minimum threshold for degraded water quality in isolation from the other sustainability indicators.

3.3.4.3 Minimum Threshold Impacts to Adjacent Basins

As described in Section 3.3.1.3, Chronic Lowering of Groundwater Levels – Minimum Threshold, the minimum threshold selected for degraded water quality is protective of causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.

3.3.4.4 Minimum Threshold Impact on Beneficial Uses

The minimum threshold for degraded water quality maintains existing and potential future beneficial uses.

3.3.4.5 Comparison between Minimum Threshold and Relevant State, Federal, or Local Standards

The minimum threshold for degraded water quality is compliant with potable drinking water standards specified in Title 22 of the CCR and water quality objectives established in the Basin Plan.

Section 13241, Division 7 of the CWC, specifies that, "[e]ach regional board shall establish such water quality objectives in water quality control plans as in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses..." The Watermaster is mindful that the Basin Plan indicates that investigative studies will be conducted to develop groundwater objectives and implementation plans for the Borrego Subarea.

3.3.4.6 Minimum Threshold Measurement Method

Groundwater quality will be monitored on a semi-annual basis at key, representative monitoring and extraction wells (shown in Table 3-4 and Table 3-5) located in each of the three management areas: NMA, CMA, and SMA. All measurements will comply with the *Sampling and Analysis Plan and Quality Assurance Project Plan* (Appendix E1) and be recorded in the Watermaster's data management system. The monitoring network and monitoring protocols are described in Section 3.5, Monitoring Network, and Section 3.5.2, Monitoring Protocols for Data Collection and Monitoring. Groundwater quality trends will be evaluated semi-annually using the Mann-

Kendall test to assess whether or not the historical dataset exhibits a trend with a selected significance level of 0.05 or confidence interval of 95%. Water quality results will be compared to background water quality objectives discussed in Section 3.4.4, Degraded Water Quality – Measurable Objectives, and potable drinking water standards specified in Title 22 of the CCR.

3.3.5 Land Subsidence – Minimum Thresholds

As explained in Section 3.2.5, Land Subsidence – Undesirable Results, land subsidence is not presently an applicable undesirable result in the Subbasin and a minimum threshold is not presently warranted.

3.3.6 Depletions of Interconnected Surface Water – Minimum Thresholds

As described in Section 3.2.6, Depletions of Interconnected Surface Water, there are no undesirable results occurring within the Subbasin associated with depletion of interconnected surface water, and thus a minimum threshold is not being proposed.

3.3.7 Groundwater Dependent Ecosystems – Minimum Thresholds

As described in Section 3.2.7, Groundwater Dependent Ecosystems, the impact of groundwater pumping within the Subbasin to GDEs occurred prior to 2015, and thus, a minimum threshold is not being proposed.

3.4 MEASURABLE OBJECTIVES

Standards for Establishing Measurable Objectives

Under Chapter 6 of SGMA, a GSP is to include "measurable objectives, as well as interim milestones in increments of 5 years, to achieve the sustainability goal in the basin within 20 years of implementation of the plan" (CWC Section 10727.2(b)(1)). In addition, the plan is to describe "how the Plan helps meet each objective and how each objective is intended to achieve the sustainability goal for the basin for the long-term beneficial uses" (CWC Section 10727.2(b)(2)). The GSP Regulations define "measurable objectives" as "specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin" (Title 23 CCR Section 351(s)).

Per GSP Regulations (Title 23 CCR Section 354.30):

a. Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

b. Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.

c. Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which shall take into consideration components such as historical water budgets, seasonal and long-term trends, and periods of drought, and be commensurate with levels of uncertainty.

d. An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence. Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.

The measurable objectives developed for each of the applicable sustainability indicators in this GMP are based on the current understanding of the Plan Area and basin setting as discussed in detail in Chapter 2. In particular, evaluation of the water budget as described in Section 2.2.3, Water Budget, concluded that the initial sustainable yield of the Subbasin is approximately 5,700 AFY and a 76% curtailment of pumping from the Baseline Pumping Allocation would be required to achieve the initial sustainability goal. As discussed in Section 3.3.1, Chronic Lowering of Groundwater Levels – Minimum Threshold, a linear reduction in pumping from current levels to an initial target of 5,700 AFY between 2020 and 2040 was applied in the BVHM to forecast change in Subbasin groundwater storage and groundwater levels at each of the BWD wells and for key indicator wells in the Subbasin. Use of the BVHM to develop measurable objectives for chronic lowering of groundwater levels and reduction of groundwater in storage is discussed in the following sections. Additionally, the basis for establishing the measurable objective for degraded water quality and depletions of interconnected surface water are also described.

3.4.1 Chronic Lowering of Groundwater Levels – Measurable Objectives

A reasonable margin of operational flexibility under adverse conditions was factored in when developing minimum thresholds and measurable objectives for chronic lowering of groundwater levels. The minimum threshold is based on a statistical evaluation of historical climate and the probability of reoccurrence as discussed in Section 3.3.1, Chronic Lowering of Groundwater Levels – Minimum Threshold. The minimum threshold for chronic lowering of groundwater levels is based on the 20th percentile, meaning 20% of the time groundwater recharge is greater than the 53 20-year historical periods evaluated. For municipal wells, the minimum threshold is equivalent to the top of the well screen.

The reduction of groundwater in storage 'curve' that assumes a 5,700 AFY average annual recharge is approximately equal to the 55th percentile meaning target sustainability occurs for 45% of the simulations using historical climate.

The measurable objective for chronic lowering of groundwater levels is based on the average annual recharge. Table 3-7 presents observed groundwater levels, observed groundwater level trends, interim milestones and measurable objectives by Subbasin management area for key indicator wells, as well as key municipal wells. The difference between minimum thresholds, measurable objectives, and the current groundwater table level is visually depicted in Figure 3.4-1 for the key municipal wells. The methodology used to establish interim milestones assumes a consistent pumping reduction applied uniformly across all pumping wells in the Subbasin, and approximates average conditions based on the BVHM. Therefore, the Watermaster will use the BVHM, including the model improvements as new data become available, to evaluate progress toward meeting interim milestones based on average conditions by management area.

Table 3-7
Measurable Objectives for Groundwater Levels

Representative Monitoring Point Well ID	2018 Observed Groundwater Elevation (feet MSL)	Observed Groundwater Level Trend (feet per year)	2020 Interim Milestone (feet MSL)	2025 Interim Milestone (feet MSL)	2030 Interim Milestone (feet MSL)	2035 Interim Milestone (feet MSL)	Measurable Objective Value (feet MSL)
North Management Area							
MW-1	377.91	-2.14	373	367	364	363	363
ID4-3	381.4	-2.09	377	371	369	368	368
SWID 010S006E09N001S	375.05	-2.48	370	367	366	365	365
ID4-18	377.94	-2.31	373	369	367	367	367
Central Management Area							
ID4-1	393.88	-1.39	391	381	375	370	370

Table 3-7
Measurable Objectives for Groundwater Levels

Representative Monitoring Point Well ID	2018 Observed Groundwater Elevation (feet MSL)	Observed Groundwater Level Trend (feet per year)	2020 Interim Milestone (feet MSL)	2025 Interim Milestone (feet MSL)	2030 Interim Milestone (feet MSL)	2035 Interim Milestone (feet MSL)	Measurable Objective Value (feet MSL)
Airport 2	407.51	-1.67	404	394	387	382	382
ID1-16	389.75	-0.95	388	384	376	370	370
South Management Area							
MW-5A	409.61	-0.74	408	400	393	387	384
MW-5B	409.6	-0.74	408	400	393	387	384
MW-3	454.38	-5.84	443	440	437	434	433
Air Ranch	465.47	-0.50	464	462	460	458	458
RH-1	468.13	-0.94	466	463	460	457	456
BWD Key Municipal Indicator Wells							
ID4-4	305.33	-2.73	300	291	285	284	284
ID4-11	390 52	-2.29	386	366	358	355	355
ID1-12	386.81	-1.51	384	377	370	369	368
ID5-5	394.7	-0.85	393	384	378	377	377

Notes: MSL = above mean sea level; BWD = Borrego Water District.
Methodologies The 2020 interim milestone is based on the spring 2018 observed groundwater elevation subtracted from the absolute value of the contemporary observed groundwater level trend multiplied by 2 years The 2025, 2030, 2035 and measurable objective are based on the results of the BVHM estimates of change in groundwater in storage and corresponding change in groundwater head at each model node with linear fixed reduction to the initial estimated sustainable yield target of 5,700 acre-feet per year and the applied 2030 DWR climate change factors. In cases where there was a groundwater level increase between 2035 and 2040, the measurable objective was held at 2035 levels. Note SWID 010S006E09N001S has a limited groundwater level record and was determined by subtracting Spring 2018 measurement from the Spring 2017 measurement.

The interim milestones define the planned pathway to sustainability and are meant to track progress toward achieving sustainability.

The Physical Soluion recognizes that climate change enhances the probability, magnitude, and periodicity of extreme precipitation events and that recharge over the 20-year GMP implementation period is an estimation. As such, the interim milestones for chronic lowering of groundwater levels will be closely monitored to determine whether the Subbasin is on track to achieve its sustainability goals. The Watermaster will annually review actual Subbasin groundwater extraction, historical and contemporary groundwater level trends, changes in groundwater storage, and climatic condition (i.e., dry, normal, wet year/period) to determine whether metrics indicate the Subbasin is on track to achieve its sustainability goals.

The Watermaster will provide at a minimum a 5-year outlook for proposed pumping reductions and annually review the pumping allowance in terms of achieving sustainability goals. The Watermaster may amend the pumping allowance to achieve and maintain the sustainability goals. The intent of the 5-year outlook is to provide clear direction to the groundwater extractors regarding the availability of water supply over the next 5-year period. The Watermaster will provide 5-year outlooks for the start of the Physical Solution implementation and for each of the 5-year milestones. If the Watermaster amends the pumping allowance in any given year, it will provide a minimum 5-year outlook that will be reevaluated at the next 5-year milestone.

3.4.2 Reduction of Groundwater in Storage – Measurable Objectives

The reduction of groundwater in storage measurable objective was developed using the same methodology as chronic lowering of groundwater levels. The estimated reduction of groundwater in storage simulated using the BVHM was used to establish the interim milestones and measurable objective, as described in Section 3.4.1, Chronic Lowering of Groundwater Levels – Measurable Objective. The reduction of groundwater in storage measurable objectives are listed in Table 3-8 for the BVHM model domain.

Table 3-8
Reduction of Groundwater in Storage Interim Milestones and Measurable Objectives

Year	Percent Pumping Reduced	Pumping Allowance (percent)	Pumping Allowance (acre-feet per year)	Cumulative Reduction of Groundwater in Storage (acre-feet)
0 (Baseline)	0.0%	100%	22,600[a]	0
5 (Interim Milestone)	19%	81%	18,376	43,500
10 (Interim Milestone)	37%	63%	14,151	73,000
15 (Interim Milestone)	56%	44%	9,925	76,600
20 (Measurable Objective)	75%	25%	5,700	72,000

Notes:
[a] The Baseline Pumping Allocation currently does not include Water Credits that may be converted to Baseline Pumping Allocation during GSP implementation

3.4.3 Seawater Intrusion

As explained in Section 3.2.3, Seawater Intrusion – Undesirable Results, seawater intrusion is not an applicable undesirable result in the Subbasin and a measurable objective is not warranted.

3.4.4 Degraded Water Quality – Measurable Objectives

Extraction wells in the Subbasin are generally screened in the upper, middle, or lower aquifers or cross-screened in multiple aquifers. These principal aquifers are discussed in Section 2.2.1.3, Principal Aquifers and Aquitards. Many extraction wells have long well screens intercepting multiple aquifers. Wellhead concentrations represent the average water quality of the formations producing flow to the well and in most cases do not represent the water quality of a specific aquifer or zone. As discussed Section 2.2.2.4, Groundwater Quality, the primary COCs identified in the Subbasin include arsenic, fluoride, nitrate, sulfate, and TDS.

As discussed in Section 3.3.4, Degraded Water Quality – Undesirable Results, the minimum threshold for degraded water quality is based on intended beneficial uses. For domestic or municipal supply (MUN), the minimum water quality means water quality that meets potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, minimum water quality should generally be suitable for agriculture use. To develop a measurable objective for degraded water quality, the Basin Plan water quality objectives have been considered. The Regional Water Quality Control Board (RWQCB), Colorado River Region Basin Plan recognizes that, "[e]stablishment of numerical objectives for groundwater involves complex considerations since the quality of groundwater varies significantly with depth of well perforations, existing water levels, geology, hydrology and several other factors" (Colorado River RWQCB 2017). The Basin Plan does not have specific water quality objectives for groundwater. Groundwater quality suitability for agricultural use is industry and crop-specific, but can be gaged through conformance with generally accepted threshold limits for irrigation used by State Water Resources Control Board, and/or through continued engagement with growers within the Subbasin. If groundwater quality destined for irrigation is measured as meeting Title 22 standards, it would also be suitable for irrigation, as drinking water quality objectives are stricter than those that would make groundwater suitable for irrigation use.

Since the aforementioned standards are minimum thresholds, the GMP's measurable objective is for groundwater quality for the identified COCs within municipal and domestic wells exhibit stable or improving trend, as measured at each 5-year evaluation. For irrigation wells, the measurable objective is the same as the minimum threshold (i.e., that water quality be of suitable quality for agricultural use).

3.4.5 Land Subsidence Measurable Objectives

As explained in Section 3.2.5, Land Subsidence – Undesirable Results, land subsidence is not presently an applicable undesirable result in the Subbasin and a measurable objective is not warranted at this time.

3.4.6 Depletions of Interconnected Surface Water – Measurable Objectives

As discussed in Section 3.3.6, Depletions of Interconnected Surface Water – Minimum Thresholds, there is not sufficient information at this time to establish a minimum threshold or measurable objective for depletions of interconnected surface water. Based on information provided by the DWR and best available data, actions implemented by the Physical Solution such as pumping reductions and PMAs do not have a substantial nexus with mitigating depletions of interconnected surface water. Specifically, a pre-SGMA impacted GDE associated with the honey mesquite located in the vicinity of the Borrego Sink and potential GDEs located along the fringes of the Subbasin.

3.4.7 Groundwater Dependent Ecosystems – Measurable Objectives

As described in Section 3.2.7, the impact of groundwater pumping within the Subbasin to GDEs occurred prior to 2015, and thus, a minimum threshold is not being proposed.

3.5 MONITORING NETWORK

Standards for Establishment of Monitoring Networks

Under SGMA, a GSP is to contain information regarding:

1. The monitoring and management of groundwater levels within the basin;
2. The monitoring and management of groundwater quality, groundwater quality degradation;
3. The type of monitoring sites, type of measurements, and the frequency of monitoring for each location monitoring groundwater levels, groundwater quality, subsidence, streamflow, precipitation, and evaporation, including a summary of monitoring information such as well depth, screened intervals, and aquifer zones monitored, and a summary of the type of well relied on for the information, including public, irrigation, domestic, industrial, and monitoring wells; and
4. Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin (CWC Section 10727.2).

According to GSP Regulations, the GSP is also to include descriptions of:

- How the monitoring network is capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation
- Monitoring network objectives including explanation of how the network will be developed and implemented to monitor:
  - o Groundwater and related surface conditions
  - o Interconnection of surface water and groundwater

- How implementation of the monitoring network objectives demonstrate progress toward achieving the measurable objectives, monitor impacts to beneficial uses or users of groundwater, monitor changes in groundwater conditions, and quantify annual changes in water budget components
- How the monitoring network is designed to accomplish the following for each sustainability indicator:
  - Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features
  - Reduction of Groundwater Storage. Estimate the change in annual groundwater in storage
  - Seawater Intrusion. Monitor seawater intrusion
  - Degraded Water Quality. Determine groundwater quality trends
  - Land Subsidence. Identify the rate and extent of land subsidence
  - Depletions of Interconnected Surface Water. Calculate depletions of surface water caused by groundwater extractions
- How the monitoring plan provides adequate coverage of the sustainability indicators
- The density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends
- The scientific rational (or reason) for site selection
- Consistency with data and reporting standards
- For each well, the corresponding sustainability indicator, minimum threshold, measurable objective, and interim milestone
- The location and type of each monitoring site on a map (Title 23 CCR Section 354.34).

Monitoring Network

The overall objective of the monitoring network in the Borrego Springs Subbasin is to track and monitor parameters to demonstrate progress toward meeting the sustainability goals, including the minimum thresholds and measurable objectives defined in Section 3.3 and Section 3.4, respectively. In 2017, the GSA developed a *Sampling and Analysis Plan and Quality Assurance Project Plan* (SAP/QAPP), and in August 2018, the GSA developed a *Groundwater Extraction Metering Plan* (both included in Appendix E). The metering plan will be a mandatory component of the Physical Solution implementation for non-*de minimis* users. The monitoring network is described in Chapter 2, Section 2.2.2.2, and the monitoring plan is described below in terms of each applicable sustainability indicator, including monitoring protocols and monitoring plan assessment and improvement. The monitoring plan described below will be re-evaluated periodically to address findings of the data and compliance criteria presented in this GMP. It is expected that data collected throughout implementation of the Physical Solution may be used to validate and update the BVHM.

The monitoring plan was prepared pursuant to the DWR's *Best Management Practices for Sustainable Management of Groundwater, Monitoring Networks, and Identification of Data Gaps (BMP)* (DWR 2016), and considers relevant data and studies performed to date for the Subbasin. Consistent with the recommendations of the BMP, the monitoring plan includes monitoring objectives and recommendations for collecting data that demonstrate short- and long-term trends in groundwater, and progress toward achieving measurable objectives. The monitoring plan is also designed to monitor impacts to beneficial uses of groundwater, and to quantify annual changes in water budget components. Monitoring objectives, previous studies and ongoing monitoring programs, data quality objectives, and monitoring scope are described in detail below.

3.5.1 Description of Monitoring Network

The monitoring network is designed to collect sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and provide representative information about Subbasin-wide groundwater conditions as necessary to evaluate Plan implementation. The most critical sustainability criteria to be monitored directly for the Subbasin are chronic lowering of groundwater levels and degraded water quality at the key indicator wells listed in Table 3-4 and Table 3-5 (Figure 3.3-1). Direct measurement of groundwater levels across the wider monitoring network described in Chapter 2 (Table 2.2-4) will be used to calculate and evaluate reductions in groundwater storage. No direct measurements of seawater intrusion, land subsidence, and depletions of interconnected surface water are proposed at this time.

The scope of monitoring is subdivided below consistent with the sustainability indicators.

3.5.1.1 Chronic Lowering of Groundwater Levels – Monitoring Network

As a critically overdrafted basin, groundwater levels in the Subbasin are the most obvious and important metric for basin sustainability, closely followed by water quality conditions. In addition, the effect of chronic lowering of groundwater levels will also be observed within each of the other sustainability indicators. The groundwater level-monitoring network currently consists of 50 wells, including 23 dedicated monitoring wells and 27 extraction wells. Of the 50 wells in the network, 46 are monitored for water levels, 30 are monitored for water quality, and 19 are monitored for production, as explained in Section 2.2.2, Current and Historical

Groundwater Conditions, and shown on Figure 2.2-12. The Subbasin monitoring density for GWE is currently approximately 48 wells per 100 square miles (Plan Area is approximately 98 square miles). While there is no definitive rule for the density of groundwater monitoring points needed in a basin, for comparison the monitoring well density recommended by CASGEM Groundwater Elevation Monitoring Guidelines ranges from 1 to 10 wells per 100 square miles (DWR 2010). Per GSP Regulation Section 354.2(a), the key indicator wells identified in Table 3-4 and Table 3-5 are proposed as the representative monitoring sites for the chronic lowering of groundwater sustainability indicator.

Wells were selected for monitoring based on a combination of factors, including geographic location, screen interval relative to the three principal aquifers, accessibility, well condition, and continuity of historical data. The groundwater level monitoring program incorporates all feasible wells in the Subbasin at this time; however, the network is expected to be further refined as access is gained to additional wells or new wells are drilled in the Subbasin. The GSA recently inspected several private wells to determine potential to include into the monitoring network and is working with private property owners to gain access or to install radio/cellular transmission meters capable of measuring well levels in monitoring wells for long-term monitoring, to be followed up by Watermaster. In addition to tracking groundwater levels at key indicator wells in the Subbasin, collected data will also be used to update groundwater level elevation contour and direction of groundwater flow maps.

Groundwater production is currently recorded monthly for 11 active BWD wells and 12 golf course wells. Additionally, many private pumpers record groundwater production at monthly or annual intervals. Upon Plan adoption, all non-*de minimis* groundwater extractors will be required to record monthly groundwater production and report to the Watermaster on an annual basis. The GSA secured Proposition 1 grant funding to install a limited number of flow meters at wells and is currently working with private well owners to get flow meters installed. The property owner (or third-party contractor acceptable to the GSA) would monitor/read the meter on a monthly basis. A manufacturer or qualified installer of such meters, or other third-party contractor acceptable to the GSA would inspect and read the meter on an annual basis to verify the accuracy of data including meter calibration. Under the Physical Solution, private well owners will install, at their own expense, Watermaster approved meters such as the SWIIM meter system that can radio transmit water production and other data to the Watermaster in real time on a schedule as determined by the Watermaster. On behalf of the property owner, the manufacturer, meter installer or third-party contractor would provide an annual statement to the Watermaster with verification of the total extraction in gallons from each well and verification that each flow meter is calibrated to within factory acceptable limits, as well as verification that there are no valves or other devices upstream of the meter that could lead to pumped water being diverted before being read by the meter. The Watermaster will keep data confidential to the maximum extent allowed by law (California Govt. Code 6254(e)). The mandatory requirements for well metering are detailed further in the *Groundwater Extraction Metering Plan* provided as Appendix E2.

The current groundwater level monitoring network is capable of collecting data of sufficient accuracy and quantity to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions.

The entire groundwater monitoring network is shown in Figure 2.2-12, whereas the key indicator wells used to track progress towards interim milestones and measurable objectives are shown in Figure 3.3-1 and Figure 3.4-1.

- Short-term trends are tracked by pressure transducers currently installed and maintained in 17 wells that record groundwater levels at intervals of 15 minutes to 1 hour (sub-daily).
- Seasonal trends are tracked by semi-annual GWE monitoring of 46 wells in the spring and fall.
- Long-term trends are tracked by analysis of data from key indicator wells monitored semi-annually in each of the management areas with historical data dating back to the mid-1950s.

The groundwater level network is sufficiently representative of groundwater conditions in the Subbasin necessary to update the BVHM and track sustainability metrics discussed in the previous sections. As discussed in Section 2.2.1.3, Principal Aquifers and Aquitards, the groundwater system has been subdivided into three principal aquifers consisting of the upper, middle and lower aquifers. Most wells are cross-screened in more than one aquifer and aquifer-specific groundwater levels are limited. As described in Section 2.2.2.1, Groundwater Elevation Data, review of existing GWE data within the Plan Area suggests that although three distinct aquifers are delineated in varying thickness across the Subbasin, the effect of well screen lengths and intervals is potentially negligible with respect to measured depths to groundwater (i.e., potentiometric surface).

Therefore, although the Watermaster may not be able to obtain data from groundwater monitoring wells screened solely in each of the three aquifer units in each of the three management areas, these data gaps are not considered significant with regard to groundwater levels, given all the other available data points. As such, for the purposes of the GMP, the need for wells screened solely in each vertical aquifer unit independently does not appear to be necessary to achieve adequate spatial representation of GWEs in the Subbasin.

3.5.1.2 Reduction of Groundwater in Storage Monitoring Network

Reduction in groundwater storage is not a parameter that can be directly measured; rather, change in storage will be estimated based on the Subbasin water budget every 5 years and monitoring results derived from analysis of GWE changes annually (aquifer properties will be refined if there are additional pump tests performed within the Subbasin). The wider monitoring network shown in Table 2.2-4 will be used to update groundwater level elevation contour and direction of groundwater flow maps. Based on the availability of sufficient aquifer properties and GWE data, monitoring of groundwater levels in the Subbasin is a sufficient surrogate for evaluating reduction of groundwater in storage (Title 23 CCR Section 354.36(b)). The method for measurement of estimating annual reduction of groundwater in storage is described in Section 3.3.2.6, Minimum Threshold Measurement Method.

3.5.1.3 Degraded Water Quality Monitoring Network

The monitoring network currently includes sampling of 30 wells on a semi-annual basis to determine and track groundwater quality trends. Wells are monitored for potential COCs that were previously identified in part by the USGS and DWR, and a review of the historical data by the GSA. The COCs include arsenic, fluoride, nitrate, sulfate and TDS. Additionally, in Fall 2017, general minerals were analyzed to establish baseline water quality and for comparison of water quality type for all wells monitored. Radionuclides were also analyzed to determine baseline conditions but are not currently considered a COC.

Additional wells are proposed to be added to the monitoring network to further evaluate both groundwater levels and groundwater quality in the CMA to better track trends in this more developed area of the Subbasin. Additionally, the Watermaster will continue to work with private landowners to expand the monitoring network.

3.5.1.4 Seawater Intrusion Monitoring Network

As explained in Section 3.2.3, Seawater Intrusion – Undesirable Results, seawater intrusion is not an applicable undesirable result in the Subbasin and monitoring is not warranted.

3.5.1.5 Land Subsidence Monitoring Network

As explained in Section 3.2.5, Land Subsidence – Undesirable Results, land subsidence is not an applicable undesirable result in the Subbasin and monitoring is not warranted. If during the Physical Solution implementation, it becomes evident that minimum thresholds and measurable objectives for lowering of groundwater levels and groundwater in storage are not being met, the degree to which land subsidence may become an undesirable result will be re-evaluated.

3.5.1.6 Depletions of Interconnected Surface Water Monitoring Network

As explained in Section 3.2.6, Depletions of Interconnected Surface Waters – Undesirable Results, the impact of groundwater pumping within the Subbasin to GDEs occurred prior to

2015, is neither currently nor expected to become an undesirable result, and thus monitoring is not warranted.

3.5.2 Monitoring Protocols for Data Collection and Monitoring

Standards for Establishing Monitoring Protocols

"Under SGMA, the GSP must contain monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin. The CWC Section 10727.2(f). According to GSP Regulations, "Each Plan shall include monitoring protocols adopted by the Agency for data collection and management, as follows:

a. Monitoring protocols shall be developed according to best management practices.
b. The Agency may rely on monitoring protocols included as part of the best management practices developed by the Department, or may adopt similar monitoring protocols that will yield comparable data.
c. Monitoring protocols shall be reviewed at least every five years as part of the periodic evaluation of the Plan, and modified as necessary" (Title 23 CCR Section 352.2).

Protocols in the Borrego Subbasin

The protocols for data collection and monitoring are detailed in the SAP/QAPP (Appendix E1). The SAP/QAPP will be updated periodically to address findings of the data and compliance criteria presented in the Physical Solution. The SAP provides a sampling and analysis plan that includes sampling objectives, potential COCs, monitoring frequency, methods for GWE and quality monitoring, and sample handling. The QAPP defines roles and responsibilities, quality objectives and criteria, special training, documentation and records, field and laboratory analytical methods, field and laboratory quality control, assessments and response actions, data reduction, review, verification and validation, data evaluation roles and responsibilities, and data reporting. Technical standards, data collection methods and quality assurance are described in detail in the SAP/QAPP to ensure comparable data and methodologies (Appendix E1).

3.5.3 Representative Monitoring

Standards for Representative Monitoring

The GSP Regulations provide that a GSA may designate a subset of monitoring sites as representative of conditions in the basin as follows:

1. Representative monitoring sites may be designated by the Agency as the point at which sustainability indicators are monitored, and for which quantitative values for minimum thresholds, measurable objectives, and interim milestones are defined.
2. Groundwater elevations may be used as a proxy for monitoring other sustainability indicators if the Agency demonstrates the following:
   a. (1) Significant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy.
   b. (2) Measurable objectives established for groundwater elevation shall include a reasonable margin of operational flexibility taking into consideration the basin setting to avoid undesirable results for the sustainability indicators for which groundwater elevation measurements serve as a proxy.
3. The designation of a representative monitoring site shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area (Title 23 CCR Section 354.36).

GWEs and water quality are the primary indicators to be directly measured and are the only sustainability indicators for which representative monitoring points are warranted at this time. GWEs are also a proxy for evaluation of storage as previously described in Section 3.5.1.2. Measurement of other sustainability indicators (i.e., seawater intrusion, subsidence, and depletion of interconnected surface water) is not currently warranted as described in Section 3.5.1.

Representative monitoring points have been selected in each of the three management areas. Multiple representative monitoring points are warranted within each management area to address the diversity of land uses, proximity to pumping centers and recharge areas, elevation differences, etc. As such, selected representative monitoring points are anticipated to be updated as the Subbasin pumping centers evolve or other pertinent data are obtained over the Physical Solution implementation. Representative monitoring points are presented in Table 3-9 and plotted on Figure 3.3-1.

Table 3-9
Representative Monitoring Points

Management Area	Well ID	Rationale
North Management Area	MW-1	Dedicated monitoring well downgradient of agricultural pumping center, screened in the lower-middle/lower aquifers
	ID4-3	Proximal and cross-gradient of agricultural pumping center and golf course (De Anza). No log or well completion information is available.

Table 3-9
Representative Monitoring Points

Management Area	Well ID	Rationale
	SWID 010S006E09 N001S	Proximal to agricultural pumping center and suspected nitrate source areas, screened in the middle and lower aquifer
	ID4-18	Proximal and cross-gradient of agricultural pumping center and screened in the upper/upper-middle aquifers
	ID4-4	Key Municipal Water Well
Central Management Area	ID4-1	Located in central portion of community of Borrego Springs with predominantly drinking water beneficial use. No log or well completion information is available.
	Airport 2	Representative of eastern portion of CMA, screened in the middle and lower aquifer
	ID1-16	Representative of southwestern portion of CMA, screened in the middle and lower aquifers
	ID4-11	Key Municipal Water Well
	ID1-12	Key Municipal Water Well
	ID5-5	Key Municipal Water Well
South Management Area	MW-5A	Effective well pair to evaluate vertical differences (groundwater levels and water quality), located near Borrego Sink, screened in the middle/lower aquifers
	MW-5B	Effective well pair to evaluate vertical differences (groundwater levels and water quality), located near Borrego Sink, screened in the upper/middle aquifers
	MW-3	Dedicated monitoring well representative of pumping effects near golf course (Rams Hill) screened in the middle/upper-lower aquifers.
	Air Ranch Well 4	Representative of conditions in southeast SMA, screened in the lower aquifer

Notes: CMA = Central Management Area; SMA = South Management Area.

3.5.4 Assessment and Improvement of Monitoring Network

Standards for Assessment and Improvement of Monitoring Network

Section 354.38 of the GSP Regulations provide that a GSA should continue to assess and improve the monitoring network throughout the planning and implementation horizon, as follows:

1. Each Agency shall review the monitoring network and include an evaluation in the Plan and each 5-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.
2. Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.

3. If the monitoring network contains data gaps, the Plan shall include a description of the following:
   a. The location and reason for data gaps in the monitoring network.
   b. Local issues and circumstances that limit or prevent monitoring.
4. Each Agency shall describe steps that will be taken to fill data gaps before the next 5-year assessment, including the location and purpose of newly added or installed monitoring sites.
5. Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:
   a. Minimum threshold exceedances.
   b. Highly variable spatial or temporal conditions.
   c. Adverse impacts to beneficial uses and users of groundwater.

3.5.4.1 Review and Evaluation of the Monitoring Network

The Subbasin monitoring network will be reviewed and evaluated for effectiveness annually and for each 5-year assessment. The review and evaluation will address uncertainty and data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin, and will consider localized effects that may not be represented throughout the respective management area. The evaluation is described in more detail in Section 5.4.5, Monitoring Network, of the GMP.

3.5.4.2 Identification of Data Gaps

Groundwater Elevation

Identification of data gaps for GWEs must consider vertical and lateral representation of the Subbasin and management areas. For vertical control, as discussed in Section 2.2.2, Current and Historical Groundwater Conditions, review of existing GWE data within the Plan Area suggests that although three distinct aquifers are delineated in varying thickness across the Subbasin, the effect of well screen lengths and intervals is potentially negligible with respect to measured depths to groundwater (i.e., potentiometric surface). Multicompletion wells or well clusters screened at discrete intervals in the upper, middle and lower aquifers would be required to determine potentiometric surface by aquifer unit. However, the average potentiometric surface measured at wells that are screened over one or more aquifer units appears to sufficiently represent groundwater conditions in the Subbasin with respect to monitoring the applicable sustainability indicators.

Laterally, the pattern of existing overlying land uses and beneficial uses of groundwater are well represented by the management areas, which the monitoring network covers. As conditions may change throughout the Physical Solution implementation, representation of overlying land uses and beneficial groundwater uses will be evaluated annually along with the network's reliability (i.e., access). Each monitoring well will be tracked and the need for alternative or additional monitoring wells will be evaluated as part of the annual and 5-year review processes, as described in Section 5.4.5, Monitoring Network, of the GMP.

As described in Section 3.5.1.1, based on the nature of the Subbasin and review of historical data, semi-annual monitoring is an appropriate monitoring frequency to continue to track seasonal trends and addresses the minimum standards of the monitoring network.

Groundwater Quality

As discussed in Section 2.2.2.4, Groundwater Quality, there are both anthropogenic and natural sources of the COCs in the Subbasin. All COCs are found in differing concentrations in the upper, middle, and lower aquifers. Extraction wells in the Subbasin are generally screened in the upper, middle, or lower aquifers or cross-screened in multiple aquifers. As such, water quality samples collected at the wellhead represent an average concentration of the formations screened and do not represent depth-discrete or aquifer specific conditions. Multicompletion wells or depth discrete water quality samples would be required to better characterize water quality by aquifer zone and depth in the Subbasin. For example, water quality results indicate that there is elevated arsenic detected at concentrations above drinking water standards in the lower aquifer of the SMA. As the occurrence of wells screened in discrete aquifer zones is limited, especially for the lower aquifer in the NMA and CMA, it is uncertain if elevated arsenic occurs at depth in these areas of the Subbasin. Additionally, there is limited contemporary data available for private wells located in the NMA and CMA to laterally and vertically delineate nitrate and TDS concentrations in the upper aquifer.

Regulatory Data Gaps

SGMA requires that the Plan consider relevant state, federal, and local standards. As such, pertinent regulatory agencies are considered stakeholders. Summaries of data gaps associated with relevant agencies are provided below:

- RWQCB – The Colorado River RWQCB has not established water quality objectives for the Region, and acknowledges that "[e]stablishment of numerical objectives for groundwater involves complex considerations since the quality of groundwater varies significantly with depth of well perforations, existing water levels, geology, hydrology and several other factors" (Colorado River RWQCB 2017).

Borrego Valley Hydrologic Model

SGMA requires that the GSA identify data gaps and uncertainty associated with key water budget components and model forecasts, and develop an understanding of how these gaps and uncertainty may affect implementation of proposed projects and water management actions.

As explained in the *Update to U.S. Geological Survey Borrego Valley Hydrologic Model for the Borrego Valley Sustainability Agency* (contained in Appendix D1), the sensitivity analysis conducted by the USGS indicated the greatest uncertainty in the numerical model was in agricultural pumping, streamflow leakage, and storage. As new data are collected and an improved understanding of the basin is developed over time, through either additional characterization, monitoring efforts, or both, the predictive accuracy of the BVHM could be improved, as needed, at annual updates and the 5-year review process. This is because new data could allow for a refinement of the underlying model assumptions (aquifer properties, stratigraphy, boundary conditions, etc.) and/or a more robust calibration due to a larger database of calibration targets (groundwater levels, surface water flows, a more robust climatic dataset, etc.).

To improve the accuracy of the BVHM in simulating actual conditions and provide greater confidence in predictive simulations, the Watermaster intends to obtain additional data and further study the hydrogeology of the basin:

- Collect actual agricultural pumping data via existing or installation of new flow meters at farm wells. The pumping data may be incorporated in the numerical model to calibrate the Farm Process Package to more accurately estimate the water demands for the various crops and golf courses being irrigated.
- Collect periodic manual streamflow measurements at major drainages that convey most of the surface water runoff to the valley, either from perennial flows or flash flows from major precipitation events. Collection of this information can be used to further verify the accuracy of the Basin Characterization Model used in the BVHM, and ultimately to provide a more accurate estimate of stream leakage.

Additional data gaps noted within this GMP, which would improve the accuracy of the BVHM, but may not be necessary to adequately apply sustainable management criteria include:

- Conduct aquifer tests at wells with screen intervals isolated to only the upper aquifer or the middle aquifer to obtain site-specific estimates of hydraulic conductivity and specific yield for each aquifer unit. This information may be used to enhance the calibration of the model to these hydraulic properties and our understanding of storage in the Subbasin.

- Evaluate subsurface inflow and outflow along the Coyote Creek fault. Currently, the Coyote Creek fault is interpreted to act as a boundary to groundwater flow between the Subbasin and the Ocotillo-Clark Valley Groundwater Basin. However, supplemental analysis of boundary conditions may be warranted to estimate a value of underflow to substantiate the working assumption regarding the negligible effect on the Subbasin water balance across this portion of the Subbasin boundary.

3.5.4.3 Description of Steps to Fill Data Gaps

The process for addressing identified data gaps is for the Watermaster to evaluate the potential significance of the data gaps, anticipated duration, costs, and overall benefit to the effectiveness of the GMP. Initial tasks to address existing data gaps include the following:

- If the Colorado River RWQCB develops interim water quality measurable objectives, the Watermaster will coordinate for determination of defensible water quality objectives.
- The Watermaster will evaluate opportunities for gathering additional data on existing or new monitoring wells screened in the upper aquifer of the NMA to determine the nature and extent of nitrate concentrations in the upper aquifer underlying areas of historical agricultural fertilizer application.
- The Watermaster will evaluate opportunities for gathering additional data on existing or new monitoring wells screened in the lower aquifer of the NMA and CMA to determine if poor water quality occurs with depth in the Subbasin, such as the elevated arsenic detected in the lower aquifer of the SMA.

3.5.4.4 Description of Monitoring Frequency and Density of Sites

Based on Subbasin conditions, as described in GMP Chapter 2; Section 3.5.1.1, Chronic Lowering of Groundwater Levels Monitoring Network; and the monitoring plan (described above), semi-annual monitoring of water quality and water elevations is considered adequate to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative data to compare to measurable objectives and minimum thresholds.

3.6 REFERENCES CITED

BWD (Borrego Water District). 2000. Estimated Cost of the Clark Lake Wells, Desalting Facility and Distribution System. Prepared by Linden Burzell, May 16, 2000.

BWD. 2002. Groundwater Management Plan. Adopted. October 18, 2002.

County of San Diego. 2009. Evaluation of Groundwater Conditions in Borrego Valley. May 18, 2009.

County of San Diego. 2010. *Evaluation of Groundwater Conditions in Borrego Valley*. General Plan Update, Appendix A. April 2010.

Dudek. 2018. *Final Tertiary Treatment Conversion Project Feasibility Study. Prepared for Borrego Water District*. March 2018.

DWR. 2016. Best Management Practices for Sustainable Management of Groundwater, Monitoring Networks and Identification of Data Gaps. December 2016.

DWR. 2018a. Disadvantaged Communities Mapping Tool. Web Map Service. Accessed at https://water.ca.gov/Work-With-Us/Grants-And-Loans/Mapping-Tools on 11/26/2018.

DWR. 2018b. Natural Communities Commonly Associated with Groundwater (NCCAG) Dataset. April 2018.

DWR. 2018c. Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development. April 2018.

ENSI (Environmental Navigation Services Inc.). 2018. RE: Methodology To Examine Future Groundwater Overdraft In Terms Of The Overall Hydrologic Water Balance Considering Recharge Variability And Parameter Uncertainty. Memorandum. Prepared for Borrego Water District. September 12, 2018.

ENSI. 2018. RE: Methodology To Examine Future Groundwater Overdraft In Terms Of The Overall Hydrologic Water Balance Considering Recharge Variability And Parameter Uncertainty. Memorandum to BWD from Jay Jones. September 12, 2018.

Huntley. 1993. Letters from Professor David Huntley, San Diego State University to John Peterson, San Diego County Department of Planning, and to Brian Billbray, San Diego County Board of Supervisors. Dated January 26, 1993.

Colorado River RWQCB (Regional Water Quality Control Board). 2017. *Water Quality Control Plan for the Colorado River Basin – Region 7*. Includes amendments adopted by the Regional Board through August 2017.

SANGIS. 2017. SanGIS/SANDAG GIS Data Warehouse. Accessed July 20, 2017. http://www.sangis.org/download/index.html.

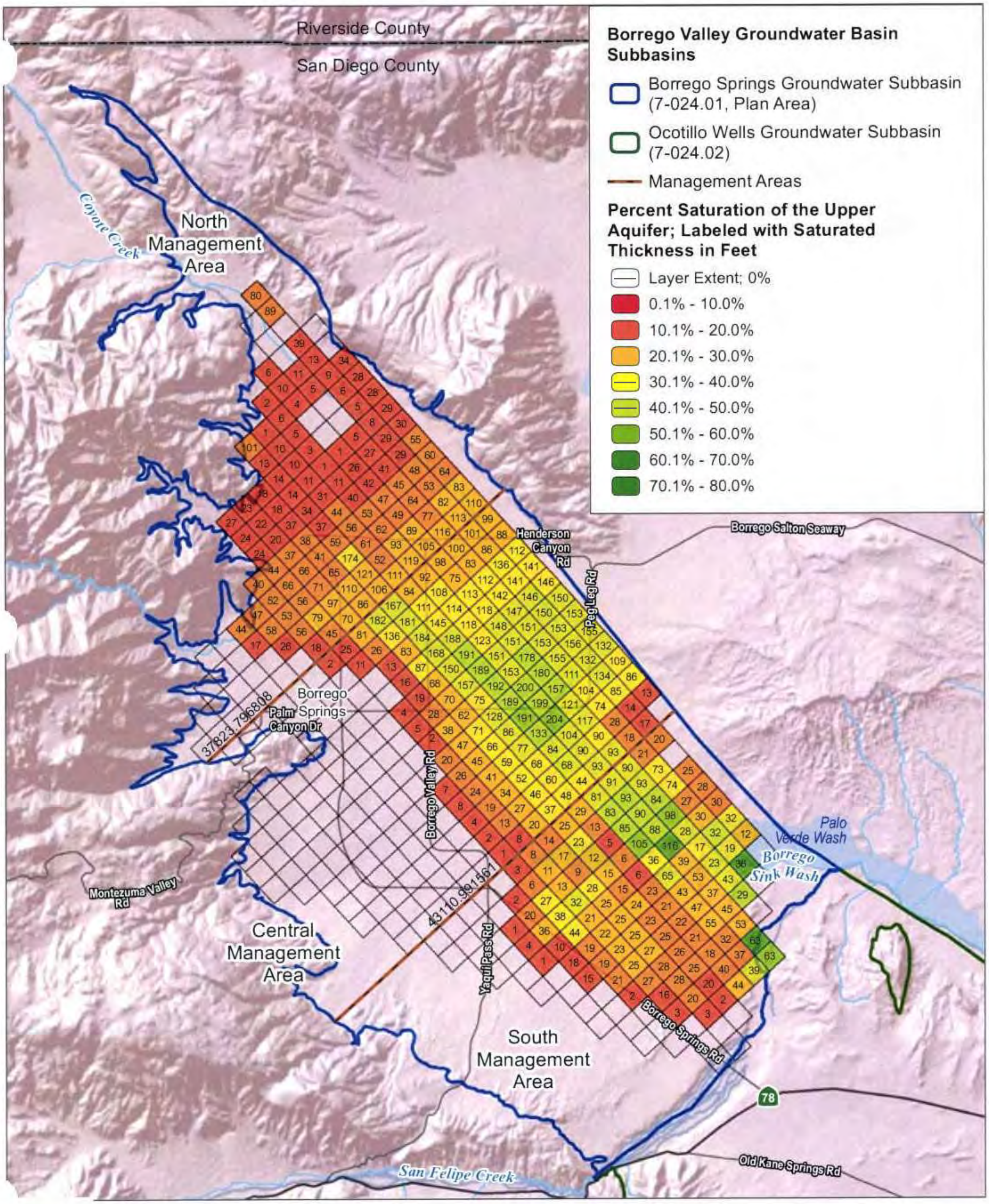
USBR (U.S. Bureau of Reclamation. 2015. *Southeast California Regional Basin Study Summary Report*. September 2015.

USGS (U.S. Geological Survey). 1982. Water Resources of Borrego valley and Vicinity, California: Phase 1-Definition of Geologic and Hydrologic Characteristics of Basin. Open-File Report 82-855. Prepared by W.R. Moyle Jr. in cooperation with County of San Diego.

USGS. 2015. Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California. Scientific Investigations Report 2015–5150. Prepared by C.C. Faunt, C.L. Stamos, L.E. Flint, M.T. Wright, M.K. Burgess, M. Sneed, J. Brandt, P. Martin, and A. L. Coes in cooperation with the Borrego Water District. DOI:10.3133/sir20155150.

Walvoord, M.A., F.M. Phillips, D.A. Stonestrom, R.D. Evans, P.C. Hartsough, B.D. Newman, and R.G. Strieg. 2003. "A Reservoir of Nitrate Beneath Desert Soils." *Science* 302(5647):1021–1024.

INTENTIONALLY LEFT BLANK



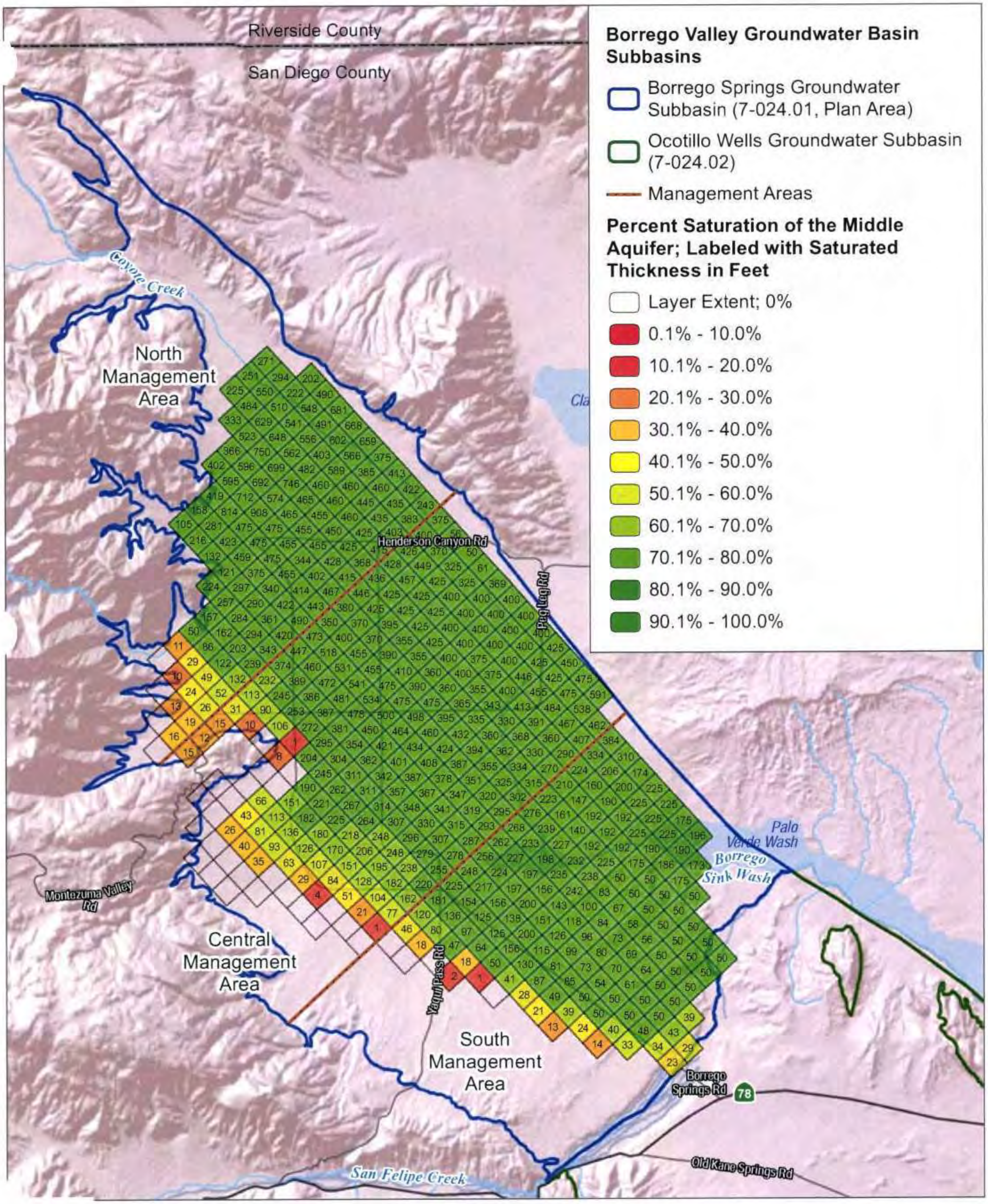
DATUM: NAD 1983, DATA SOURCE: DWR 2015, USGS 2015

DUDEK January 2020

0 1 2 Miles

Figure 3.2-1
Model Upper Aquifer Saturated Thickness - September 2016

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983. DATA SOURCE: DWR 2015, USGS 2015

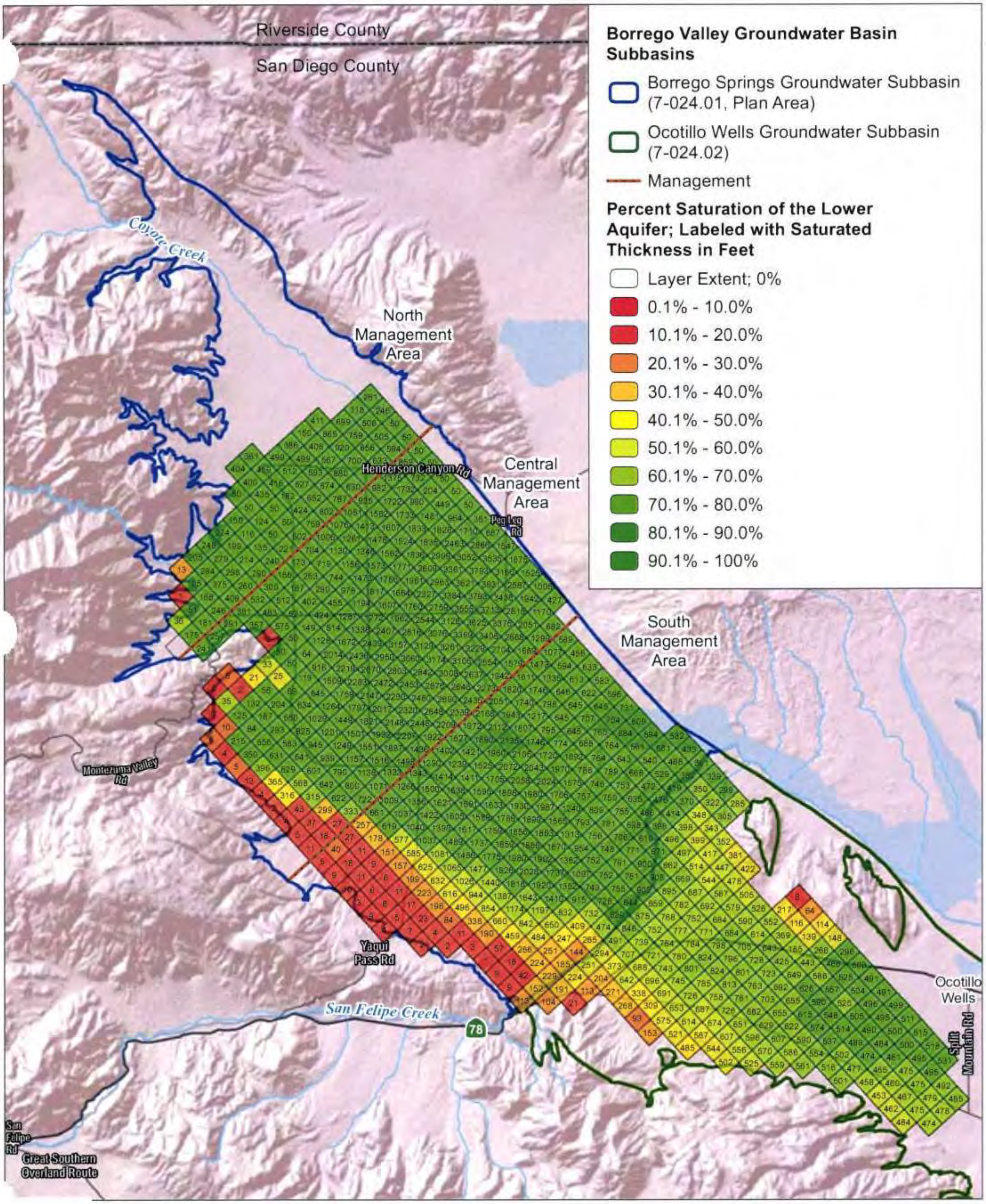
DUDEK January 2020

0 1 2 Miles

Figure 3.2-2

Model Middle Aquifer Saturated Thickness - September 2016

INTENTIONALLY LEFT BLANK

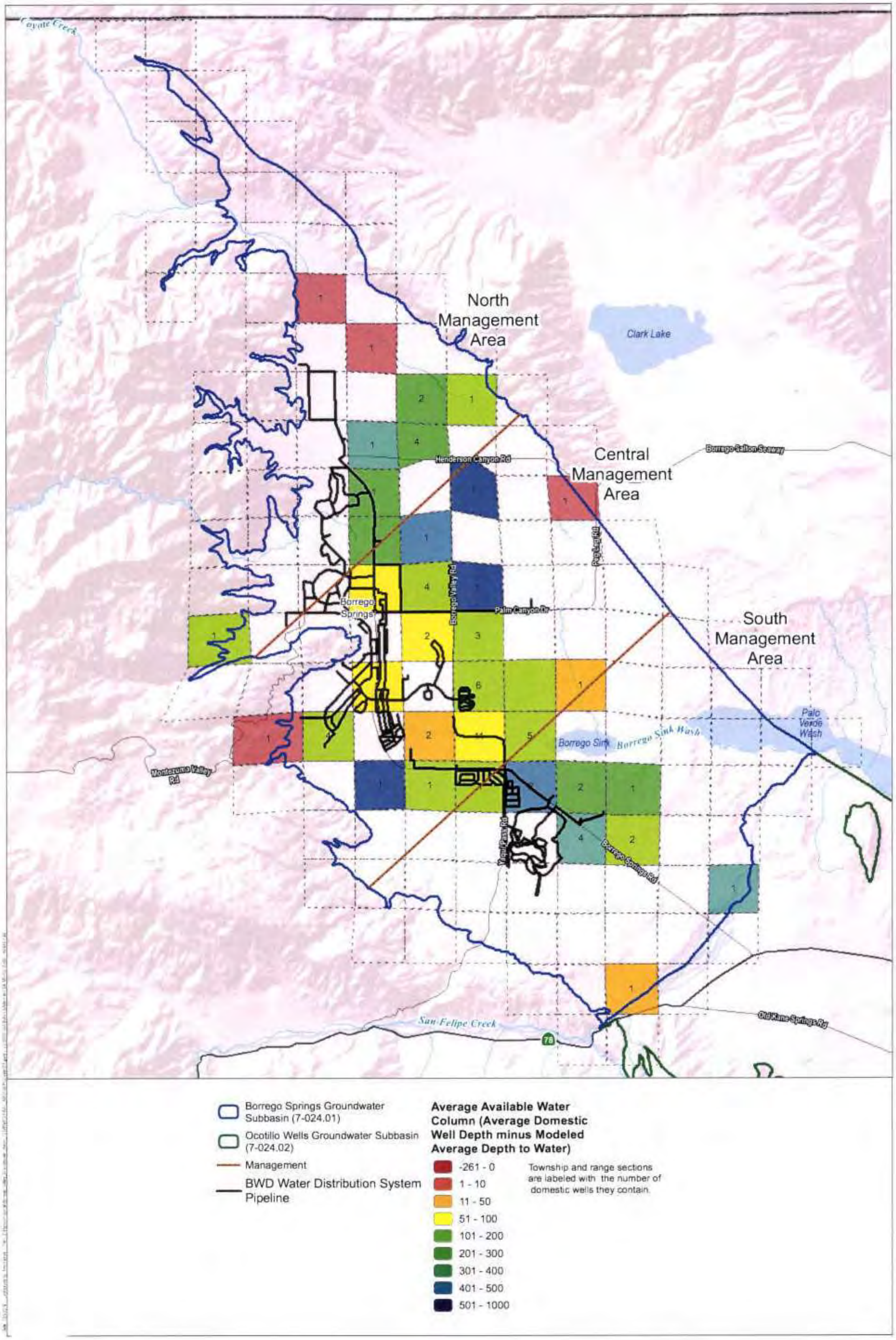


DATUM: NAD 1983, DATA SOURCE: DWR 2015, USGS 2015

DUDEK January 2020 0 1.25 2.5 Miles

Figure 3.2-3
Model Lower Aquifer Saturated Thickness - September 2016

INTENTIONALLY LEFT BLANK



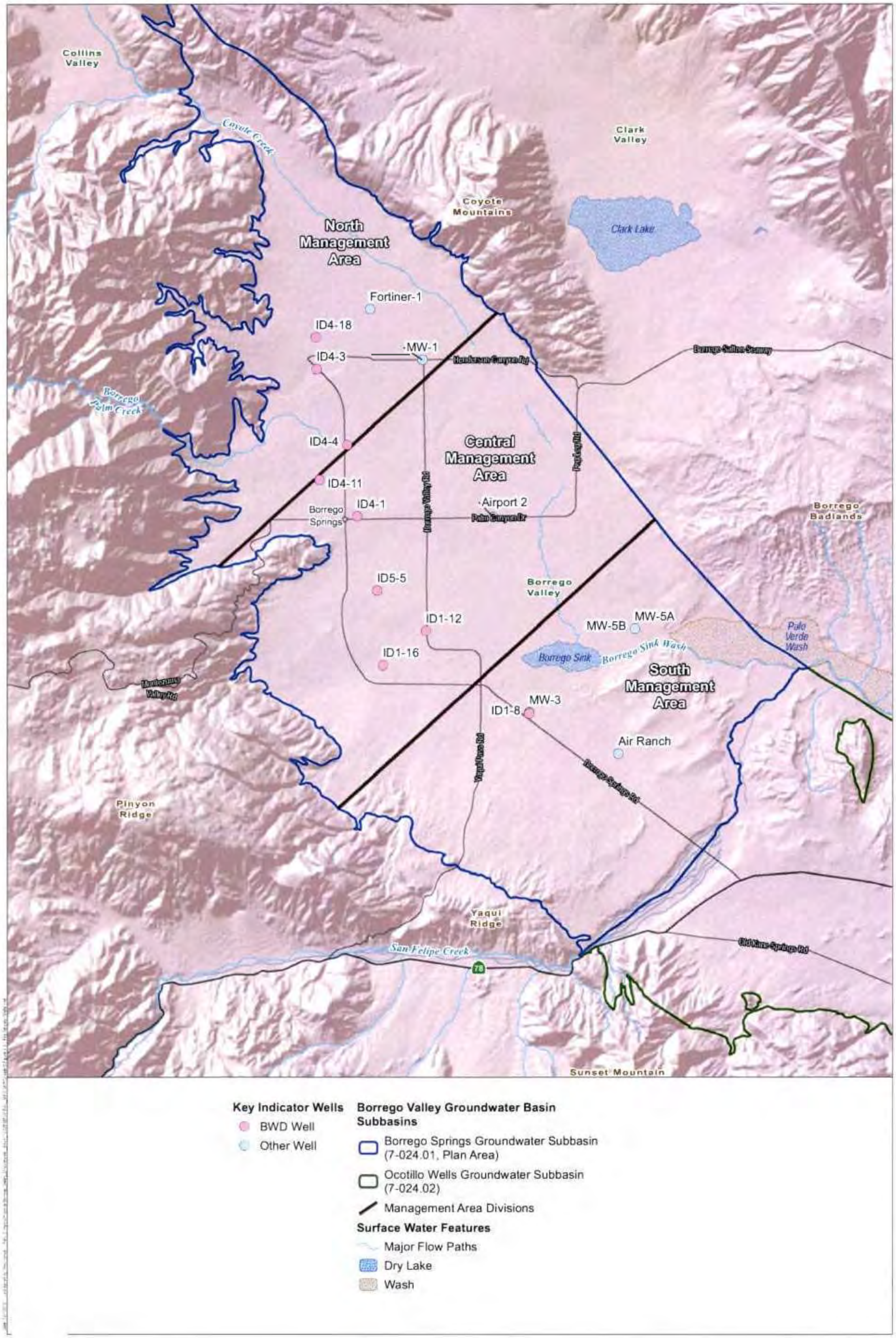
DATUM: NAD 1983 DATA SOURCE: SanGIS 2017, BWD, DWR 2018

DUDEK January 2020

Figure 3.2-4

BWD Distribution System and De Minimis Users

INTENTIONALLY LEFT BLANK



DATUM: NAD 1983

DUDEK January 2020

Figure 3.3-1
Key Indicator Wells

INTENTIONALLY LEFT BLANK

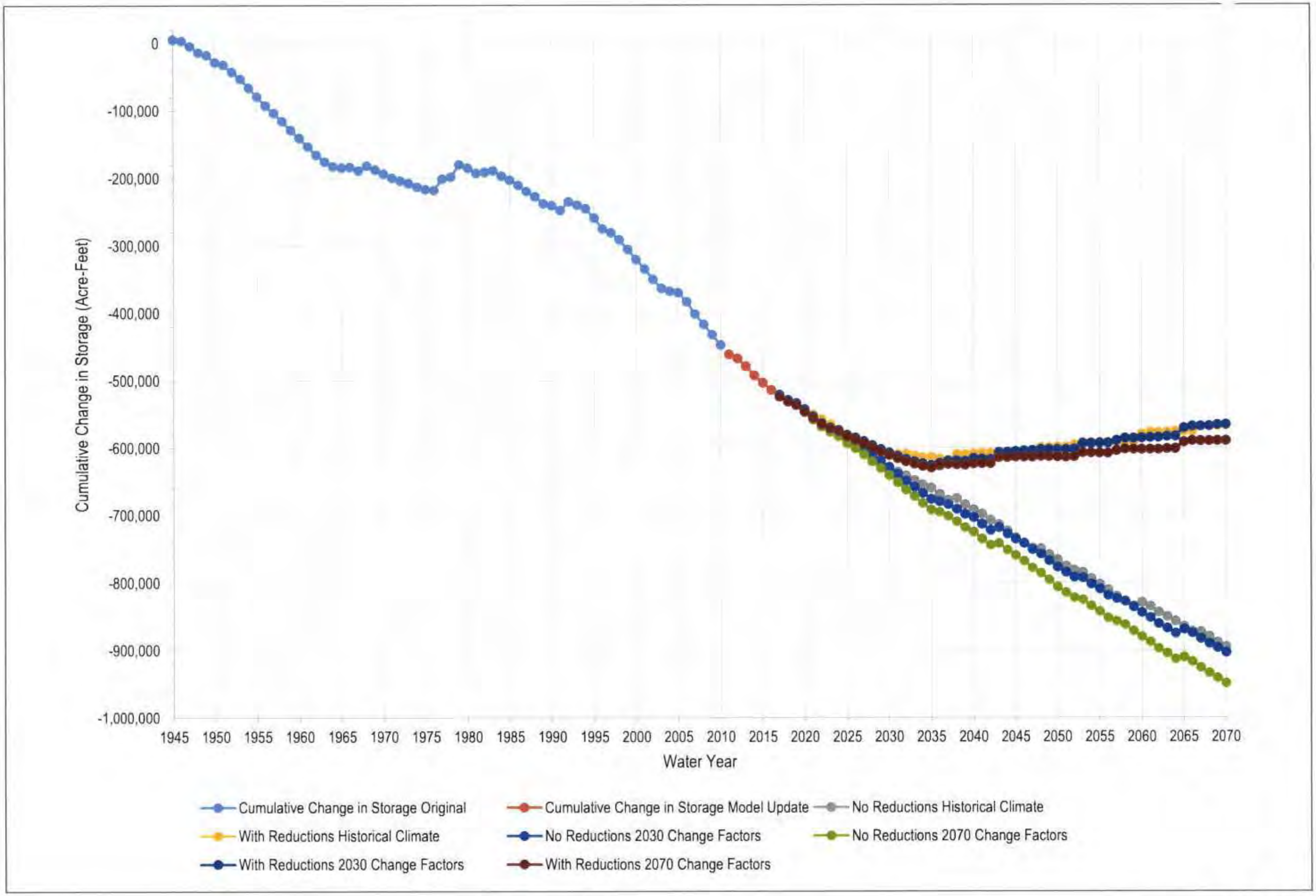
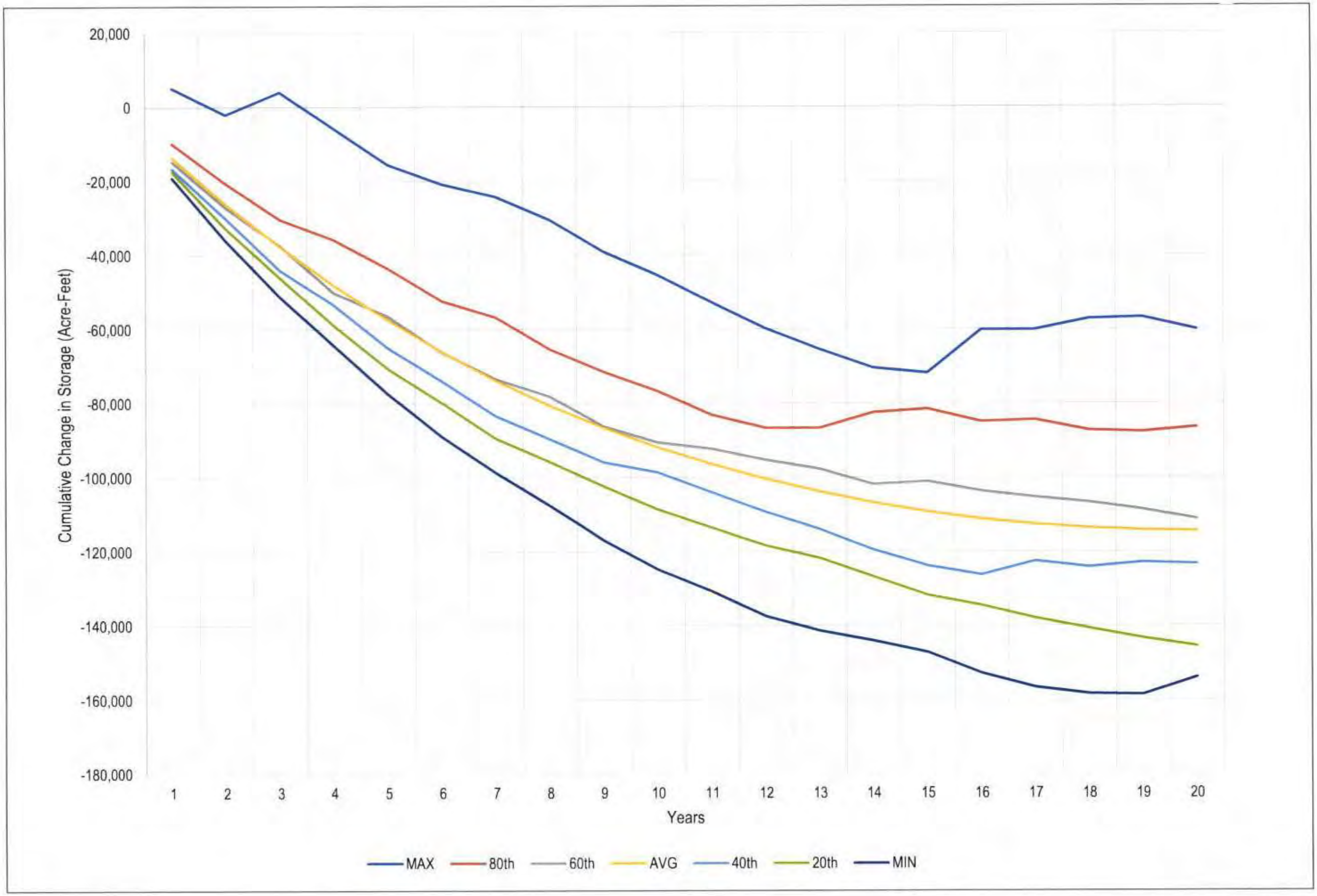


FIGURE 3.3-2

BVHM Model Runs Addressing Future Climate and Pumping Reductions

INTENTIONALLY LEFT BLANK

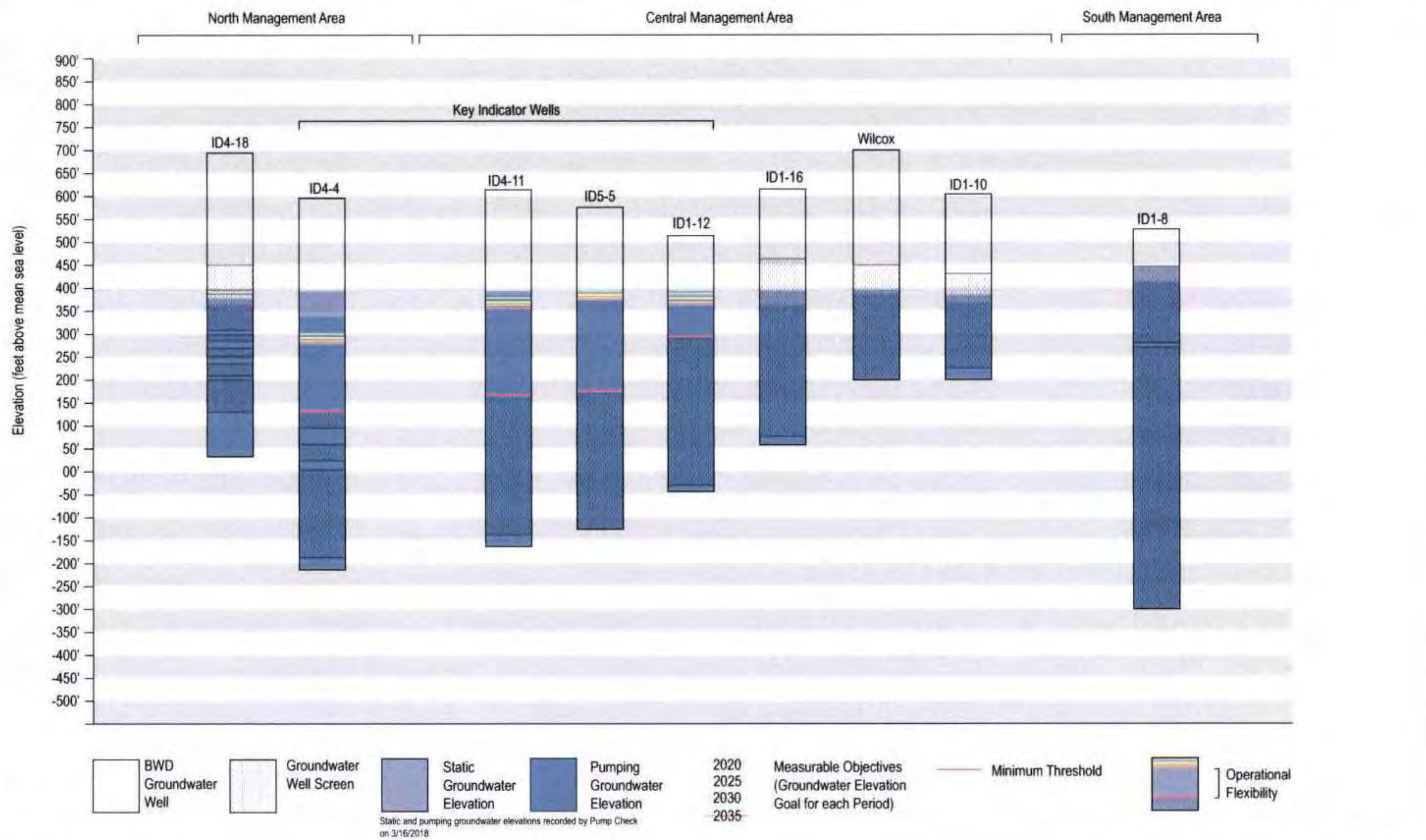


SOURCE: ENSI 2018

FIGURE 3.3-3

Monte Carlo Simulation Time Varying Recharge 1945 to 2010 and Forcasted Cumulative Overdraft

INTENTIONALLY LEFT BLANK



SOURCE: Pump Check 2018

FIGURE 3.4-1

BWD Municipal Well Screens Relative to 2018 Groundwater Elevations

INTENTIONALLY LEFT BLANK

CHAPTER 4
PROJECTS AND MANAGEMENT ACTIONS

4.0 PROJECTS AND MANAGEMENT ACTIONS TO ACHIEVE SUSTAINABILITY GOAL

Standards for Projects and Management Actions

Under the Regulations, the Groundwater Sustainability Plan (GSP, Plan) is to include the following:

1. "Each Plan shall include a description of the projects and management actions the Agency [Groundwater Sustainability Agency (GSA)] has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
2. Each Plan shall include a description of the projects and management actions that include the following:
   a. A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:
      i. A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.
      ii. The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.
   b. If overdraft conditions are identified through the analysis required by California Code of Regulations (CCR) Section 354.18 [Water Budget], the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.
   c. A summary of the permitting and regulatory process required for each project and management action.

d. The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

e. An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

f. An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

g. A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

h. A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

i. A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

3. Projects and management actions shall be supported by best available information and best available science.

4. An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions" (CCR Section 354.44).

Further, a GSA "has and may use the powers [in the Sustainable Groundwater Management Act (SGMA)] to provide the maximum degree of local control and flexibility consistent with the sustainability goals of [SGMA]" (California Water Code (CWC), Section 10725(b)). "A groundwater sustainability agency may perform any act necessary or proper to carry out the purposes of [SGMA]" (CWC, Section 10725.2(a)). The Watermaster takes the place of the GSA and may exercise the authority of a GSA consistent with the Judgment and subject to the restrictions on such authority in SGMA and under the continuing jurisdiction of the Court.

4.1 INTRODUCTION TO PROJECTS AND MANAGEMENT ACTIONS

Projects and management actions (PMAs) have been developed to address sustainability goals, measurable objectives, and undesirable results identified for the Borrego Springs Subbasin (Subbasin), with a view towards reducing the potential socioeconomic impacts associated with actions required to sustainably manage the Subbasin. The applicable undesirable results are chronic lowering of groundwater levels, reduction of groundwater storage, and degradation of water quality as explained in Section 3.2, Undesirable Results. In addition, groundwater dependent ecosystems (GDEs), which suffered significant and unreasonable adverse impacts well before January 1, 2015 (CWC, Section 10727.2(b)(4), were also evaluated, quantified, and considered.

The PMAs have been selected and developed with consideration of the arid climate that affords few opportunities for capture of excess precipitation. The Subbasin is remote to potential sources of imported water and totally dependent on groundwater for its water supply as described in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use. In addition, water uses by volume within the Subbasin are primarily for agriculture and recreation with lesser amounts for municipal, domestic and industrial uses as described in Section 2.1.4, Beneficial Uses and Users. Water quality degradation is attributable to overlying land uses and the mobilization of naturally occurring contaminants from the underlying geologic formations as described in Section 3.2.4, Degraded Water Quality – Undesirable Results. Finally, the magnitude of the overdraft, estimated to be almost 400% above sustainable yield, is a primary factor in the selection of PMAs and the degree to which they will need to be implemented to achieve Subbasin sustainability.

The PMAs determined to achieve the sustainability goals for the Subbasin are: (1) Water Trading Program, (2) Water Conservation, (3) Pumping Reduction Program, (4) Voluntary Fallowing of Agricultural Land, (5) Water Quality Optimization, and (6) Intra-Subbasin Water Transfers. These proposed PMAs have been developed using preexisting basin studies and vetted through a public outreach and agency collaboration process as described in Section 2.1.5, Notice and Communication.

The identified PMAs are interrelated in many respects and the benefits of each may be augmented by co-implementation. The following are prospective examples of interrelated PMA benefits:

- PMA No. 1 – Water Trading Program incentivizes PMA No. 2 – Water Conservation.
- Water use reductions from PMA No. 3 – Pumping Reduction Program and PMA No. 4 – Voluntary Fallowing of Agricultural Land may mitigate groundwater quality as part of PMA No. 5 – Water Quality Optimization.
- PMA No. 6 – Intra-Subbasin Water Transfers may be used to match water quality to its potable and non-potable beneficial uses in accordance with PMA No. 5 – Water Quality Optimization.

4.2 PROJECTS AND MANAGEMENT ACTION NO. 1 – WATER TRADING PROGRAM

In 2005, the Borrego Water District (BWD) implemented a water credits program as described in Section 2.1.2, Water Resources Monitoring and Management Programs, that assigned a water allocation for fallowing of primarily agricultural land based on crop or turf type and allowed for water credits to be transferred to new development to offset water demand. The program was initiated in response to overdraft conditions within the groundwater basin and was designed to encourage water conservation and reduce high water consumptive land uses.

4.2.1 Water Trading Program Description

The Water Trading Program will have a similar intent as the existing Water Credit Program but be informed by the pumping allocations developed in conjunction with the Physical Solution, and the estimated sustainable yield of the Subbasin, and be administered by the Watermaster. The program will enable permanent transfer and potentially long-term or short-term lease of baseline pumping allocations (BPA) (as reduced over time per PMA No. 3) and replace the existing Water Credits Program. The program is intended to allow groundwater users or new development to purchase needed groundwater allocation from others to maintain economic activities in the Subbasin, encourage and incentivize water conservation, and facilitate adjustment of pumping allocations as water demands and basin conditions fluctuate during the 20-year GMP implementation period. The Water Trading Program will be implemented as set forth in the Judgment.

The Physical Solution will allocate a specific amount of allowable groundwater use (pumping allowance) to non-*de minimis* pumpers consistent with the finalized BPA (see PMA No. 3 – Pumping Reduction Program). Each year during the Physical Solution implementation, the Watermaster will publish the annual pumping allowance as a percentage of the BPA (e.g., in year five of the GMP implementation period, the pumping allowance is to be set at 75% of the BPA with annual reductions through 2040 to reach the target sustainability, initially set at 5,700 acre-feet per year (AFY), for the Subbasin as a whole). Every 5 years, the Watermaster is required to report progress toward achieving the Subbasin's sustainability goals to Department of Water Resources (DWR). Non-*de minimis* pumpers may be able to privately negotiate the sale of all or a portion of their pumping allowance with willing purchasers, within the confines of the Water Trading Program and Watermaster rules. Upon agreement, a proposed trade would be submitted to the Watermaster for review and approval. If approved, the shareholder parties would be notified, the trade certified, and the Watermaster would update the official, publicly accessible register to notate the trade and the updated annual pumping allowances.

The Water Trading Program will include either temporary or permanent water transfers, or both. Each user's pumping allowance will represent and entitle the user to extract a specific volume of groundwater over time, adjusted commensurate with the pumping reduction schedule developed by the Watermaster and where applicable, water trading between non-*de minimis* pumpers. The water trade review process by the Watermaster is intended to be structured to prevent unintended consequences, such as hoarding, collusion, or speculation. For example, to prevent hoarding, the Watermaster could cap the BPA held by an individual at a maximum percentage of the total BPA allocated to all users in the Subbasin. If warranted, the Water Trading Program Policy and/or rules will be reviewed annually, and updated as needed to address unintended consequences or other unanticipated program deficiencies.

Summary of Process to Adopt Program and How Program Will be Accomplished

The Water Trading Program implementing regulations are incorporated into the Physical Solution pertaining to transfers of BPA. The Technical Advisor retained by the Watermaster will develop and test an accounting/register system to track BPA, pumping allowance, water trades and compliance though metering of groundwater production.

Finalize the details of the initial Water Trading Program into a comprehensive Water Trading Program Policy document to be developed through the Technical Advisory Committee process and approved by the Watermaster.

Legal Authority and Regulatory Process

It is the established policy of the State of California "to facilitate the voluntary transfer of water and water rights where consistent with the public welfare" (CWC, Section 109(a)). "The Legislature hereby finds and declares that voluntary water transfers between water users can result in a more efficient use of water, benefitting both the buyer and the seller" (CWC, Section 475). To these ends, BWD has previously duly adopted and implemented a Demand Offset Mitigation Water Credits Policy. That policy has been implemented under the umbrella of a 2013 Memorandum of Agreement between the BWD and the County of San Diego Regarding Water Credits and Section 67.720 (Chapter 7) of the County Groundwater Ordinances. Thus, in addition to the authority described as follows, each of the members of the GSA has independent legal authority to implement water transfer programs in their respective jurisdictions under existing law and they have done so.

Under SGMA, a GSA has authority to "authorize temporary and permanent transfers of groundwater extraction allocations within the [GSA's] boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the [GSP]" CWC, Section 10726.4(a)(3). a GSA also has authority to "provide for a program of voluntary fallowing of agricultural lands or validate an existing program" (CWC, Section 10726.2(c)). Under the California Constitution, Article X, Section 2, a Physical Solution pursuant to a Stipulation for Judgment may allow for transfers of pumping allocations.

The Water Trading Program identified in this chapter carries forward the policy of the state and satisfies SGMA requirements by establishing a voluntary program that encourages water within the Subbasin to be transferred to beneficial uses of water in a manner designed to achieve the sustainability goals and to protect against undesirable results. The Water Trading Program is expected to operate in parallel with the Voluntary Fallowing of Agricultural Land Program described in Section 4.5, Projects and Management Action No. 4 – Voluntary Fallowing of Agricultural Land.

4.2.2 Water Trading Program Relationship to Sustainability Criteria

The Water Trading Program is intended to avoid undesirable results in the Subbasin by providing incentives for water conservation, the transfer of water to other beneficial uses and the reduction of water intensive land uses. The Water Trading Program will be implemented in a manner consistent with the baseline production allocations and the schedule of ramp downs necessary to achieve the sustainability objectives developed for the Physical Solution. This program will help achieve stabilization of groundwater levels and groundwater in storage, and potentially limit water quality degradation.

Relationship to Measurable Objectives

The Water Trading Program primarily provides for the potential voluntary reallocation of available water supplies to other beneficial uses of water. Reallocation of available water supplies may result in changes to the existing distribution of pumping in the Subbasin that could result in direct effects primarily to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives. The Water Trading Policy will explicitly consider the direct effects to measurable objectives when evaluating proposed water trades. For instance, an area of origin of pumping requirement (i.e., North Management Area) may be required for trades. PMA No. 6 – Intra-Subbasin Transfers is being evaluated to address and optimize the distribution of pumping in the Subbasin as a result of implementation of PMAs.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the Water Trading Program may result in direct, positive effects primarily to the chronic lowering of groundwater levels and reduction of groundwater in storage minimum thresholds. The Water Trading Policy will explicitly consider the direct effects to minimum thresholds when evaluating proposed water trades.

4.2.3 Expected Benefits of the Water Trading Program

The Water Trading Program will provide an economic incentive for conserving water and promoting beneficial uses of water and land uses by providing for the potential to monetize voluntary water conservation or the elimination of water intensive uses. For example, the Water Trading Program provides the ability for replacement of water intensive crop types with other land uses such as residential development, lower water use hydroponics, or solar projects. It may also encourage restoration of land for use as open or recreational space in accordance with the Voluntary Fallowing of Agricultural Land Program (see Section 4.5). It may also serve to shift pumping from areas and aquifers of depressed groundwater levels or poorer quality groundwater to those more favorable for additional pumping. PMA No. 5 – Water Quality Optimization and PMA No. 6 – Intra-Subbasin Water Transfers have been selected to evaluate and mitigate the potential effects of shifting pumping in the Subbasin (see Sections 4.6 and 4.7).

4.2.4 Timetable for Implementation of the Water Trading Program

The Water Trading Program will commence immediately under interim authority of the Watermaster that will be established by the Court.

4.2.5 Metrics for Evaluation of Water Trading Program Effectiveness

The Water Trading Program will include both direct and indirect metrics to evaluate its effectiveness. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are potentially the most representative metric to evaluate Program effectiveness. Additionally, comparison of metered or estimated historical water use versus metered water use after the Physical Solution adoption is integral to implement the program. Pursuant to the Metering Plan, all non-*de minimis* groundwater extractors will be required to register their wells during Physical Solution implementation and report metered production data. In addition, BPA, pumping reduction, temporary or permanent water trades, voluntary fallowing of agricultural land and other land use changes will be documented. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Water Trading Program as shown in Table 4-1.

Table 4-1
Metrics for Evaluating Water Trading Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 1	Water Trading Program	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Baseline pumping allocation (BPA) 5. Pumping reduction (ramp down) 6. Water trades 7. Area of irrigated land and crop type 8. Used and unused BPA	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost

Notes: PMA = Projects and Management Action

4.2.6 Economic Factors and Funding Sources for Water Trading Program

The costs of the Water Trading Program will be borne solely by the parties to the transfer and as such may be allocated between the parties as they deem acceptable.

4.2.7 Water Trading Program Uncertainty

Elements of uncertainty associated with the Water Trading Program include the impact of voluntary fallowing of agricultural land and changing land use to the overall economy of the Subbasin, the relationship of the program to existing property and water rights, and how program compliance will be enforced. It is anticipated that program design and stakeholder outreach will reduce this level of uncertainty.

4.3 PROJECTS AND MANAGEMENT ACTION NO. 2 – WATER CONSERVATION

The BWD has historically implemented measures to encourage efficient water use. These include a tiered water rate structure and other incentive programs (BWD 2009). In the past, rebate programs were established for purchase of low flow toilets, low water use washing machines, and high water use turf removal. Additionally, the BWD provided rate payer irrigation system audits and may pay a portion of recommended irrigation system improvements as described in Section 2.1.2, Water Resource Monitoring and Management Programs. The Borrego Springs Community Plan (County 2013) includes a policy requiring the continuation of "...aggressive, multi-faceted water conservation programs to reduce existing agricultural, golf course, commercial and residential [water] use."

The agricultural sector has made significant investment in end use efficiency technologies such as drip irrigation. Some golf courses have invested in control technologies to optimize the timing and application of irrigation. Use of lower water demand native plants has also been incorporated into non-turf areas for some of the golf courses. BWD has also adopted a water conservation (shortage) policy (BWD 2018). In addition, the County of San Diego adopted and enforces an ordinance containing groundwater use reduction measures for new development. San Diego County Code of Regulatory Ordinances (County Code) Section 67.720.

4.3.1 Water Conservation Program Description

The Water Conservation Program would consist of separate components for the three primary sectors: agricultural, municipal, and recreation. Programs for each sector would follow a similar approach consisting of reviewing historical programs and projects, identifying areas and methods for greatest potential water savings, outreach and coordination with potential participants, developing project cost estimates, competitively evaluating project alternatives implementing projects, and acquiring follow-up metrics.

Legal Authority and Regulatory Process

California Constitution Article X, Section 2 and CWC Section 100 provide that because of conditions prevailing in the state, it is the declared policy of the state that the general welfare requires that the water resources of the state shall be put to beneficial use to the fullest extent of which they are capable, the waste or unreasonable use of water shall be prevented, and the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare.

Additionally, in May 2016, Governor Brown signed Executive Order B-37-16 that set a policy of making water conservation a California way of life and ordered state agencies to establish permanent changes so Californians use water more efficiently. It set a framework for moving the state from temporary, emergency water conservation measures to a more permanent approach customized to the unique local conditions. In April 2017, DWR, the State Water Resources Control Board, the California Public Utilities Commission, the California Department of Food and Agriculture, and the California Energy Commission issued a report entitled "Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16" to establish a long-term framework for water conservation and drought planning (DWR et al. 2017).

In May 2018, Governor Brown signed Senate Bill 606 and Assembly Bill 1668, which stem from the Governor's Executive Order and report to implement it. The legislation establishes a foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts. Most of the legislation applies to conservation measures for urban water suppliers, but the legislation recognizes that small water suppliers and rural communities require guidance from the state to improve drought and conservation planning (CWC, Section 10609.40.) Accordingly, DWR and the State Water Resources Control Board must propose to the Governor and Legislature by January 1, 2020, recommendations and guidance relating to the development and implementation of countywide drought and water shortage contingency plans to address the planning needs of small water suppliers and rural communities (CWC, Section 10609.42). The County may be able to adopt additional conservation measures that result from the forthcoming recommendations.

The State of California has set standards for water efficiency in landscaping since 1990. These requirements are currently set forth in the Water Conservation in Landscaping Act, Government Code Sections 65591 et seq. The DWR adopted and periodically amended a Model Water Efficient Landscape Ordinance (MWELO). The MWELO is currently codified in Title 23 CCR Sections 490 et seq. The County is at all times required to adopt an ordinance as effective as the

MWELO at conserving water or apply the MWELO. The County adopted and has enforced its own water efficient landscape regulations since the first MWELO became effective on January l, 1993. In response to prolonged drought conditions in the state, Governor Brown, by Executive Order B-29-15 issued April l, 2015, directed the DWR to amend the MWELO to increase water efficiency standards for new and existing landscapes and to limit the use of turf. The DWR revised the MWELO in accordance with the Executive Order and the California Water Commission approved the revised MWELO on July 15, 2015. Consistent with the requirements of the Water Conservation in Landscaping Act, the County amended its water efficient landscape requirements set forth at Sections 86.701 et seq. of the County Code to ensure that the County's requirements are as effective as the current MWELO at conserving water.

Public noticing will be an integral part of the conservation program implementation. To be most effective, the availability of optional water conservation program services such as water audits and rebate programs will be widely advertised through billing inserts, websites, or mailings to BWD customers and other members of the public. In addition, water conservation outreach will be discussed at public meetings conducted by the Watermaster.

Agricultural Sector

Agricultural extractions from the Subbasin are estimated to be about 15,749 AFY based on the BPA making agriculture the largest potential sector for water savings in the Subbasin. Potential agricultural water savings are from reduction of applied water to crops, planting lower water use crops and/or increased efficiency of irrigation systems. Efficiencies in fertilizer or pesticide use can serve to limit degradation of groundwater quality potentially caused by agricultural return flows. The primary element of the agricultural conservation program will be voluntary water audits to be performed by third-party contractors such as the Resource Conservation District of Greater San Diego County, which may have the following components:

- Pre-audit analysis of historical water use, topography, climate data, and land use
- Analysis of distribution uniformity (amount of water supplied by irrigation system to each plant), crop density, and crop types
- Analysis of irrigation efficiency (amount of water used beneficially by crop compared to the total water applied)
- Analysis of soil grain size and texture, agronomic soil suitability including salinity, drainage, and water retention properties
- Analysis of irrigation system water use efficiency, pressure, and maintenance
- Pesticide and fertilizer application and use
- A report containing recommendations for improving efficiency and crop yield

- Follow up analysis of measures implemented actions/practices and savings obtained

The steps to implement the audit program will consist of the following:

1. Historical project analysis – Compile and analyze information from previously conducted audit programs and estimate cost and water savings achieved
2. Analysis of potential acreage, land use, and water savings – Geographic information systems (GIS) analysis of Subbasin agriculture, land use, and property ownership in order to determine scope and design of program and to target appropriate landowners for outreach efforts
3. Program design – Design and select program components based on crop types, program cost, and potential water savings; may include irrigation audits, equipment rebates, and cost sharing
4. Program Outreach – Contact, inform, and coordinate with potential program participants to determine needs and constraints
5. Conduct Audits – Each audit will include a report documenting "pre" conditions, recommendations for implementing water savings measures, and potential quantified benefits
6. Follow up on Audit Results – Return to each audit location after a suitable amount of time to document recommendations implemented and other metrics

Municipal Sector

Approximately 1,700 AFY of water is currently supplied for municipal purposes within the Subbasin and about 75% of that is used out of doors. Therefore, outdoor water use has great potential for municipal water savings. There is potential for water savings associated with turf removal or replacement and irrigation system upgrades for homeowner associations (HOAs). However, indoor conservation measures will be implemented to raise awareness of the value of the resource as well as for the water savings they provide.

Potential programs to be included in the municipal water conservation sector include landscape irrigation audits, rebates for turf replacement, efficient landscape irrigation equipment and indoor water fixtures. Smart irrigation controllers may be encouraged in order to automatically adjust landscape irrigation based on real-time, local weather conditions. A BWD-dedicated water conservation website would give water users voluntary access to free water conservation information such as a landscape watering calculator, a watering index, and a water efficient plant database. See the San Diego County Water Authority conservation website for example projects and programs (https://www.watersmartsd.org/tools).

The BWD may sponsor an accreditation program for gardeners and landscapers that complete a training program that may include water efficiency, green waste reduction, pesticide reduction, and fertilizer management. The individuals and companies that receive certification may be included in a conservation website list, to be contacted by those interested in hiring "environmentally responsible" landscaping professionals. Professionals could include those primarily employed in the agricultural sector as part of a job retraining program.

The following steps will be conducted as part of implementation of the Municipal water conservation program:

- A conservation and efficiency analysis will be performed to identify Best Management Practices for water conservation for residential and commercial stakeholders.
- The scope, feasibility, and impact of a landscape restrictive ordinance for existing development will be evaluated in addition to water efficient landscape requirements set forth at Section 86.701 et seq. of the County Code for new development.
- Determination of the applicability of conservation requirements for existing water users (BWD Conservation Program) versus new development (i.e., County water efficient landscape requirements).
- The nature of a potential conservation incentive program will be evaluated, which may include incentives for turf removal, installation of efficient water fixtures, etc.
- Development of an updated program to provide voluntary home inspections to assist residents with identifying water conservation and efficiency opportunities.
- Preparation of a Municipal Water Conservation and Efficiency Plan to convey the findings of the previously referenced assessments, present resources to be made available to stakeholders, and document requirements of the plan, if any.

Recreation Sector

Opportunities for water savings in the recreational sector are primarily from golf courses. Changes in golf course irrigation practices, turf types, irrigated area, and adjacent landscaping afford opportunities for significant water savings. The physical and operational improvements to golf course irrigation systems may include modification of irrigation types and schedules, and the installation of soil moisture and evapotranspiration sensors (Mann 2014).

The following tasks will be implemented for the development of a Recreation Water Conservation and Efficiency Plan:

- Identify stakeholders/participants and conduct interviews to receive input and identify concerns to be addressed in the program development. Additionally, the interviews would be used to solicit suggestions for specific resources that will assist the recreational sector with improving efficiency.

- Assessment of each golf course's irrigation practices and irrigated acreage to identify areas where more efficient irrigation practices could be applied, and the potential cost/benefit of the action for the operator.
- Independent of specific property evaluations, a variety of irrigation practices, alternative turf types or management actions should be evaluated to recommend the best methods for increasing irrigation efficiency and groundwater conservation in the Subbasin.
- Preparation of a Recreational Water Conservation and Efficiency Plan to convey the findings of the previously referenced assessments, present resources to be made available to stakeholders, and document requirements of the plan, if any.

4.3.2 Water Conservation Program Relationship to Sustainability Criteria

The specific components of a water conservation program to be implemented within the Subbasin will be developed through a process of outreach, data compilation, and program design for each sector. By reducing the amount of water consumed within each sector, the program will reduce the water produced, thereby directly addressing the requirement to ramp down groundwater production to meet the sustainability goals. Chronic lowering of groundwater levels and reduction of groundwater in storage will be addressed by a reduction of pumping from the Subbasin. In addition, agriculture and landscape audits may result in a reduction in fertilizer and pesticide use needed for crops and turf, thereby limiting the amount of primarily nitrate and total dissolved solids (TDS) infiltrating to the aquifer.

Relationship to Measurable Objectives

The Water Conservation Program will incrementally reduce water demand in the Subbasin and is an option worth considering to achieve measurable objectives during Plan implementation and throughout the planning period. The Water Conservation Program is directly related to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as an incremental, direct physical action to maintain sustainability indicators, including groundwater levels and groundwater storage, above minimum thresholds to avoid undesirable results. The Water Conservation

Program also has the potential to improve water quality by augmenting the quantity and quality of return flows.

4.3.3 Expected Benefits of the Water Conservation Program

In addition to the potential for incremental water savings estimated at 1,455 AFY for all sectors, the conservation program will raise awareness of the value of water as a resource and help modify the culture of water use. Therefore, the benefits of the program will accumulate as a larger segment of the local population becomes more educated about water conservation and modifies behavior over time. By taking a proactive role in water efficiency issues, the BWD and the Watermaster will lead by example.

Agricultural audits are commonly performed by agencies throughout California. They are generally recognized as beneficial for increasing efficiency, reducing water use, and increasing crop yields. Audits are often conducted by Resource Conservation Districts with funding provided by counties or state grant programs. A previous study of the Subbasin completed by Roger Mann for DWR and BWD identified several individual actions and estimated costs for reducing water use (Mann 2014). This study estimated potential water savings of 365 AFY by maximizing agricultural irrigation efficiency. Potential water conservation savings for the municipal sector of 255 AFY assumes 20% water savings on BWD outdoor water use. An updated recreation sector water conservation estimate of 835 AFY was developed based on the assumptions made by Mann and interviews with several golf course landscape professionals with experience in Borrego Springs. Estimated water savings by sector as a result of implementing water conservation programs are listed in Table 4-2.

Table 4-2
Estimated Potential Water Savings by Sector for Water Conservation Programs

Water Sector/Crop	Potential Water Savings Acre-Feet Per Year
Agriculture	365[a]
Municipal	255[b]
Recreation	835[c]
Total	**1,455**

Source: Mann 2014.
Notes:
a Potential water savings for agriculture is based on an estimate of current irrigation efficiency of 79%, rising to 85% with implementation of irrigation system improvements. There may be potential for additional savings.
b Assumes 20% savings of outdoor water use that is about 75% of total BWD demand.
c Based on 2018 interviews and/or previous assumptions by Mann

Recreation Sector

Potential water savings for golf courses are achievable by two primary activities: 1) converting turf to desert landscaping or low water use xeriscaping, and 2) optimizing golf course irrigation system management. Estimated potential water savings for golf courses by implementing turf conversion is provided in Tables 4-3.

Table 4-3
Estimated Potential Water Savings by Sector for Water Conservation Programs

Golf Course	Estimated Turf Acres[a]	Estimated Convertible Acres[b]	Potential Water Savings Acre-Feet Per Year
Borrego Springs Resort	106.00	32.0[c]	192.6
Club Circle	23.00	3.9	23.5
De Anza	146.76	24.9	149.9
Ram's Hill[d]	96.75	0.0	—
Road Runner Golf and Country Club	46.23	7.9	
The Springs	42.45	7 2	43.3
Total	**461.19**	**75.9**	**456.9**

Notes:
a Turf area based on aerial analysis of GIS.
b Assumes 17% of irrigated turf is convertible and 90 irrigated turf acres per 18-hole golf course, except where golf course specific information was provided. Water savings assume average water demand of 6.02 acre-feet per year per acre of turf.
c Borrego Springs Resort has indicated that up to 32 acres of turf is potentially convertible to desert landscaping based on their preliminary evaluation (Bambach, pers comm 2018)
d Rams Hill Golf Course has indicated that it is unlikely that they have any convertible turf. However, they have implemented irrigation system improvements and conversion of non-turf areas to native landscaping and are working with irrigation professionals to identify future water savings projects (Smith, pers. comm 2018).

The average cost of turf conversion per acre for golf courses is $20,000. Conversion cost assumes turf removal and fine grading with sand or decomposed granite to match grade of adjacent turf. No irrigation replacement or plant material is included. Conversion to desert landscaping from turf would be approximately $2.86 per square foot or $125,000 per acre (Smith, pers. comm. 2018).

Optimizing golf course irrigation system management is another management strategy that may result in water savings. This involves installation of new controllers and sprinkler heads, soil moisture sensors, and weather stations to improve irrigation efficiency. For instance some golf courses are required to turn on multiple sprinklers covering a large area even when only a small portion of the golf course requires irrigation. Estimated potential water savings for golf courses by optimizing golf course irrigation system management is provided in Table 4-4.

Table 4-4
Golf Course Irrigation System Management

Golf Course	Estimated Managed Acres of Irrigated Turf[a]	Potential Water Savings Acre-Feet Per Year at 0.82 AF/ acre/year[b]
Borrego Springs Resort	106.00	86.92
Club Circle	23.00	18.86
De Anza	146.76	120.34
Ram's Hill	96.75	79.34
Road Runner Golf and Country Club	46 23	37.91
The Springs	42 45	34.81
Total	461.19	378.18

Notes: AFY = acre-feet per year; AF = acre-feet.
[a] Turf area based on aerial analysis of geographic information system (GIS)
[b] Mann 2014.

The average cost of optimizing a golf course irrigation system is approximately $400 per acre per year (Mann 2014). For 100 acres of turf that works out to $40,000 per year; however, it should be noted that there are substantial upfront capital costs to install irrigation system infrastructure and train staff to use software and maintain equipment. Actual costs and potential water savings will vary, and require detailed evaluation and study of each golf course's existing irrigation system.

Municipal Sector

The Borrego Springs HOA implemented turf replacement projects in the last 5 years, which indicate the potential costs and benefits that may be achieved through additional turf replacement programs. Approximate data for historical turf replacement projects are presented in Table 4-5.

Table 4-5
Historical Turf Replacement Projects, Borrego Springs

Year	Area Replaced (square feet)	Total Cost	Cost/Square Foot	Estimated Outdoor HOA Water Savings (%)
Club Circle West, Borrego Springs HOA				
2013	38,800	$125,250	$3.23	37
2017	3,438	$8,695	$2.53	7
2018	2,770	$7,756	$2.80	7
2018	6,700	$15,000	$2.24	NA
Total	**51,708**	**$156,701**	**$3.03[a]**	**51**

Source: Duncan, pers. comm. 2018a, 2018b.
Notes: HOA = homeowner association; NA = not applicable
[a] Average cost per square foot

Based on the Borrego Springs HOA turf replacement projects, the average cost is approximately $3.00 per square foot or $131,000 per acre. Actual costs and water savings will be determined by specific program configuration and funding sources. Previous estimates indicate that HOA turf replacement and irrigation efficiency projects, if implemented throughout the Subbasin, have the potential to save approximately 90 AFY (Mann 2014).

Graywater Guidance Programs

In recent years, state regulations for the use of graywater have been relaxed, making it easier to utilize wastewater from showers, clothes washers, and wash basins for irrigation of certain types of landscaping (CWC, Chapter 15). "Laundry to Landscape" systems conforming to certain requirements do not currently require a state permit. The County Department of Environmental Health (DEH) administers graywater systems in unincorporated areas of the County. No construction permit is required for clothes washer systems provided the system is installed in accordance with the Graywater System Requirements for a Single Clothes Washer (County 2015). Larger graywater systems, which require more extensive plumbing modifications, require a permit. The County DEH has developed guidance for the design, installation, operation and maintenance of graywater systems to ensure subsurface irrigation systems discharging graywater will not contaminate surface water or groundwater or create public health hazards (County 2015b). The guidance also explains the permitting procedures and inspection of graywater systems. The DEH graywater systems webpage can be found at: https://www.sandiegocounty.gov/content/sdc/deh/lwqd/lu_graywater_systems.html

Installation of an individual graywater system in Borrego Springs is feasible provided a graywater system meets the requirements outlined in the guidance. There is an average of about 40 gallons per person per day available for graywater recycling and the average family can reduce their freshwater use by as much as 30% by using graywater for irrigation (SOW 2019).

4.3.4 Timetable for Implementation of Water Conservation Program

Because water conservation is a beneficial component of sustainable water supply planning, it is intended that the water conservation program will be enacted within the first few years of Physical Solution implementation subject to the availability of grant funding, and continue indefinitely recognizing that all of the sectors have historically implemented or are in the process of evaluating water conservation and efficiency projects.

4.3.5 Metrics for Evaluation of Water Conservation Program

The Water Conservation Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds is this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are potentially the most representative metrics to evaluate Program effectiveness. Additionally, the metrics available for evaluation of the Water Conservation Program are dependent on the water use sector and specific programs to be evaluated. Direct metrics will include groundwater levels and corresponding groundwater storage, and metered pumping records, effective after adoption of the Physical Solution.

BWD water supply records will be used to directly evaluate water supply reduction for specific water accounts that have implemented water conservation program components. The number and types of water conservation projects implemented with quantification of water saved will also be documented. Indirect metrics may also include follow up evaluation of water users having received water audits to see which recommended measures were implemented and the associated estimated water savings. For water efficient fixture give-away or rebate programs, records of the number and type of fixtures will be used to approximate water savings. Similarly, follow up evaluation of turf replacement projects will allow for an approximation of water savings related to irrigation reduction. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Water Trading Program as shown in Table 4-6.

Table 4-6
Metrics for Evaluating Water Conservation Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 2	Water Conservation	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Number/type of projects implemented 5. Quantification of water saved	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost 5. Audits

Notes: PMA = Projects and Management Action.

4.3.6 Economic Factors and Funding Sources for Water Conservation Program

Planning-level development cost for establishing the Water Conservation Program is estimated to be approximately $130,000.

Potential sources of funding for the Water Conservation Program components include state grants.

4.3.7 Water Conservation Program Uncertainty

Only high level estimates of the cost and benefits of the water conservation program are possible until there is a detailed plan for project components, stakeholder interest, and quantification of benefits for each sector. Some benefits such as stakeholder awareness and level of participation in voluntary programs are difficult to predict or quantify. Other components of uncertainty are the extent to which conservation measures have already been implemented and how to incentivize or require participation in specific components of the conservation programs.

4.4 Projects and Management Action No. 3 – Pumping Reduction Program

The Pumping Reduction Program is the central tool to implement the Physical Solution and achieve the sustainability goal for the Subbasin. The pumping reduction program is based on the establishment of each respective user's BPA. To establish the program, the GSA worked with the groundwater extractors in the Subbasin to determine individual BPAs. Once the program is implemented, BPAs will be ramped down over time to bring pumping in the Subbasin within its sustainable yield by 2040. As described in SGMA, any limitation on extractions by the GSA "shall not be construed to be a final determination of rights to extract groundwater from the basin or any portion of the basin" (CWC, Section 10726.4(a)(2)). The Physical Solution resolves uncertainty over water rights by incorporating the pumping reduction program into the Judgment in a groundwater rights adjudication.

Adoption and implementation of the ramp down component of the pumping reduction program in the Subbasin is accomplished by means of the Judgment. Ramp down will begin immediately upon Court approval of an interim Watermaster.

4.4.1 Pumping Reduction Program Description

It is anticipated that the Pumping Reduction Program will consist of the following general components: (1) estimation of the Subbasin sustainable yield through the Technical Advisory Committee process based on a future projection scenario analyzed using the BVHM, and (2) pumping allocation reduction recommendations to reach the estimated sustainable yield by 2040. In summary, each non-*de minimis* groundwater user within the Subbasin has been assigned an allocation based on their historical groundwater use. That allocation will be reduced incrementally as necessary until 2040 such that the total extraction from the Subbasin will be equal to the estimated sustainable yield at the end of that period. Non-*de minimis* groundwater users will be able to trade their pumping allowances in accordance with PMA No. 1, but the total volume of pumping allowances within the Subbasin will decrease over time. Each component of the program is discussed in greater detail as follows.

Estimation of the Subbasin Sustainable Yield

A water budget approach has been used to establish the estimated sustainable yield for the Subbasin as explained in Section 2.2.3, Water Budget, and Section 2.2.3.6, Sustainable Yield Estimate. Based on existing data, the initial estimated sustainable yield of the Subbasin is 5,700 AFY, which is an approximately 76% reduction from historical water use of up to 24,215 AFY as established by the BPA. The estimated sustainable yield is the target amount to which groundwater is to be reduced over the implementation period. As described in Section 3.5.4, Assessment and Improvement of Monitoring Network, data gaps may be filled and improvements to the Borrego Valley Hydrologic Model may occur as implementation of the Physical Solution proceeds. It should be noted that the 5,700 AFY sustainable yield value is an estimate that depends on a number of climate and hydrological factors that will be re-evaluated based on a future projection scenario of pumping and recharge within the Subbasin using the BVHM model runs concurrent with the Physical Solution 5-year updates. If the sustainable yield changes as a result of significant new data, the pumping reduction schedule will be modified accordingly.

Determination of Baseline Pumping Allocation

BPAs have been determined for pumpers in each of the three sectors: recreational, municipal, and agricultural. The "baseline pumping allocation" is defined as the amount of groundwater each pumper in the Subbasin is allocated prior to SGMA-mandated reductions and is determined by the maximum annual production[1], in AFY, for each well owner over the baseline pumping period. The baseline pumping period is the 5-year period from January 1, 2010, to January 1, 2015. In addition to the three water use sectors, there are two small water use systems and two non-potable irrigators, the baseline allocations for which were considered separately. These are the Anza-Borrego Desert State Park (ABDSP) and the Borrego Air Ranch Water Co. The two

[1] This is an estimate based on metered data from BWD, small water systems, and other pumpers, as well as estimated pumping based on the evapotranspiration method described in Appendix F.

non-potable irrigators are the Borrego Springs Unified School District (Elementary School) and La Casa Del Zorro Resort and Spa (La Casa Del Zorro).

The BPA is determined to be the maximum annual groundwater extraction during the baseline pumping period. Metered historical data is the most accurate method of determining maximum historical use. Therefore, metered data has been used when available. Metered data was available for the ABDSP, a limited number of private pumpers and for all of BWD's production. Where metered data was unavailable, including for golf courses and a large proportion of agriculture, water use is estimated using plant-specific evapotranspiration rates during the baseline period.

The evapotranspiration method requires the determination of irrigated areas and plant types and the application of a water use factor. Irrigated area and plant types have been determined from aerial photographs, limited field reconnaissance, GIS analysis tools and correspondence with pumpers. The water use factor is an annual estimate of water use in feet of water that includes plant type, climate, irrigation system efficiency, and for some crops such as citrus, the leaching of salts from the soils. The BPA methodology developed for the Subbasin is detailed in Appendix F, and the baseline pumping allocated by sector is provided in Chapter 2, Table 2.1-3.

Pumping Allocation Reduction

As described in Section 2.2.3.6, the initial estimated sustainable yield for the Subbasin is 5,700 AFY. This is approximately 24% of the historical extraction levels of about 24215 AFY resulting in a required reduction in pumping of 76%.

Because many of the parameters used to determine water use and sustainable yield estimate are modeled or estimated, it is anticipated that adjustments will be required to achieve the sustainability goals. Therefore, the reduction of allocation will be reviewed at least every 5 years using the BVHM in relation to groundwater levels, groundwater in storage and other sustainability criteria. Adjustments to the program will be made when necessary in the future by Watermaster.

Pumping Overage Charges

The SGMA legislation allows for charging fees for pumping in excess of allocations or non-compliance with other GSA regulations (CWC Section 10732 (a)). The Physical Solution requires the Watermaster to establish an Overproduction Penalty Assessment for violations of pumping allowance and/or reporting during the Physical Solution implementation as set forth in the Judgment.

4.4.2 Pumping Reduction Program Relationship to Sustainability Criteria

Permanent reduction in pumping directly relates to all of the applicable sustainability criteria. Pumping reductions will serve to stabilize declining groundwater levels and prevent loss of groundwater storage. Degradation of water quality may be limited as a result of a reduction in fertilizer use needed for crops and turf, thereby limiting the amount of primarily nitrate and TDS infiltrating to the aquifer.

Relationship to Measurable Objectives

The pumping reduction program will serve as a significant, direct physical action to meet the measurable objectives of chronic lowering of groundwater levels and the reduction in groundwater storage. Further, it is anticipated to support certain measurable objectives to protect against degradation of water quality.

Relationship to Minimum Thresholds

Consistent with the measurable objectives, the program serves as a significant, direct physical action to maintain sustainability indicators, including groundwater levels and groundwater storage, above minimum thresholds to avoid undesirable results. Additionally, improvements to water quality are expected as a result of reduction of fertilizer use and return flows to the aquifer.

4.4.3 Expected Benefits of the Pumping Reduction Program

As the central component to achieving sustainability within the Subbasin, the Pumping Reduction Program will result in the avoidance of undesirable results including chronic lowering of groundwater levels, reduction of groundwater in storage, and potentially degraded water quality. Peripheral benefits may include potential investment in alternate land uses or taking advantage of the water trading or land fallowing management programs. To achieve the required reductions, the sectors may implement conservation measures resulting in more efficient use of water and greater resiliency to long-term climate variability.

4.4.4 Timetable for Implementation of the Pumping Reduction Program

Individual allocations have been provided by the Judgment to each existing user. Metering will be required by March 31, 2020. As the central component of the Physical Solution, the Pumping Reduction Program is anticipated to be implemented upon interim approval of the Judgment. The program will be ongoing throughout the Physical Solution implementation as annual adjustments to the pumping allocations are made. It is anticipated that the ramp down schedule will be revisited during the 5-year Physical Solution updates.

4.4.5 Metrics for Evaluation of Effectiveness of Pumping Reduction Program

The Pumping Reduction Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are probably the most representative metrics to evaluate effectiveness. Water metering will be required to implement the Physical Solution, so that extractions from wells will be directly measured as specified in the Metering Plan (Appendix E2). Establishment of the BPA and pumping reduction or ramp down rates is required to be developed to implement the Pumping Reduction Program. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Pumping Reduction Program as shown in Table 4-7.

Table 4-7
Metrics for Evaluating Pumping Reduction Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 3	Pumping Reduction Program	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Baseline pumping allocation (BPA) 5. Pumping reduction (ramp down) 6. Area of irrigated land and crop types 7. Used and unused BPA	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost

Notes: PMA = Projects and Management Action.

4.4.6 Economic Factors and Funding Sources for Pumping Reduction Program

Private parties will be installing their own meters and radio/cellular data transmitting systems. Watermaster costs to determine and enforce compliance will be funded through pumping fees.

Concerns regarding this PMA specific to the SDAC community include water affordability (BWD rate impacts), loss of jobs/local economy, impacts to infrastructure, and/or quality of life. In response, the BWD commissioned an SDAC Impact/Vulnerability Assessment to understand the implications that the implementation of SGMA will have on the SDAC population of Borrego Springs. The report remarks that the 20-year SGMA compliance period does provide time for the community to adapt. The BWD's tiered rate structure (maintenance of low water rates for baseline water use) and seeking state funding to support the SDAC are strategies that consider the needs of the SDAC during Physical Solution implementation.

BWD continues to actively work to assess water use and to evaluate how to best structure water costs for the SDAC. SGMA- and SDAC-related grants and other publicly funded support is expected to continue to be available and pursued by BWD to assist in subsidizing future water costs. Borrego Springs is a key part of the utilization experience for the ABDSP.

4.4.7 Pumping Reduction Program Uncertainty

Uncertainty associated with the Pumping Reduction Program is related to the method of establishing the estimated sustainable yield. As described in Section 2.2.3, Water Budget, and previously in Section 4.4.1, it has been necessary to estimate historical groundwater use where direct measurement was unavailable. Therefore, evaluation and as-needed adjustment to the Program parameters will be conducted every 5 years, at a minimum.

Legal authority and Regulatory Process

SGMA provides the GSA with authority to: "control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate, . . . or otherwise establishing groundwater extraction allocations" (CWC, Section 10726.4(a)). Also,

> in addition to any other authority granted to a groundwater sustainability agency by this part or other law, a groundwater sustainability agency may enter into written agreements and funding with a private party to assist in, or facilitate the implementation of, a groundwater sustainability plan or any elements of the plan (CWC, Section 10726.5).

Further, the powers outlined in SGMA are in addition to, and not a limitation on the authority granted to local agencies under any other law (CWC, Section 10725(a), 10726.8(a)). And, counties have independent authority under their police powers to act to protect groundwater and other related resources (Envt'l Law Foundation v. State Water Resources Control Board (Aug. 29, 2018), 3rd District Court of Appeal case no. C083239; Allegretti & Co. v. County of Imperial (2006) 138 Cal.App.4th 1261; Baldwin v. County of Tehama (1994) 31 Cal.App.4th 166). Courts have power to adopt pumping restrictions in situations of overdraft as part of a Physical Solution under the California Constitution Article X, Section 2. Ramp down provisions have been approved by California Courts as acceptable means of implementing physical solutions.

In addition, under SGMA, "no extraction of groundwater between January 1, 2015, and the date of adoption of the plan pursuant to this part . . . may be used as evidence of, or to establish or defend against, any claim of prescription" (CWC, Section 10720.5(a)). The protection of the Subbasin and the achievement of the sustainability goals could be put at significant and unreasonable risk were the establishment of BPA's delayed until a later date. Failure to approve the BPA's at the time of Physical Solution adoption could encourage pumpers to pump more groundwater in order to establish or defend against prescription. The Watermaster takes the place of the GSA and may exercise the authority of a GSA consistent with the Judgment and subject to the restrictions on such authority in SGMA and under the continuing jurisdiction of the Court. Accordingly, adopting the BPA's and ramp down immediately, as part of the Physical Solution, is the most protective of the Subbasin and in compliance with SGMA and other laws.

4.5 PROJECTS AND MANAGEMENT ACTION NO. 4 – VOLUNTARY FALLOWING OF AGRICULTURAL LAND

4.5.1 Program Description of Voluntary Fallowing of Agricultural Land

The voluntary Fallowing Program will constitute a mechanism to facilitate the conversion of high water use irrigated agriculture to low water use open space, public land, or other development on a voluntary basis. Due to the extent of the overdraft within the Subbasin and the infeasibility of increasing water production or tapping imported supplies, land fallowing is a necessary and principal management action to achieve sustainability. Although some fallowing programs in California are short term to address a specific drought or shortage, the program proposed for the Subbasin is primarily for long-term or permanent fallowing or conversion to other land uses. Approximately 2,480 acres of land in the Subbasin have been fallowed in the last several decades and another 600 acres were recently fallowed as part of the water credit program as described in Section 2.1.2, Water Resources Monitoring and Management Program.

Currently, there are about 2,624 acres of active agriculture within the Subbasin. It is anticipated that each of these lands/landowners with water demands during 2010–2014 will receive freely transferable BPAs as part of the Physical Solution that, in turn, will encourage cultivated lands to be fallowed. Factors that will be considered for the fallowing program include the current extent of agriculture land and water use, the intended land and water use after fallowing, and the potential environmental impacts associated with fallowing. These include airborne emissions through wind-blown dust, the introduction or spreading of invasive plant species, and changes to the landscape that could adversely affect visual quality. The land uses proximal to the fallowing projects will affect the processes utilized and best management practices associated with fallowing proposals will be developed as part of this management action. For example, there could be differing levels of site stabilization or restoration needed or required based on the land use intended post- fallowing. Temporary stabilization will be less expensive and may be appropriate for properties to be developed for other use in the near term. A passive restoration approach may be applied if the goal is for the property to eventually return to native habitat, and active restoration may be applied for relatively near-term restoration to native habitat with the goal of providing open space, parks, or public trails.

The Physical Solution includes mandatory minimum fallowing requirements for permanent BPA transfers.

Legal Authority and Regulatory Process

Establishment of a voluntary land fallowing program is expressly authorized under SGMA (CWC, Section 10726.2(c)).

4.5.2 Voluntary Fallowing of Agricultural Land Program Relationship to Sustainability Criteria

The Fallowing Program will address each of the undesirable results that have been identified for the Subbasin by reducing the amount of groundwater consumed from existing uses and reduced application of fertilizers or other agrichemicals. Reduced pumping will help to stabilize groundwater levels and increase groundwater in storage. Degradation of water quality may be limited to the extent that land fallowing or changes in land use reduces the amount of fertilizers applied for the former land uses.

Relationship to Measurable Objectives

The land fallowing program will serve as a significant, direct physical action to meet the measurable objectives of chronic lowering of groundwater levels and the reduction in groundwater storage. Further, it is anticipated to support certain measurable objectives for degradation of water quality, most notably for nitrate and TDS associated with agricultural return flows.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as a significant, direct physical action to maintain sustainability indicators, including groundwater levels, groundwater storage, and water quality above minimum thresholds to avoid undesirable results. Additionally, improvements to water quality are expected as a result of reduction of fertilizer use and return flows to the aquifer.

4.5.3 Expected Benefits from Voluntary Fallowing of Agricultural Land Program

In addition to the benefits derived directly from reduced pumping, the program will allow for a level of land use and community planning for converted properties not otherwise available. Depending on the nature of land uses implemented, the program could result in increased recreational space or potential economic benefits from conversion of land use types. For example, the conversion of previously fallowed land to a land restoration project that is expected to improve infiltration of stormwater runoff along the Coyote Creek wash is currently being evaluated.

4.5.4 Timetable for Implementation of Voluntary Fallowing of Agricultural Land Program

The program will result in immediate groundwater savings, which may increase with addition of fallowed lands and fluctuate depending on the nature and timing of converted land use.

4.5.5 Metrics for Evaluation of Voluntary Fallowing of Agricultural Land Program

The Voluntary Fallowing of Agricultural Land Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are the ultimate metrics to evaluate effectiveness. Direct metrics by which to evaluate the success of the fallowing program include comparison of pre- and post- pumping records for fallowed or converted properties, to the extent available. The area of irrigated land and crop types should also be directly tracked to monitor program effectiveness. Additionally, the number of fallowing projects implemented, active and or planned are to be tracked. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Voluntary Fallowing of Agricultural Land Program as shown in Table 4-8.

Table 4-8
Metrics for Evaluating Voluntary Fallowing of Agricultural Land Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 4	Voluntary Fallowing of Agricultural Land	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Area of irrigated land and crop type	1 Water budget components 2. Water quality 3. Subbasin demographics 4. End-use of fallowed land

Table 4-8
Metrics for Evaluating Voluntary Fallowing of Agricultural Land Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
		5. Area of fallowed land 6. Number of implemented/active/planned projects	5. Stabilization of site soils 6. Cost

Notes: PMA = Projects and Management Action

4.5.6 Economic Factors and Funding Sources for Voluntary Fallowing of Agricultural Land Program

The Voluntary Fallowing of Agriculture Program will be self-funded by the parties to any permanent transfer of agricultural BPA.

Additionally, wells that will no longer be used will have costs to be properly destroyed. Such costs will be self-funded by the parties to any permanent transfer of agricultural BPA..

4.5.7 Voluntary Fallowing of Agricultural Land Program Uncertainty

Compliance with the minimum fallowing standards is required for permanent transfers of BPA. Program uncertainty is related to the willingness of property owners to participate in the program and the water consumption of future, post fallowing, post transfer land uses. These parameters will be evaluated during the first phase of the implementation.

4.6 PROJECTS AND MANAGEMENT ACTION NO. 5 – WATER QUALITY OPTIMIZATION

Groundwater is extracted for multiple beneficial uses in the Subbasin including municipal and domestic use, and for irrigation. At a minimum, for municipal and domestic wells, the water quality must meet potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture and recreational use. Water quality optimization is primarily focused on ensuring potable water quality for municipal and domestic use. Additionally, water quality optimization will evaluate the potential to match water quality for intended uses such as the potential to use groundwater with elevated nitrate concentrations or other constituents of concern for irrigation. In general, the groundwater quality in the Subbasin is good and meets California drinking water maximum contaminant levels without the need for treatment.

As documented in Section 2.2.2.4, Groundwater Quality, naturally occurring poor water quality has been identified in specific areas: near the margins of the Subbasin where unconsolidated sediments are in contact with fractured bedrock; for select wells screened predominantly in the lower aquifer of the South Management Area that have concentrations of arsenic above the drinking water maximum contaminant level; and near the Borrego Sink where elevated sulfate and TDS are likely associated with dissolution of evaporites from the dry lake. Historical groundwater quality impairment for nitrates is noted for select portions of the Subbasin predominantly in the upper aquifer of the North Management Area underlying the agricultural areas and near high density of septic point sources. The source of nitrates is likely associated with either fertilizer applications or septic return flows. It should be noted that BWD does not have wells in the Borrego Sink area, and utilizes wells that produce water meeting Title 22 requirements without further treatment.

A robust groundwater quality monitoring program is essential to the implementation of the "Water Quality Optimization Program." Analysis of the existing monitoring program and data gaps has revealed lateral, vertical, and temporal limitations to water quality data availability. These data gaps will be addressed with collection and analysis of additional data and implementation of this GMP as described in Section 3.5, Monitoring Network.

4.6.1 Water Quality Optimization Program Description

Implementation of the Water Quality Optimization Program is to be initially conducted at the planning level. However, preliminary evaluations have already been conducted for several water quality optimization options. These are presented briefly following the section on planning considerations as follows.

Water Quality Optimization Planning

Development of the Groundwater Quality Optimization Program is anticipated to include three general phases: (1) investigation to identify the sources, nature, and extent of existing and potential future water quality impairments; (2) as needed, development of work plans to implement mitigation strategies; and (3) implementation of water quality mitigation projects.

The initial program phase will be to evaluate key issues associated with program development as follows:

- Evaluate existing data for gaps related to identification of contaminant sources (e.g., well construction information in areas with suspected surficial contaminant sources) through the Technical Advisory Committee process.
- Perform outreach with applicable stakeholders to obtain input regarding pertinent practices or anticipated future activities and vulnerabilities (e.g., meeting with farmers regarding fertilizer application practices).
- Scope investigations to fill data gaps or refine preliminary findings.
- Evaluate proactive abandonment of inactive wells to minimize migration pathways.

- As needed, prepare recommended mitigation alternatives for Watermaster consideration, with associated cost-benefit analyses.
- Identify potential funding sources.
- Consider costs and benefits for combined treatment projects and methods.
- As needed, scope a feasibility study for outlining the procedures for characterizing and mitigating degraded groundwater quality in the Subbasin.
- Prepare a Groundwater Quality Optimization Plan.

BWD Water Quality Optimization Options

Both direct treatment and indirect options have been considered to optimize groundwater quality and its use. Direct treatment of some types of groundwater contaminants may not be cost effective. There are indirect methods that may be more cost effective such as blending of poor quality water with better quality water, the construction of new wells in areas or aquifers with better quality water, transfer of water to areas where water use is better suited to a particular water quality as described in Section 4.7, PMA No. 6 – Intra-Subbasin Water Transfers, and reallocation of pumping production between wells.

Direct Treatment Options

The BWD has investigated the treatment of arsenic and nitrates on a preliminary basis. Treatment and cost considerations are presented *in Water Replacement and Treatment Cost Analysis for the Borrego Valley Groundwater Basin* (Dudek 2015). The feasibility of treatment is dependent on several factors including the contaminant concentration, quantity of water to be treated, the type of treatment facilities, and the operation and maintenance cost associated with particular treatment methods. Wellhead treatment systems yielded a wide range of total costs based on the level of uncertainty. The costs have been estimated to be between $227 and $548 per acre-foot for municipal production wells (Dudek 2015). Treatment system costs have not been evaluated for domestic wells because there have been no known detections of arsenic above drinking water standards reported for domestic wells. If private wells were to become impacted by water quality degradation, the feasibility of direct treatment would be evaluated.

Indirect Treatment Methods

Indirect treatment methods considered include various blending scenarios, the construction of new wells and delivery facilities, and re-allocation of pumping among existing wells.

Blending

Arsenic levels above the maximum contaminant level have historically been documented in one active BWD well and several private irrigation wells in the South Management Area; however, all BWD wells currently meet drinking water standards. There is a potential that continued decline in groundwater levels may result in increased arsenic concentrations. If increased arsenic concentrations do occur in BWD wells in the future, blending of water from these wells with BWD wells that do not have elevated arsenic is potentially a low-cost alternative to direct treatment. The cost associated with blending is highly variable and will depend on proximity of wells and the water quality of the blending source well. Additionally, the Division of Drinking Water would need to review and approve any potential blending plan, and it may not be possible to meet Division of Drinking Water standards because blending is not a preferred permanent alternative due to the potential for variability in the concentration of arsenic at the well-head over time.

New Well and Pipeline

This option would require the construction of new extraction wells in a part of the basin with acceptable water quality (potentially the North Management Area or Central Management Area). In addition to well construction costs associated with this alternative, costs to be evaluated include the cost of distribution pipelines, ongoing maintenance costs, and project power. The BWD is currently locating, designing and constructing up to three new potable extraction wells as part of its current Capital Improvement Plan.

Reallocation of Pumping from Existing Wells

Another option in the future is to re-allocate production from wells with higher levels of constituents of concern and potential for future water quality degradation, with production from more reliable wells with better water quality. The feasibility of this mitigation measure would be based on availability of water resources from wells in other parts of the Subbasin. If private wells were to become impacted by water quality degradation, the feasibility of drilling new wells or connecting to the BWD distribution system would be evaluated.

4.6.2 Water Quality Optimization Relationship to Sustainability Criteria

The Water Quality Optimization Program will address the undesirable result of water quality degradation. Avoiding undesirable results to water quality benefits the whole Subbasin to the benefit of all pumpers. Depending on the methods selected to optimize water quality, the Water Quality Optimization Program could potentially help to alleviate declining groundwater levels in particular areas of the basin by relocating pumping to other parts or management areas.

Relationship to Measurable Objectives

The Water Quality Optimization Program will be implemented to meet the measurable objectives for water quality.

Relationship to Minimum Thresholds

Consistent with the measurable objectives, the program serves as a direct physical action to maintain water quality above minimum thresholds to avoid undesirable results.

4.6.3 Expected Benefits of Water Quality Optimization

The primary benefit of the Water Quality Optimization Program is the existing and future maintenance of high quality water produced by groundwater extractors. Associated benefits may include lower long-term water costs to customers and reduction of future degradation of water quality.

4.6.4 Timetable for Implementation of the Water Quality Optimization

It is anticipated that the Water Quality Optimization Program will require a significant analysis and planning component prior to the implementation of specific water quality projects. Such planning has already started and the entire planning component is expected to take from 18 to 24 months after adoption of the Physical Solution. The need for specific water quality optimization projects will be evaluated annually through the Technical Advisory Committee process based on the results of the monitoring network described in Section 3.5, Monitoring Network.

4.6.5 Metrics for Evaluation of Water Quality Optimization

Water Quality Optimization will include both direct and indirect metrics to evaluate the effectiveness of the program. Effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater quality in the Subbasin is the ultimate metric to evaluate effectiveness. Water quality evaluation has been included in the data gaps analysis and groundwater monitoring plan as described in Section 3.5, Monitoring Network. Specific metrics will include monitoring for the constituents most likely to be of concern in the basin, including arsenic, nitrate, sulfate, fluoride, and TDS. Metered groundwater extraction, groundwater levels and corresponding changes in groundwater storage will be monitored as they potentially relate to the potential for leaching of contaminants from subsurface geology. Active and implemented optimization projects will be tracked, and the need for new projects will be identified. Water budget components, when combined with demographic information and project costs may be used as an indirect measure of the effectiveness of the Water Quality Optimization as shown in Table 4-9.

Table 4-9
Metrics for Evaluating Water Quality Optimization Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 5	Water Quality Optimization	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Water quality 5. Active projects/identification of need for projects 6. List of implemented projects	1. Water budget components 2. Subbasin demographics 3. Cost

Notes: PMA = Projects and Management Action.

4.6.6 Economic Factors and Funding Sources for Water Quality Optimization Program

Planning-level development cost for establishing the Water Quality Optimization Program is estimated to be approximately $124,000.

Potential sources of funding for the Water Quality Optimization program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.6.7 Water Quality Optimization Program Uncertainty

Program uncertainty includes unknown existing and future water quality, and the costs and efficacy associated with projects selected to address water quality degradation. These costs are dependent on a more thorough characterization of the severity and location of existing and potential future water quality impairments. Additionally, there is uncertainty regarding the availability of funding to implement the Water Quality Optimization Program.

4.7 PROJECTS AND MANAGEMENT ACTION NO. 6 – INTRA-SUBBASIN WATER TRANSFERS

4.7.1 Intra-Subbasin Water Transfers Program Description

The purpose of Intra-Subbasin Transfer Program is to mitigate existing and future reductions in groundwater storage and groundwater quality impairment by establishing conveyance of water from higher to lower production alternative areas in the Subbasin. This PMA will evaluate the feasibility and effectiveness of utilizing new or existing well sites in the Subbasin where groundwater conditions are more favorable for continued groundwater extraction. Currently, the BWD is the only entity in the Subbasin with a large water distribution system. The BWD distribution system supplies only potable water. All other water users in the Subbasin only have small, private conveyance restricted to limited areas of land. These include both potable and non-potable systems for domestic and irrigation use.

The GMP has designated three Subbasin management areas as described in Section 2.2.4, Management Areas. The management areas are based primarily for the purpose of groundwater quality management since the end uses of groundwater differs substantially across the three management areas. Wells in the North Management Area (NMA) serve primarily agricultural use whereas wells in the Central Management Area (CMA) primarily serve municipal and recreational uses, and wells in the South Management Area (SMA) primarily serve recreational use which means there may be different thresholds for undesirable results for potable versus non-potable uses. For example, groundwater pumped in the NMA, with potentially elevated nitrate levels from irrigation return flow, might be beneficially used to irrigate golf course turf in the CMA or SMA. Conveyance of non-potable water in the Subbasin would require construction of a new non-potable distribution system. A non-potable distribution system could benefit all pumpers in the Subbasin because it would preserve areas of the Subbasin where water meets drinking water standards. Additionally, because the Desert Lodge anticline effectively compartmentalizes the SMA from the CMA, it may be necessary to convey water between management areas to achieve location specific measurable objectives for groundwater levels and groundwater in storage. The need for transfer of pumped groundwater may be of benefit to other areas of the Subbasin depending on the timing and location of pumping reductions. For instance, if a sizable area of land were fallowed in the NMA, there is the potential to use existing wells to supply water to the CMA or SMA.

This PMA would only be implemented after the Watermaster evaluates the feasibility and effectiveness of utilizing new or existing well sites in the Subbasin where groundwater conditions are more favorable for continued groundwater extraction. As part of this PMA, current system infrastructure, condition, and needs as well as identify potential siting for new wells and conveyance facilities will be evaluated.

Development of the Intra-Subbasin transfer program will include the following steps:

- Inventory of existing infrastructure with considerations for capacity, condition, and vulnerabilities.
- Identification and prioritization of specific extraction wells that warrant mitigation/replacement.
- Preliminary opportunities and constraints analysis.

- Identification of current and potential future water blending opportunities and limitations.
- Estimated costs for anticipated future water treatment requirements (i.e., arsenic, nitrate, TDS) for the existing well network.
- Cost-benefit analysis for various selected project alternatives.
- Development of a more specific Intra-Subbasin Water Transfer Plan.

Legal Authority and Regulatory Process

A GSA has the power to "perform any act necessary or proper to carry out the purposes of [SGMA]" (CWC Section 10725.2(a)). A GSA may also "authorize temporary and permanent transfers of groundwater extraction allocations within the agency's boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the groundwater sustainability plan." A GSA also has the power to "(e) Transport, reclaim, purify, desalinate, treat, or otherwise manage and control polluted water, wastewater, or other waters for subsequent use in a manner that is necessary or proper to carry out the purposes of this part" (CWC, Section 10726.2(e)).

4.7.2 Intra-Subbasin Water Transfers Program Relationship to Sustainability Criteria

The Intra-Subbasin Transfer Program will potentially address multiple undesirable results identified for the Subbasin. Groundwater level declines may be addressed by the transfer of water from parts of the Subbasin with stable groundwater levels to those with pumping depressions or groundwater level declines. Water transfers may also allow for selective pumping of the middle or lower aquifers as opposed to the upper aquifer, which is likely more susceptible to water quality impacts as a result of septic and irrigation return flows. Use of groundwater resources may be optimized by the transport of water for uses to which the water quality is compatible, thereby potentially preserving good water quality for potable use. For example, transfer of high nitrate groundwater for irrigation may reduce the reliance on potable water.

Relationship to Measurable Objectives

The Intra-Subbasin Transfer Program is intended to optimize water supply and demand for beneficial users in the Subbasin. This program will evaluate the distribution of pumping in the Subbasin that could result in direct effects to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as a direct physical action to manage groundwater levels, groundwater in storage and water quality above minimum thresholds to avoid undesirable results.

4.7.3 Expected benefits of the Intra-Subbasin Water Transfers Program

The primary benefit of the Intra-Subbasin Transfer Program is that it will provide flexibility in regard to where groundwater is produced and consumed. In particular, it provides a potential mechanism to convey both potable and non-potable water to end users. This would allow for conveyance of groundwater of specific water quality for purposes to which its use is compatible. Additionally, it could provide an additional tool to reduce groundwater extraction from areas of declining groundwater levels. It is expected that Intra-Subbasin Transfer Program would help achieve measurable objectives for groundwater levels, groundwater in storage and water quality.

4.7.4 Timetable for Implementation of the Intra-Subbasin Water Transfers Program

It is anticipated that the planning part of the Intra-Subbasin Transfer and analysis plan will require approximately 9–12 months but potentially be required to be initiated through the Technical Advisory Process during Physical Solution implementation based on the results of the monitoring network as described in Section 3.5, Monitoring Network.

4.7.5 Metrics for Evaluation of the Intra-Subbasin Water Transfers Program

The Intra-Subbasin Water Transfer Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds. As such, groundwater levels, corresponding changes in Subbasin groundwater storage, and water quality are probably the most representative metrics to evaluate effectiveness. Direct metrics by which to evaluate the success of the metrics for the evaluation of the Intra-Subbasin Transfer Program include area and aquifer-specific measurement of groundwater levels and corresponding changes in groundwater storage, metering of groundwater production and monitoring water quality. Active and implemented projects will be tracked, and the need for new projects will be identified. Water budget components, when combined with demographic information and project costs, may be used as an indirect measure of the effectiveness of the Intra-Subbasin Water Transfers as shown in Table 4-10.

Table 4-10
Metrics for Evaluating Intra-Subbasin Water Transfers Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 6	Intra-Subbasin Water Transfers	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater production 4. Water quality 5. Active projects/identification of need for projects 6. List of implemented projects	1. Water budget components 2. Subbasin demographics

Notes: PMA = Projects and Management Action

4.7.6 Economic Factors and Funding Sources for Intra-Subbasin Water Transfers Program

Planning-level development cost for establishing the Intra-Subbasin Water Transfers Program is estimated to be approximately $90,000.

Potential sources of funding for the Intra-Subbasin Water Transfers Program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.7.7 Intra-Subbasin Water Transfers Program Uncertainty

Program uncertainty associated with intra-subbasin water transfers includes the cost and availability of land for infrastructure and facilities construction, level of participation of water users, and water quality suitability for contributing and receiving uses, some of which activities may require CEQA compliance. Intra-subbasin water transfers may require construction of new pipeline conveyance systems, siting and construction of new extraction wells, and additional analysis of water quality.

4.8 GROUNDWATER SUSTAINABILITY PLAN COORDINATION WITH GENERAL PLAN UPDATE

SGMA (CWC, Sections 10727.2(g), 10726.9) requires coordination of GSPs with General Plan Updates in order to promote consistency within the planning documents. In this case, the County will have a representative on the Watermaster Board and, thus, this task of coordination is more streamlined than it may be with the development of GSPs.

The sustainability goals of the Physical Solution are anticipated to play a central role in the County's next General Plan update process, which encompasses updates to the Borrego Springs Community Plan (see Chapter 2, Basin Setting). The GSA prepared a *Planning, Permitting and Ordinance Review Technical Report* attached as Appendix __ that identifies key issues of current County plans and policies that may need to be changed or updated to ensure consistency with the

Physical Solution's long-term sustainability goal and sustainable management criteria of the GMP.

4.9 REFERENCES CITED

Bambach, J.C. 2018. Borrego Springs Resort Golf Club & Spa Turf Irrigation. Phone communication with J.C. Bambach (Borrego Springs Resort Golf Club & Spa) and T. Driscoll (Dudek). August 27, 2018.

BWD (Borrego Water District). 2009. Borrego Water District Integrated Water Resources Management Plan. Prepared by William R. Mills. March 2009.

BWD. 2018. Draft Ordinance No. 2018-1 of the Board of Directors of the Borrego Water District Relating to Water Shortages and Water Shortage Emergencies. April 25, 2018.

County (County of San Diego). 2013. Borrego Springs Community Plan. Prepared by the County of San Diego planning Department. Amended May 15, 2013.

County. 2015. County of San Diego Department of Environmental Health Land and Water Quality Division. Graywater System Requirements for a Single Clothes Washer. January 12. 2015.

County. 2015b. County of San Diego Department of Environmental Health Land and Water Quality Division. Graywater Systems for Outdoor Irrigation Design and Procedures Manual. February 3, 2015.

Dudek 2015. Water Replacement and Treatment Cost Analysis for the Borrego Valley Groundwater Basin. December 11, 2015.

Duncan, D. 2018a. Turf Removal Projects. Email communication with D. Duncan (President, Borrego Springs Homeowners Association) and T. Driscoll (Dudek). May 10, 2018.

Duncan, D. 2018b. Turf Removal Projects. Email communication with D. Duncan (President, Borrego Springs Homeowners Association) and T. Driscoll (Dudek). July 26, 2018.

DWR (Department of Water Resources), State Water Resources Control Board, California Public Utilities Commission, California Department of Food and Agriculture, and California Energy Commission. 2017. Making Water Conservation a California Way of Life. Implementing Executive Order B-37-16. Final Report. April. 2017.

Mann, R. 2014. Economic Analysis of Individual Actions Recommended for Detailed Analysis For: California Department of Water Resources and Borrego Water Coalition, R. Mann, PhD, June 2, 2014.

Smith, S. 2018. Rams Hill Golf Course Turf Irrigation. Phone communication with S. Smith (Rams Hill Golf Course) and T. Driscoll (Dudek). August 21, 2018.

SOW (Save Our Water). 2019. Site accessed February 22, 2019. https://saveourwater.com/

CHAPTER 5
PLAN IMPLEMENTATION

5.1 GROUNDWATER MANAGEMENT PLAN IMPLEMENTATION AND ESTIMATED COSTS

The Physical Solution (Plan) will be implemented by the Watermaster under the Judgment. The following sections include cost estimates previously developed by the GSA for Plan implementation including annual reporting, periodic updates, monitoring protocols, and projects and management actions (PMAs). The Watermaster's costs for Physical Solution implementation are likely less than those GSP implementation costs estimated by the GSA due to anticipated efficiencies entailed by the negotiated terms of the Physical Solution that have been agreed to by participating pumpers.

As a potential worst case cost assessment, the following sections include potential Physical Solution implementations costs, as developed for the GSA/GSP process. Potential funding sources and mechanisms are presented along with a tentative schedule for implementing the Plan's primary components. In addition, annual reporting and 5-year update procedures for the Borrego Springs Groundwater Subbasin (Subbasin, Plan Area) are described.

Standards for Plan Implementation

Under the GSP Regulations (23 California Code of Regulations (CCR) Section 350, et seq.), a GSP is to include the following:

- An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs (23 CCR Section 354.6(e)).
- Schedule for Implementation (23 CCR Sections 352.4(c)(2) and 355.4(b)(2)).

Annual Reporting

The Watermaster shall submit an annual report to the Court and Department of Water Resources (DWR) by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:

1. General information, including an executive summary and a location map depicting the basin covered by the report.
2. A detailed description and graphical representation of the following conditions of the basin managed in the Plan:
    a. Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

   i. Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

   ii. Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

b. Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

c. Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

d. Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements.

e. Change in groundwater in storage shall include the following:

   i. Change in groundwater in storage maps for each principal aquifer in the basin.

   ii. A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

3. A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report (CCR Section 356.2).

5-Year Evaluation

The Watermaster shall evaluate its Plan at least every 5 years and whenever the Plan implementation is amended, and provide a written assessment to DWR as part of its Annual Report. The assessment shall describe whether the Plan implementation, including implementation of PMAs, are meeting the sustainability goal in the Subbasin, and shall include the following:

1. A description of current groundwater conditions for each applicable sustainability indicator relative to measurable objectives, interim milestones and minimum thresholds.

2. A description of the implementation of any projects or management actions, and the effect on groundwater conditions resulting from those projects or management actions.
3. Elements of the Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, shall be reconsidered and revisions proposed, if necessary.
4. An evaluation of the basin setting in light of significant new information or changes in water use, and an explanation of any significant changes. If the Agency's evaluation shows that the basin is experiencing overdraft conditions, the Agency shall include an assessment of measures to mitigate that overdraft.
5. A description of the monitoring network within the basin, including whether data gaps exist, or any areas within the basin are represented by data that does not satisfy the requirements of the GSP Regulations (23 CCR Sections 352.4 and 354.34(c)). The description shall include the following:
    a. An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of Section 354.38.
    b. If the Agency identifies data gaps, the Plan shall describe a program for the acquisition of additional data sources, including an estimate of the timing of that acquisition, and for incorporation of newly obtained information into the Plan.
    c. The Plan shall prioritize the installation of new data collection facilities and analysis of new data based on the needs of the basin.
6. A description of significant new information that has been made available since Plan adoption or amendment of the Plan's implementation, or the last 5-year assessment. The description shall also include whether new information warrants changes to any aspect of the Plan's implementation, including the evaluation of the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results.
7. A description of relevant actions taken by the Watermaster, including a summary of Rules and Regulations related to the Plan.
8. Information describing any enforcement or legal actions taken by the Agency in furtherance of the sustainability goal for the basin.
9. A description of completed or proposed Plan amendments.
10. Where appropriate, a summary of coordination that occurred between multiple Agencies in a single basin, Agencies in hydrologically connected basins, and land use agencies.
11. Other information the Agency deems appropriate, along with any information required by DWR to conduct a periodic review as required by California Water Code (CWC) Section 10733 (CCR Section 356.4).

5.1.1 Groundwater Sustainability Agency Annual Budget

The GSA previously performed substantial work toward estimating the cost of contemplated GSP implementation. Summaries of the tasks and costs previously estimated by the GSA to undertake the draft GSP are provided in the following subsections. The cost estimates below do not reflect the cost of Watermaster implementation of the Physical Solution. The Initial Watermaster Budget is attached to the Judgment and subsequent year projected costs will be developed as part of the Watermaster Annual Budget process.

5.1.1.1 Operations and Monitoring Costs

Annual operations include semi-annual monitoring of groundwater levels, water quality, and streamflow monitoring, and annual review of land subsidence data, if necessary, in accordance with the monitoring plan (described in Chapter 3, Section 3.5). Other tasks include data management system maintenance, update of the groundwater model, and monitoring equipment maintenance. The required annual report will be produced in accordance with Section 356.2 of the GSP Regulations. The total annual cost of these tasks is estimated to be $303,261 per year starting in fiscal year (FY) 2020; however, some tasks such as the Borrego Valley Hydrologic Model update or land subsidence review may not occur annually throughout GMP implementation but have been included annually to provide a conservative estimate. A task list and related estimated annual costs are provided in Table 5-1.

Table 5-1
Operations and Monitoring Costs

Expense Item		Estimated Annual Costs (FY 2020)
Task 1:	Semi-Annual Groundwater Level Monitoring	$29,616 *
Task 2:	Semi-Annual Water Quality Monitoring	$69,131
Task 3:	Semi-Annual Stream Monitoring	$11,302
Task 4:	Pump Metering	$10,927 *
Task 5:	Land Subsidence Review	$9,168
Task 6:	Operation and Maintenance	$20,739
Task 7:	Data Management System	$19,508
Task 8:	Annual Groundwater Model Update	$79,375 *
Task 9:	Annual Comprehensive DWR Reporting	$16,444
Task 10:	Project Management and Coordination	$37,051
	Total	**$303,261**

Notes: FY = fiscal year; DWR = Department of Water Resources. * Task Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution

A summary of the scope of each task previously described by the GSA for implementation of the draft GSP is as follows. The following tasks do not necessarily describe Watermaster implementation costs for the Physical Solution:

12. **Semi-Annual Groundwater Level Monitoring** Monitoring of groundwater levels conducted semi-annually throughout the well network within the Subbasin. This may consist of multiple days of field monitoring annually in which trained professionals will manually measure depth to groundwater, or, collect data from transducer data loggers. Management of data, as well as annual preparation of groundwater level monitoring summary memorandum.
13. **Semi-Annual Water Quality Monitoring** Collection, testing, and analysis of groundwater samples from designated monitoring wells on a semi-annual basis. A trained professional will visit designated wells, perform field testing of select water quality parameters, collect samples, and send samples to laboratory for water quality testing. Test results will be tabulated and reported per the GSP guidelines. Management of data, as well as annual preparation of water quality monitoring summary.
14. **Semi-Annual Stream Monitoring** Inspection and monitoring of streams within basin on a semi-annual basis. Tasks may include measuring flow rates, visual inspection of streams, noting changes in geomorphology, and preparation of stream monitoring summary.
15. **Pump Metering** Quality assurance and quality control of supplied metering data of groundwater extraction, annual meter reads (non-self-reporting wells), meter calibration and validation, and new meter installations in accordance with the Metering Plan (Appendix E). Preparation of annual groundwater extraction summary.
16. **Land Subsidence Monitoring** Evaluation of existing monument survey to examine and estimate any changes in land subsidence. Management of data and preparation of periodic land subsidence summary, if necessary.
17. **Operation and Maintenance** Maintenance and minor repairs to various monitoring instruments including: transducers, dataloggers, well heads, etc. This task may also include inspections of fallowed lands.
18. **Data Management System** Maintenance and hosting of data management system. Updates and quality assurance of organization and viability of stored data.
19. **Annual Groundwater Model Update** Annual updates to groundwater model as a result of new and higher resolution data within the Subbasin. Preparation of periodic groundwater model summary, as necessary.
20. **Annual Comprehensive Department of Water Resources (DWR) Reporting** Preparation of draft DWR annual reports as outlined in the draft GSP. Review and edits of draft annual reports. Preparation and submittal of final DWR annual reports as outlined in the draft GSP.
21. **Project Management and Coordination** Correspondence between GSA and consultants, including GSA and Borrego Town Hall or GSP implementation update

meetings. Project management and as-needed correspondence to complete annual draft GSP requirements.

5.1.1.2 Management, Administration, and Other Costs

The GSA previously anticipated that it would incur additional costs for internal management and administration by Borrego Water District (BWD) and County staff. The following discussion does not reflect Watermaster administration and other costs. Initial Watermaster costs are included in the Initial Watermaster Budget attached to the Judgment and subsequent year projected costs will be developed as part of the Watermaster Annual Budget process. The level of effort in fulltime equivalent (FTE) employees and corresponding fully burdened rates is still being estimated, but at this state the GSA estimates it will require two FTEs at a fully burdened rate of $120,000 per FTE. The GSA may also incur costs related to repair and replacement of capital assets such as well meters, vehicles, equipment, and supplies, as well as potential legacy costs of well abandonment. It is assumed that the GSA will lease office and other space from BWD for operations and administration. Rent is roughly estimated at $500 per month or $6,000 per year. Legal fees are estimated at $30,000 per year based on legal fees currently paid to develop the draft GSP. Other expenses include audit services, insurance, office supplies, etc. and are roughly estimated based on comparable agency costs. Cost estimates for these items require additional evaluation; however, these other expenses are expected to be a fraction of personnel and legal expenses. Additional variable costs include engineering services, permits and fees, and land management/stewardship expenses that are expected to be incurred once PMAs are fully developed. Once PMAs are developed the GSA will update annual management, administration and other costs. Table 5-2 provides a comprehensive list of line item expense types that the GSA was expected to incur.

Table 5-2
Management, Administration, and Other Costs

Expense Item		Estimated Annual Costs (FY 2020)
1	Administrative Personnel (two FTE)	$240,000
2	Rent/Leases (BWD space)	$6,000
3	Utilities	$500
4	Consulting Services	$10,000
5	Audit and Professional Services	$5,000
6	Legal	$30,000
7	Insurance	$3,750
8	Public Outreach	$6,000
9	Repairs and Maintenance	$1,500
10	Supplies and Equipment	$750
11	Office Supplies	$500
12	Miscellaneous Expenses	$1,500

Table 5-2
Management, Administration, and Other Costs

Expense Item	Estimated Annual Costs (FY 2020)
Total	$305,500

Notes: FY = fiscal year; FTE = fulltime equivalent, BWD = Borrego Water District. * Costs above do not reflect Watermaster costs for implementing the Physical Solution

5.1.2 Reserves and Contingencies

In addition to covering the operations budget, the Watermaster budget includes a reserves policy which is expressly authorized by the Sustainable Groundwater Management Act (SGMA) (CWC Sections 10730(a) and 10730.2(a)(1)). Reasonable and achievable reserves are a prudent financial tool to aid in cash flow timing and unforeseen expenditures. Generally, a reserve for operations targets a specific percentage of annual operating costs or days of cash on hand. The reserve target is influenced by several factors including the frequency of billing and the recurrence of expenses. Comparable agencies use a reserve percentage of 50% of operating budget if billing semi-annually, less if more frequent. The bases and values for reserves are presented in the Initial Watermaster Budget attached to the Judgment. Subsequent years' reserves will be included in the Watermaster's Annual Budget process.

5.1.3 Periodic (5-Year) Groundwater Sustainability Plan Update Costs

Every fifth year of Physical Solution implementation and whenever the Physical Solution implementation is amended, the Watermaster will prepare and submit a Watermaster Evaluation and Assessment Report to the Court and DWR together with the annual report for that year. The assessment and report will be prepared as described in California Code of Regulations (CCR) Section 356.10. Table 5-3 provides a list of tasks and estimated cost that the GSA expected to incur to complete 5-year updates as part of the draft GSP.

Table 5-3
Groundwater Sustainability Plan 5-Year Update Costs

Expense Item		Estimated 5-Year Additional Costs
Task 1	Updated Water Budget, Groundwater Model and Sustainable Yield	$31,430
Task 2	Assessment of Pumping Allocations	$14,450
Task 3	5-Year Plan Evaluation and Assessment Report	$19,120
	Total	$65,000

. * Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution

5.1.4 Projects and Management Actions Development Costs

Details of the proposed PMAs are presented in Chapter 4, Projects and Management Actions. Task descriptions and estimated costs associated with the GSA's development of each PMA for the draft GSP are summarized in Table 5-4. Proposed PMAs are presented at the planning level and additional costs will be incurred with full implementation.

Table 5-4
Projects and Management Actions Development Costs

PMA Number	PMA	Estimated Cost	Level of Project Development
1	Water Trading Program	$122,065	Planning and trading system development*
2	Water Conservation Program (Demand Management)	$130,390	Planning, field surveys and cost development*
3	Pumping Reduction Program	$82,430	Planning and outreach*
4	Voluntary Fallowing of Agricultural Land	$103,175	Planning and outreach*
5	Water Quality Optimization	$124,060	Planning and preliminary engineering*
6	Intra-Basin Transfers	$89,545	Planning and preliminary engineering*

Notes: PMA = Projects and Management Action.. * Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution 5 1.5 Total Costs

Annual implementation costs may vary from year to year as a result of the status of PMAs, significance of new data, and increased milestone reporting requirements every fifth year of implementation. For planning purposes, the estimated annual budget for GSA operations and monitoring have been adjusted for annual inflation assumed at 2.8% per year to determine the total GSP implementation cost. The GSA's previously estimated draft GSP implementation cost for the anticipated 20-year implementation period for operations and monitoring, management, administration and other costs, 5-year annual reviews and 10% contingency is approximately $19,200,000 as summarized in Table 5-5.

Table 5-5
Groundwater Sustainability Plan Estimated Implementation Cost Through 2040

Fiscal Year	Operations and Monitoring Costs	Management, Administration and Other Costs	5-Year Annual Reviews	10% Contingency	Total
2020	$303,261	$305,500	$0	$60,876	$669,637
2021	$311,752	$314,054	$0	$62,581	$688,387
2022	$320,481	$322,848	$0	$64,333	$707,662
2023	$329,455	$331,887	$0	$66,134	$727,476
2024	$338,680	$341,180	$0	$67,986	$747,846
2025	$348,163	$350,733	$72,592	$77,149	$848,636
2026	$357,911	$360,554	$0	$71,846	$790,311
2027	$367,933	$370,649	$0	$73,858	$812,440
2028	$378,235	$381,027	$0	$75,926	$835,188
2029	$388,825	$391,696	$0	$78,052	$858,574

Table 5-5
Groundwater Sustainability Plan Estimated Implementation Cost Through 2040

Fiscal Year	Operations and Monitoring Costs	Management, Administration and Other Costs	5-Year Annual Reviews	10% Contingency	Total
2030	$399,712	$402,664	$83,340	$88,572	$974,287
2031	$410,904	$413,938	$0	$82,484	$907,327
2032	$422,410	$425,528	$0	$84,794	$932,732
2033	$434,237	$437,443	$0	$87,168	$958,849
2034	$446,396	$449,692	$0	$89,609	$985,696
2035	$458,895	$462,283	$95,679	$101,686	$1,118,543
2036	$471,744	$475,227	$0	$94,697	$1,041,668
2037	$484,953	$488,533	$0	$97,349	$1,070,835
2038	$498,532	$502,212	$0	$100,074	$1,100,818
2039	$512,490	$516,274	$0	$102,876	$1,131,641
2040	$526,840	$530,730	$109,846	$116,742	$1,284,157
	$8,511,809	**$8,574,653**	**$361,456**	**$1,744,792**	**$19,192,710**

Notes: Assumes inflation factor of 2.8% per year.* Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution

Estimated total draft final GSP implementation costs previously estimated by the GSA assumes the following general components:

- Data collection, management, and evaluation
- Annual reporting
- 5-year review assessment and reporting
- Data gap analysis and additional evaluation
- PMAs development and implementation of components as funding allows
- Management, administration, and other costs
- 10% contingency assumed over 20-year plan implementation period

In addition to the $19,200,000 required for 20-year draft final GSP implementation costs, an additional $652,000 was estimated to be required for PMAs development costs as previously provided in Table 5-4. In addition, $500,000 was budgeted for preparation of the Environmental Impact Report (EIR) for GSP implementation. Budget for the EIR has been secured though funding provided by Proposition 1 Severely Disadvantaged Community grant. Thus, the current total estimated draft final GSP implementation cost was approximately $20,352,000, including a contingency of $1,745,000. It is emphasized that this estimate does not include the implementation of all PMAs nor final costs incurred by BWD for internal management and administration. BWD intends to request reimbursement from the GSA for some of its GSA creation and GSP development related expenses and these costs are not included in the estimates.

Additional budget will be required to implement PMAs once they have been developed. Implementation of PMAs such as the water conservation program will be highly dependent upon securing funding such as through state or federal grants. Administrative costs to implement the primary water reduction programs that include the Water Trading Program, Pumping Reduction Program and Voluntary Fallowing of Agricultural Land was expected to be covered by the costs estimated in Table 5-5.

5.1.6 Funding Sources

In general, the GSA planned to fund draft final GSP implementation using a combination of groundwater extraction charges, including monthly fixed charges and variable pumping fees, assessments/parcel taxes, and grants. Because of Constitutional limitations imposed through California Propositions 13, 218, and 26, there are strict rules about what constitutes a fee versus a tax. Taxes and assessments require voter approval. Water rates passed under Proposition 218 are subject to mandatory noticing and a potential majority protest. Regulatory fees identified as an exemption from taxes under Proposition 26 can be passed by the vote of the governing body of the agency imposing the fee. An example is a $/AF pumping charge levied by a groundwater management agency. Assessments for special benefit are also governed by Proposition 218 and can be assessed to pay for a public improvement or service if it provides a special benefit to the properties. A benefit nexus is required to determine the amount of special benefit to each property. Grants from DWR have funded the majority of the GSP costs to date and it is expected that grants available from general obligation bonds such as Proposition 68 will be available to fund GSP implementation and development of PMAs. Potential funding sources specific to PMAs are presented in Chapter 4.

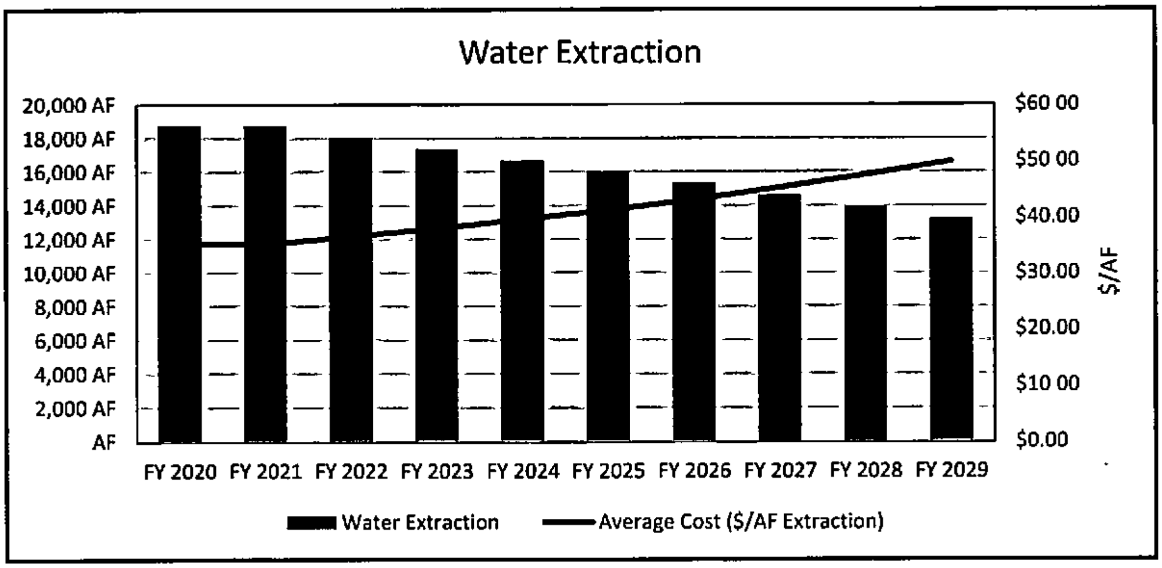
The GSA performed a preliminary financing plan options evaluation to determine a funding structure to fund the proposed GSA activities and expected financial commitments throughout GSP implementation. Development of the funding mechanism(s) is critical to facilitate successful implementation of the GSP consistent with the requirements of SGMA. A key success factor is preparing a cost allocation that is equitable to GSA members and stakeholders. Subsequent to the evaluation of financing plan options, a preliminary financing model was developed to determine revenue required to fund the operating plan, reserve balances and to evaluate required adjustments to the fee structure over time as pumping ramps down to the estimated sustainable yield.

The working draft Financing Plan identified the following proposed cost allocation structure:

- Monthly fixed charge based on well meter size (i.e., specific meter fee based on meter pipe diameter; 0–2 inches, 2–4 inches, 4–6 inches, 6–8 inches, and more than 8 inches; all non-*de minimis* extraction wells to be registered with the GSA)
- Variable pumping fee based on volume of groundwater extracted (all non *de minimis* wells to be metered)

It was expected that a portion of the pumping cost would be apportioned though the monthly meter fee and a portion applied at least semi-annually based on metered production. The intent of the meter fee was to provide regular cash flow to the GSA in order for it to meet its financial obligations. Monthly regular cash flow would also minimize the reserve target that would need to be greater if based solely on variable pumping revenues. Over the first 10 years of plan implementation, it was expected that up to $50/AF will be required to cover operations and monitoring costs, management, administration and other costs such as reserves (Exhibit 1). This cost did not include additional potential fees required to implement specific PMAs nor internal management and administration. Additional PMA planning, stakeholder outreach and detailed cost development is required to determine additional costs associated with PMAs implementation. Cost per acre-foot to cover GSA expenses was expected to continue to increase through 2040 as required revenue is spread over less groundwater extraction as a result of pumping ramp down. Exhibit 1 shows the estimated groundwater extracted and average cost per acre-foot.

Exhibit 1. Estimated Groundwater Extracted and Average Cost (dollar per acre-foot)



Notes: AF = acre-feet, FY = fiscal year. * Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution FY 2020 groundwater extraction is estimated based on recent agnculture, municipal, recreation, and other non-*de minimis* pumping. Pumping is assumed to ram down annually over time to the estmated sustainable yield The cost per acre-foot pumped increases as revenue is spread over less groundwater extraction.

5.2 IMPLEMENTATION SCHEDULE

The Physical Solution will be operated on an interim basis in connection with Court and DWR filing of the Judgment (including this GMP) no later than January 31, 2020. Figure 5.2-1 through 5.2-4 provides the GSA's preliminary schedule for implementation of the primary draft GSP components. The GMP schedule will be advanced by interim operation of the Physical Solution under Court supervision and continuing thereafter as the process proceeds. Each annual and periodic report will include a reevaluation and update of the schedule components based on progress toward the sustainability goal or other factors.

Routine annual and 5-year reporting of Physical Solution progress will be performed in accordance with SGMA requirements. Annual Reports will be prepared and submitted to the Court and DWR by April 1 of each year. Periodic Reports (5-Yearly or following substantial GSP amendments) will be submitted to the DWR by April 1 at least every 5 years (i.e., 2025, 2030, 2035, and 2040). The contents of Annual and Periodic Reports are described in the following Sections 5.3 and 5.4.

The six PMAs the GSA proposed and their implementation schedules are presented in Figure 5.2-3. The GSA anticipated that activities that might cause physical change to the environment requires California Environmental Quality Act (CEQA) review. There are CEQA exemptions that could apply for some of these activities. Regardless, the GSA would still have needed to go through the process of CEQA review to determine which exemptions would apply, and then file for the exemption. PMA No. 1 – Water Trading Program, PMA No. 3 – Pumping Reduction Program, and PMA No. 4 – Voluntary Fallowing of Agricultural Land, all were considered as activities to undergo CEQA. The GSA thought it was likely an Environmental Impact Report (EIR) will be required to be prepared and adopted. It was anticipated an EIR would take approximately two years to develop. PMA No. 5 – Water Quality Optimization and PMA No. 6 – Intra-Subbasin Water Transfer, have no definitive timeframe for implementation. The GSA would evaluate projects on a case-by-case basis to determine CEQA requirements. The Physical Solution is being undertaken by private pumpers and the Court-appointed Watermaster under the Judgment, and is not subject to CEQA.

5.3 ANNUAL REPORTING

The annual report will, at a minimum, include the components described as required pursuant to CCR Section 356.2. In addition to being available from DWR, the Watermaster will make annual reports available to the Court, the public and stakeholders through the methods described in Chapter 2 (Section 2.1.5, Notice and Communication), primarily through the Watermaster's website, but also through email announcements, newsletters/columns, and/or water bill inserts.

5.3.1 General Information

An executive summary will be prepared to summarize the findings of the Annual Report and include a location map similar to Figure 1-1. This section will include a description of significant progress and pertinent findings of the reporting period and key recommendations for going forward.

5.3.2 Description and Graphical Representations of Groundwater Information

Groundwater Elevation Data

Detailed descriptions and graphical representations will be included to demonstrate the following conditions of the Subbasin in accordance with the monitoring plan and monitoring network described in Section 3.5, and attached as Appendix E. Groundwater elevation data for each management area will be depicted and summarized using groundwater contour maps similar to those included as Figures 2.2-13A. The contour maps will include delineation of the primary aquifers (Figure 2.2-10) and groundwater contours for seasonal high and low conditions. Hydrographs depicting current and historical data for each management area will be included (Figure 2.2-13E). The written section will include a description and interpretation of the data shown in the figures and a discussion of observed data gaps and recommendations for modifications to the monitoring network, if warranted.

Groundwater Extraction

Groundwater extraction information for the preceding water year will be presented. Data sources will include BWD pumping records and metered extraction data from private agricultural, golf courses and other non-*de minimis* wells (i.e., pumpers extracting greater than 2 acre-feet per year). All non-*de minimis* groundwater users will be required to register their wells with the Watermaster upon initial GMP implementation in accordance with the Metering Plan (Appendix E). Data will be presented in a table that summarizes groundwater extractions by water use sector and management area, and identifies the measurement method (direct or estimated) and accuracy of measurements. A map of general location and volume of groundwater extractions will be provided. Groundwater extraction will be documented in conformance with the Metering Plan (Appendix E).

Surface Water Supply

Currently, there are only natural sources of groundwater recharge to the basin. The annual report will note developments or studies in regard to surface water supplies. The contribution from natural sources of recharge are presented in Section 2.2.3, Water Budget, and will be quantified as part of the water budget.

Sources of imported water and recycled water from wastewater treatment plant upgrades have been evaluated and determined to be infeasible at this time as explained in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use.

Total Water Use

The total water use for the Basin will be reported in tabular format including water use by sector (agriculture, recreation, and municipal) and geographically by management area. Sources of data will include BWD production and delivery records and metered well use for the private sector. Where direct measurement is not possible, indirect methods will be used to estimate water use.

Changes in Groundwater Storage

Estimated changes in storage will be evaluated for each management area and each principal aquifer and this information will be depicted on maps. This section will include a graph of climate, groundwater use, and annual and cumulative change in storage for the period of available record through the reporting period.

5.3.3 Plan Implementation Progress

A description of progress toward implementing the Physical Solution will be included, including achieving interim milestones and implementation of PMAs since the previous report. Current progress will be compared to the planned schedule using the chart shown in Figures 5.2-1 through 5.2-4.

5.4 PERIODIC EVALUATION AND REPORTING

The Watermaster will evaluate its Plan implementation at least every 5 years and whenever the Plan implementation is amended and provide a written assessment to the DWR. The evaluation will include the elements of the annual reports and an assessment of the progress toward the sustainability goal as defined in Section 3.1.3, Sustainability Goal consistent with the Judgment. At a minimum, the Periodic Evaluations will include the elements required Pursuant to CCR Section 356.4. In addition to being available from DWR, the Watermaster will make periodic evaluations available to the public and stakeholders through the methods described in Chapter 2 (Section 2.1.5, Notice and Communication), primarily through the Watermaster's website, but also through the County's SGMA website, email announcements, newsletters/columns, and/or water bill inserts. In addition, the assessment will include the following components:

5.4.1 Current Groundwater Conditions

A description of current groundwater conditions will be included for each applicable sustainability indicator relative to measurable objectives, interim milestones, and minimum thresholds defined in Section 3.2, Undesirable Results. For example, hydrographs showing groundwater elevations for key wells in relation to the measurable objective and minimum threshold will be prepared.

5.4.2 Implementation of Projects or Management Actions

A description will be provided to summarize the implementation and status of PMAs, and the effect on groundwater conditions or other socioeconomic effects resulting from those PMAs. The success of PMAs will be evaluated in terms of whether implementation is achieving Subbasin sustainability goals. If not, PMAs would require re-evaluation or potentially accelerated implementation. Major deviations to the PMAs implementation schedule would be coordinated with the Subbasin stakeholders through an outreach process.

5.4.3 Plan Elements

Elements of this Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, will be reconsidered and revisions proposed, if necessary. Such considerations will include the extent to which this Plan is progressing toward achievement of the sustainability goal and meeting interim milestones.

5.4.4 Basin Evaluation

Each Periodic Evaluation will include an assessment of unanticipated changes that have occurred, or new information impacting water use, and how they may impact the plan implementation and achievement of the sustainability goal. Such changes may include unanticipated climate extremes. Changes will be evaluated in regard to impacts on overdraft conditions and adjustments made to mitigate overdraft and conditions contributing to undesirable effects.

Water Balance Review

The data collected to date will be reviewed to determine a revision in the estimated sustainable yield value by a future projection scenario analysis using the BVHM, as updated, on a schedule consistent with the Judgment.

The report will describe the impact of revised sustainable yield value on the following:

- Pumping allowances
- Measurable objectives/interim milestones
- Other pertinent components of the Physical Solution

5.4.5 Monitoring Network

The Watermaster's periodic evaluation will include a description of the monitoring network within the Basin, including whether data gaps exist, or whether areas within the Basin are represented by data that do not satisfy the Data and Reporting Standards. The descriptions shall include the following:

- An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of CWC Section 354.38.
  - The periodic evaluation will provide an update of data gaps. The evaluation shall include options for obtaining additional data sources, an estimate of timing to obtain new data sources, and for potential incorporation of newly obtained information into the GMP.
  - The evaluation will prioritize the installation of new data collection facilities and analysis of new data based on the needs of the Basin.
- An assessment of whether areas within the Basin are represented by data that does not satisfy the requirements of CCR Section 352.4 and Section 354.34(c), Data and Reporting Standards.

5.4.6 Pumping Allowance

The primary mechanism for achieving sustainability in the Basin is establishing Baseline Pumping Allocations and pumping ramp down (Basin-wide percentage reduction in cumulative pumping (from total BPA) effective in any particular Water Year, which when subtracted from 100 percent will determine the effective Pumping Percentage applicable to the BPAs that year). A summary will be provided to describe the status of pumping allocations and allowance in the Basin, including adjustments based on potential changes in the estimated sustainable yield of the Basin.

5.4.7 New Information

A description will be provided for significant new information that has been made available since Physical Solution adoption or implementation amendment, or the last 5-year assessment. The description will also include whether new information warrants changes to any aspect of the Physical Solution implementation, including the evaluation of the Basin setting, measurable objectives, minimum thresholds, or the specific criteria defining undesirable results.

5.4.8 Relevant Actions

A description will be provided for relevant actions taken by the Watermaster since the prior Periodic Report (or GMP adoption for the initial Periodic Report). Relevant actions may include rules and regulations related to the Physical Solution, development of additional PMAs, or other actions pertinent to the implementation of the Physical Solution.

5.4.9 Enforcement or Legal Actions

Information will be provided to describe enforcement or legal actions taken by Watermaster in furtherance of the sustainability goal for the Basin. Information will include a description of enforcement or legal actions, penalties, resolutions, or any other relevant information.

5.4.10 Plan Amendments

Descriptions will be provided for completed or proposed Physical Solution implementation amendments.

5.4.11 Summary of Coordination

Where appropriate, a summary will be provided to describe coordination activities that occurred during the reporting period with local agencies.

At the time of Physical Solution adoption, no other GSAs exist within the BVGB or adjoining basins. Therefore, if new GSAs are subsequently formed in these relevant areas a summary will be provided in the Periodic Report.

Coordination with the County of San Diego is anticipated throughout implementation of the Physical Solution, including any CEQA review and approval that may be required by the County or BWD as lead agency, and modification of land use designations, local ordinances, etc. This section will provide detailed summaries of relevant coordination with the County of San Diego as the land use agency.

5.4.12 Other Information

The Periodic Report should include other information the Watermaster deems appropriate and relevant, along with any information required by the DWR to conduct a periodic review as required by CWC Section 10733.

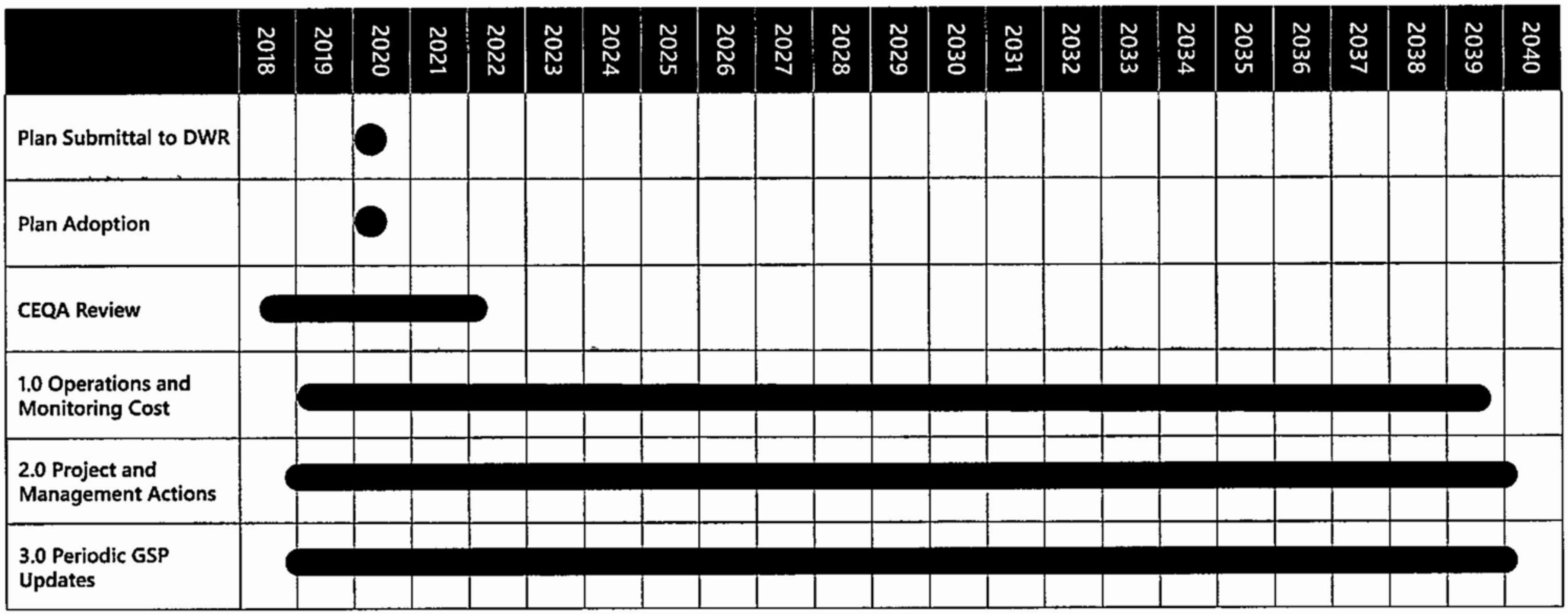


FIGURE 5.2-1

Schedule for Implementation - Overview

Groundwater Management Plan for the Borrego Springs Groundwater Subbasin

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
1.0 Operations and Monitoring Cost	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	
1.1 Semi-Annual Groundwater Level Monitoring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.2 Semi-Annual Groundwater Quality Monitoring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.3 Semi-Annual Stream Monitoring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.4 Pump Metering	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1
1.5 Land Subsidence Review	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.6 Operations and Maintenance		Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
1.7 Data Management System	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.8 Groundwater Model Update	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.9 Annual Comprehensive DWR Reporting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.10 Project and Management Coordination		Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing

2 Occurs twice a year in spring and fall

12/1 Monthly recording with annual reporting

1 Occurs once a year anytime of the year

Ongoing

FIGURE 5.2-2

Schedule for Implementation - Operations and Monitoring Cost

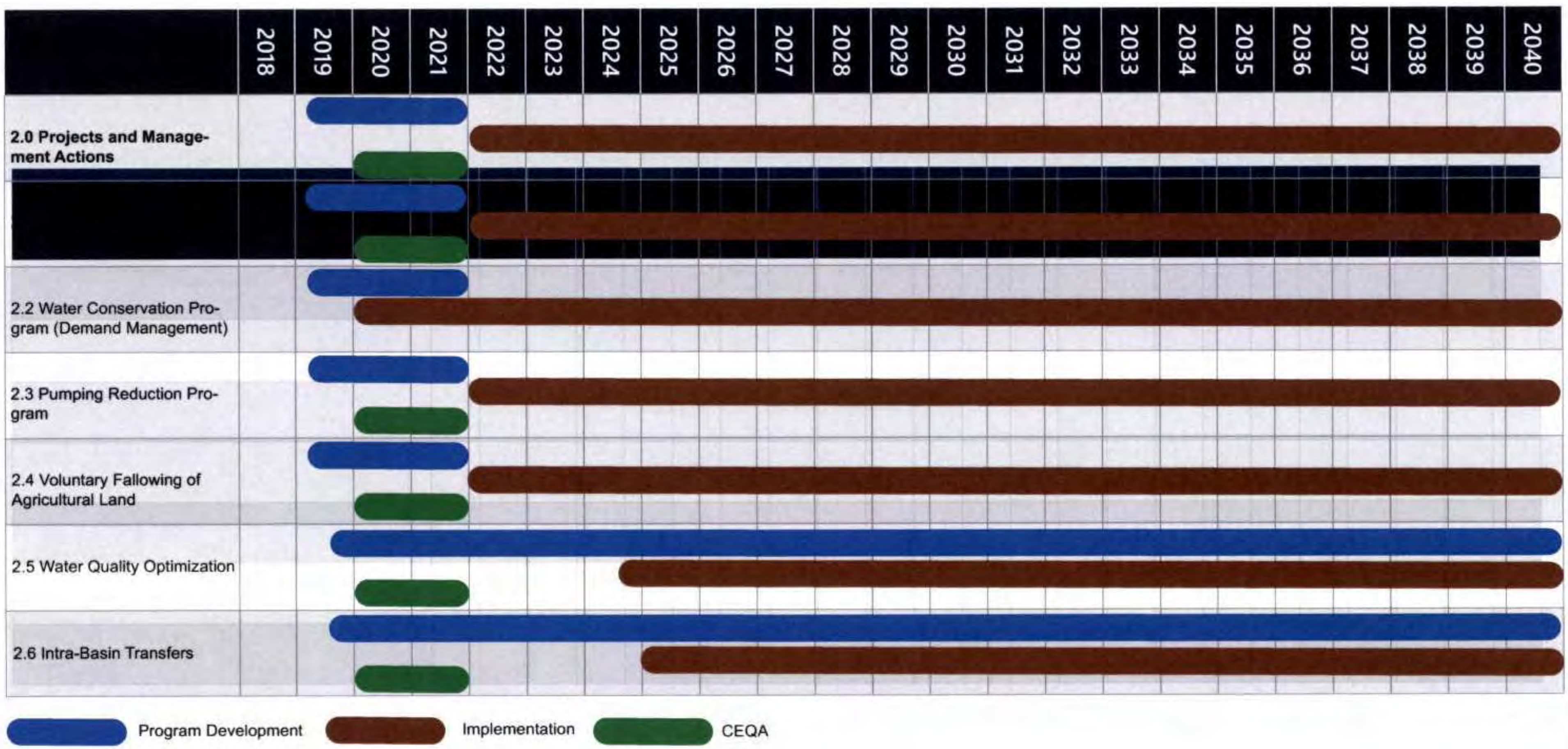
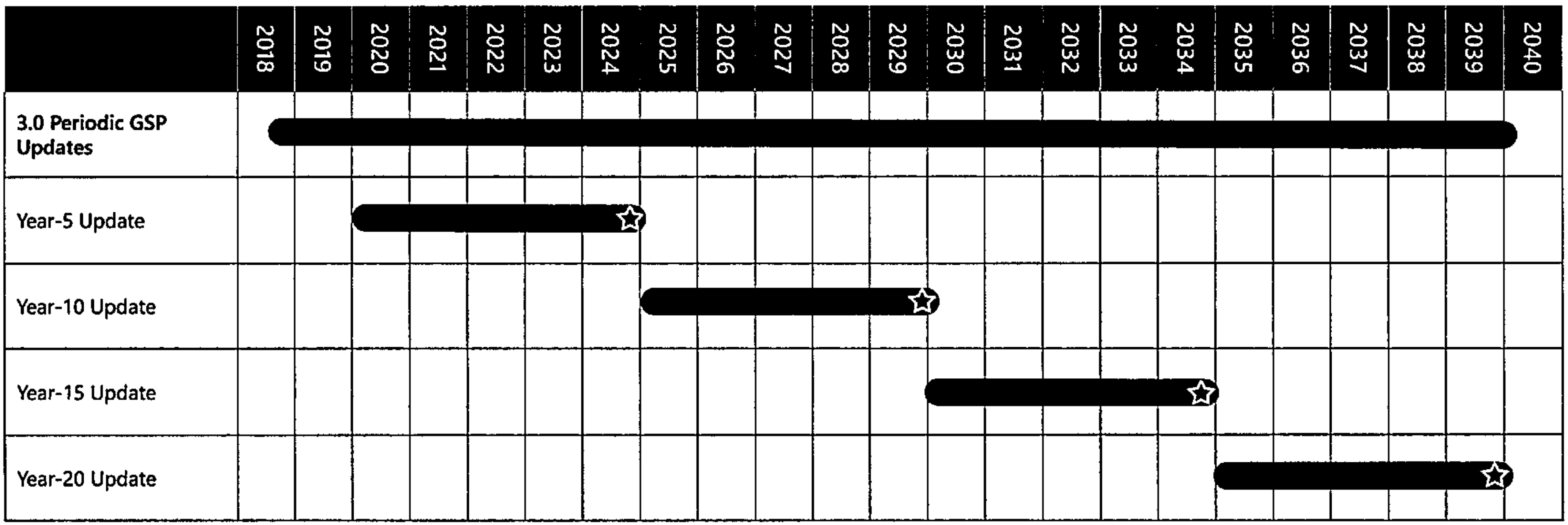


FIGURE 5.2-3

Schedule for Implementation - Project and Management Actions



* All updates will include the following: Update Budget, Groundwater Model, and Sustainable Yield; Assessment of Pumping Allocations; Five-year Plan Evaluation and Assessment

☆ Deliverable Milestone for Submittal of 5-year Updates

FIGURE 5.2-4

Schedule for Implementation - Periodic GSP Updates

APPENDIX A

DWR Preparation Checklist for GSP Submittal

A separate DWR preparation checklist will be submitted to DWR for the Stipulated Judgment and GMP as an alternative to a GSP pursuant to SGMA (Wat. Code, §§10733.6; 10737.4).

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 3. Technical and Reporting Standards				
352.2		Monitoring Protocols	· Monitoring protocols adopted by the GSA for data collection and management · Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin	Section 3.5, Section 5.4.5, and Appendix E
Article 5. Plan Contents, Subarticle 1. Administrative Information				
354.4		General Information	· Executive Summary · List of references and technical studies	Chapter ES, and "References Cited" section at end of each Chapter.
354.6		Agency Information	· GSA mailing address · Organization and management structure · Contact information of Plan Manager · Legal authority of GSA · Estimate of implementation costs	Section 1.3 and Appendix B
354.8(a)	10727.2(a)(4)	Map(s)	· Area covered by GSP · Adjudicated areas, other agencies within the basin, and areas covered by an Alternative · Jurisdictional boundaries of federal or State land · Existing land use designations · Density of wells per square mile	Figures 2.1-1 through 2.1-6
354.8(b)		Description of the Plan Area	· Summary of jurisdictional areas and other features	Section 2.1.1
354.8(c) 354.8(d)	10727.2(g)	Water Resource Monitoring and Management Programs	· Description of water resources monitoring and management programs · Description of how the monitoring networks of those plans will be incorporated into the GSP	Section 2.1.2

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
354.8(e)			· Description of how those plans may limit operational flexibility in the basin	
			· Description of conjunctive use programs	Section 2.1.6
354.8(f)	10727.2(g)	Land Use Elements or Topic Categories of Applicable General Plans	· Summary of general plans and other land use plans	Section 2.1.3
			· Description of how implementation of the GSP may change water demands or affect achievement of sustainability and how the GSP addresses those effects · Description of how implementation of the GSP may affect the water supply assumptions of relevant land use plans	Section 2.1.3
			· Summary of the process for permitting new or replacement wells in the basin	Section 2.1.2
			· Information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management	Section 2.1.2 and Section 2.1.3
354.8(g)	10727.4	Additional GSP Contents	Description of Actions related to:	
			· Control of saline water intrusion	Section 2.1.6 and Section 2.2.2.3
			· Wellhead protection	Section 2.1.6 and Section 2.2.2.4
			· Migration of contaminated groundwater	Section 2.1.6, 2.2.2.4, and 2.2.4.1
			· Well abandonment and well destruction program	Section 2.1.2 and 2.1.6
			· Replenishment of groundwater extractions	Section 2.1.6 and 2.2.3.7
			· Conjunctive use and underground storage	Section 2.1.6 and Chapter 4
			· Well construction policies	Section 2.1.2

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· Addressing groundwater contamination cleanup, recharge, diversions to storage, conservation, water recycling, conveyance, and extraction projects	Section 2.1.6 , 2.2.2.4, 2.2.3, and 4.7.5
			· Efficient water management practices	Section 2.1.6, and Section 4.3
			· Relationships with State and federal regulatory agencies	Section 2.1.2 and 2.1.6
			· Review of land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity	Sections 2.1.2, 2.1.3, and 2.1.6
			· Impacts on groundwater dependent ecosystems	Sections 2.1.6, 2.2.2.6, and 2.2.2.7; and Appendix D4
354.1		Notice and Communication	· Description of beneficial uses and users	Section 2.1.4
			· List of public meetings	Appendix C
			· GSP comments and responses	Appendix G
			· Decision-making process · Public engagement · Encouraging active involvement	Section 2.1.5
			· Informing the public on GSP implementation progress	Section 2.1.5 and Section 5.4
Article 5. Plan Contents, Subarticle 2. Basin Setting				
354.14		Hydrogeologic Conceptual Model	· Description of the Hydrogeologic Conceptual Model	Section 2.2.1 and Figure 2.2-1
			· Two scaled cross-sections	Figure 2.2-10
			· Map(s) of physical characteristics: topographic information, surficial geology, soil characteristics, surface water bodies, source and point of delivery for imported water supplies	Figure 2.2-1 through Figure 2.2-9

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
354.14(c)(4)	10727.2(a)(5)	Map of Recharge Areas	· Map delineating existing recharge areas that substantially contribute to the replenishment of the basin, potential recharge areas, and discharge areas	Figure 2.2-11
	10727.2(d)(4)	Recharge Areas	· Description of how recharge areas identified in the plan substantially contribute to the replenishment of the basin	Sections 2.2.1.4, 2.2.2.6, and 2.2.3.1
354.16	10727.2(a)(1) 10727.2(a)(2)	Current and Historical Groundwater Conditions	· Groundwater elevation data · Estimate of groundwater storage · Seawater intrusion conditions · Groundwater quality issues · Land subsidence conditions · Identification of interconnected surface water systems · · Identification of groundwater-dependent ecosystems	Section 2.2.2
354.18	10727.2(a)(3)	Water Budget Information	· Description of inflows, outflows, and change in storage · Quantification of overdraft · Estimate of sustainable yield · Quantification of current, historical, and projected water budgets	Section 2.2.3
	10727.2(d)(5)	Surface Water Supply	· Description of surface water supply used or available for use for groundwater recharge or in-lieu use	Section 2.2.3.8
354.2		Management Areas	· Reason for creation of each management area · Minimum thresholds and measurable objectives for each management area · Level of monitoring and analysis · Explanation of how management of management areas will not cause undesirable results outside the management area	Section 2.2.4, and Sections 3.3.1.3, 3.3.2.3, and 3.3.4.3

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· Description of management areas	
Article 5. Plan Contents, Subarticle 3. Sustainable Management Criteria				
354.24		Sustainability Goal	· Description of the sustainability goal	Section 3.1.3
354.26		Undesirable Results	· Description of undesirable results · Cause of groundwater conditions that would lead to undesirable results · Criteria used to define undesirable results for each sustainability indicator · Potential effects of undesirable results on beneficial uses and users of groundwater	Section 3.2, Appendix D4
354.28	10727.2(d)(1)	Minimum Thresholds	· Description of each minimum threshold and how they were established for each sustainability indicator	Sections 3.3.1.1, 3.3.2.1, and 3.3.4.1
	10727.2(d)(2)		· Relationship for each sustainability indicator	Sections 3.3.1.2, 3.3.2.2, and 3.3.4.2
			· Description of how selection of the minimum threshold may affect beneficial uses and users of groundwater	Sections 3.3.1.4, 3.3.2.4, and 3.3.4.4
			· Standards related to sustainability indicators	Section 3.3
			· How each minimum threshold will be quantitatively measured	Sections 3.3.1.6, 3.3.2.6, and 3.3.4.6
354.3	10727.2(b)(1)	Measureable Objectives	· Description of establishment of the measureable objectives for each sustainability indicator	Sections 3.4.1, 3.4.2, and 3.4.4
	10727.2(b)(2)		· Description of how a reasonable margin of safety was established for each measureable objective	Sections 3.4.1, 3.4.2, and 3.4.4
	10727.2(d)(1) 10727.2(d)(2)		· Description of a reasonable path to achieve and maintain the sustainability goal, including a description of interim milestones	Sections 3.4.1, 3.4.2, and 3.4.4
Article 5. Plan Contents, Subarticle 4. Monitoring Networks				
354.34	10727.2(d)(1)	Monitoring Networks	· Description of monitoring network	Section 2.2.2, Section 3.5 and Appendix E

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
	10727.2(d)(2)		· Description of monitoring network objectives	Section 3.5 and Appendix E
	10727.2(e)		· Description of how the monitoring network is designed to: demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features; estimate the change in annual groundwater in storage; monitor seawater intrusion; determine groundwater quality trends; identify the rate and extent of land subsidence; and calculate depletions of surface water caused by groundwater extractions	Section 3.5.1
	10727.2(f)		· Description of how the monitoring network provides adequate coverage of Sustainability Indicators	Section 3.5.1
			· Density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends · Scientific rational (or reason) for site selection · Consistency with data and reporting standards	Section 3.5, Appendix E
			· Corresponding sustainability indicator, minimum threshold, measureable objective, and interim milestone	Section 3.3, 3.4, 3.5, and Appendix E
			· Location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used	Section 2.2.2, Table 2.2-4, Table 2.2-5, and Figure 2.2-12

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· Description of technical standards, data collection methods, and other procedures or protocols to ensure comparable data and methodologies	Section 3.5, Appendix E
354.36		Representative Monitoring	· Description of representative sites	Section 3.5.3 and Figure 3.3-1
			· Demonstration of adequacy of using groundwater elevations as proxy for other sustainability indicators	Section 3.5.3 and Figure 3.3-1
			· Adequate evidence demonstrating site reflects general conditions in the area	Section 3.5.3 and Figure 3.3-1
354.38		Assessment and Improvement of Monitoring Network	· Review and evaluation of the monitoring network · Identification and description of data gaps · Description of steps to fill data gaps · Description of monitoring frequency and density of sites	Section 3.5.4
Article 5. Plan Contents, Subarticle 5. Projects and Management Actions				
354.44		Projects and Management Actions	· Description of projects and management actions that will help achieve the basin's sustainability goal	Sections 4.2.1, 4.3.1, 4.4.1, 4.5.1, 4.6.1, and 4.7.1
			· Measureable objective that is expected to benefit from each project and management action	Sections 4.2.2, 4.3.2, 4.4.2, 4.5.2, 4.6.2, and 4.7.2
			· Circumstances for implementation · Public noticing · Permitting and regulatory process	Sections 2.1.2 and 2.1.5; and Appendix C
			· Time-table for initiation and completion, and the accrual of expected benefits	Sections 4.2.4, 4.3.4, 4.4.4, 4.5.4, 4.6.4, and 4.7.4
			· Expected benefits and how they will be evaluated	Sections 4.2.3, 4.3.3

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· How the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.	Sections 4.2.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3, and 4.7.3; and Sections 4.2.5, 4.3.5, 4.4.5, 4.5.5, 4.6.5, and 4.7.5
			· Legal authority required	Section 1.3.2; and Appendix B
			· Estimated costs and plans to meet those costs	Section 5.1.4, and Sections 4.2.6, 4.3.6, 4.4.6, 4.5.6, 4.6.6, and 4.7.6
			· Management of groundwater extractions and recharge	Chapter 4
354.44(b)(2)	10727.2(d)(3)		· Overdraft mitigation projects and management actions	
Article 8. Interagency Agreements				
357.4	10727.6	Coordination Agreements - Shall be submitted to the Department together with the GSPs for the basin and, if approved, shall become part of the GSP for each participating Agency.	Coordination Agreements shall describe the following:	
			· A point of contact · Responsibilities of each Agency · Procedures for the timely exchange of information between Agencies · Procedures for resolving conflicts between Agencies · How the Agencies have used the same data and methodologies to coordinate GSPs · How the GSPs implemented together satisfy the requirements of SGMA · Process for submitting all Plans, Plan amendments, supporting information, all monitoring data and other pertinent information, along with annual reports and periodic evaluations	Cahpter 1, Appendix B, and Chapter 5. Organizational structure of the GSA (County and BWD) is simple, and there are no adjacent basins that are required to or expected to develop a GSP under SGMA

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· A coordinated data management system for the basin · Coordination agreements shall identify adjudicated areas within the basin, and any local agencies that have adopted an Alternative that has been accepted by the Department	GSP under SGMA.

APPENDIX B

GSA Formation and Interagency Agreement Documentation

B1: Advisory Commitee Bylaws

B2: Notice of Intent to Develop a Groundwater Sustainability Plan

B3: GSA Notification (Amended)

B4: Signed Memorandum of Understanding

B5: County of San Diego Notice of Election to Become a Groundwater Sustainability Agency

B6: Borrego Water District Notice of Election to Serve as Groundwater Sustainability Agency

Until a final judgment is entered by the Court in this action and all appeals are complete, the interim Watermaster shall assume all responsibility for the sustainable management of the Basin as set forth in the proposed Stipulated Judgment. During this time, the GSA (with only Borrego Water District as the remaining member) will be dormant, and thus the GSA will not perform any groundwater management actions or assess any fees or assessments. Upon entry of the Stipulated Judgment establishing the Watermaster, BWD is to withdraw as a GSA by notifying the Department under Water Code section 10723.8(e).

APPENDIX B1

Advisory Committee Bylaws

BORREGO VALLEY
GROUNDWATER SUSTAINABILITY PLAN
ADVISORY COMMITTEE
BY-LAWS

Adopted and approved at the June 29, 2017 Borrego Valley GSP Advisory Committee Meeting:

Article 1 PURPOSE AND FORMATION of the ADVISORY COMMITTEE

Section A – On September 20, 2016, the Board of Directors of the Borrego Water District (District) approved a Memorandum of Understanding (MOU) between the County of San Diego (County) and the District, which memorialized each agency's role and responsibilities for developing a Groundwater Sustainability Plan (GSP) for the Borrego Valley Groundwater Basin (Borrego Basin). On October 19, 2016, the Board of Supervisors of the County also approved the MOU, thereby establishing a multiple-agency Groundwater Sustainability Agency (GSA) responsible for developing and implementing a GSP for the Borrego Basin. The MOU establishes a Core Team comprised of County and District staff tasked with coordinating the activities of the Borrego Basin GSP Advisory Committee (AC).

Section B – In consideration of the interests of all beneficial uses and users of groundwater in the basin, stakeholder engagement and education of both stakeholders and the general public will be conducted in part via the deliberations of the AC pursuant to California Water Code Section 10723.2. The purpose of the AC is to provide input to aid in the development of the planning and policy recommendations contained in the GSP. As information supporting the GSP is prepared by the GSA, these items will be brought before the AC for discussion, analysis, and recommendations.

Section C – The AC is a non-partisan, non-sectarian, non-profit advisory organization. The AC is not empowered by ordinance, establishing authority, or policy to render a binding decision of any kind.

Section D – The AC is advisory to the Core Team. The Core Team will develop a GSP that meets the requirements of SGMA and is acceptable to the District and to the County. The GSP shall include, but not be limited to, groundwater use enforcement measures, a detailed breakdown of each GSA Party's responsibilities for Plan implementation, anticipated costs of implementing the Plan, and cost recovery mechanisms, if necessary.

Article 2 MEMBERSHIP AND TERM OF OFFICE

Section A – The AC shall consist of individuals with backgrounds in developing, deliberating, planning, and/or advocating for sustainable use of groundwater in the Borrego Basin, under the requirements of SGMA.

Section B – The AC is limited to nine (9) members as established in the MOU. Potential representatives shall be nominated by the following six (6) Stakeholder Organizations and shall be apportioned as follows:

(1) Four members nominated by the Borrego Water Coalition and filling the following representative roles- 1 agricultural member; 1 recreation member; 1 independent pumper; 1 at large member,
(2) One member nominated by the Borrego Springs Community Sponsor Group,
(3) One member nominated by the Borrego Valley Stewardship Council,
(4) One member nominated by the Borrego Water District Board of Directors who is not an employee or elected official –to represent ratepayers/property owners,
(5) One member nominated by the County of San Diego who is not an employee or elected official –to represent the Farm Bureau, and
(6) One member nominated by the California State Parks, Colorado Desert Region – to represent the Anza-Borrego Desert State Park.

Each person nominated to the AC by the above Stakeholder Organizations must be endorsed by the Board of Directors of the District and the Director of Planning & Development Services (PDS) of the County before serving on the AC. Substitution of an alternate for an endorsed AC Member is not permitted. Only endorsed Members may serve on the AC.

Section C – Each AC Member shall serve a term, which shall run concurrently with the development and completion of the GSP.

Section D - A vacancy shall be recognized for any AC Member who: (1) dies; (2) resigns; (3) has unexcused absences from more than three of the scheduled AC meetings within a single calendar year; (4) misses three meetings in a row; (5) regularly fails to abide by the discussion covenants of the AC; (6) violates the Ralph M. Brown Act; or (7) fails to exercise the purpose and authority of the AC as described in Article 1 above. The AC shall notify the Core Team if a position is deemed vacant pursuant to items 1-4 above, or if the AC recommends the removal of a member as related to items 5–7 above. If a vacancy occurs, the Stakeholder Organization may nominate another AC member appointee for that position that must then be endorsed by the District Board and County Director of PDS. The new appointee member shall serve through the development and completion of the GSP.

Article 3 DUTIES

The AC shall have the following duties and responsibilities:

(1) Serve as a resource to the Core Team on GSP development issues for the Borrego Basin;

(2) Advise in the formation of the planning and policy recommendations to be included in the GSP. This may include reviewing technical materials and providing comment, data, and relevant local information to the GSA related to Plan development; assisting in communicating concepts and requirements to the stakeholder constituents that they represent; providing comments on materials and reports prepared; assisting the Core Team to anticipate short- and long-term future events that may impact groundwater sustainability, trends and conditions that will impact groundwater management;

(3) Participate in AC and Core Team public decision-making meetings, expected to occur on an approximately quarterly basis or as needed during GSP development.

Article 4 STRUCTURE

Section A – AC meetings will be facilitated by a facilitator from the California State University, Sacramento, Center for Collaborative Policy ("CCP") or other such facilitator acceptable to the Core Team. The Facilitator shall convene the meeting, establish the existence of a quorum and oversee the meeting to insure the timely completion of the published agenda. If for any reason, the Facilitator cannot facilitate at a particular meeting, a Core Team member shall assume the facilitation responsibilities assigned above to the facilitator.

Section B – The Facilitator, in consultation with the AC, shall assign coordinating duties and/or specific tasks to subcommittees of the AC as necessary. The Facilitator will work with the Core Team to determine a meeting schedule, develop meeting materials, coordinate communications to the AC in advance of meetings, and other similar organizational responsibilities.

Section C – The District shall assign staff to record the minutes of all AC meetings, maintain a list of all active representatives, handle committee correspondence, and keep records of actions as they occur at each meeting. It is the responsibility of the Core Team staff assigned to the AC to assure that posting of meeting notices in a publicly accessible place for 72 hours prior to an AC meeting, to keep a record of such posting, and to reproduce and distribute the AC notices and minutes of all meetings.

Article 5 ORGANIZATIONAL PROCEDURES

Section A – Robert's Rules of Order govern the operation of the AC in all cases not covered by these by-laws, the AC may formulate specific procedural rules of order to govern the conduct of its meetings.

Section B – Any voting is on the basis of one vote per AC member. No proxy or absentee voting is permitted.

Section C – All AC recommendations regarding the GSP shall be made by consensus. Consensus is achieved when AC participants indicate that they are at Levels 1-4 (not Levels 5 or 6) as described below. If after multiple attempts, the AC deems consensus improbable among the AC members on a particular matter, the issue will be returned to the Core Team without a recommendation.

Levels of consensus are as follows:

1. I can say an **unqualified 'yes'** to the decision. I am satisfied that the decision is an expression of the wisdom of the group.
2. I find the decision **acceptable**. It is the best of the real options we have available to us.
3. I can **live with** the decision. However, I'm not enthusiastic about it.
4. I do not fully agree with the decision and need to register my view about it. However, I do not choose to block the decision and will **stand aside**. I am willing to support the decision because I trust the wisdom of the group.
5. We need to **do more work** before consensus can be achieved.

6. I do not agree with the decision and feel the need to **block** the decision being accepted as consensus.

Section D – AC meetings shall be held under the following discussion covenants:

- Focus on the future as much as possible.
- All perspectives are valued. You are not required to defend your perspective, but you are asked to share it and to provide supporting rationale.
- All ideas have value. If you believe another approach is better, offer it as a constructive alternative.
- Everyone will have an equal opportunity to participate.
- Everyone will be encouraged to talk.
- One person speaks at a time.
- No side conversations.
- View disagreements as problems to be solved rather than battles to be won.
- Avoid ascribing motives to or judging the actions of others. Please speak about your experiences, concerns, and suggestions. Treat each other with respect.
- Avoid right-wrong paradigms.
- When communicating outside of the AC, Members are asked to speak only for themselves when asked about AC progress unless there has been adoption of concepts or recommendations by the full body.

Section E – A majority of the AC members currently appointed shall constitute a quorum. A quorum is required for an Official Meeting to occur. No consensus vote of the AC shall be considered as reflecting an official recommendation by the AC unless a vote was taken at an Official Meeting.

Section F – All meetings of the AC and its subcommittees are open to the public to the extent required by the Ralph M. Brown Act. Meetings are to be held in accessible, public places in Borrego Springs, California. Notice of all AC meetings shall be posted in a publicly accessible place for a period of 72 hours prior to the meeting. A majority of the AC members shall not use a series of communications of any kind, directly or through intermediaries, to discuss, deliberate, or take action on any AC-related business outside of a public meeting in violation of the Ralph M. Brown Act.

Section G –All members of the AC must abide by these by-laws. The County and District reserve the right to remove members that do not abide by the by-laws.

Article 6 COMPENSATION

Members of the AC shall serve without compensation.

APPENDIX B2

Notice of Intent to Develop a Groundwater Sustainability Plan

County of San Diego

MARK WARDLAW
DIRECTOR

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE, SUITE 310, SAN DIEGO, CA 92123
www.sdcounty.ca.gov/pds
PHONE (858) 694-2962 FAX (858) 694 2555

March 22, 2017

Trevor Joseph, SGM Section Chief
Department of Water Resources
901 P Street, Room 213
Post Office Box 942836
Sacramento, CA 94236

Delivery via E-Mail
(Trevor.Joseph@water.ca.gov)

NOTICE OF INTENT TO DEVELOP A GROUNDWATER SUSTAINABILITY PLAN FOR THE BORREGO VALLEY GROUNDWATER BASIN

Dear Mr. Joseph:

The purpose of this letter is to notify you that the Borrego Valley Groundwater Sustainability Agency (GSA), which comprises the County of San Diego (County) and Borrego Water District (District), intends to develop a Groundwater Sustainability Plan (GSP) for the Borrego Valley Groundwater Basin (BVGB) [Attachment 1] pursuant to California Water Code (Water Code) Section 10727.8. In November 2016, the Department of Water Resources (DWR) acknowledged resolution of the overlapping GSA status of the County and District through the adoption of a Memorandum of Understanding (MOU) between the two agencies, and approved the Borrego Valley GSA as the Exclusive Multi-Agency GSA for the BVGB (DWR Bulletin 118 Groundwater Basin Number 7-24).

To determine the best way to consider the interests of all beneficial uses and users of groundwater, pursuant to Water Code Sections 10723.2 and 10723.4, the Borrego Valley GSA established an ad-hoc advisory committee (AC) to aid in developing and implementing the GSP. The first meeting of the Borrego Valley Sustainable Groundwater Management Act (SGMA) AC occurred on March 6, 2017. In accordance with Water Code Section 10727.8(a), interested parties may participate in the development and implementation of the GSP by attending AC meetings in Borrego Valley and may sign up to receive information about AC meetings and GSP development at the County's SGMA webpage located at: http://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html. AC meeting notices will also be posted at the Borrego Post Office, provided to the *Borrego Sun*, and posted to the District's website at: http://borregowd.org/.

The Borrego Valley GSA reviewed the Emergency Regulations for Groundwater Sustainability Plans and Alternatives that were adopted by the California Water

Commission on May 18, 2016 (California Code of Regulations Title 23. Division 2. Chapter 1.5. Subchapter 2. Groundwater Sustainability Plans) and developed a scope of work to comply with these regulations. The GSP will include, among other components, a groundwater model and projects/management actions that will be required to sustainably manage groundwater in the BVGB. The Borrego Valley GSA anticipates compiling and assessing existing data in the coming weeks and finalizing the GSP prior to the January 2020 SGMA-mandated deadline.

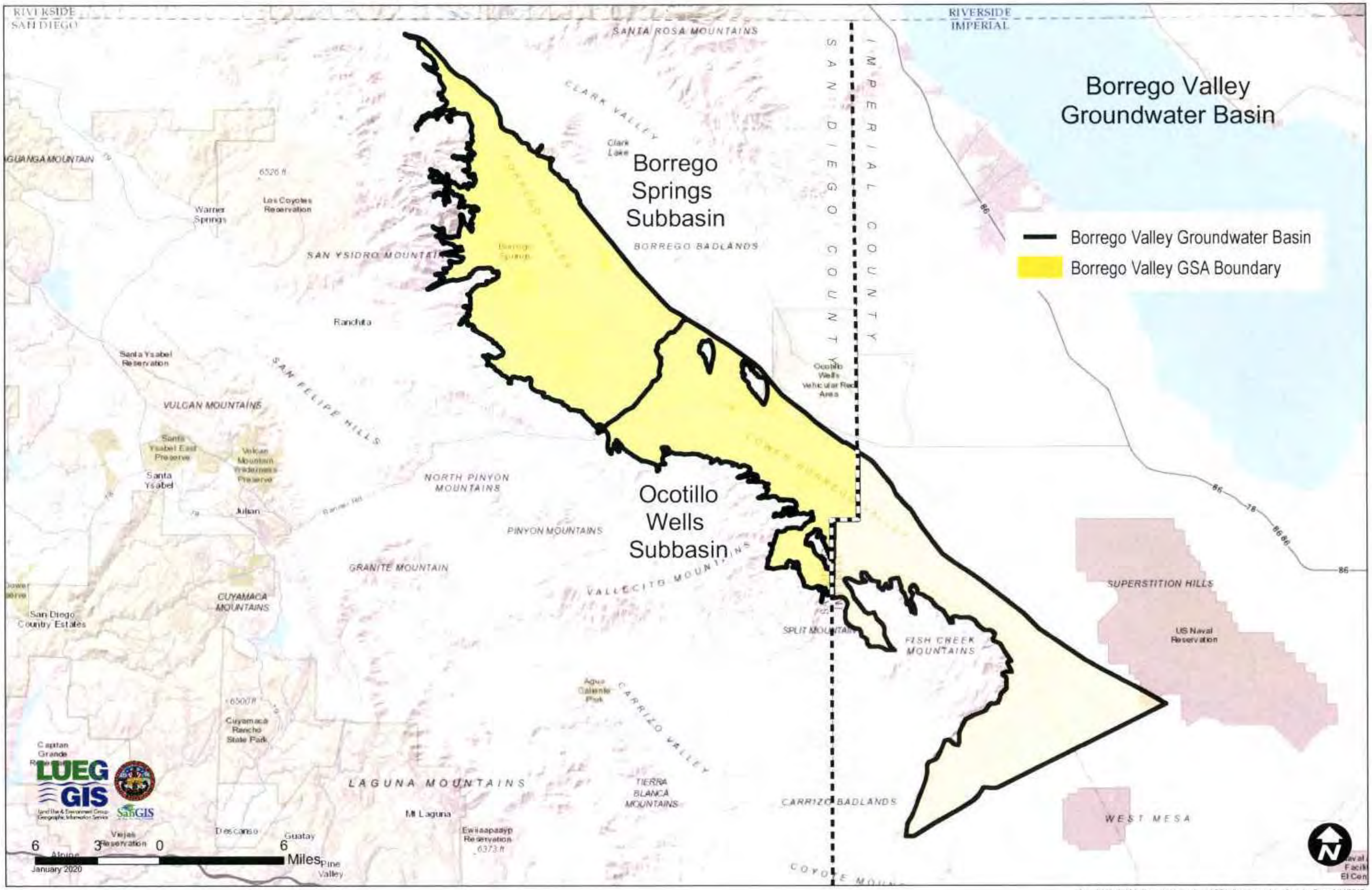
If you have any questions, or require additional information, please contact me at (858) 694-3820.

Sincerely,

JIM BENNETT, Groundwater Geologist
Planning & Development Services

Attachments:
Attachment 1 – Borrego Valley Groundwater Basin Map

cc.
Geoff Poole, General Manager, Borrego Water District
(geoff@borregowd.org)


Borrego Valley Groundwater Basin
Borrego Valley Groundwater Basin
Borrego Valley GSA Boundary
Borrego Springs Subbasin
Ocotillo Wells Subbasin
SAN DIEGO COUNTY
IMPERIAL COUNTY
RIVERSIDE
SAN DIEGO
RIVERSIDE
IMPERIAL
SANTA ROSA MOUNTAINS
CLARK VALLEY
BORREGO BADLANDS
SAN YSIDRO MOUNTAINS
SAN FELIPE HILLS
VULCAN MOUNTAINS
NORTH PINYON MOUNTAINS
PINYON MOUNTAINS
GRANITE MOUNTAIN
VALLECITO MOUNTAINS
CUYAMACA MOUNTAINS
SPLIT MOUNTAIN
FISH CREEK MOUNTAINS
CARRIZO VALLEY
LAGUNA MOUNTAINS
TIERRA BLANCA MOUNTAINS
CARRIZO BADLANDS
SUPERSTITION HILLS
US Naval Reservation
WEST MESA
Warner Springs
Los Coyotes Reservation
Ranchita
Santa Ysabel Reservation
Santa Ysabel
Julian
San Diego Country Estates
Cuyamaca Rancho State Park
Descanso
Guatay
Mt Laguna
Ewiiaapaayp Reservation
Ocotillo Wells Vehicular Rec Area
Agua Caliente Park
6 3 0 6 Miles
January 2020
Path: P:\20151020_Borrego_Valley_basin\GSA_Borrego_color_v2.mxd - Date: 3/14/2017

APPENDIX B3

GSA Notification (Amended)

County of San Diego

MARK WARDLAW
DIRECTOR

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE, SUITE 310, SAN DIEGO, CA 92123
www.sdcounty.ca.gov/pds
PHONE (858) 694-2962 FAX (858) 694-2555

March 22, 2017

Mark Nordberg, GSA Project Manager
Senior Engineering Geologist
Department of Water Resources
901 P Street, Room 213A
Post Office Box 942836
Sacramento, CA 94236

Delivery via E-Mail
(Mark.Nordberg@water.ca.gov)

GSA NOTIFICATION (AMENDED): MEMORANDUM OF UNDERSTANDING FOR THE BORREGO VALLEY GROUNDWATER SUSTAINABILITY AGENCY

Dear Mr. Nordberg:

Pursuant to California Water Code (Water Code) Section 10723.8, the County of San Diego (County) provided notice on January 13, 2016 to the California Department of Water Resources (DWR) of the County's decision to become a Groundwater Sustainability Agency (GSA) for the Borrego Valley Groundwater Basin (BVGB) [Attachment 1]. Since Borrego Water District (BWD) also provided notice to become a GSA for BVGB (DWR Basin No. 7-24), the County and BWD collaborated on a Memorandum of Understanding (MOU) to eliminate any overlap in the areas proposed to be managed. This MOU (Attachment 2) was approved by BWD on September 20, 2016 and by the County Board of Supervisors on October 19, 2016 and establishes the Borrego Valley GSA, which is a multi-agency GSA for the BVGB.

In October 2016, DWR released final 2016 modifications to California's basin boundaries (Bulletin 118 Basins [2016 Edits]), which included the subdivision of the BVGB into two separate subbasins (Borrego Springs and Ocotillo Wells). As such, this notification includes a map and GIS files of the proposed Borrego Valley GSA boundary within the limits of the revised basin in San Diego County (Attachment 1).

In addition to eliminating the overlap, the MOU serves to memorialize each agency's roles and responsibilities for developing a single Groundwater Sustainability Plan (GSP) that complies with the requirements of the Sustainable Groundwater Management Act (SGMA) to sustainably manage groundwater in the BVGB. As indicated in the initial notices, the County and BWD intend to work cooperatively to jointly manage groundwater in the basin.

Both agencies remain committed to considering the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing a GSP. Each agency further anticipates working collaboratively with stakeholders to develop and implement the GSP for the Borrego Valley Groundwater Basin. To aid this effort, the County and BWD established an advisory committee in spring 2017. In accordance with Water Code Section 10727.8(a), interested parties may participate in the development and implementation of the GSP by attending advisory committee meetings in Borrego Valley and may sign up to receive information about GSP development at the County's SGMA webpage located at: http://www.sandiegocounty.gov/pds/SGMA.html.

The County and BWD concur that this agreement does not involve a material change from the information in the posted notices from BWD and the County, yet eliminates the overlap as required by California Water Code Section 10723.8(c).

If you have any questions, or require additional information, please contact the County Groundwater Geologist, Jim Bennett, at (858) 694-3820.

Sincerely,

MARK WARDLAW, Director
Planning & Development Services

Attachments:
Attachment 1 – Borrego Valley Groundwater Basin Map
Attachment 2 – MEMORANDUM OF UNDERSTANDING FOR THE BORREGO VALLEY GROUNDWATER SUSTABILITY AGENCY

cc.
Jim Bennett, Groundwater Geologist, County of San Diego
(jim.bennett@sdcounty.ca.gov)
Geoff Poole, General Manager, Borrego Water District
(geoff@borregowd.org)

APPENDIX B4

Signed Memorandum of Understanding

January 2020

MEMORANDUM OF UNDERSTANDING
DEVELOPMENT OF A GROUNDWATER SUSTAINABILITY PLAN
FOR THE BORREGO VALLEY GROUNDWATER BASIN

This Memorandum of Understanding for the Development of a Groundwater Sustainability Plan ("Plan") for the Borrego Valley Groundwater Basin ("MOU") is entered into and effective this 29 day of October, 2016 by and between the Borrego Water District ("District") and the County of San Diego ("County"). The District and the County are each sometimes referred to herein as a "Party" and are collectively sometimes referred to herein as the "Parties."

RECITALS

WHEREAS, on September 16, 2014, Governor Jerry Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739, known collectively as the Sustainable Groundwater Management Act (Act);

WHEREAS, Act went into effect on January 1, 2015;

WHEREAS, Act seeks to provide sustainable management of groundwater basins, enhance local management of groundwater; establish minimum standards for sustainable groundwater management; and provide local groundwater agencies the authority and the technical and financial assistance necessary to sustainably manage groundwater;

WHEREAS, the Parties have each declared to be a Groundwater Sustainability Agency (GSA) overlying portions of Borrego Valley Groundwater Basin (Borrego Basin), identified as Basin Number 7.24, a Bulletin 118 designated (medium-priority) basin;

WHEREAS, each Party has statutory authorities that are essential to groundwater management and Act compliance;

WHEREAS, Section 10720.7 of Act requires all basins designated as high- or medium-priority basins designated in Bulletin 118 be managed under a Plan or coordinated Plans pursuant to Act;

WHEREAS, Section 10720.7 of Act requires all critically over drafted basins be managed under a Plan by January 31, 2020;

WHEREAS, the California Department of Water Resources (DWR) has identified the Borrego Basin as critically over drafted;

WHEREAS, the Parties intend to eliminate overlap of the Parties by collectively developing and implementing a single Plan to sustainably manage Borrego Basin pursuant to section 10727 et seq. of Act;

WHEREAS, the Parties wish to use the authorities granted to them pursuant to the Act and utilize this MOU to memorialize the roles and responsibilities for developing the Plan;

WHEREAS, it is the intent of the Parties to complete the Plan as expeditiously as possible in a manner consistent with Act and its implementing regulations;

WHEREAS, it is the intent of the Parties to cooperate in the successful implementation of the Plan not later than the date as required by the Act for the Borrego Basin;

WHEREAS, the Parties wish to memorialize their mutual understandings by means of this MOU; and

NOW, THEREFORE, in consideration of the promises, terms, conditions, and covenants contained herein, the Borrego Water District and the County of San Diego hereby agree as follows:

I. Purposes and Authorities.

This MOU is entered into by the Parties for the purpose of establishing a cooperative effort to develop and implement a single Plan to sustainably manage the Borrego Basin that complies with the requirements set forth in the Act and its associated implementing regulations. The Parties recognize that the authorities afforded to a GSA pursuant to Section 10725 of the Act are in addition to and separate from the statutory authorities afforded to each Party individually. The Parties intend to memorialize roles and responsibilities for Plan implementation during preparation of the Plan.

II. Definitions.

As used in this Agreement, unless context requires otherwise, the meanings of the terms set forth below shall be as follows:

1. "Act" refers to the Sustainable Groundwater Management Act.
2. "Advisory Committee" refers to the stakeholder group created in Section III of the MOU.
3. "Core Team" refers to the working group created in Section III of the MOU.
4. "County" refers to the County of San Diego, a Party to this MOU. The County has designated the Director, Planning & Development Services, or his designee(s), as the County department representative to carry out the terms of this MOU for the County.
5. "District" refers to the Borrego Water District, a Party to this MOU.
6. "DWR" refers to the California Department of Water Resources.
7. "Effective Date" means the date on which the last Party executes this Agreement.
8. "Governing Body" means the legislative body of each Party: the District Board of Directors and the County Board of Supervisors, respectively.
9. "Groundwater Sustainability Plan (Plan)" is the basin plan for the Borrego Basin that the parties to this MOU are seeking to develop and implement pursuant to the Act.
10. "Memorandum of Understanding (MOU)" refers to this agreement.
11. "Party" or "Parties" refer to the County of San Diego and Borrego Water District.

12. "Plan Funding" is the funding necessary for the preparation and implementation of the Plan.

13. "Plan Schedule" includes all the tasks necessary to complete the Plan and the date scheduled for completion.

14. "State" means the State of California.

15. "SWRCB" refers to the State Water Resources Control Board.

16. "Undesirable Result" shall be defined as in the Act Section 10721(x) 1-6

III. Agreement.

This section establishes the process for the Borrego Basin Plan Core Team and the Advisory Committee.

1. Establishment and Responsibilities of the Plan Core Team (Core Team).

    a. The Core Team shall jointly develop a coordinated Plan. The Plan shall include, but not be limited to, enforcement measures, a detailed breakdown of each Parties responsibilities for Plan implementation, anticipated costs of implementing the Plan, and cost recovery mechanisms (if necessary).

    b. The Core Team will consist of representatives from each Party to this MOU working cooperatively together to achieve the objectives of the Act. Core Team members serve at the pleasure of their appointing Party and may be removed/changed by their appointing Party at any time. A Party must notify all other Parties to this MOU in writing if that Party removes or replaces Core Team members.

    c. Each member of the Core Team shall be responsible for keeping his/her respective management and governing board informed of the progress towards the development of the Plan and for obtaining any necessary approvals from management/governing board. Each member of the Core Team shall keep the other member reasonably informed as to all material developments so as to allow for the efficient and timely completion of the Plan.

    d. Each Core Team member's compensation for their service on the Core Team is the responsibility of the appointing Party.

    e. The Core Team shall develop and implement a stakeholder participation plan that involves the public and area stakeholders in an Advisory Committee role to aid in developing and implementing the Plan.

    f. The Core Team will cooperatively work with the Advisory Committee to develop bylaws for the governance of the Advisory Committee. These bylaws are subject to approval by the Core team prior to adoption by the Advisory Committee. The Core Team may establish an appointment process and other administrative procedures for the Advisory Committee, in accordance with District and County policies intended to promote active participation in local government, and requirements to include stakeholders in the development of the Plan as established in the Act.

g. The Core Team will be the primary liaison with the Advisory Committee; and will guide Advisory Committee activities.

2. Core Team Meetings.

a. The Core Team will establish a meeting schedule and choice of locations for regular meetings to discuss Plan development and implementation activities, assignments, milestones and ongoing work progress.

b. The Core Team may establish and schedule meetings of the Advisory Committee to coordinate development and implementation of the Plan.

c. Attendance at all Core Team meetings may be augmented to include staff or consultants to ensure that the appropriate expertise is available.

3. Establishment and Role of the Advisory Committee

a. The Parties shall establish an Advisory Committee. The Advisory Committee will provide input to the Core Team on Plan development, including providing recommendations on basin sustainability measures, and the planning, financing, and implementation of the Plan. The Parties will agree on the composition of the Advisory Committee and acknowledge that the Advisory Committee must meet the requirements established in the Act.

b. Advisory Committee members will not be compensated for activities associated with the Advisory Committee, Plan development or any activity conducted under this agreement.

c. The Advisory Committee that is formed through this process shall be subject to and abide by the California open meeting laws under Government Code sections 54950 et seq., otherwise known as the "Brown Act," in order for the Parties to accept an Advisory Committee's recommendations.

d. Meetings of the Advisory Committee shall be held in Borrego Springs, CA.

IV. <u>Interagency Communication.</u>

1. To provide for consistent and effective communication between parties, each Party agrees that a single member from each Party's Core Team will be their central point of contact on matters relating to this MOU. Additional representatives may be appointed to serve as points of contact on specific actions or issues.

2. The Core Team shall appoint a single representative to communicate actions conducted under this agreement to DWR. The appointee shall not communicate formal actions or decisions without prior written approval from the Core Team. This is not intended to discourage informal communications between the Parties

and DWR.

V. Roles and Responsibilities of the Parties.

1. The Parties are responsible for developing a coordinated Plan that meets the requirements of the Act.
2. The Parties will jointly establish their roles and responsibilities for implementing a coordinated Plan for the Borrego Basin in accordance with the Act.
3. The Parties will jointly work in good faith and coordinate all activities to meet the objectives of this MOU. The Parties shall cooperate with one another and work as efficiently as possible in the pursuit of all activities and decisions described in the MOU.
4. Each of the Parties will provide expertise, guidance, and data on those matters for which it has specific expertise or statutory authority, as needed to carry out the objectives of this MOU. Further development of roles and responsibilities of each Party will occur during Plan development.
5. After execution of this MOU as soon as reasonably possible, the Core Team shall mutually develop a timeline that describes the anticipated tasks to be performed under this MOU and dates to complete each task (Plan Schedule); and scope(s) of work and estimated costs for Plan development. The Plan Schedule will allow for the preparation of a legally defensible Plan acceptable to the Parties and include allowances for public review and comment, and approval by governing boards prior to deadlines required in the Act. Due to the critical nature of the Borrego Basin overdraft, both Parties shall make every effort to complete the draft Plan as soon as possible but no later than July 1, 2019. The Plan Schedule shall become part of this MOU through reference. The Plan Schedule will be referred and amended as necessary to conform to developing information, permitting, and other requirements. Therefore, this Plan Schedule may be revised from time to time upon mutual agreement of the Core Team. Costs shall be funded and shared as outlined in Section VI.
6. The Parties recognize that they may disagree as to the composition of the Plan and/or the timelines/methods for implementing the Plan. In the event that the Parties have attempted, in good faith, to resolve the matter on their own and are unsuccessful, the Parties agree to jointly seek to use the non-binding mediation services provided by the DWR to address disputes arising under the Act, to the extent that such services are available. If non-binding mediation from the DWR is not available or if either Party believes it would be more useful to consult with the State Water Resources Control Board ("SWRCB"), the Parties agree to request non-binding mediation from the Chair of the SWRCB or another Member designated by the Chair who is acceptable to both Parties. The Parties recognize that the failure to timely complete a Plan or to achieve any of the other milestones in the Act may result in intervention by the SWRCB.

VI. Contracting and Funding for Plan Development.

1. The Parties shall mutually develop a scope of work, budget, cost sharing agreement and cost recovery plan ("Plan Funding") for the work to be undertaken pursuant to this MOU. The Plan Funding shall be included and adopted in the final Borrego Basin Plan. Both the budget and cost sharing agreement shall be determined prior to any substantial financial expenditures or incurrence of any financial obligations related to consultant costs.
2. Specifically, to fulfill the requirements of the Act, the Core Team will jointly prepare and agree upon a scope of work for the consultants needed to prepare the Plan. The Parties agree that any work contracted for the purpose of developing the Plan shall be a cooperative effort.
3. The County shall hire consultant(s) to complete required components of the Plan. The contracting shall be subject to the County's competitive bid process and be subject to auditing by the County's Auditor and Controller.
4. Within the parameters of the County's contracting regulations, policies and procedures, the Core Team will be cooperatively involved in the evaluation, selection and oversight of the consultant(s).
5. Each Party is free to retain other consultants for its own purposes and at its own cost, *provided that* each Party consults with the other Party before conducting such work. The scope of any such work may not conflict with or duplicate work performed under this MOU. Nothing in this agreement prohibits either Party from exercising its statutory authorities afforded to each Party individually.
6. The Parties agree that each Party will bear its own staff costs to develop the Plan.

VII. Approval.

1. The Parties agree to make best efforts to adhere to the required Plan Schedule and will forward a final Borrego Basin Plan to their respective governing boards for approval and subsequent submission to DWR for evaluation as provided for in Act.
2. Approval and amendments will be obtained from the District Board of Directors prior to submission to the County Board of Supervisors.
3. Each Governing Board retains full authority to approve, amend, or reject the proposed Plan, provided the other Governing Board subsequently confirms any amendments, but both Parties also recognize that the failure to adopt and submit a Plan for the Basin to DWR by January 31, 2020 risks allowing for state intervention in managing the Basin.
4. The Parties agree that they will use good-faith efforts to resolve any issues that one or both Governing Boards may have with the final proposed Plan for the Basin in a timely manner so as to avoid the possibility of state intervention. An amendment to this MOU is anticipated upon acceptance of the Borrego Basin Plan by both Governing Boards.

VIII. Staffing.

Each Party agrees that it will devote sufficient staff time and other resources to actively participate in the development of the Plan for the Basin, as set forth in this MOU.

IX. Indemnification.

1. Claims Arising From Sole Acts or Omissions of County.
The County of San Diego (County) hereby agrees to defend and indemnify the District, its agents, officers and employees (hereinafter collectively referred to in this paragraph as "District"), from any claim, action or proceeding against District, arising solely out of the acts or omissions of County in the performance of this MOU. At its sole discretion, District may participate at its own expense in the defense of any claim, action or proceeding, but such participation shall not relieve County of any obligation imposed by this MOU. The District shall notify County promptly of any claim, action or proceeding and cooperate fully in the defense.

2. Claims Arising From Sole Acts or Omissions of the District.
The District hereby agrees to defend and indemnify the County of San Diego, its agents, officers and employees (hereafter collectively referred to in this paragraph as 'County') from any claim, action or proceeding against County, arising solely out of the acts or omissions of District in the performance of this MOU. At its sole discretion, County may participate at its own expense in the defense of any such claim, action or proceeding, but such participation shall not relieve the District of any obligation imposed by this MOA. County shall notify District promptly of any claim, action or proceeding and cooperate fully in the defense.

3. Claims Arising From Concurrent Acts or Omissions.
The County of San Diego ("County") hereby agrees to defend itself, and the District hereby agrees to defend itself, from any claim, action or proceeding arising out of the concurrent acts or omissions of County and District. In such cases, County and District agree to retain their own legal counsel, bear their own defense costs, and waive their right to seek reimbursement of such costs, except as provided in paragraph 5 below.

4. Joint Defense.
Notwithstanding paragraph 3 above, in cases where County and District agree in writing to a joint defense, County and District may appoint joint defense counsel to defend the claim, action or proceeding arising out of the concurrent acts or omissions of District and County.. Joint defense counsel shall be selected by mutual agreement of County and District. County and District agree to share the costs of such joint defense and any agreed settlement in equal amounts, except as provided in paragraph 5 below. County and District further agree that neither party may bind the other to a settlement agreement without the written consent of both County and District.

5. Reimbursement and/or Reallocation.
Where a trial verdict or arbitration award allocates or determines the comparative fault of the parties, County and District may seek reimbursement and/or reallocation

of defense costs, settlement payments, judgments and awards, consistent with such comparative fault.

X. Litigation.

In the event that any lawsuit is brought against either Party based upon or arising out of the terms of this MOU by a third party, the Parties shall cooperate in the defense of the action. Each Party shall bear its own legal costs associated with such litigation.

XI. Books and Records.

Each Party shall have access to and the right to examine any of the other Party's pertinent books, documents, papers or other records (including, without limitation, records contained on electronic media) relating to the performance of that Party's obligations pursuant to this Agreement, *providing that* nothing in this paragraph shall be construed to operate as a waiver of any applicable privilege.

XII. Notice.

All notices required by this Agreement will be deemed to have been given when made in writing and delivered or mailed to the respective representatives of County and the District at their respective addresses as follows:

For the District:

General Manager
Borrego Water District
PO Box 1870
806 Palm Canyon Drive
Borrego Springs, CA 92004

With a copy to:

David Aladjem
Downey Brand LLP
621 Capitol Mall, 18th Floor
Sacramento, CA 95814

For the County:

San Diego County
Administrative Officer
San Diego County
1600 Pacific Highway
San Diego, CA 92101

With a copy to:

Justin Crumley, Senior Deputy
Office of County Counsel
1600 Pacific Highway, Rm 355
San Diego, CA 92101

Any party may change the address or facsimile number to which such communications are to be given by providing the other parties with written notice of such change at least fifteen (15) calendar days prior to the effective date of the change.

All notices will be effective upon receipt and will be deemed received through delivery if personally served or served using facsimile machines, or on the fifth (5^{th}) day following deposit in the mail if sent by first class mail.

XIII. Miscellaneous.

1. Term of Agreement. This MOU shall remain in full force and effect until the date upon which the Parties have both executed a document terminating the provisions of this MOU.
2. No Third Party Beneficiaries. This Agreement is not intended to, and will not be construed to, confer a benefit or create any right on a third party, or the power or right to bring an action to enforce any of its terms.
3. Amendments. This Agreement may be amended only by written instrument duly signed and executed by the County and the District.
4. Compliance with Law. In performing their respective obligations under this MOU, the Parties shall comply with and conform to all applicable laws, rules, regulations and ordinances.
5. Jurisdiction and Venue. This MOU shall be governed by and construed in accordance with the laws of the State of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this MOU shall be brought and maintained to the extent allowed by law in the County of San Diego, California.
6. Waiver. The waiver by either party or any of its officers, agents or employees, or

the failure of either party or its officers, agents or employees to take action with respect to any right conferred by, or any breach of any obligation or responsibility of this Agreement, will not be deemed to be a waiver of such obligation or responsibility, or subsequent breach of same, or of any terms, covenants or conditions of this Agreement, unless such waiver is expressly set forth in writing in a document signed and executed by the appropriate authority of the County and the District.

7. Authorized Representatives. The persons executing this Agreement on behalf of the parties hereto affirmatively represent that each has the requisite legal authority to enter into this Agreement on behalf of their respective party and to bind their respective party to the terms and conditions of this Agreement. The persons executing this Agreement on behalf of their respective party understand that both parties are relying on these representations in entering into this Agreement.

8. Successors in Interest. The terms of this Agreement will be binding on all successors in interest of each party.

9. Severability. The provisions of this Agreement are severable, and the adjudicated invalidity of any provision or portion of this Agreement shall not in and of itself affect the validity of any other provision or portion of this Agreement, and the remaining provisions of the Agreement shall remain in full force and effect, except to the extent that the invalidity of the severed provisions would result in a failure of consideration or would materially adversely affect either party's benefit of its bargain. If a court of competent jurisdiction were to determine that a provision of this Agreement is invalid or unenforceable and results in a failure of consideration or materially adversely affects either party's benefit of its bargain, the parties agree to promptly use good faith efforts to amend this Agreement to reflect the original intent of the parties in the changed circumstances.

10. Construction of Agreement. This Agreement shall be construed and enforced in accordance with the laws of the United States and the State of California.

11. Entire Agreement.

    a. This Agreement constitutes the entire agreement between the County and the District and supersedes all prior negotiations, representations, or other agreements, whether written or oral.

    b. In the event of a dispute between the parties as to the language of this Agreement or the construction or meaning of any term hereof, this Agreement will be deemed to have been drafted by the parties in equal parts so that no presumptions or inferences concerning its terms or interpretation may be construed against any party to this Agreement.

IN WITNESS WHEREOF, the parties hereto have set their hand on the date first above written.

BORREGO WATER DISTRICT

By: Beth A Hart

Beth A. Hart
President, Board of Directors

COUNTY OF SAN DIEGO,
a political subdivision of
the State of California

By:

Clerk of the Board of Supervisors

DATE: 10/24/16

APPROVED AS TO FORM AND LEGALITY
BY COUNTY COUNSEL

By: 10/19/16
Senior Deputy

Approved and/or authorized by the
Board of Supervisors of the County of San Diego.
Meeting Date: 10/19/16 Minute Order No. 1
By: Date: 10/24/16
Deputy Clerk of the Board Supervisors

APPENDIX B5

County of San Diego Notice of Election to Become a Groundwater Sustainability Agency

County of San Diego

MARK WARDLAW
DIRECTOR
PHONE (858) 694-2962
FAX (858) 694-2555

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE SUITE 310 SAN DIEGO CA 92123
www.sdcounty.ca.gov/pds

DARREN GRETLER
ASSISTANT DIRECTOR
PHONE (858) 694-2962
FAX (858) 694-2555

January 13, 2016

Mark Nordberg, GSA Project Manager
Senior Engineering Geologist
Department of Water Resources
901 P Street, Room 213A
Post Office Box 942836
Sacramento, CA 94236

Delivery via E-Mail and US Mail
(MarkNordberg@water.ca.gov)

NOTICE OF ELECTION TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY FOR THE BORREGO VALLEY GROUNDWATER BASIN

Dear Mr. Nordberg:

Pursuant to California Water Code Section 10723.8, the County of San Diego (County), a political subdivision of the State of California, gives notice to the California Department of Water Resources (DWR) of the County's decision to become a Groundwater Sustainability Agency (GSA) and to undertake sustainable groundwater management in the portion of the Borrego Valley Groundwater Basin (DWR Basin No. 7-24) within the boundary of San Diego County. The County overlies a portion of the basin as indicated on the attached map (Exhibit A of Attachment 1).

On January 6, 2016, the County Board of Supervisors held a public hearing in accordance with California Water Code Section 10723(b). The public hearing was noticed in the Daily Transcript in accordance with Government Code Section 6066 (Attachment 2).

After holding the public hearing, the County Board of Supervisors adopted Resolution Number 16-001 (Attachment 1) electing to become a GSA over the portion of the Borrego Valley Groundwater Basin within the boundary of San Diego County. No new bylaws, ordinances, or authorities were adopted by the County at that time.

The County is coordinating with Borrego Water District (BWD), which also submitted notice of election to DWR to become a GSA over the Borrego Valley Groundwater Basin within San Diego County. The County and BWD intend to work cooperatively to jointly manage groundwater in the basin. The County of Imperial and Imperial Irrigation District provided notice of election to DWR to become GSAs over the portion of the basin within

Imperial County. It should be noted that BWD and the County intend to submit a basin, boundary adjustment under separate cover which will request that DWR adjust the basin boundaries in Bulletin 118-2003.

The County Board of Supervisors authorized the Director of Planning & Development Services to negotiate inter-agency agreements with BWD, the County of Imperial, Imperial Irrigation District, and/or other agencies or entities utilizing groundwater in the Borrego Valley Groundwater Basin, as necessary for the purpose of implementing a cooperative and coordinated governance structure to sustainably manage the basin.

Pursuant to California Water Code Section 10723.2, the County will consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing a Groundwater Sustainability Plan (GSP). An initial list of stakeholders and interested parties include, but are not limited to, the following:

a) Holders of overlying groundwater rights, including:
    1) Agricultural users – 17 property owners encompassing about 3,976 acres.
    2) Domestic well owners – About 275 wells within the GSA boundary.
b) Municipal well operators – No incorporated cities within the GSA boundary.
c) Public water systems – Borrego Water District.
d) Local land use planning agencies – County of San Diego and Borrego Springs Community Sponsor Group.
e) Environmental users of groundwater – Anza-Borrego Desert State Park.
f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies – No hydrologic connection.
g) The federal government, including, but not limited to, the military and managers of federal lands – None.
h) California Native American tribes – None.
i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems – Borrego Water District ratepayers and domestic well owners.
j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency – The BWD and County have filed and maintain California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring data with the DWR.

The County intends to work cooperatively with stakeholders to develop and implement the GSP for the Borrego Valley Groundwater Basin and will maintain a list of interested parties to be included in the formation of the GSP. By this notification, the County has provided DWR with all applicable information in California Water Code Section

10723.8(a). If you have any questions, or require additional information, please contact the County Groundwater Geologist, Jim Bennett, at (858) 694-3820.

Sincerely,

MARK WARDLAW, Director
Planning & Development Services

Attachments:
Attachment 1 – Resolution No. 16-001 (with Exhibit A – Borrego Valley Groundwater Basin Map)
Attachment 2 – Proof of Publication

Attachment 1 – Resolution No. 16-001 (with Exhibit A – Borrego Valley Groundwater Basin Map)

Resolution No.:16-001
Meeting Date: 1/6/16 (1)

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN DIEGO TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY OVER BORREGO VALLEY GROUNDWATER BASIN.

WHEREAS, on September 16, 2014, the Sustainable Groundwater Management Act (SGMA) was signed into law and adopted into the California Water Code, commencing with Section 10720, and became effective on January 1, 2015;

WHEREAS, the legislative intent of the SGMA is to provide for sustainable management of groundwater basins and sub-basins defined by the California Department of Water Resources (DWR), to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater;

WHEREAS, Water Code Section 10723(a) authorizes local land use authorities, water suppliers, and certain other local agencies, or a combination of local agencies, overlying a groundwater basin to elect to become a Groundwater Sustainability Agency (GSA) for the basin;

WHEREAS, San Diego County (County) is a local agency qualified to become a GSA under SGMA;

WHEREAS, the County overlies a portion of Borrego Valley (DWR Basin No. 7-24), a DWR-designated medium-priority, non-adjudicated groundwater basin, as shown on the map at Exhibit "A" attached to this Resolution.

WHEREAS, California Water Code Section 10723.8 requires that a local agency electing to serve as a GSA notify DWR of its election to form the GSA and undertake sustainable groundwater management within a basin;

WHEREAS, California Water Code Section 10723.8 mandates that within 90 days of the posting of a notice by DWR of an entity's election to form a GSA, that entity shall be presumed to be the exclusive GSA for that area unless another entity provides notice to DWR of its intent to form a GSA, or notice that the entity has formed a GSA;

WHEREAS, on August 11, 2015 the County of Imperial provided notice to DWR of election to form a GSA within the portion of Borrego Valley that lies within their jurisdiction;

WHEREAS, on October 27, 2015 Borrego Water District (BWD) provided notice to DWR of its election to form a GSA within the portion of Borrego Valley that lies within its jurisdiction;

WHEREAS, California Water Code Section 10724(a) states that if there is an area within the basin that is not within the management area of another entity, the County will be presumed to be the GSA for that area;

WHEREAS, no other entities have jurisdiction over the Borrego Valley Groundwater Basin in its entirely within San Diego County;

WHEREAS, the County intends to work cooperatively with the BWD, the County of Imperial, and community interests to form a GSA over Borrego Valley Groundwater Basin;

WHEREAS, the County is uniquely qualified to become the GSA over that portion of Borrego Valley Groundwater Basin located within the County as a result of its;

- current jurisdiction over the entire extent of Borrego Valley Groundwater Basin within the County of San Diego (reference Exhibit "A");
- experience in regulating groundwater through the San Diego County Groundwater Ordinance (San Diego County Code Title 6, Division 7, Chapter 7 Groundwater), and groundwater monitoring via the County's role of administering and enforcing State standards and local ordinances pertaining to the construction or destruction of any well or boring within the County (Article 4, Section 67 of the San Diego County Code and the California Well Standards Bulletin 74-90); and
- experience regulating groundwater use by making land use decisions based on the availability of groundwater for project use and whether or not the project will negatively impact groundwater quantity or quality.

WHEREAS, establishing the County as a GSA will enable the County to coordinate well permitting and extraction allocations with Groundwater Sustainability Plan (GSP) requirements, apply uniform basin management requirements, and ensure diverse stakeholder interests are represented during GSP development;

WHEREAS, the County is committed to the management of its groundwater resources to create and promote sustainable groundwater use for the residents of the State of California, the County of San Diego, and Borrego Valley, in particular;

WHEREAS, the County held a public hearing on January 6, 2016 after publication of notice pursuant to Government Code Section 6066 to consider adoption of this Resolution; and

WHEREAS, no new bylaws were adopted in conjunction with this Resolution and the County's existing Board of Supervisors will serve for governance purposes of the GSA or until the County and BWD cooperatively adopt a governing structure for a unified GSA; and

WHEREAS, adoption of this Resolution does not constitute a "Project" under the California Environmental Quality Act (CEQA) pursuant to 15060(c)(3) and 15378(b)(5) of the State CEQA Guidelines because it is an administrative action that does not result in any direct or indirect physical change in the environment.

THEREFORE, BE IT RESOLVED that the Board of Supervisors of the County of San Diego does hereby elect to become a GSA for the portion of DWR Basin No. 7-24 within the jurisdiction of the County of San Diego, pursuant to California Water Code Section 10723, as shown on <u>Exhibit "A"</u> attached to this Resolution.

BE IT FURTHER RESOLVED that the County shall develop an outreach program to ensure that all beneficial uses and users of groundwater are considered.

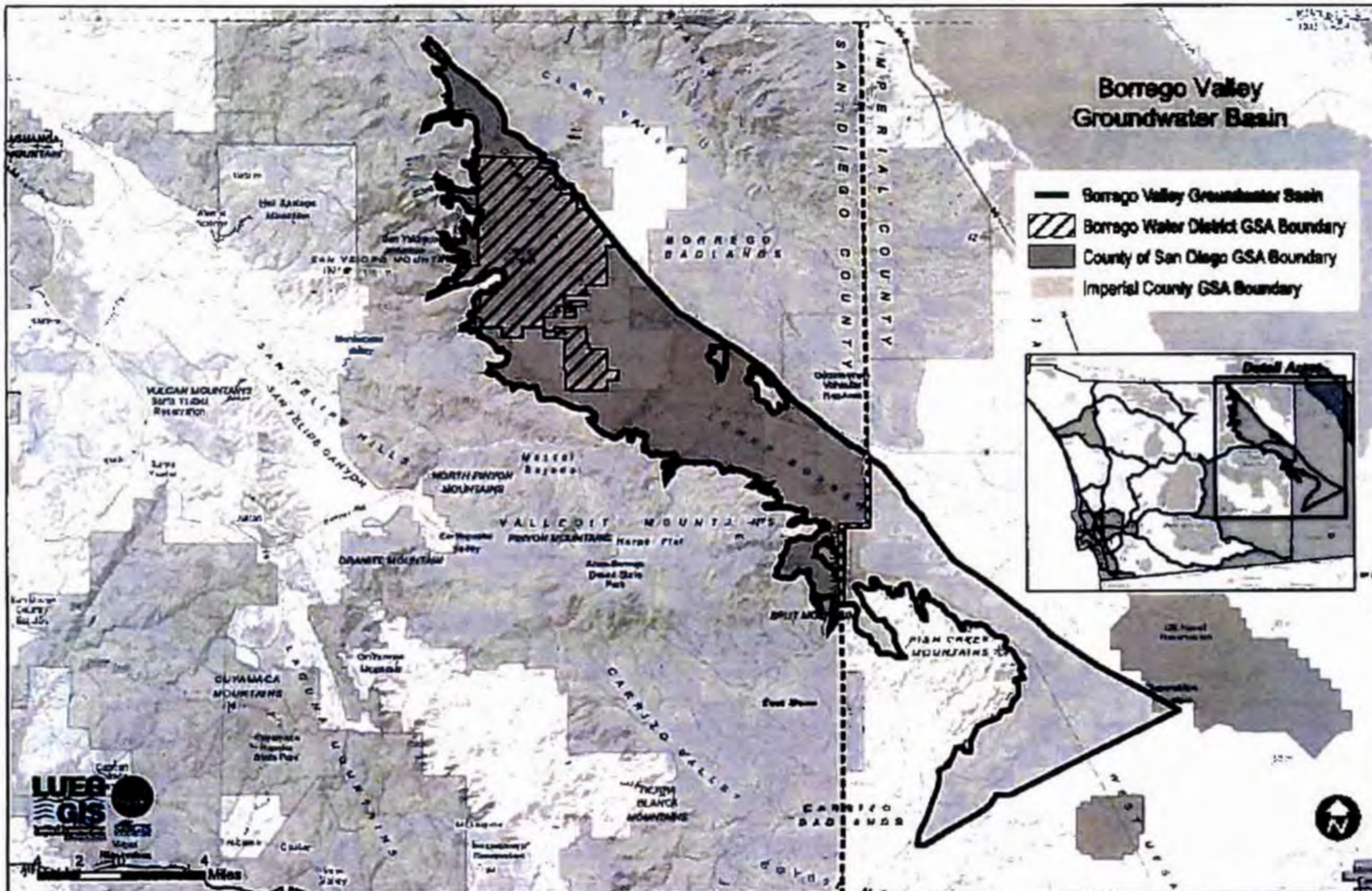
BE IT FURTHER RESOLVED that the Clerk of the Board of Supervisors is hereby directed to submit to DWR, on behalf of the County, a notice of this action to become a GSA and undertake sustainable groundwater management in accordance with SGMA for the portion of DWR Basin No. 7-24 within the jurisdiction of the County of San Diego.

BE IT FURTHER RESOLVED that the notification to DWR shall include the boundary of the portion of DWR Basin No. 7-24 within the jurisdiction of the County of San Diego that the County intends to sustainably manage, a copy of this Resolution, and the initial list of interested parties developed pursuant to California Water Code Section 10723.2, including an explanation of how their interests will be considered in the development and implementation of the GSP.

Approved as to form and legality

Senior Deputy County Counsel
By: Justin Crumley

Exhibit A


Borrego Valley
Groundwater Basin
Borrego Valley Groundwater Basin
Borrego Water District GSA Boundary
County of San Diego GSA Boundary
Imperial County GSA Boundary
Detail Area
IMPERIAL COUNTY
SAN DIEGO COUNTY
BORREGO BADLANDS
VALLECITO MOUNTAINS
SAN FELIPE HILLS
SAN FELIPE CANYON
NORTH PINYON MOUNTAINS
PINYON MOUNTAINS
GRANITE MOUNTAIN
FISH CREEK MOUNTAINS
CARRIZO VALLEY
CARRIZO BADLANDS
CUYAMACA MOUNTAINS
LAGUNA MOUNTAINS
VULCAN MOUNTAINS
Miles

ON MOTION of Supervisor D. Roberts, seconded by Supervisor Jacob, the above Resolution was passed and adopted by the Board of Supervisors, County of San Diego, State of California, on this 6^{th} day of January, 2016, by the following vote:

AYES: Cox, Jacob, D. Roberts, R. Roberts, Horn

\- - -

STATE OF CALIFORNIA)
County of San Diego)^{SS}

I hereby certify that the foregoing is a full, true and correct copy of the Original Resolution entered in the Minutes of the Board of Supervisors.

DAVID HALL
Clerk of the Board of Supervisors

By: Elizabeth Miller, Deputy

Resolution No. 16-001
Meeting Date: 01/06/16 (1)

Attachment 2 – Proof of Publication

THE DAILY TRANSCRIPT

2652 4TH AVE 2ND FL, SAN DIEGO, CA 92103
Telephone (619) 232-3486 / Fax (619) 270-2503

This space for filing stamp only

Jim Bennett
SD CO CLERK OF THE BOARD
1600 PACIFIC HWY., RM. 402
SAN DIEGO, CA - 92101

SD #: 2825264

NOTICE IS HEREBY GIVEN that the Board of Supervisors of the County of San Diego (County) will consider whether to elect to become a Groundwater Sustainability Agency (GSA) for the Borrego Valley Groundwater Basin. Pursuant to California Government Code section 6066 and California Water Code section 10723, the resolution to become a GSA will be considered for adoption on January 6, 2016. After the public hearing the Board may elect to submit a notice of intent for the County to become a GSA to the California Department of Water Resources (DWR). The notice of intent shall be posted by DWR pursuant to Water Code Section 10733.3 and will include a description of the proposed boundaries of the basin for which the County will be the GSA. The Board of Supervisors meets at 9:00 a.m. in Room 310, County Administration Center, 1600 Pacific Highway, San Diego, California. Interested persons are encouraged to review the text of the proposed resolution. A copy of the full text is posted in the office of the Clerk of the Board of Supervisors, Room 402, of the County Administration Center.
12/21, 12/28/15

SD 2825264#

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of SAN DIEGO) ss

Notice Type: GOV - GOVERNMENT LEGAL NOTICE

Ad Description:

AUTHORIZATION TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY OVER

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of THE DAILY TRANSCRIPT, a newspaper published in the English language in the city of SAN DIEGO, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN DIEGO, State of California, under date of 05/13/2003, Case No. GIC808715. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

12/21/2015, 12/28/2015

Executed on 12/28/2015
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

January 2020 *A000003967003*

APPENDIX B6

Borrego Water District Notice of Election to Serve as Groundwater Sustainability Agency

BORREGO WATER DISTRICT

October 26, 2015

Mark Nordberg, GSA Project Manager Senior Engineering Geologist
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236
Mark.Nordberg@water.ca.gov

RE: Notice of Election to Serve as a Groundwater Sustainability Agency

Dear Mr. Nordberg:

Pursuant to Water Code section 10723.8, the Borrego Water District (District), provides this notice of its election to serve as the Groundwater Sustainability Agency (GSA) for the portion of the Borrego Valley Groundwater Basin (number 7-24) within the boundaries of the District and wholly within the County of San Diego, as identified in the attached Exhibit A.

The District is a California Water District formed and operating under the provisions of the California Water Code 35565 and has the authority to exercise powers related to groundwater management. The District adopted an AB3030 Groundwater Management Plan is 2002. The District territory lies entirely within San Diego County and is the sole source water supply for the unincorporated community of Borrego Springs.

On October 20, 2015, the District held a public hearing to consider applying for the GSA status. The District noticed this hearing in both the bi-weekly Borrego Sun and the daily San Diego Union Tribune newspapers, as required by Water Code section 10723(b). A copy of the notice is provided in Exhibit B.

The District also mailed courtesy copies to the Counties of Imperial and San Diego which are the only other local agencies with groundwater authority in the Bulletin 118-2003 configuration of the Borrego Valley Groundwater Basin. A copy of the resolution through which the District elected to become a GSA is attached as Exhibit C. Please note that, under separate cover, the District, the County of Imperial, and the County of San Diego will jointly request the Department of Water Resources adjust the basin boundaries in Bulletin 118-2003 so as to split the basin so that the District and the County of San Diego will manage the portion within the County of San Diego and the County of Imperial will manage the portion within its boundaries.

P O BOX 1870 / 806 PALM CANYON DRIVE, BORREGO SPRINGS, CA 92004 (760) 767-5806 FAX (760) 767-5994 www borregowd org

The District will work cooperatively with the two Counties, along with all interested stakeholders pursuant to Water Code 10723.2. These interested parties include, but are not limited to, the following:

a) Holders of overlying groundwater rights
    1) agricultural users - 17 property owners encompassing 3,976 acres
    2) domestic well owners - approximately 75 wells located within the District boundary
b) Municipal well operators - no incorporated cities within District boundary
c) Public water systems - Borrego Water District
d) Local land planning agencies - San Diego County Department of Planning and Development Services, Borrego Springs Community Sponsor Group
e) Environmental users of groundwater - Anza-Borrego Desert State Park
f) surface water users - Anza-Borrego Desert State park
g) The federal government - none
h) California Native American Tribes - none
i) Disadvantaged Communities - all ratepayers of the Borrego Water District
j) Entities listed in Section 10927 - the Borrego Water District has filed and maintains CASGEM monitoring data with the Department of Water Resources.

The District will consider the interests of all users of groundwater within its boundaries and will maintain a list of interested parties to be included in the formation of the Groundwater Sustainability Plan.

If the DWR has any question, or requires additional information regarding this notification, please feel free to contact me.

Sincerely,

Jerry Rolwing
General Manager
760/767-5806
jerry@borregowd.org

RESOLUTION 2015-10-02

Electing to Become a Groundwater Sustainability Agency

WHEREAS the Legislature recently adopted the Sustainable Groundwater Management Act of 2014, which authorizes local agencies to manage groundwater in a sustainable fashion; and

WHEREAS, in order to use the authority granted in the Sustainable Groundwater Management Act, a local agency must elect to become a groundwater sustainability agency; and

WHEREAS, where more than one local agency overlies a groundwater basin, the Sustainable Groundwater Management Act calls on local agencies to cooperate to manage the groundwater basin in a sustainable manner for the common good; and

WHEREAS, the District together with the Counties of Imperial and San Diego overlies the Borrego Valley groundwater basin; and

WHEREAS, it is the intent of the District to work cooperatively with community interests (including but not limited to the Borrego Water Coalition), the County of Imperial, and the County of San Diego, to manage the Borrego Valley groundwater basin in a sustainable fashion; and

WHEREAS, the District has provided informal notice of its intent to serve as a groundwater sustainability agency for the Borrego Valley Groundwater Basin (the "Basin" as defined in DWR Bulletin 118-80) by means of written communications to the Borrego Water Coalition and the Counties of Imperial and San Diego; and

WHEREAS, on October 5th and October 12th, 2015, the District caused notice of its election to serve as a groundwater sustainability agency for the Basin in the San Diego *Union-Tribune*; and

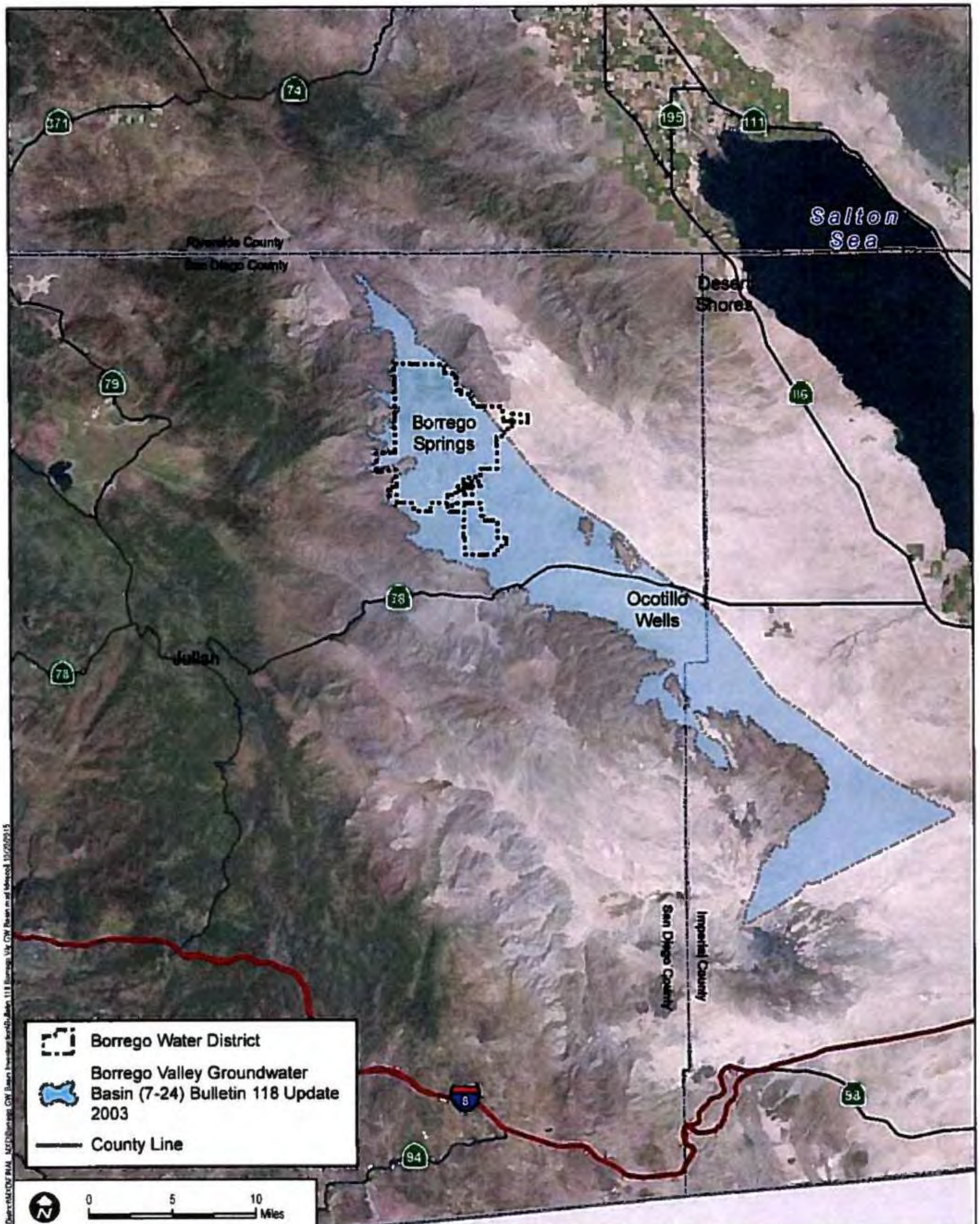
WHEREAS, on October 20, 2015, the District held a public hearing to consider whether it should elect to become a groundwater sustainability agency for the Basin.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Borrego Water District as follows:

1. The District hereby elects to become a groundwater sustainability agency for the Basin.

2. District staff are hereby directed to provide notice of this election to the California Department of Water Resources in the manner required by law.

3. District staff are hereby directed to promptly meet with the Borrego Water Coalition and the Counties of Imperial and San Diego in order to begin the process of developing a groundwater sustainability plan for the Basin. District staff are further directed to develop that plan in consultation and close coordination with the California Department of Water Resources,



DUDEK

SOURCE: BING 2014; DWR 2003

FIGURE 1

Borrego Valley Groundwater Basin (7-24)

OCTOBER 2015
January 2020

Borrego Water District

the Regional Water Quality Control Board, the State Water Resources Control Board, and other interested stakeholders, as contemplated by the Sustainable Groundwater Management Act.

4. District staff are hereby directed to report back to the Board of Directors at least quarterly on the progress toward developing the groundwater sustainability plan for the Basin. The Board of Directors wishes to move forward aggressively to complete the development of this plan as quickly as may be feasible and to ensure that the groundwater basin will be managed in a sustainable fashion at the earliest possible date.

ADOPTED, SIGNED AND APPROVED this 20th day of October, 2015.

Beth A Hart

Beth Hart, President
Board of Directors of Borrego Water District

ATTEST:

Joseph Tatusko

Joseph Tatusko, Secretary
Board of Directors of Borrego Water District

{Seal}

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

I, Joseph Tatusko, Secretary of the Board of Directors of the Borrego Water District, do hereby certify that the foregoing resolution was duly adopted by the Board of Directors of said District at a regular meeting held on the 20th day of October, 2015, and that it was so adopted by the following vote:

AYES: DIRECTORS: Hart, Brecht, Tatusko, Delahay

NOES: DIRECTORS:

ABSENT: DIRECTORS: Estep

ABSTAIN: DIRECTORS:

Joseph Tatusko

Joseph Tatusko, Secretary of the Board of Directors
of Borrego Water District

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

I, Joseph Tatusko, Secretary of the Board of Directors of the Borrego Water District, do hereby certify that the above and foregoing is a full, true and correct copy of RESOLUTION NO. 2015-10-2, of said Board, and that the same has not been amended or repealed.

Dated: October 20, 2015

Joseph Tatusko

Joseph Tatusko, Secretary of the Board of Directors
of Borrego Water District

APPENDIX C
Stakeholder Engagement

C1: Stakeholder Engagement Plan

C2: List of Public Meetings

APPENDIX C1

Stakeholder Engagement Plan

The Stakeholder Engagement Plan has been superseded. Upon completion of the final draft GSP, the final Advisory Committee meeting was held on October 4, 2019, and the Advisory Committee was dissolved. Public meetings of the Watermaster Board and TAC will be conducted under the Stipulated Judgment.

STAKEHOLDER ENGAGEMENT PLAN

BORREGO VALLEY GROUNDWATER BASIN (7-24)

SAN DIEGO COUNTY, CALIFORNIA

SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA) PROGRAM

Prepared for

Prepared by

County of San Diego
Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123

March 20, 2017

TABLE OF CONTENTS

Page

TABLE

1 INTRODUCTION

This Stakeholder Engagement Plan (Engagement Plan) summarizes the strategies to educate and involve stakeholders (those individuals and representatives of organizations who have a direct stake in the outcome of the planning process) and other interested parties in the preparation of a Groundwater Sustainability Plan (GSP) for the Borrego Valley Groundwater Basin (Borrego Basin). This GSP will be prepared in accordance with the Sustainable Groundwater Management Act (SGMA), which was signed by Governor Brown in September 2014 and became effective January 1, 2015.

SGMA provides a framework to regulate groundwater for the first time in California's history. The intent of SGMA is to strengthen local management of specified groundwater basins that are most critical to the state's water needs by regulating groundwater and land use management activities. SGMA also aims to preserve the jurisdictional authorities of cities, counties and water agencies within groundwater basins while protecting existing surface water and groundwater rights.

The County of San Diego (County) and Borrego Water District (the District) elected to become a Multi-Agency Groundwater Sustainability Agency (GSA) for the Borrego Basin – Department of Water Resources (DWR) Basin No. 7-24. The primary purpose of a GSA under SGMA is to develop a GSP to achieve long-term groundwater sustainability. Additionally, SGMA requires and directs GSAs to involve stakeholders and interested parties in the process to regulate groundwater.

2 PURPOSE

The purpose of the outreach activities described in this Engagement Plan is to provide individual stakeholders and stakeholder organizations, and other interested parties an opportunity to be involved in the development and evaluation of the GSP for the Borrego Basin. As a Multi-Agency GSA, the County and the District intend to develop and implement a basin-specific GSP for the Borrego Basin. This GSP is required under SGMA to be completed by no later than January 31, 2020. The projects and management actions necessary to implement the GSP could affect numerous individuals and groups who have a stake in ensuring the basin is sustainably managed as required by SGMA.

In an effort to understand and involve stakeholders and their concerns in the decision-making and activities of the GSA, the County and the District have prepared this Engagement Plan to achieve broad, enduring and productive involvement during the GSP development and implementation phases. This Engagement Plan will assist the County and the District in providing timely information to stakeholders and receive input from interested parties during GSP development. This Engagement Plan will identify stakeholders who have an interest in groundwater in the Borrego Basin, and recommend outreach, education and communication strategies for engaging those stakeholders during the development and implementation of the GSP. The plan also includes an approach for evaluating the overall success of stakeholder engagement and education of both stakeholders and the general public. In consideration of the interests of all beneficial uses and users of groundwater in the basin, this Engagement Plan has been developed pursuant to California Water Code Section 10723.2.

3 GENERAL INFORMATION

The following personnel at the County will serve as contacts for the public during preparation of the GSP.

3.1 SGMA Coordinator

The County's SGMA Coordinator will serve as the central contact for stakeholders and the public. For information on the GSP, contact:

Jim Bennett, Groundwater Geologist
Planning & Development Services
County of San Diego
PDS.groundwater@sdcounty.ca.gov
(858) 694-3820

3.2 Media Contact

Media inquiries should be addressed to:

Alex Bell, Group Communications Officer
Land Use and Environment Group
County of San Diego
Alex.Bell@sdcounty.ca.gov
(619) 531-5410

4 OUTREACH ACTIVITIES

The County and the District will implement the following outreach activities to maximize stakeholder involvement during the development of the GSP and throughout SGMA implementation.

4.1 Public Notices

To ensure that the general public is apprised of local activities and allow stakeholders to access information, SGMA specifies several public notice requirements for GSAs. Refer to Table 1 for a summary of statutory requirements. Three sections of the California

Water Code require public notice before establishing a GSA, adopting (or amending) a GSP, or imposing or increasing fees:

- Section 10723(b). Before electing to be a groundwater sustainability agency, and after publication of notice pursuant to Section 6066 of the Government Code, the local agency or agencies shall hold a public hearing in the county or counties overlying the basin.

- Section 10728.4. A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing, held at least 90 days after providing notice to a city or county within the area of the proposed plan or amendment.

- Section 10730(b)(1). Prior to imposing or increasing a fee, a groundwater sustainability agency shall hold at least one public meeting, at which oral or written presentations may be made as part of the meeting....(3) At least 10 days prior to the meeting, the groundwater sustainability agency shall make available to the public data upon which the proposed fee is based.

In accordance with California Water Code Section 10723(b), the following was noticed to the public:

- On October 20, 2015, the District held a public hearing to consider becoming a GSA for the portion of the Borrego Basin within their boundaries. The District noticed the hearing in both the bi-weekly Borrego Sun and the daily San Diego Union Tribune newspapers.

- On January 6, 2016, the County Board of Supervisors held a public hearing to consider becoming a GSA over the portion of the Borrego Basin within San Diego County. The public hearing was noticed in the Daily Transcript in accordance with Government Code Section 6066.

- On September 20, 2016, the District held a public hearing to consider adopting a Memorandum of Understanding (MOU) between the District and the County. The District noticed the hearing in both the bi-weekly Borrego Sun and the daily San Diego Union Tribune newspapers.

- On October 19, 2016, the County Board of Supervisors held a public hearing to also consider adopting a MOU between the District and the County. The public hearing was noticed in the Daily Transcript in accordance with Government Code Section 6066.

Future noticing will occur as required by SGMA.

4.2 Stakeholder Identification

SGMA mandates that a GSA establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents. The County and the District compiled a list of interested persons wishing to receive information that will be maintained throughout the GSA formation and GSP development phases. An initial list of stakeholders and interested parties include, but are not limited to, the following:

a) Holders of overlying groundwater rights, including:

   1) Agricultural users.

   2) Domestic well owners.

   3) Borrego Water District – From the purchase of private water companies

b) Municipal well operators – No incorporated cities within the GSA boundary.

c) Public water systems – Borrego Water District.

d) Local land use planning agencies – County of San Diego and Borrego Springs Community Sponsor Group.

e) Environmental users of groundwater – Anza-Borrego Desert State Park.

f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies – No hydrologic connection.

g) The federal government, including, but not limited to, the military and managers of federal lands – None.

h) California Native American tribes – None.

i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems – Borrego Water District ratepayers and domestic well owners.

j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency – The District and County have filed and maintain California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring data with the DWR.

The County intends to work cooperatively with stakeholders and interested parties to develop and implement the GSP for the Borrego Basin and will maintain a list of stakeholders and interested parties to be included in the formation of the GSP.

4.3 Town Hall Meetings

The District hosts an annual town hall meeting for the public each March. The County and the District will continue outreach efforts to identify stakeholders and interested parties and conduct a stakeholder assessment during the town hall meeting on March 29, 2017. Some key questions for the stakeholder assessment will be:

- What are their interests, concerns, and priorities?
- What is the best way to communicate with them?
- How involved would they like to be in development of the GSP?
- What information would be helpful for engagement of stakeholders and interested parties to better participate in the development and/or implementation of the GSP?

4.4 Planning Group

The Borrego Springs Community Sponsor Group is actively involved in the community on matters dealing with planning and land use in Borrego Valley. Since this group provides a forum for the discussion of land use planning that directly impacts GSP issues that are important to the community, it is important for this group to be well informed throughout GSP development. County/District team members will attend these meetings at key milestones to provide up-to-date information and hear feedback from group members.

4.5 Public Hearings/Meetings

4.5.1 Planning Commission

On April 22, 2016, County staff presented an informational item about SGMA to the County's Planning Commission. The presentation served to inform the commission and community on SGMA and what impacts the legislation has on San Diego County. Periodic updates on SGMA implementation will be provided to the commission and the public will be invited to listen. No action will be taken during these meetings. Planning Commission hearings can be viewed online at: http://www.sandiegocounty.gov/pds/PC/sop/PCHearing_stream.html.

4.5.2 District Board Hearings and Meetings

On October 20, 2015, the Board of Directors for the District held a public hearing and voted to become a GSA for the portion of the Borrego Basin within their boundaries. On September 20, 2016, the District held a public hearing and adopted a MOU between the District and the County, which serves to memorialize each agency's role and responsibilities for developing a GSP. SGMA has been, and will continue to be, an agenda item at the regular meetings of the District's Board of Directors. These meetings are held every third Tuesday and fourth Wednesday of the month at 9:00 a.m. at the District office, 806 Palm Canyon Drive, Borrego Springs, CA. Each meeting has a scheduled time for public comments. Information about upcoming meetings can be found on the District's website (http://www.borregowd.org/). Additionally, on most third Tuesdays of each month, an informal workshop is held for the public to discuss SGMA and GSP-related issues.

4.5.3 County Board of Supervisors Hearings

On January 6, 2016, the County Board of Supervisors held a public hearing and voted to become a GSA over the portion of the Borrego Basin within San Diego County. On October 19, 2016, the County Board of Supervisors held a public hearing to also consider adopting a MOU between the District and the County. Additional Board of Supervisors Hearings will be scheduled at key stages during SGMA implementation, including adoption of the GSP for Borrego Basin. Hearings can be viewed online at: http://www.sandiegocounty.gov/content/sdc/general/board-meeting-video.html.

4.6 Direct Mailings/Email

Advisory committee meetings and project information will be disseminated through email. This communication will provide information for the Borrego Valley community, public agencies, and other interested persons/organizations about milestones, meetings, and the progress of GSP development. Property owners with groundwater wells within the basin will be notified via email and/or direct mailings about the establishment of an interested persons list and given the opportunity to receive future notices.

4.7 Newsletters/Columns

Recurring updates in the *Borrego Sun* newspaper and County Planning & Development Services (PDS) newsletter, *eBlast*, will be provided to advise, educate, and inform the public on SGMA implementation in Borrego Valley. The latest County PDS *eBlast* can be found online at http://www.sandiegocounty.gov/pds/.

4.8 SGMA Website

A variety of information about SGMA and groundwater conditions will be produced by the County and the District. This information will include maps, timelines, frequently asked questions, groundwater information, and schedules/agenda of upcoming meetings and milestones. This information will be accessible on the County's SGMA webpage located at: http://www.sandiegocounty.gov/pds/SGMA.html. County staff will update the website regularly and invite users to request information or be added to the interested persons list. Additionally, the District maintains a repository of groundwater, economic, and GSP-related technical studies on its website at: http://www.borregowd.org/Groundwater_Management_EY7H.php.

4.9 Database

To distribute information about GSP development, a mailing list and email list has been compiled into a database of interested persons and stakeholders. The database will be updated regularly to add names of attendees at sponsor group or town hall meetings along with those requesting information via email or through the SGMA website.

4.10 Advisory Committee

Comprehensive stakeholder involvement will include the establishment of an Advisory Committee to aid in developing and implementing the GSP. In addition to signing up to receive information about GSP development at the County's SGMA webpage, interested parties may participate in the development and implementation of the GSP by attending public Advisory Committee meetings in Borrego Springs, in accordance with Water Code Section 10727.8(a). The Multi-Agency GSA approved nine-member Borrego Valley Advisory Committee (Advisory Committee) comprises the following members:

- Borrego Water Coalition - 1 agricultural member; 1 recreation member; 1 independent pumper; 1 at large member,
- 1 member Borrego Springs Community Sponsor Group,
- 1 member Borrego Valley Stewardship Council,
- 1 member District representative for ratepayers/property owners,
- 1 member San Diego County Farm Bureau, and
- 1 member California State Parks, Colorado Desert Region.

The Borrego Water Coalition represents a broad cross-section of groundwater pumpers and users of the Borrego Basin who together represent approximately 80% of annual withdrawals from the Borrego Basin. The Borrego Springs Community Sponsor Group is the officially appointed representative body charged with addressing land use issues to the County. The Borrego Valley Stewardship Council represents community groups associated with the Anza-Borrego Desert State Park and geotourism economic development initiative. The District represents over 2,000 ratepayers/property owners in Borrego Springs. Through the Agricultural Alliance for Water and Resource Education (AAWARE), the San Diego County Farm Bureau represents farming interests in Borrego Springs who, at present, collectively use approximately 70% of annual withdrawals from the Borrego Basin. The California State Parks represent the approximately 600,000 acre Anza-Borrego Desert State Park that surrounds Borrego Springs.

5 EVALUATION

To determine the level of success of the Engagement Plan, the County and the District will implement the following measures:

5.1 Attendance/Participation

A record of those attending public and Advisory Committee meetings will be maintained throughout the GSP development process. The County and the District will utilize sign-in sheets and request feedback from attendees to determine adequacy of public education and productive engagement in the GSP development and implementation process. Meeting minutes will also be prepared and will be provided on the SGMA website once approved.

5.2 Adherence to Schedule

Public participation in developing projects and management actions for inclusion in the GSP is instrumental to the success of the GSP. Keeping these tasks on schedule will be an important indicator of stakeholder involvement. Early identification of milestones and due dates will be important in ensuring a commitment from Advisory Committee members.

6 REFERENCES

Community Water Center. 2015. *Collaborating for Success: Stakeholder Engagement for Sustainable Groundwater Management Act Implementation.* July.

TABLE

Table 1. Summary of Statutory Requirements for Stakeholder Engagement in SGMA[1]

During GSA Formation:	
"Before electing to be a groundwater sustainability agency… the local agency or agencies shall hold a public hearing."	Water Code Sec. 10723 (b)
"A list of interested parties [shall be] developed [along with] an explanation of how their interests will be considered."	Water Code Sec. 10723.8.(a)(4)
During GSP Development and Implementation:	
"A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing".	Water Code Sec. 10728.4
"Prior to imposing or increasing a fee, a groundwater sustainability agency shall hold at least one public meeting".	Water Code Sec. 10730(b)(1)
"The groundwater sustainability agency shall establish and maintain a list of persons interested in receiving notices regarding plan preparation, meeting announcements, and availability of draft plans, maps, and other relevant documents".	Water Code Sec. 10723.4
"Any federally recognized Indian Tribe… may voluntarily agree to participate in the preparation or administration of a groundwater sustainability plan or groundwater management plan… A participating Tribe shall be eligible to participate fully in planning, financing, and management under this part".	Water Code Sec. 10720.3(c)
"The groundwater sustainability agency shall make available to the public and the department a written statement describing the manner in which interested parties may participate in the development and implementation of the groundwater sustainability plan".	Water Code Sec. 10727.8(a)
Throughout SGMA Implementation:	
"The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater".	Water Code Sec. 10723.2
"The groundwater sustainability agency shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin".	Water Code Sec. 10727.8(a)

[1] Source: Community Water Center. *Collaborating for Success: Stakeholder Engagement for Sustainable Groundwater Management Act Implementation.* July 2015.

APPENDIX C2

List of Public Meetings

Appendix C2 - List of Public Meetings

Date	Location	Start Time	End Time	**Topics** (Not listed are opening/closing procedures and certain administrative/informational items)	Meeting Type	Attendance			
						Advisory Committee Members	Core Team Members	Staff	Public / Stakeholders
3/6/2017	Borrego High School	10:00 AM	2:25 PM	Brown Act Training; Collaborative Problem Solving and Consensus Decision Making; Draft Advisory Committee Bylaws	Advisory Committee	8	4		10
4/10/2017	Borrego High School	10:00 AM	2:55 PM	Support for A/C Members; Review, Discussion and Possible Adoption of A/C By-Laws; GSP Update, Overview and Informational Presentation	Advisory Committee	7	5	2	9
5/15/2017	Borrego Water District	10:00 AM	3:10 PM	Review, Discussion and Possible Adoption of A/C By-Laws ; Review and Discussion of Draft A/C Agenda Development Schedule and Interaction with Constituent Group (CG); Borrego Valley Stewardship Council (BVSC); Receive Updates from A/C Members on CG Engagement; Presentation on the Borrego Basin Groundwater Sustainability Plan	Advisory Committee	8	4	2	13
6/29/2017	Borrego Water District	10:00 AM	2:45 PM	Review, Discussion and Possible Adoption of A/C By-Laws; Proposition 1 Grant Funding Opportunity – Flow Metering; Groundwater Sustainability Plan: Discuss Proposed Management Areas; Receive A/C Input on Roger Mann Study; 2018 Statewide Water Bond Update; Receive Updates from A/C Members on Constituent Group Discussions	Advisory Committee	8	5	3	3

Appendix C2 - Li_ ᵢ Public Meetings

Date	Location	Start Time	End Time	<u>Topics</u> (Not listed are opening/closing procedures and certain administrative/informational items)	Meeting Type	Attendance			
						Advisory Committee Members	Core Team Members	Staff	Public / Stakeholders
7/27/2017	Borrego Water District	10:00 AM	3:00 PM	Continued Discussion and Potential Actions: Proposition 1 Grant Funding Opportunity; Requiring the Metering of all Wells in Borrego Springs Subbasin and Proposed Monitoring Program; Benchmarking under SGMA Presentation; Policy on Projects Creating Additional Water Use post January 1, 2015 Pending Determination of Existing Allocations; Review Timeline for GSP Development and Milestones for AC Input/Recommendations on High-level Topics	Advisory Committee	7	4	3	7
9/28/2017	Borrego Water District	10:00 AM	3:00 PM	Metering Requirements for Non-de Minimis Wells; Baseline Pumping Allocations; Sustainability Indicators, Measurable Objectives, and Minimum Thresholds; Proposition One Grant Application Update; Revisions to SGMA Frequently Asked Questions (FAQ) Document	Advisory Committee	7	4	4	14
10/26/2017	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	2:50 PM	Metering Requirements for Non-de Minimis Wells; Baseline Pumping Allocation; Water Budget and Reduction Period; Proposition One Grant Application Update	Advisory Committee	8	4	3	16
11/27/2017	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	2:50 PM	Metering Requirements for Non-de Minimis Wells; Baseline Pumping Allocation; Pumping Allowance; Sustainability Period and Reduction Period; Streamflow	Advisory Committee	9	4	4	7

Appendix C2 - List of Public Meetings

Date	Location	Start Time	End Time	Topics (Not listed are opening/closing procedures and certain administrative/informational items)	Meeting Type	Attendance			
						Advisory Committee Members	Core Team Members	Staff	Public / Stakeholders
1/25/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	3:00 PM	Sustainability Indicators; Water Credits Program; Projects and Management Actions to be Considered; Water Quality Presentation	Advisory Committee	9	4	5	8
3/5/2018	Steele/Burnand Anza-Borrego Desert Research Center	5:30 PM	7:30 PM	SGMA Overview, GSP Timeline, Prop 1 Grant, community outreach, Community QA/C Session	Community Meeting	8	5	7	85
3/16/2018	Steele/Burnand Anza-Borrego Desert Research Center	5:30 PM	7:30 PM	Rising water rates; Economic impacts; Land use designations; Water use allocations; Sustainability strategies; Water quality; Environmental impacts; GSP development; Community meetings	Community Meeting	8	5	7	102
3/29/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	2:50 PM	Considering Human Right to Water Use; Municipal Allocations; Projects and Management Actions to be Considered	Advisory Committee	8	4	5	12
4/27/2018	Borrego Springs Library	1:00 PM	3:00 PM	Ad Hoc Committee on Severely Disadvantaged Community (SDAC) Involvement	SDAC	Unknown			
5/31/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	3:05 PM	Baseline Pumping Allocation Update; Projects and Management Actions to be Considered; Well Metering Plan; Groundwater Dependent Ecosystems Presentation	Advisory Committee	8	4	4	11

Appendix C2 - L[illegible] Public Meetings

Date	Location	Start Time	End Time	Topics (Not listed are opening/closing procedures and certain administrative/informational items)	Meeting Type	Attendance			
						Advisory Committee Members	Core Team Members	Staff	Public / Stakeholders
7/26/2018	Borrego Springs Resort	10:00 AM	3:00 PM	Review of GSP Development Progress Over Last Year; Baseline Pumping Allocation Update; Groundwater Monitoring Network Spring 2018 Results; Socioeconomic Efforts; Groundwater Dependent Ecosystems	Advisory Committee	8	5	5	7
8/30/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	12:00 PM	Baseline Pumping Allocations & Reductions; CEQA Process Presentation; BWD SDAC Grant Tasks 2 and 3 Presentation; Community Engagement Efforts; Water Vulnerability & New Extraction Well Site Feasibility Analysis Presentation	Advisory Committee (SDAC)	8	3	6	8
8/31/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM		Model/Water Budget Presentation	Technical Meeting	Unknown			
9/19/2018	Borrego Springs Unified School District	5:00 PM	8:00 PM	Rising water rates; Economic impacts; Land use designations; Water use allocations; Sustainability strategies; Water quality; Environmental impacts; GSP development; Community meetings	Community Meeting	1	1	3	34
10/4/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	2:40 PM	Socioeconomic Efforts: Community Engagement Efforts Update; EIR and CEQA Process; GSP Ch. 1-3 Presentation	Advisory Committee	8	5	5	14

Appendix C2 - List of Public Meetings

Date	Location	Start Time	End Time	Topics (Not listed are opening/closing procedures and certain administrative/informational items)	Meeting Type	Attendance			
						Advisory Committee Members	Core Team Members	Staff	Public / Stakeholders
11/29/2018	Steele/Burnand Anza-Borrego Desert Research Center	10:00 AM	3:00 PM	Review of Chapters 2 & 3: Key Concept Slides from Oct. 4th AC Meeting; Opportunity to Clarify Technical/Informational Material presented on 10-04-2018; Ch. 4 Presentation	Advisory Committee	7	5	4	11
1/31/2019	Borrego Springs Library	10:00 AM	3:00 PM	GSP: Review of Draft Chapters; Chapter 5; GSP Appendices; Groundwater Dependent Ecosystems Presentation	Advisory Committee	8	4	3	14
5/10/2019	San Diego County Planning & Development Services	1:00 PM	3:00 PM	AAWARE Technical Questions Meeting	Technical Meeting	Unknown			
7/25/2019	Borrego Springs Library	10:00 AM	2:00 PM	Review of Draft GSP Response to Comments	Advisory Committee	7	5	4	16

AC meeting agendas and minutes are available on County website at: https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html

Appendix C.2 – List of Public Meetings

Date	Location	Start Time	End Time	Topics	Meeting type	Board Members	Public/ Stakeholders	Staff	
10/04/19	Borrego Springs Library	10.00 AM	12:30 PM	Consider a Consensus Recommendation on the draft-final GSP	Final Advisory Committee meeting	9 Advisory Committee members		2 Staff/ Consultants	
10/22/19	Borrego Water District	9.00 AM	11 00 AM	Borrego Springs Sub Basin Stipulation Schedule Update	Regular Board Meeting	5			
11/12/19	Borrego Water District	9:00 AM	11:00 AM	Borrego Springs Sub Basin 1. Update on Release of Stipulated Agreement Between Borrego Springs Pumpers a. Overview of how public input has been handled in other adjudicated basins b. Discussion of Public Meeting Schedule and Structure for 30-day review period	Regular Board Meeting	5			
11/20/19	Borrego Water District	9 30 AM	11:30 AM	Public Release of Borrego Springs Subbasin Sustainable Groundwater Management Act (SGMA) alternative to a Groundwater Sustainability Plan (GSP) Stipulation Documents Authorization to Commence Analysis of 5 Year Annual Groundwater Production Exhibit by Pumper as required under the Stipulation Judgment	Special Board Meeting	5			
12/3/19	Borrego High School	6:00 PM	7:30 PM	Overview of Stipulation Judgment (Questions, Comments and Queries)	Public Meeting				

Appendix C.2 – List of Public Meetings

Date	Location	Start Time	End Time	Topics	Meeting type	Board Members	Public/ Stakeholders	Staff	
12/10/19	Borrego High School	6:00 PM	7:30 Pm	Overview of Stipulation Judgment (Questions, Comments and Queries) Public Comment on Proposed Stipulated Judgment for Borrego Spring Sub Basin	Public Meeting Special Board Meeting				
12/17/19	Borrego Water District	9:00 AM	11:00 AM	Overview of 30-Day Stipulated Agreement Public Review Period	Regular Board meeting	5			
12/17/19	Borrego High School	6:00 PM	7:30 PM	Overview of Stipulation Judgment (Questions, Comments and Queries)	Public Meeting				
1/7/20	Borrego Water District	9:00 AM	9:45 AM	Acknowledge receipt of Comment Letters and Draft Responses. Approve Settlement Agreement unanimously	Public Meeting				

APPENDIX D

Technical Appendices

D1: Update to the USGS Borrego Valley Hydrologic Model

D2: BWD Water Quality Review and Assessment

D3: Groundwater Hydrographs

D4: Borrego Springs Subbasin Groundwater Dependent Ecosytems

The conclusions reached regarding Water Budget components and recommendations for further data and study contained in these Technical Appendices are to be periodically updated by the Watermaster through the Technical Advisory Committee processes, as set forth in Sections II.E and III.F of the Judgment.

APPENDIX D1

Update to the USGS Borrego Valley Hydrologic Model

DRAFT FINAL

Update to United States Geological Survey Borrego Valley Hydrologic Model for the Borrego Valley Sustainability Agency

Prepared for:

County of San Diego
Planning & Development Services
5510 Overland Avenue
San Diego, California 92123
Contact: Jim Bennett PG, CHG; Leanne Crow, PG

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024
Contact: Trey Driscoll, PG, CHG; Steven Stuart, PE

JULY 2019

TABLE OF CONTENTS

Section **Page No.**

ATTACHMENTS

FIGURES

TABLE

1 INTRODUCTION

In 2009, the United States Geological Survey (USGS) initiated a study of the Borrego Valley Groundwater Basin (BVGB) with the Borrego Water District (BWD). The goals of the study were to enhance the understanding of groundwater conditions in BVGB, and develop a numerical model as a tool to manage groundwater resources and evaluate possible future conditions in the basin. The USGS used the MODFLOW numerical modeling code One-Water Hydrologic Flow Model, or MF-OWHM, to simulate the interaction between surface water (e.g., stream flow and applied irrigation) and groundwater in Borrego Valley. From a Sustainable Groundwater Management Act (SGMA) perspective, MF-OWHM provides a fully integrated numerical modelling system capable of simulating the full hydrologic cycle to evaluate potential undesirable effects like declining groundwater storage, declining groundwater levels in areas with groundwater-dependent habitat, subsidence, and seawater intrusion.

[The conclusions reached regarding Water Budget components and recommendations for further data and study contained in this Update are to be periodically updated by the Watermaster through the Technical Advisory Committee processes, as set forth in Sections II.E and III.F of the Judgment.]

INTENTIONALLY LEFT BLANK

2 2015 BORREGO VALLEY HYDROLOGIC MODEL

The Borrego Valley Hydrologic Model (BVHM) was developed as part of a cooperative study between the USGS and the BWD. The study began in 2009, with the objectives of 1) improving the understanding of groundwater conditions and land subsidence in the BVGB, 2) using the BVHM to assist in the management of groundwater resources in the BVGB, and 3) using the BVHM to evaluate several management scenarios (Faunt et al. 2015). The BVHM simulates the use, movement, and storage of water throughout the BVGB through time. The BVHM is a finite-difference groundwater model that was developed using the MODFLOW numerical code MF-OWHM. The BVHM was used as part of the development of the Groundwater Sustainability Plan for the Borrego Springs Subbasin to help develop historical water budgets and to assist basin planning for future climate change and basin development following the guidelines outlined in SGMA.

2.1 Simulation Period

The BVHM simulated conditions using monthly stress periods from October 1929 to December 2010. There were 975 monthly stress periods in the simulation. Faunt et al. (2015) noted that, "the first 192 stress periods (years 1930–1945) are considered a model spin-up period, and the model calibration as well as the target simulation period used for analysis was October 1945 through December 2010." Faunt et al. (2015) stated that the 16-year "spin-up" was used in the model to "eliminate significant effects caused by uncertainty in the initial conditions" defined in the model. Because there was groundwater development and irrigation before the simulation period (1945–2010), the initial conditions defined in the model, per groundwater levels mapped in 1945, may not have represented steady-state conditions.

Each monthly stress period has two time steps, with the exception of the first stress period with 16 time steps. The time step multiplier was 0.75 for each stress period, meaning that the duration of the first time step (excluding the first stress period) ranged from 16 days to 17.7 days depending on the number of days in the month. The second time step ranged from 12 days to 13.3 days.

2.2 Model Domain

The boundaries of the active model domain of the BVHM were defined by the Coyote Creek fault on the northeast and east of the alluvial valley, the Vallecito Mountains to the south, and the San Ysidro Mountains to the west and northwest. The southeastern boundary of the model was defined at a surface-water divide southwest of Ocotillo Wells. This boundary marks an area of the alluvial valley where subsurface flow leaves the basin.

The model domain is defined by a finite-difference grid of uniform cells, or nodes, with each cell being 2,000-feet by 2,000-feet, or approximately 92 acres in area. The model domain includes 30 rows and 75 columns with 2,250 active cells (Figure 1). The total area simulated in the model is

73,876 acres. The model was divided vertically into three layers. The top layer represents the upper unconfined aquifer unit consisting of Quaternary alluvium. The thickness of the top layer ranged from 50 feet to 643 feet. The middle aquifer unit (Layer 2) is Pleistocene age continental deposits with a thickness ranging from 50 feet to 908 feet. The lower aquifer unit (Layer 3) includes the lower Palm Spring and Imperial Formations with a thickness ranging from 50 feet to 3,831 feet.

2.3 Hydrogeologic Characteristics

Layer 1 represents the upper unconfined aquifer, which historically has been the main source of water in the valley with well yields as high as 2,000 gallons per minute (GPM). The upper aquifer includes unconsolidated gravel, sand, silt, and clay of Holocene to Pleistocene age. Layer 2 represents the middle aquifer, which includes Pleistocene age continental deposits of gravel to silt with moderate amounts of consolidation and cementation. The middle aquifer yields moderate amounts of water north of San Felipe Creek. Layer 3 represents the lower aquifer and includes deposits of the lower Palm Springs and Imperial Formations. It is comprised of sandstone, siltstone, and conglomerate with low well yields. All three layers were simulated as convertible between unconfined and confined, meaning that when the water table declines below the top elevation of a layer that was fully saturated (i.e., confined), then the layer was converted to unconfined to account for a change in the saturated thickness and unsaturated portion of the layer.

The USGS used a geostatistical approach on grain size and texture characterized from various lithologic and geophysical logs recorded in Borrego Valley to simulate the heterogeneity of the aquifer units in the Borrego Basin. The textural map was based on the percentage of coarse-grain material described in each lithologic log. Coarse-grained sediments were characterized with having primarily boulders, cobbles, pebbles, gravel, and sand.

The distribution of coarse-grain sediment across the basin was interpolated between locations of borings and geophysical logs using kriging or cokriging algorithms over a grid matching the finite-difference gird utilized in the BVHM. Coarse-grain sediments were predominantly defined at the base of the foothills in the alluvial valley, and along major streambeds like Coyote Creek. The upper aquifer had the largest percentage of coarse-grain sediment, which reflected the depositional and geomorphic environments originating from the watersheds and drainages tributary to Borrego Valley. The middle and lower aquifers had finer sediments.

2.3.1 Hydraulic Conductivity

Hydraulic conductivity in the BVHM was defined based on the distribution of coarse-grain sediments defined by the textural map created from lithologic and geophysical logs. Horizontal hydraulic conductivity was "calculated as the weighted arithmetic mean of the hydraulic conductivities of the coarse-grained and fine-grained lithologic end members and the distribution of sediment texture for each model cell" (Faunt et al. 2015). Faunt et al. (2015) noted that, "hydraulic conductivities generally decrease with depth and with increasing distances from the original source of the sediments in adjacent mountain ranges and river channels, which is consistent with the fining-down and fining-toward-the-basin-center sequences observed in the aquifer sediments and texture model. Coarser grained sediments were assumed to be present near stream channels in the alluvium in the upper reaches of all three aquifers."

The saturated horizontal hydraulic conductivity in the upper aquifer ranged from 0.3 feet per day to 184 feet per day. The highest hydraulic conductivities were defined in the central portion of the valley where sand deposits of Quaternary age were characterized and older fan deposits at the base of the San Ysidro and Vallecito Mountains (Figure 2). Lower hydraulic conductivities were identified in areas characterized with younger fan deposits and consolidated continental deposits. The Borrego Sink was characterized with a uniform hydraulic conductivity of 6 feet per day in all three aquifer units. The saturated hydraulic conductivity in the middle and lower aquifer units ranged from 0.02 feet per day to 7 feet per day. The lower hydraulic conductivity in the middle and lower aquifers relative to the upper aquifer were based on a lower energy depositional environment to the valley prior to activity along the Coyote Creek fault that opened the northern portion of the valley to sediment deposition from Coyote Creek.

Faunt et al. (2015) reported estimated hydraulic conductivities based on previous aquifer tests conducted in the valley. Four constant-rate aquifer tests yielded an estimated hydraulic conductivity of 2 feet per day in a clay interbedded with sand to 336 feet per day in a coarse sand unit. The lower aquifer unit, which included the Palm Springs Formation characterized with cemented interbedded clays and gravels, had an estimated hydraulic conductivity of 10 feet per day. Previous studies cited in the USGS model report included hydraulic conductivities that ranged from 0.1 to 178 feet per day, with a ratios of horizontal to vertical hydraulic conductivity ranging from 10 to 100 for the upper and middle aquifers, and from 1 to 100 for the lower aquifer (Faunt et al. 2015).

2.3.2 Aquifer Storage Properties

Specific yield, which represents unconfined aquifer storage and equals the percentage of bulk aquifer volume that would drain under gravity, ranged from 12% to 17% (average was 15%) for the upper aquifer. Specific yield was defined in the BVHM similarly to how hydraulic conductivity was defined using a textural map to simulate the heterogeneity of the aquifer units. The specific yield for the middle aquifer ranged from 15% to 21% with an average of 17.5% (Figure 3). The specific yield for the lower aquifer ranged from 0.7% to 5.6% with an average of 3%. A specific yield was defined for each aquifer unit because of the possibility that portions (i.e., model nodes) of each aquifer unit, or model layer, could become unconfined (i.e., not fully saturated) when the hydraulic head fell below the top elevation at each model node.

Faunt et al. (2015) reported that the specific storage defined for each aquifer unit under confined conditions ranged from $5.1 x 10^{-7}$ in the upper aquifer to $1.6 x 10^{-6}$ in the middle aquifer. The specific storage represents the amount of water that would be released from storage per unit volume of aquifer for a unit change in hydraulic head while the aquifer remains fully saturated. The specific storage terms were defined uniformly for each layer.

2.4 Boundary Conditions

The boundaries of the model domain were mostly defined as no-flow boundaries coinciding with the Coyote Creek fault and the foothills of the San Ysidro and Vallecito Mountains. There were a few exceptions: specified fluxes were defined at 44 cells representing underflow originating from the upstream watersheds draining to Borrego Valley, 24 stream flow entry points were defined at nodes representing the locations where stream flow entered the valley via Coyote Creek, San Felipe Creek, Borrego Palm Creek, and other drainages, and three constant-head boundary nodes simulating the outflow of groundwater at the southern end of the BVHM. The natural recharge of underflow and surface water runoff from the adjoining watersheds was estimated from data obtained from the regional-scale USGS Basin Characterization Model (BCM).

2.4.1 Basin Characterization Model

The BCM was developed by the USGS in 2004 and provides a "deterministic water-balance approach to estimate recharge and runoff in a basin" on a regional scale (Faunt et al. 2015). The BCM "uses the distribution of precipitation, snow accumulation and melt, [potential evapotranspiration] PET, soil-water storage, and bedrock permeability to estimate a monthly water balance for the groundwater system" (Faunt et al. 2015). The result is an estimate of water recharging a basin (of which some may leave the basin as underflow to an adjacent basin) and potential runoff. Potential underflow and runoff to Borrego Valley was estimated from the BCM using the watersheds surrounding Borrego Valley. Water entering BVGB via underflow was represented by 44 cells along the mountain boundaries in the valley each defined with a constant specified flux based on estimates from the BCM. Water entering BVGB via surface water runoff was represented by 24 cells defined as entry points to the stream segments defined in the stream-flow routing (SFR) package (Figure 4).

Runoff and underflow entering the BVGB, as estimated by the BCM, were "simulated for the watersheds draining into the Borrego Valley on a monthly basis for years 1940–2007 as spatially distributed among the watersheds draining into Borrego Basin" (Faunt et al. 2015). The average annual underflow entering the BVGB was approximately 900 acre-feet per year (AFY), or 10% of the estimated recharge to the adjacent watersheds estimated by the BCM. There was little to no stream flow to the BVGB from 1940 to 2007. Only after major wet seasons or large individual rainfall events did runoff to BVGB exceed 10,000 AFY or more. This only occurred during 7 years between 1940 and 2007. Runoff to the BVGB ranged from less than 10 AFY to 44,000 AFY with an average annual rate of 3,600 AFY. The BVHM includes perennial flow entering Coyote Creek at 0.014 cubic feet per second (cfs; approximately 10 AFY) and an unnamed tributary at 0.002 cfs (approximately 1.4 AFY) from a minor watershed to the southwest of the BVGB.

2.5 Farm Process

MF-OWHM is a fully coupled integrated hydrologic numerical modeling code capable of simulating all interactions of surface water and groundwater in the hydrosphere. Integrated within MF-OWHM is the Farm Process Package, or FMP, which simulates the movement of water over a landscape. Water may originate from natural (e.g., rainfall) and/or anthropogenic sources (e.g., applied irrigation) and move via surface water runoff, evapotranspiration, and infiltration into the unsaturated zone. A landscape is characterized by a land-use type (e.g., farm, golf course) with certain characteristics defined like rooting depth, soil moisture characteristics, and application inefficiencies defined for irrigation and precipitation. The FMP simulates the water budget over a landscape defined at each cell, or node, in the model domain. Water inputs may include rainfall, applied irrigation, and stream flow. Water outputs may include evapotranspiration, surface water runoff, and infiltration in the unsaturated zone and groundwater pumping from the saturated zone.

The USGS (2015) defined 52 water-balance subregions (WBS), or "farms," in the BVHM. These 52 "farms" were defined based on a parcel map showing land ownership from 2010. The definition of these "farms" in the model domain were held constant throughout the simulation. Each "farm" was assigned one or more land-use types, of which there were 15 classifications that included golf course, urban, fallow, native, and certain crop types like grapes, citrus, and palm. The USGS redefined land-use types on a near annual basis, with some land uses changing due to urbanization, zoning, and/or farming restrictions through the simulation. For example, Faunt et al. (2015) noted that "before development, about 10 percent of land use consisted of phreatophytes, and 90 percent was other types of native vegetation and bare ground. In 2009, 78 percent was natural vegetation (6 percent phreatophytes and 72 percent other native types), 11 percent residential/municipal, 8 percent developed agricultural land, and about 3 percent recreational uses (golf courses)."

Land-use type was assigned on a cell-by-cell basis (Figure 5). The coarse grid of the BVHM, with cells of uniform dimensions of 2,000 feet by 2,000 feet (or 92 acres), however, meant that the land-use type that comprised the largest fraction of a cell was assigned to that cell. For example, the WBS representing Rams Hill Golf Course included 10 cells comprising a total of 920 acres, but only two of those cells (total of 184 acres) were assigned a golf course land-use type after 2009. The other 8 cells were assigned a "native classes" land-use type designation.

Pumping data for agricultural uses was not available to the USGS when designing the BVHM. Instead, the FMP in the MODFLOW-OWHM code was used to estimate pumping for agricultural uses in the BVHM. The FMP estimates agricultural pumping by calculating estimated water demands for the various crop types receiving applied irrigation. The FMP calculates the water demand for a specific crop using potential evapotranspiration (PET) provided by the BCM and crop coefficients assigned to each crop type. The FMP then calculates a crop irrigation requirement (CIR), or residual water demand, after accounting for water supplied via precipitation and root uptake via groundwater. The CIR was increased to compensate for evaporative losses and estimated inefficiencies of delivering water for irrigation supply. The result is a total farm delivery requirement (TFDR) defined for each WBS, or "farm," that is satisfied in the BVHM via estimated pumping in the FMP.

2.6 Water Budget

An annual water budget was calculated for the BVGB for every water year. A water year spans the year from October 1 to the subsequent September 30.

2.6.1 Inflow from Stream Leakage

Faunt et al. (2015) noted that "the primary source of natural recharge to the basin is infiltration from the ephemeral stream and washes entering the Borrego Valley from the adjacent mountains." Surface water runoff entering the model domain was estimated using data from the BCM and introduced into the model domain using the SFR package. The SFR package is a head-dependent boundary condition that can simulate stream flow routing, groundwater discharges in reaches characterized as gaining streams, stream flow leakage in reaches characterized as losing streams, and the capture and conveyance of surface runoff. The BVHM includes 84 stream segments defined in the SFR package, where multiple segments were joined to represent stream flow in Coyote Creek, San Felipe Creek, Borrego Palm Creek, and other minor tributaries. The streams received inflow at 24 entry points that represented runoff from the adjoining upstream watersheds in the San Ysidro and Vallecito Mountains.

Recharge from stream leakage during the model simulation period (1945–2010) ranged from 112 acre-feet (AF) in 1948 to 22,500 AF in 1978 (Figure 6). The annual average recharge rate from stream leakage was 4,028 AFY with a standard deviation of 5,142 AFY.

2.6.2 Inflow from Applied Irrigation Return Flows

Another source of inflow to the basin, particularly as the valley became more developed, was return flow from applied irrigation at agricultural areas. Applied irrigation at agricultural areas was estimated using the FMP. The volume of applied water in excess of losses to evapotranspiration, irrigation inefficiencies, and surface runoff was simulated as infiltrating below the root zone and entering the unsaturated zone. The FMP was linked to the unsaturated zone flow package, or UZF, of MODFLOW. The UZF simulates the movement of water through the unsaturated zone based on soil moisture characteristics and a uniform definition of vertical hydraulic conductivity in the unsaturated zone.

Early versions of MODFLOW simulated an instantaneous contribution of infiltrating water from land surface to the water table. However, water does not infiltrate instantaneously, but moves through an unsaturated zone where the movement of water is a function of soil moisture content (i.e., degree of saturation) and highly variable hydraulic conductivities based on the moisture content. Faunt et al. (2015) noted, "depending on the unsaturated-zone thickness, permeability, and residual moisture content, it can take years to decades for irrigation return flow to pass through the unsaturated zone." The UZF provides a more realistic estimation of irrigation return flows in the BVHM.

Recharge from applied irrigation return flows ranged from 572 AF to 3,706 AF during the model simulation period (1945–2010; Figure 6). The annual average recharge rate from the unsaturated zone was 1,486 AFY with a standard deviation of 737 AFY.

2.6.3 Septic System Return Flows

The USGS cited a previous study that estimated an average use of 100 gallons per day per household and assumed that 50% of the water used was lost to evaporation and transpiration. Therefore, the USGS estimated that return flow from septic tank systems in the valley was constant at 0.056 AFY per home, or 0.19 cubic meters per day (m^3/day). The USGS identified residential and/or developed areas in the valley and estimated a number of septic tank systems associated with those land use types on a per node basis in the numerical model. The number of septic tank systems were periodically defined in the model and used for subsequent monthly stress periods until the next count. The last count of septic tank systems defined in the numerical model was based on development identified in 2009. The USGS reported that, "the infiltration from irrigation of municipal lawns and treated and untreated wastewater was assumed to be negligible."

2.6.4 Inflow from Subsurface Flow

Underflow entering the BVGB from the adjoining upstream watersheds was simulated using the Flow Head Boundary (FHB) package. Underflow from these watersheds was distributed over 44 cells aligned at the model domain boundaries with the San Ysidro and Vallecito Mountains. The rate of underflow entering the BVHM for each cell was based on monthly data obtained from the BCM. The USGS defined an average rate of underflow at each cell to the model domain and held these rates constant throughout the simulation. The total underflow to the model domain was 3.7 AF per day, or 1,367 AFY (Figure 6). Variations in monthly underflow in the model represent differences in the lengths of the months and do not indicate variations in the rate of underflow into the basin.

2.6.5 Outflow via Pumping

The BVHM simulated municipal pumping using metered data obtained from BWD, and agricultural and recreational pumping estimated using the FMP. Before 1944, groundwater pumping in the basin averaged less than 300 AFY, which was used mostly for domestic purposes (Faunt et al. 2015). No pumping was simulated in the BVHM from 1929 to 1943. Population growth in Borrego Valley after World War II led to increasing groundwater production with the majority of water produced for irrigation purposes. Groundwater production in the model ramped up from essentially 0 AFY in 1943 to over 10,000 AFY in 1955 (Figure 7). Annual production declined to less than 7,000 AFY beginning in 1965, but began increasing again in the mid-1970s with a peak production of almost 20,000 AFY in 2006. Faunt et al. (2015) reported that, "about 70 percent of the groundwater used each year has been for agriculture, about 20 percent for golf courses and other recreational uses, and about 10 percent for municipal and domestic use (residential, commercial, and the Anza-Borrego Desert State Park)."

Pumping for agricultural, recreational and municipal uses were simulated using the MODFLOW multi-node well package (MNW2). The MNW2 package simulates the effects of pumping from wells that intersect multiple aquifer units that contribute flow under different hydraulic heads. A number of wells were completed in more than one of the aquifer units in Borrego Valley. Faunt et al. (2015) identified up to 82 wells operating in the basin. Seventy of those wells were linked to farms identified in the model domain with pumping determined from the FMP package. These wells represented pumping for agricultural and recreational uses in Borrego Valley. Municipal pumping, which was based on metered data, was provided by BWD.

2.6.6 Outflow via Evapotranspiration

Monthly potential evapotranspiration data was obtained from the BCM and included as part of the water-balance calculations in the FMP. Direct evapotranspiration from groundwater was estimated in the FMP by calculating the monthly PET values by monthly crop coefficients assigned to each land-use type (e.g., phreatophytes, citrus, golf courses, native), the rooting depths defined for each land-use type, the depth to groundwater and height of capillary fringe. Phreatophytes, found mostly in the northern part of Borrego Valley and around the Borrego Sink, had the deepest rooting depth at 15.3 feet. They were responsible for most of the groundwater losses from the basin prior to the mid-1940s. Faunt et al. (2015) reported that approximately 4,300 AFY was lost via evapotranspiration from phreatophytes before 1946. The amount of water extracted by pumping from the basin surpassed losses by evapotranspiration by 1954 (Figure 7). This was attributed to declining water levels in the basin, which reduced the amount of water available for transpiration. Evapotranspiration losses were less than 2,000 AFY by 1990 and less than 1,000 AFY by 2000.

2.6.7 Outflow at Southern Boundary of BVGB

A constant-head boundary condition was assigned to three cells marking the southern boundary of the BVGB. This boundary was identified by the USGS based on water level data from other sources that indicated this area was not influenced by water level fluctuations and hydraulic conditions to the north. The average outflow at this boundary throughout the simulation was 1.4 AF per day. No water flowed into the model domain at this boundary.

Annual outflow from the BVGB at the southern boundary of the basin ranged from 499 AF to 573 AF. The annual average was 525 AFY with a standard deviation of 15 AFY.

2.6.8 Water Balance

The annual average water balance for the model period (1945–2010) is presented in Table 1. The BVGB has experienced more in water losses via pumping and evapotranspiration than inflows from stream leakage and underflow from the adjoining watersheds since the 1929–1930 water year (Figure 8). The exceptions were during more-than-normal wet years, like 1976, 1978, and 1991, when stream flow leakage was a significant contributor of inflow to the basin. In those years, there was a net influx of 13,000 to 18,000 AF of water to the basin. Outside of those wet years, the average annual loss from the basin was approximately 13,100 AFY (Attachment A).

Faunt et al. (2015) reported that the average annual natural recharge of water reaching the saturated zone, which includes stream leakage and infiltrating water through the unsaturated zone, was 5,700 AFY. This estimate was derived from a "pre-development" run of the model, where the model was run with all land uses being replaced with native vegetation and phreatophytes, and the model being run for the full simulation period from 1945 to 2010.

The average annual loss in storage in the BVGB from 1945 to 2010 was approximately 6,800 AFY.

Table 1
Summarized Water Budget

Water Budget Components (Units in Acre-Feet per Year)	Original USGS Model (1945–2010)	Model Update (1945–2016)	Most Recent 20 Years (1997–2016)	Most Recent 10 Years (2007–2016)
Inflows				
Stream Recharge	4,028	3,905	2,749	1,865
Unsaturated Zone Recharge [a]	1,486	1,497	1,635	1,505
Underflow from Adjacent Basins	1,367	1,367	1,367	1,367
Total Average Annual Inflow	**6,881**	**6,770**	**5,751**	**4,737**
Outflows				
Pumping	10,128	10,597	16,466	16,856

Table 1
Summarized Water Budget

Water Budget Components (Units in Acre-Feet per Year)	Original USGS Model (1945–2010)	Model Update (1945–2016)	Most Recent 20 Years (1997–2016)	Most Recent 10 Years (2007–2016)
Evapotranspiration [b]	3,032	2,815	759	498
Underflow (Flow Out of Southern End)	522	522	520	523
Total Average Annual Outflow	**13,682**	**13,934**	**17,745**	**17,877**
Average Annual Deficit				
Change in Storage	**-6,801**	**-7,164**	**-11,994**	**-13,140**

Notes: USGS = U.S. Geological Survey.
[a] Consists of flow from the unsaturated zone into groundwater. Includes direct precipitation recharge (negligible), leakage from some streams within the model domain, and irrigation return flows (Distributed Recharge).
[b] Consumptive use of water calculated by the Farm Process Package for all land use type; primarily represents evapotranspiration.

2.7 Model Calibration and Sensitivity

2.7.1 Calibration

The model was calibrated to observed hydraulic heads (i.e., measured groundwater levels at wells) collected from 1945 to 2010. Faunt et al. (2015) reported that 2,224 groundwater level measurements were obtained from databases maintained by BWD, USGS, and California Department of Water Resources. The groundwater level data was collected at 73 wells in the basin. Model calibration was evaluated by calculating the difference (i.e., residual) between the observed groundwater level measured at a well to the corresponding simulated groundwater level. The USGS employed a combination of manual modifications and the use of an automated parameterization algorithm, or parameter estimation tool (PEST), to adjust parameters (e.g., hydraulic conductivity, storage, stream inflows) over a series of simulation runs to minimize the residuals between observed and simulated hydraulic heads.

Faunt et al. (2015) reported that "the overall model fit for groundwater-level comparisons is generally good when the simulated head values are compared against the measured groundwater levels. About 90 percent of the residuals were between -20 and +20 feet, and more than 50 percent were between -5 and +5 feet" (Attachment C). The mean residual from 1945 to 2010 was +2.41 feet (from 2,258 residuals ranging from -249.48 to +235.9 feet), indicating that the model tended to underestimate hydraulic heads compared to observed values (Figure 9).

A plot of simulated versus observed hydraulic heads from 1945 to 2010 shows a bias of the model to overestimate lower observed hydraulic heads and underestimate higher observed hydraulic heads (Figure 10). A perfect match of simulated heads with observed heads would yield a uniform slope. A linear trend line fitted to the observed and simulated hydraulic head data had a slope of

0.65, which may indicate a flatter hydraulic gradient simulated across the basin than one estimated from the observed hydraulic heads.

A measure of the average error in the model simulating observed hydraulic heads is indicated by the root mean squared error (RMSE) of the residuals. The RMSE is the best measure of error if the residuals are normally distributed in the basin. An acceptable error is gaged by the magnitude of the change in hydraulic head in the simulation compared to the RMSE. The RMSE was 17.88 feet between observed and simulated hydraulic heads from 1945 to 2010. Hydraulic heads declined 10 feet to 130 feet from the 1950s to 2010 with an average decline of 57.3 feet. The ratio of the RMSE (17.88 feet) to the average decline in hydraulic head in the basin (57.3 feet) is 0.31, which is an acceptable level of error given the coarse grid (2,000 feet by 2,000 feet) and layer thicknesses of 50 feet to 643 feet in the upper aquifer (layer 1) of the model domain.

2.7.2 Sensitivity

The parameter estimation process using PEST was used to evaluate the sensitivity of the BVHM to parameters defined in the model. A sensitivity analysis, as conducted by the USGS for the BVHM, provides a measure of the uncertainty in the model results arising from the assumptions made in defining the hydrogeology and parameters in the model. Faunt et al. (2015) reported that the BVHM was most sensitive to scaling factors used in estimating runoff from precipitation and applied irrigation, crop coefficients, and irrigation efficiency, all of which were included in the FMP and contribute to calculating the water demand for the various land-use types defined in the model. The next most sensitive parameters were specific yield and scaling factors used to adjust the amount of runoff and underflow estimated by the BCM that entered the BVGB.

The highest levels of uncertainty in the model were from agricultural pumping, specific yield, and stream flow entering the valley. Agricultural pumping (and to a lesser extent recreational pumping) was estimated using the FMP package, which calculates a water demand on a cell-by-cell basis for each land-use type. The water demand is based on an estimated water consumption factoring in evapotranspiration, applied water (via irrigation or rainfall), efficiencies of applied irrigation water, soil moisture content, rooting depth, and potential runoff. The following measures could be taken to improve the uncertainty in the model: (1) information on actual pumping for agricultural and recreational uses can be used to improve the accuracy of the FMP in estimating pumping, (2) long-term constant-rate aquifer tests in the upper and middle aquifer units would improve the estimates of specific yield, and (3) the installation of stream gaging stations in Coyote Creek and other major drainages to the valley would improve the estimates of runoff to the basin.

INTENTIONALLY LEFT BLANK

3 UPDATE OF THE BORREGO VALLEY HYDROLOGIC MODEL

The BVHM was updated to extend the simulation period to September 2016. This required increasing the number of monthly stress periods from 975 to 1,044. The additional stress periods were configured with the same number of time steps (2) and time-step multiplier (0.75) used in the original stress periods of the model. Inflow from subsurface flow representing underflow to the basin and outflow represented by the constant-heads at the southern end of the basin were maintained at their same respective constant rates and heads defined in the original model from January 2011 to September 2016. No changes were made to hydraulic properties like saturated hydraulic conductivity and storativity (specific yield and specific storage) and to hydraulic properties of the unsaturated zone.

Monthly precipitation and evapotranspiration data for January 2011 to September 2016 were obtained from the BCM. The Farm Process package was updated to incorporate the monthly precipitation and evapotranspiration data, and changes to land-use type were made in the FMP based on a review of aerial imagery and documented fallowed land through the BWD and County of San Diego (County) Water Credits Program. Municipal pumping by District wells from January 2011 to September 2016 was included in the updated files.

3.1 Updating the Farm Process Package

3.1.1 Land Use Types

Land use types were updated after reviewing aerial imagery of the Borrego Valley from 2011 to 2016, and reviewing Water Credits filed with the County. The following modifications were made to the last land use type characterization from the original file: in September 2013, the land use at one cell was changed from citrus to fallow; in August 2014, one cell was changed from native to residential; in December 2014, one cell was changed from citrus to fallow; in July 2015, one cell was changed from palms to fallow; and in May 2016, one cell was changed from citrus to fallow. All other land-use types defined in the original model remained the same.

3.1.2 Precipitation and Evapotranspiration

Monthly precipitation and evapotranspiration data were obtained from the BCM for January 2011 to September 2016. The precipitation and evapotranspiration data were compiled in separate files for each month. The FMP was updated to read each precipitation and evapotranspiration data file corresponding to the additional stress periods in the updated model. The FMP used the monthly precipitation and evapotranspiration data to calculate a water balance on a cell-by-cell basis. The data from the BCM are in units of millimeters per month. The FMP includes a multiplier of $3.29e^{-5}$ that is applied to each value from the BCM to convert it to units of meters per day.

3.2 Stream Flow

Runoff to the 24 stream flow entry points were taken from historical stream gage and precipitation data. An attempt was made to repeat the methodology the USGS used in defining runoff to the 24 stream flow entry points using BCM data, but the process utilized by the USGS could not be discerned when comparing BCM data to runoff values used in the numerical model for earlier stress periods.

Therefore, stream flow entering the valley after December 2010 was simulated based on historical rainfall compared to runoff. Precipitation data recorded at climatic stations from 2011 to 2016 in the BVGB were compared to historical (i.e., pre-2011) monthly precipitation data recorded at the same climatic stations to find months with similar precipitation. These months were then used to pull stream gage data from stream gages on Coyote Creek, Palm Canyon Creek, and San Filipe Creek during historical periods when these stream gages were active. These monthly values were added to the appropriate stress periods for the extended model simulation.

3.3 Pumping

Monthly municipal pumping data from January 2011 to September 2016 was obtained from BWD. The pumping data was converted from AF per month to cubic meters per day and incorporated in the updated BVHM. The average monthly pumping rates for municipal wells ranged from 0 m^3/day to 2,011 m^3/day at well ID4-11. Agricultural and recreational pumping continued to be estimated using the FMP.

3.4 Septic System Return Flows

The number of septic tank systems were periodically defined in the model and used for subsequent monthly stress periods until the next count. The last count of septic tank systems defined in the numerical model was based on development identified in 2009. The updated model repeated this information from 2009 during the extended period from January 2011 to September 2016.

4 WATER BALANCE OF UPDATED MODEL

An annual water balance from the 2010–2011 to 2015–2016 water years was calculated for the BVGB using the updated BVHM. In addition, average annual water balance estimates for the entire model period (1945–2016) are presented in Table 1. Stream leakage was the largest contributor of inflow to the basin, which ranged from 1,180 AF to 6,500 AF. The 6,500 AF occurred during the winter of 2011. The average annual inflow from stream leakage was 2,550 AFY. Recharge from the unsaturated zone, including irrigation return flows, averaged 1,630 AFY. Underflow was held constant from the original model and averaged 1,400 AFY. The average annual total inflow, or recharge, to the BVGB was 5,550 AFY from the 2010–2011 to 2015–2016 water years (Attachment B).

Pumping was the largest outflow component from the basin. The average annual outflow via pumping from the basin was 15,800 AFY. Other sources of outflow included evapotranspiration (435 AFY) and the southern constant-head boundary of the basin (520 AFY). Pumping constituted 94% of the total outflow. The average annual total outflow from the BVGB was 16,700 AFY from the 2010–2011 to 2015–2016 water years.

The average annual water balance from the 2010–2011 to 2015–2016 water years was a deficit of 11,000 AFY, which further contributed to a decline in groundwater storage in the BVGB (Figure 13).

INTENTIONALLY LEFT BLANK

5 MODEL VALIDATION

All hydraulic head and stream flow data collected up through 2010 were used to calibrate the numerical model. No exercise was conducted by the USGS to verify, or validate, the results of the BVHM. Model validation is a method to evaluate the model's accuracy in predicting future conditions. "A model is verified if its accuracy and predictive capability have been proven to lie within acceptable limits of error by tests independent of the calibration data" (Anderson 1992). Updating the BVHM with data collected outside the calibration period from January 2011 to September 2016 presented the opportunity of validating the model. As described previously, only climatic parameters (precipitation, evapotranspiration, stream flow) and metered pumping were added to the additional stress periods defined in the updated model. Parameters defining hydraulic properties (hydraulic conductivity, storage) and uniform boundary conditions (constant underflow and heads at the southern boundary) were consistent in the updated model.

The simulation results from January 2011 to September 2016 were compared to observed hydraulic heads recorded in this period to validate the numerical model. The mean residual from October 2010 to September 2016, which included the 2010–2011 to 2015–2016 water years, was +6.18 feet (from 225 residuals ranging from -55.72 to +52.71 feet), indicating that the model continued to underestimate hydraulic heads compared to observed values (Figure 11, Attachment C).

A plot of simulated versus observed hydraulic heads from 1945 to September 2016 continues to show a bias of the model to overestimate lower observed hydraulic heads and underestimate higher observed hydraulic heads (Figure 12). A linear trend line fitted to the observed and simulated hydraulic head data from January 2011 to September 2016 was parallel (slope of 0.65) to the linear trend line matched to the 1945 to 2010 data. The BVHM, updated with recent data outside the calibration period, provided similar results with similar error.

When residual at key wells from Spring 2016 are plotted on a map, other trends in potential model bias emerge (Figure 14). A plot of these wells shows that, in general, wells in the northeastern portion of the basin (particularly in the northern management area) tend to have heads that are underestimated compared to manual observations, while wells that are in the southwestern portion of the basin have heads that tend to be overestimated. The northeastern portion of the basin, where heads tend to be underestimated, is the area with the most intensive pumping. Given this bias, future updates to the model should focus on improving estimates of head in this area by including more precise pumping and aquifer data.

The RMSE between observed and simulated hydraulic heads from January 2011 to September 2016 was 18.78 feet, which was comparable to the RMSE of 17.88 feet calculated for the residuals from 1945 to 2010. Hydraulic heads declined an additional 2 to 18.5 feet from 2011 to 2016 with an average decline of 9.3 feet over the 6-year period.

INTENTIONALLY LEFT BLANK

6 RECOMMENDATIONS

The sensitivity analysis conducted by the USGS indicated the greatest uncertainty in the numerical model was in agricultural pumping, stream flow leakage, and storage. The FMP estimates agricultural pumping using precipitation and evapotranspiration data obtained from the BCM, assumptions about soil types and their associated soil moisture characteristics, rooting depths, crop coefficients, overland runoff, and estimated efficiencies of applied irrigation. Additionally, the coarse uniform grid of the model domain may overstate the water demands of certain land-use types, like golf courses, and, consequently, overestimate the amount of groundwater pumped to meet the water demand.

The simulated hydraulic heads compared to observed hydraulic heads indicated a slight bias of the model in underestimating hydraulic heads. This may be the result of the model simulating too much pumping compared to actual usage, or underestimating storage values like specific yield for the upper aquifer, or underestimating the amount of recharge to the BVGB, or a combination of all three. A spatial view of modeled residuals indicates that simulated heads may be underestimated where most agricultural pumping occurs. To improve the accuracy of the BVHM in simulating conditions in the basin and provide greater confidence in predictive simulations, the following are recommended actions to undertake to obtain additional data and further study the hydrogeology of the basin:

- Collect actual agricultural pumping data using existing flow meters or installing new flow meters at wells used for irrigation purposes. The pumping data may be incorporated in the numerical model to calibrate the FMP to more accurately estimate the water demands for the various crops and golf courses being irrigated.
- Install stream gaging stations at major drainages that convey most of the surface water runoff to the valley, either from perennial flows or flash flows from major precipitation events. The goal would be to install two gaging streams in the same creek to measure differences in flow. This information would provide a more accurate estimate of stream leakage.
- Conduct aquifer tests at wells screened only in the upper aquifer and only in the middle aquifer to obtain site-specific estimates of hydraulic conductivity and specific yield for each aquifer unit. This information may be used to enhance the calibration of the model to these hydraulic properties and our understanding of storage in the BVGB.

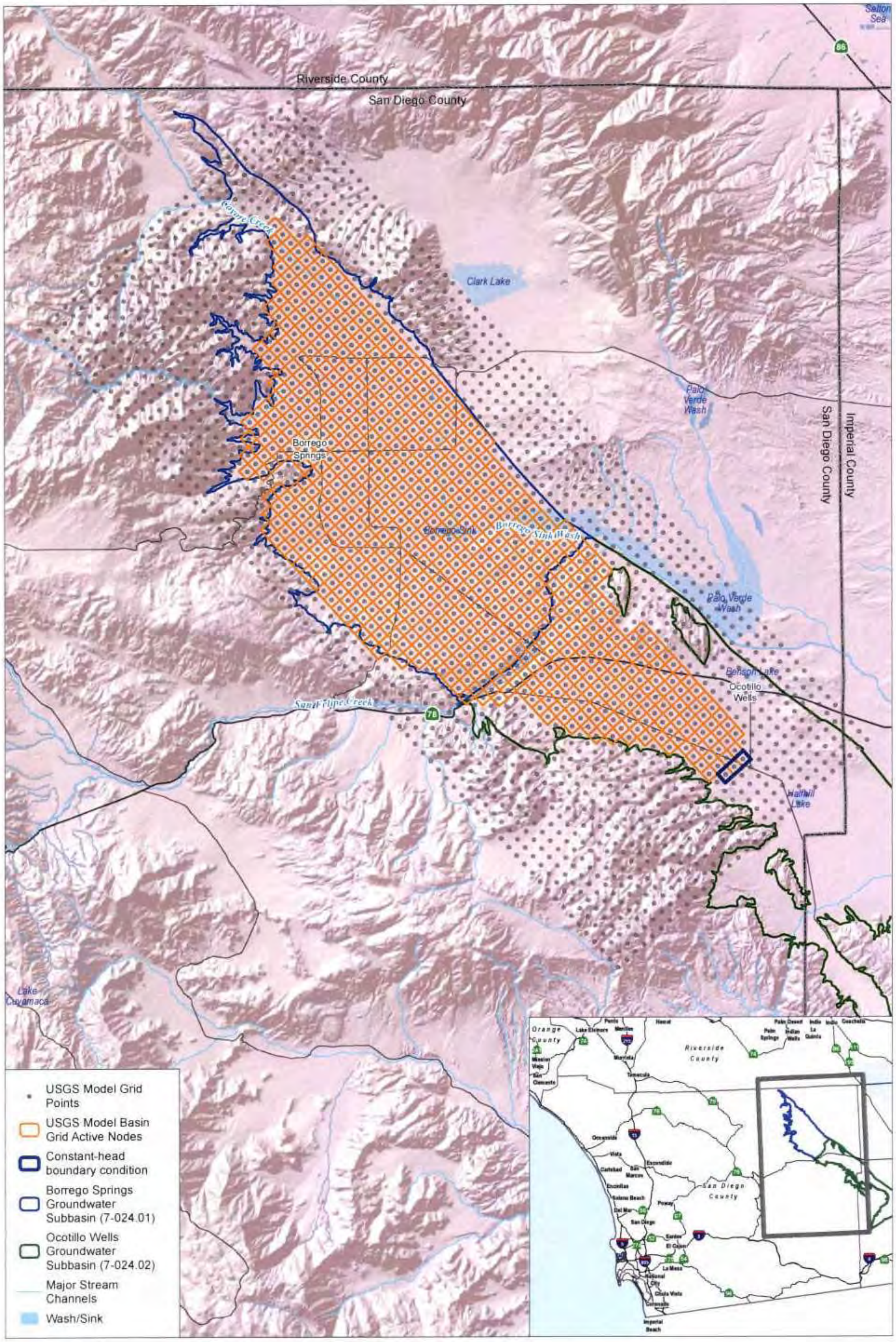
INTENTIONALLY LEFT BLANK

7 REFERENCES CITED

Anderson, M.P., and W.W. Woessner. 1992. *Applied Groundwater: Modeling Simulation of Flow and Advective Transport*. San Diego: Academic Press Inc.

Faunt, C.C., C.L. Stamos, L.E. Flint, M.T. Wright, M.K. Burgess, M. Sneed, J. Brandt, P. Martin, and A.L. Coes. 2015. Hydrogeology, hydrologic effects of development, and simulation of groundwater flow in the Borrego Valley, San Diego County, California: U.S. Geological Survey Scientific Investigations Report 2015-5150, 135 p.

INTENTIONALLY LEFT BLANK

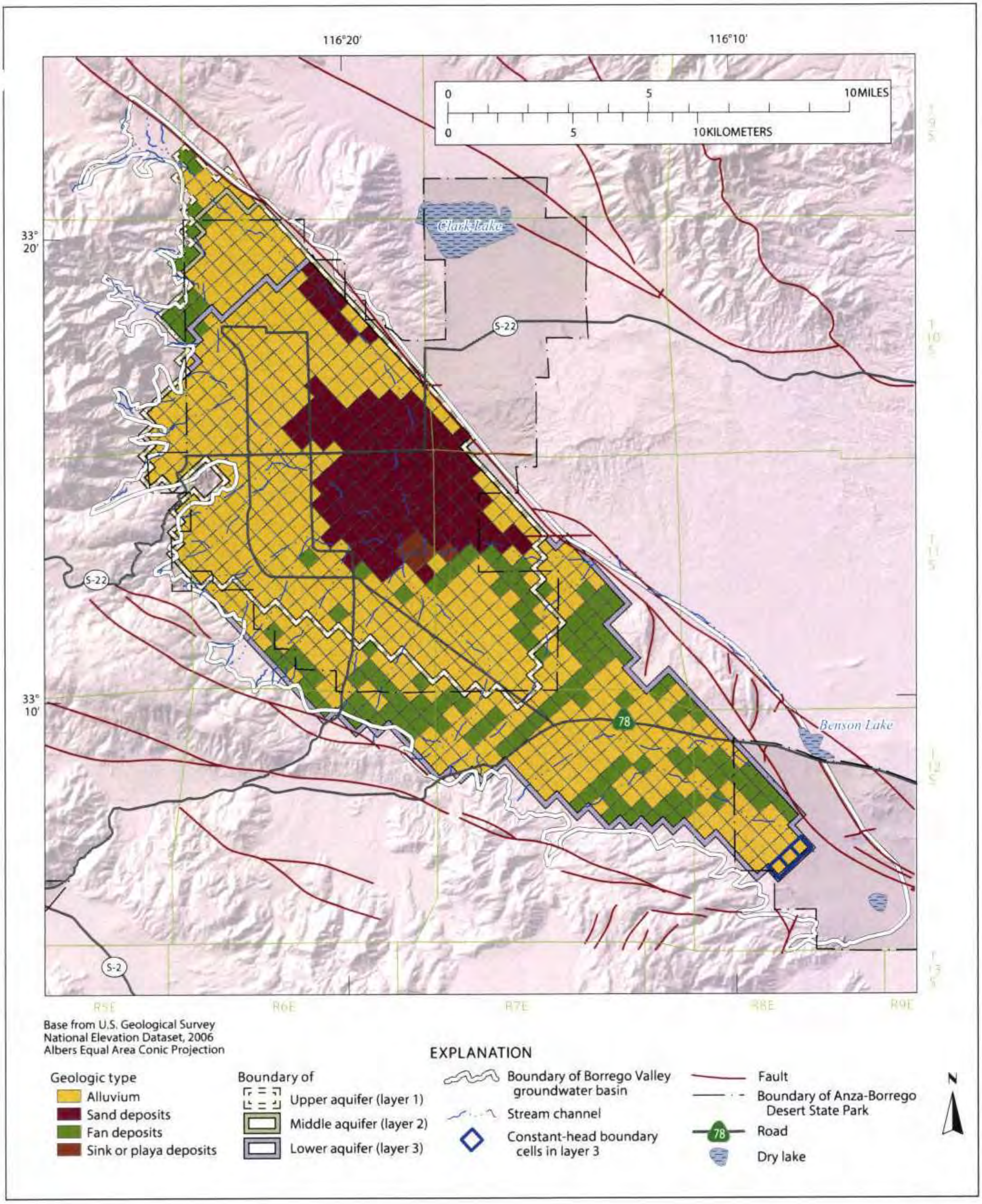


SOURCE: Faunt et al. 2015

DUDEK January 2020

Figure 1
Model Domain for Borrego Valley Hydrologic Model
Update to United States Geologic Survey Borrego Valley Hydrologic Model

INTENTIONALLY LEFT BLANK

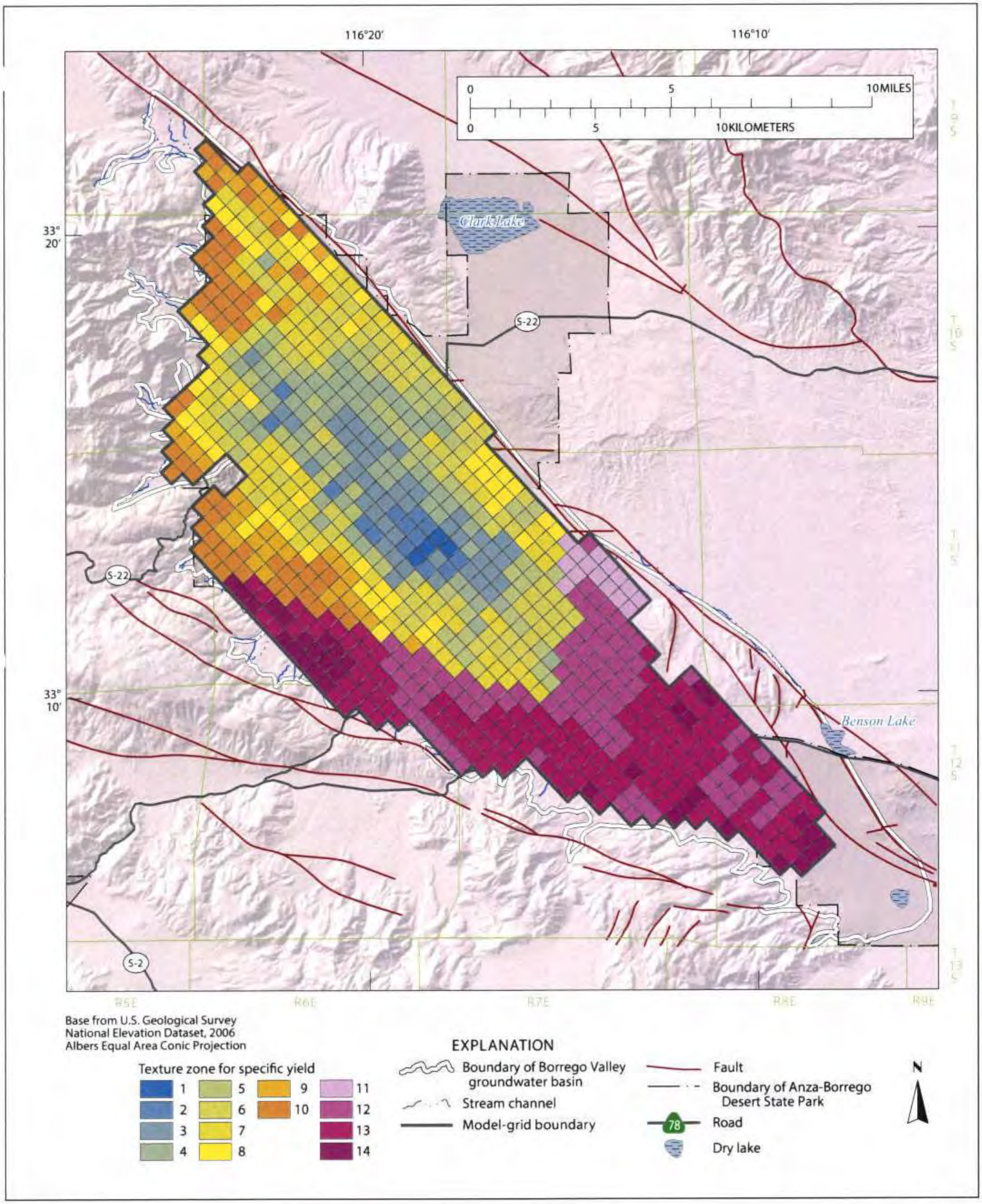


SOURCE: Faunt et al., 2015

FIGURE 2

Hydrogeologic Parameter Zones in Borrego Valley Hydrologic Model

INTENTIONALLY LEFT BLANK



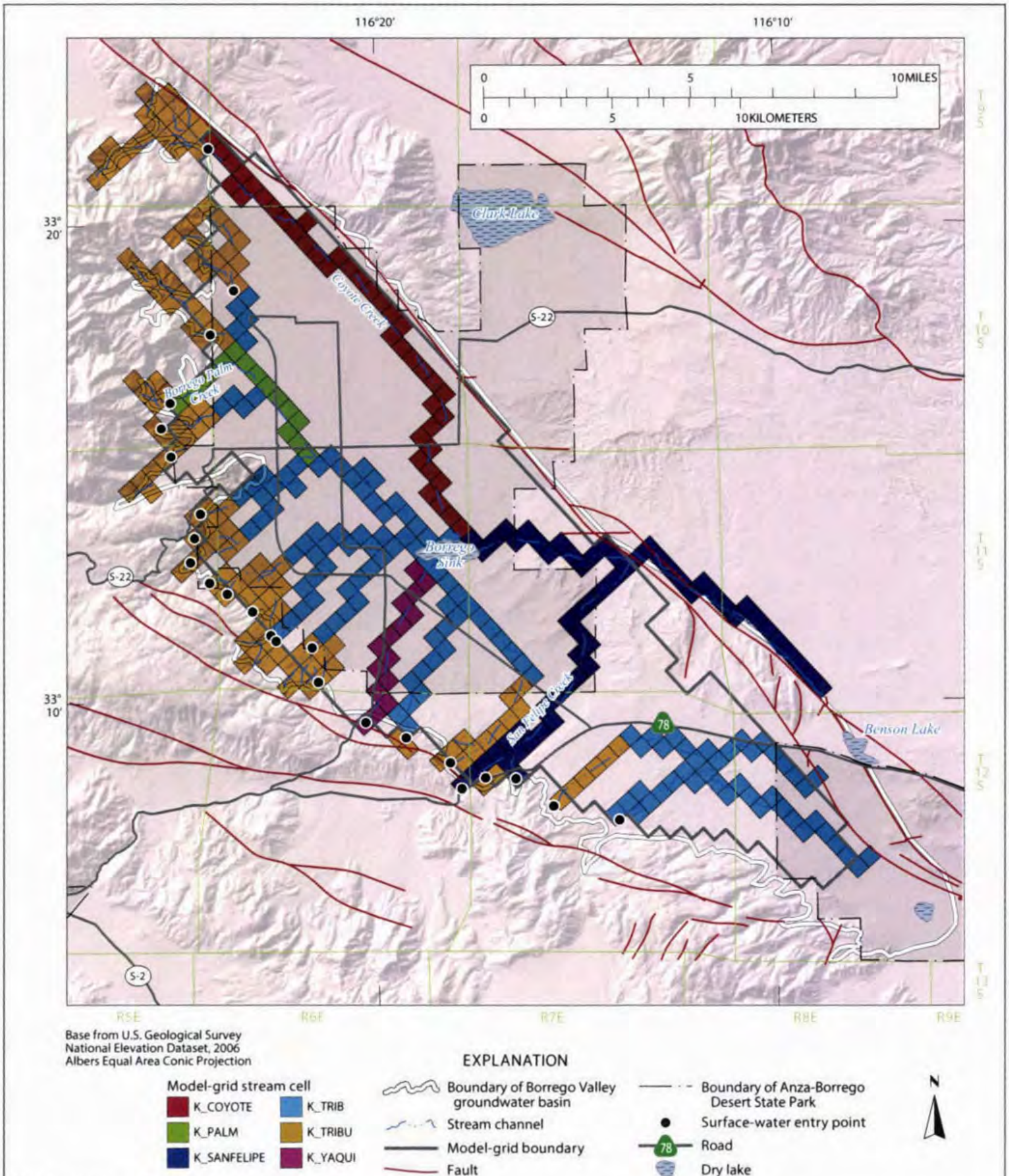
SOURCE: Faunt et al., 2015

FIGURE 3

Textural Map of Specific Yield in Borrego Valley Hydrologic Model

Update to United States Geologic Survey Borrego Valley Hydrologic Model

INTENTIONALLY LEFT BLANK



Model-grid stream cell explanation

K, hydraulic conductivity; K_v, vertical hydraulic conductivity; COYOTE, Coyote Creek; PALM, Borrego Palm Creek; SANFELIPE, San Felipe Creek; TRIB, unidentified tributary streams; TRIBU, upper portions of unidentified tributary streams; YAQUI, Yaqui Creek

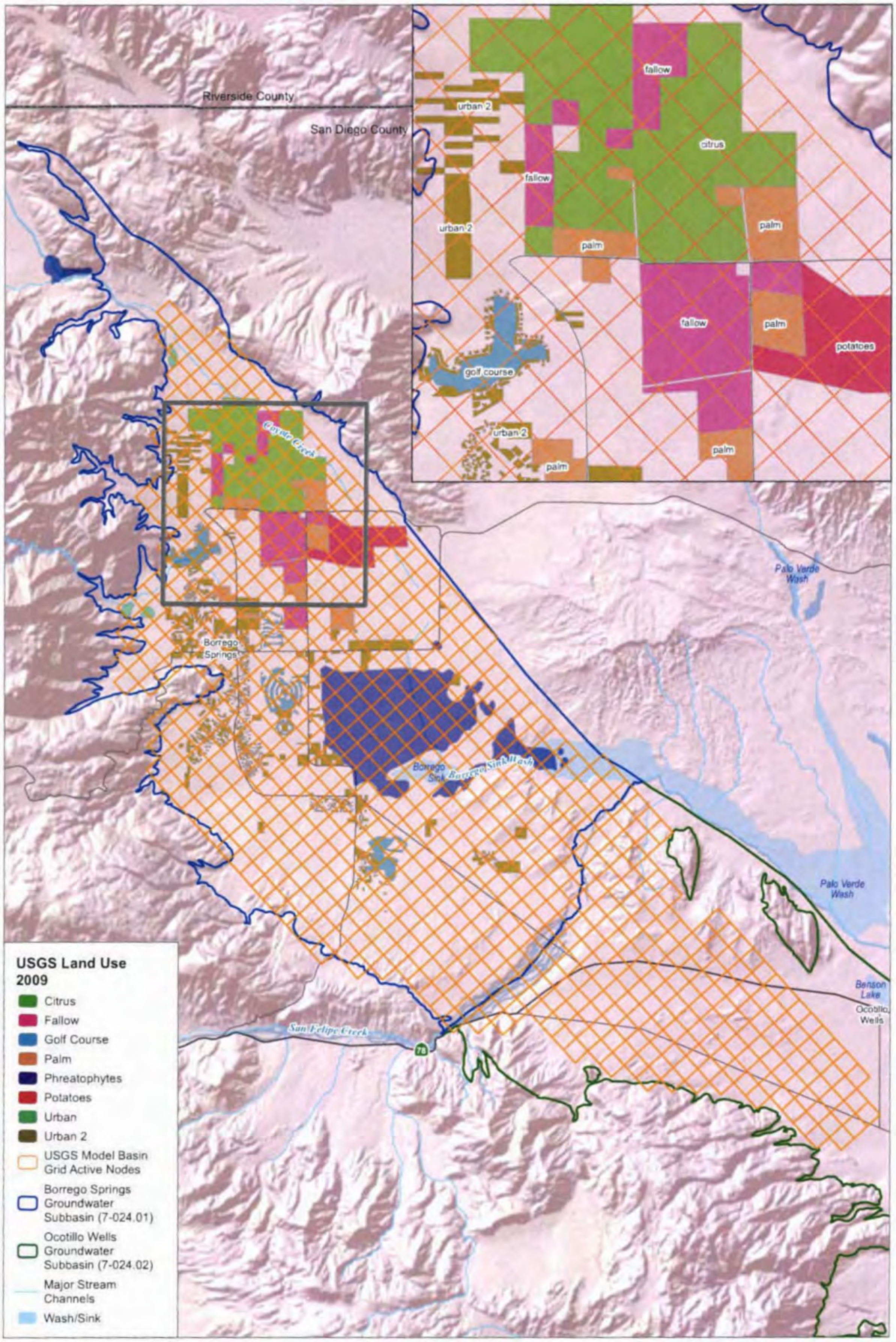
SOURCE: Faunt et al., 2015

FIGURE 4

Simulated Stream Flow in Borrego Valley Hydrologic Model

Update to United States Geological Survey Borrego Valley Hydrologic Model

INTENTIONALLY LEFT BLANK



SOURCE: Faunt et al. 2015

January 2020

DUDEK

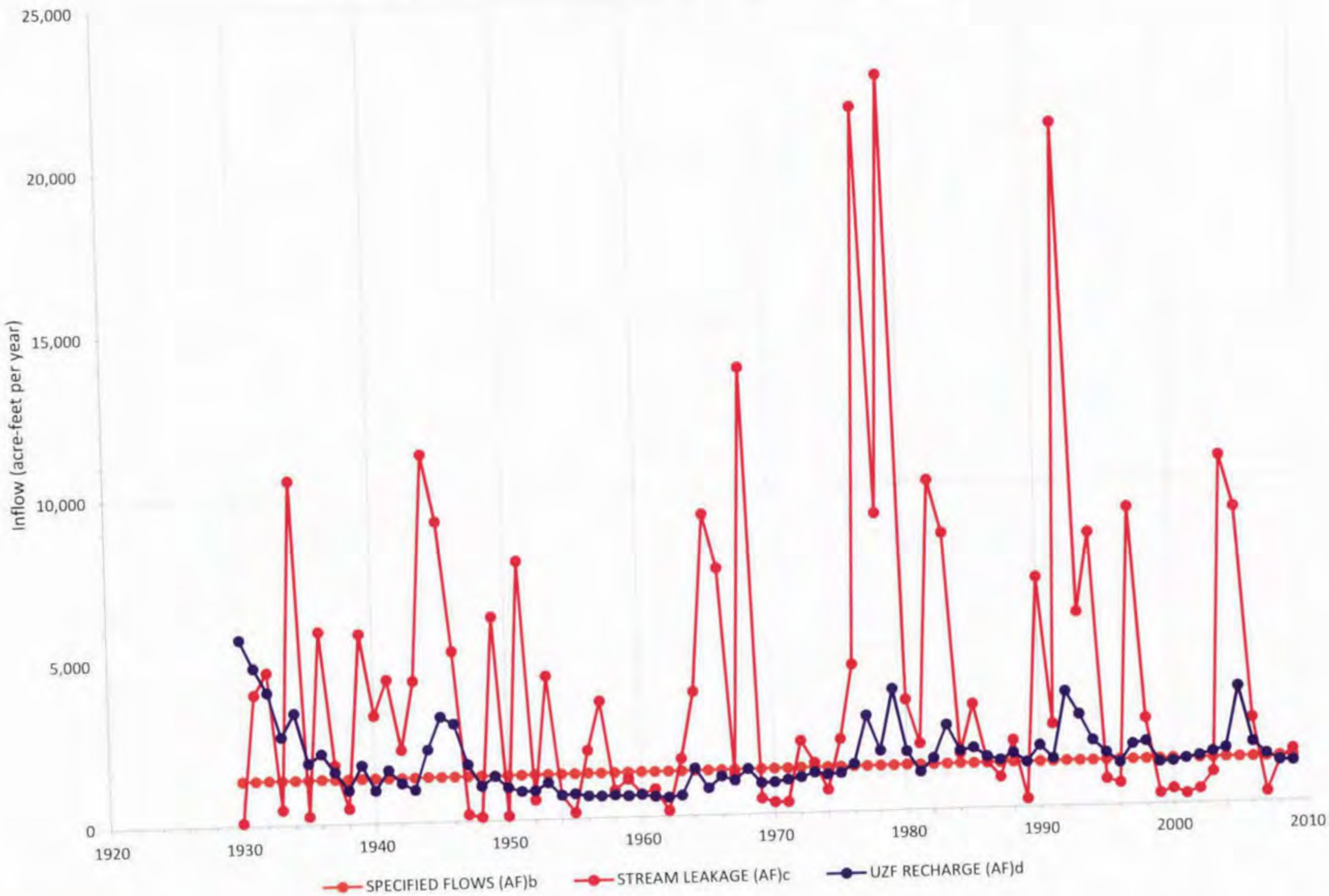
Figure 5

Land-Use Types in the Borrego Valley Hydrologic Model

Update to United States Geologic Survey Borrego Valley Hydrologic Model

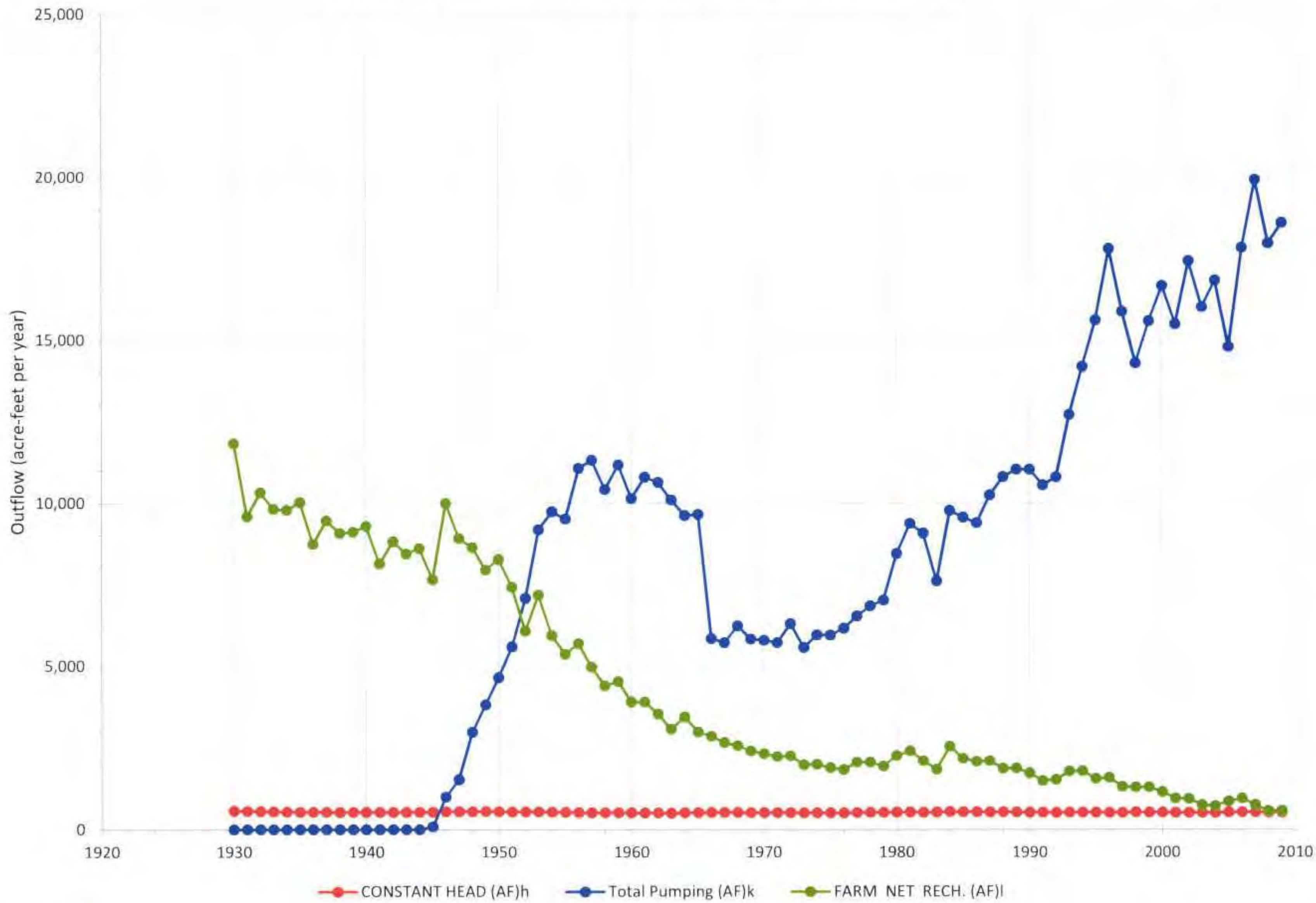
INTENTIONALLY LEFT BLANK

Figure 6. Inflows to Borrego Valley Groundwater Basin



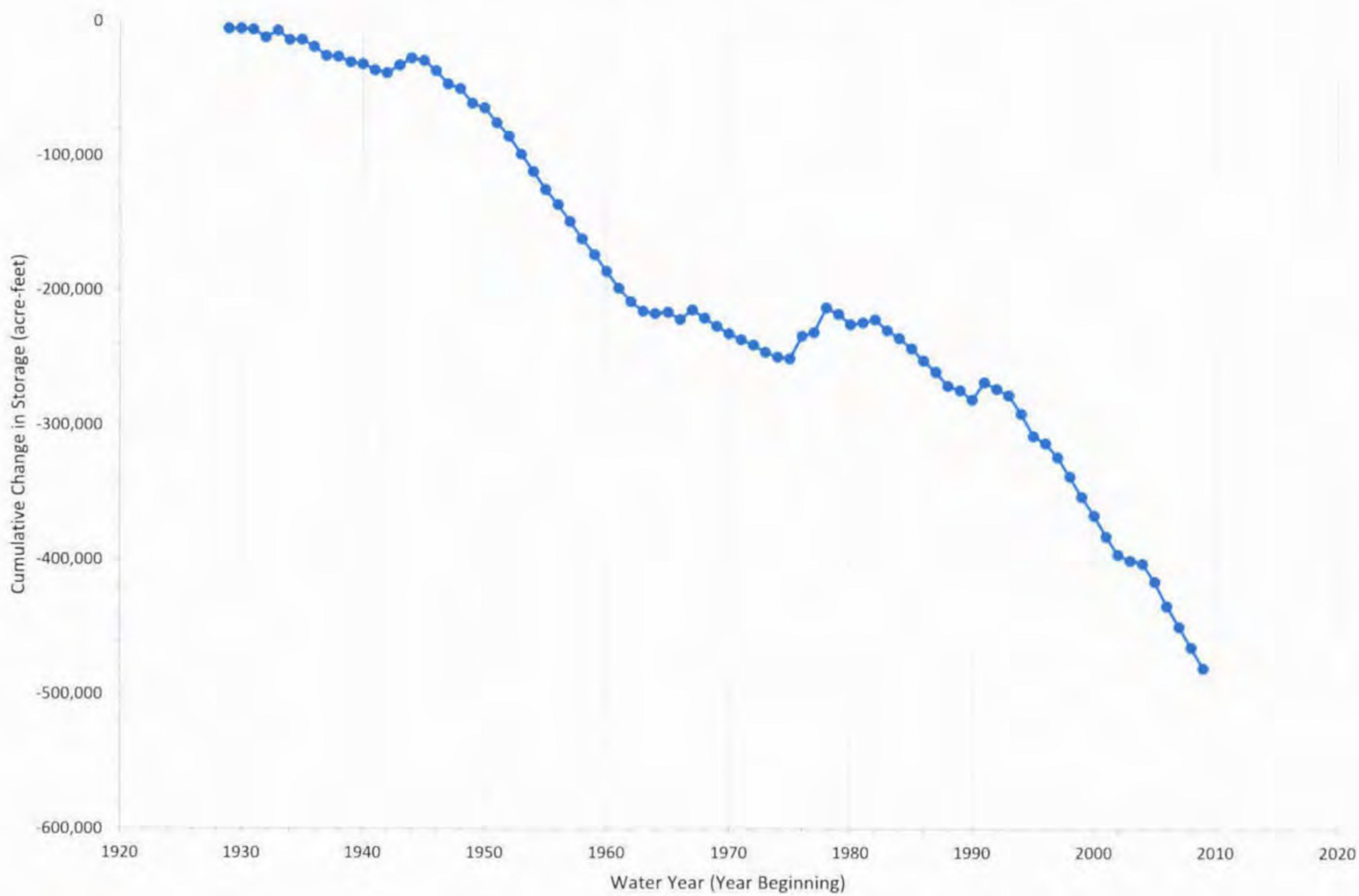
INTENTIONALLY LEFT BLANK

Figure 7. Outflows from Borrego Valley Groundwater Basin



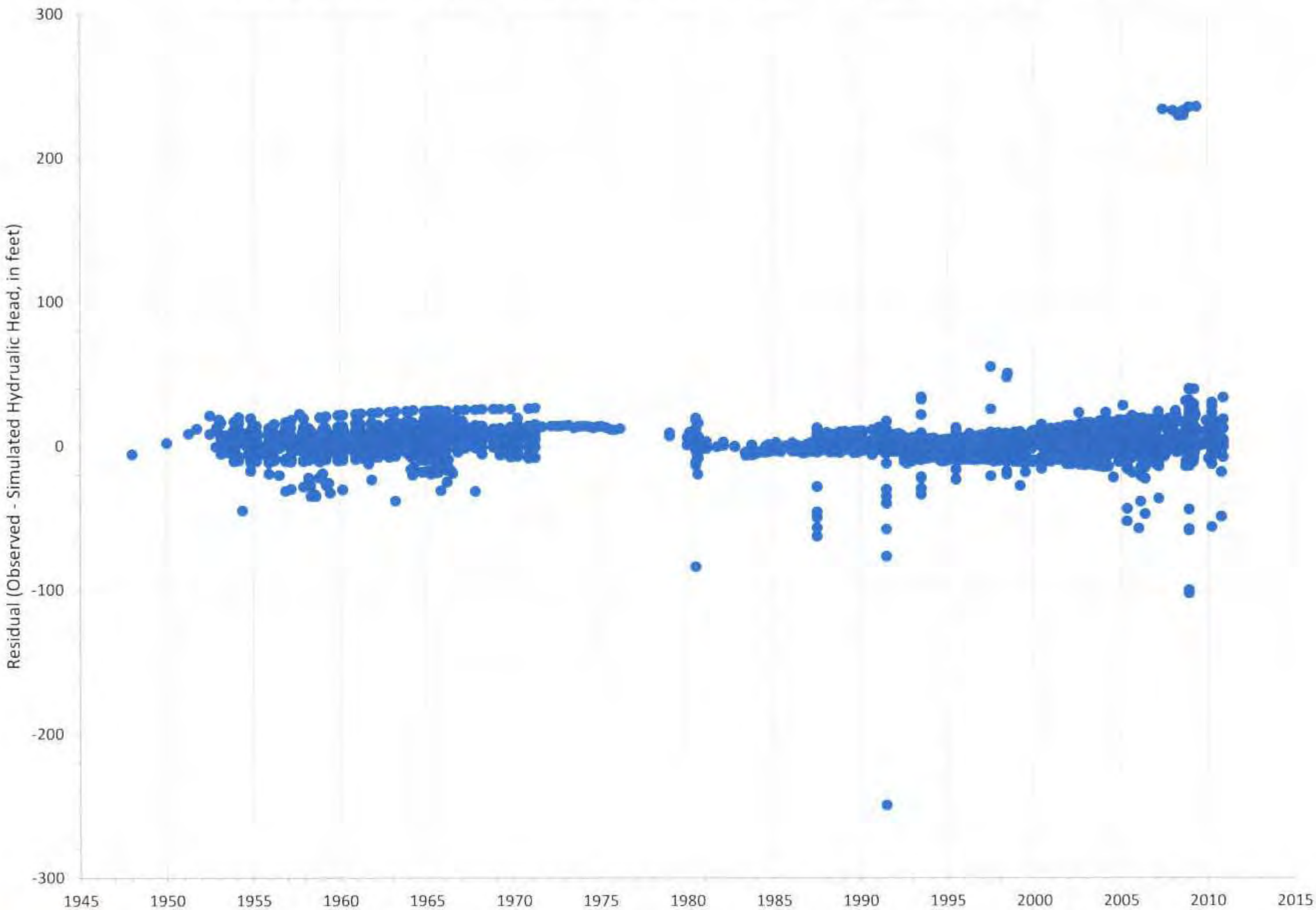
INTENTIONALLY LEFT BLANK

Figure 8. Cumulative Change in Storage in Borrego Valley Groundwater Basin from 1945 to 2010



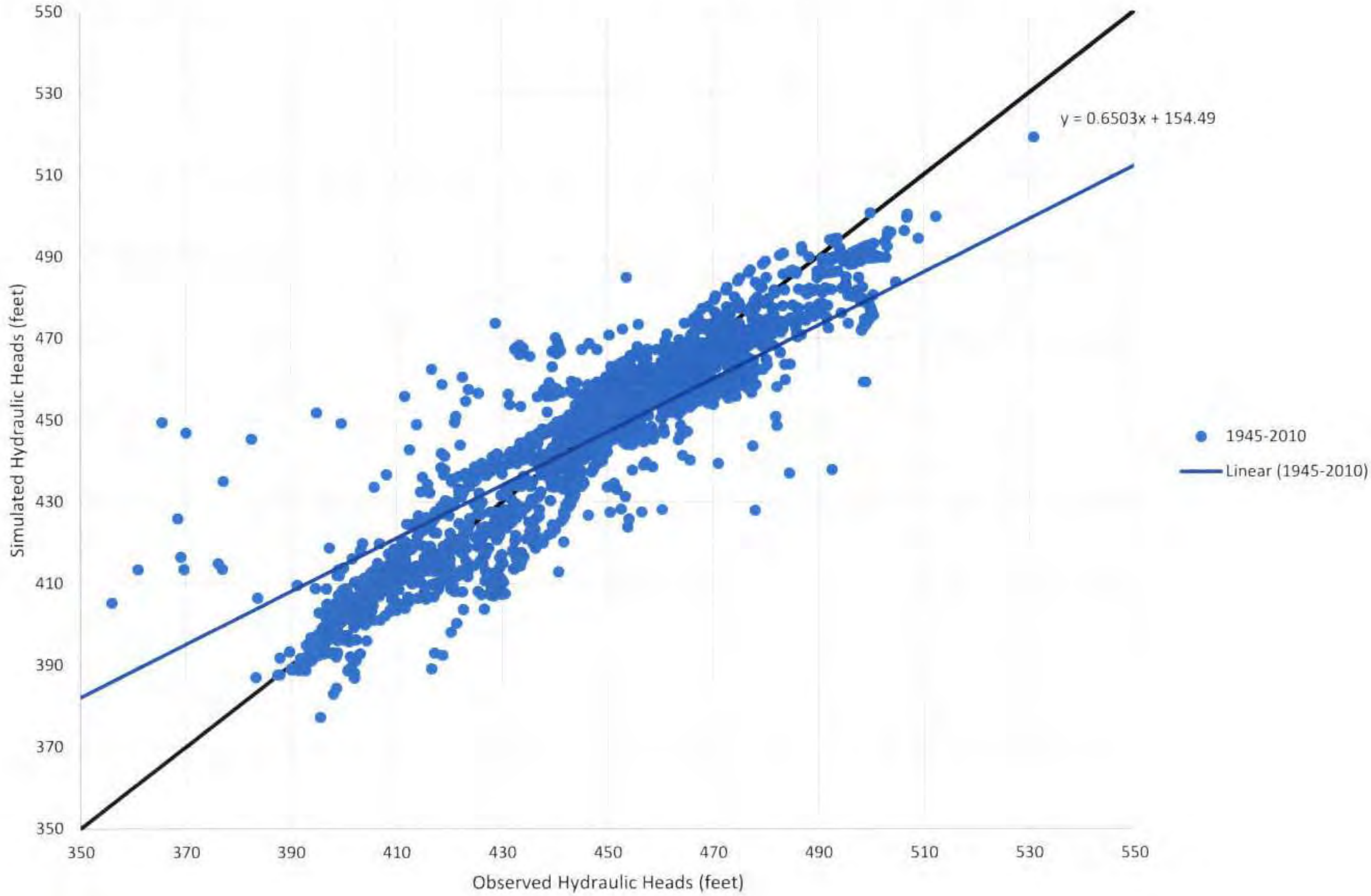
INTENTIONALLY LEFT BLANK

Figure 9. Observed - Simulated Hydraulic Heads (Residuals) from 1945 to 2010



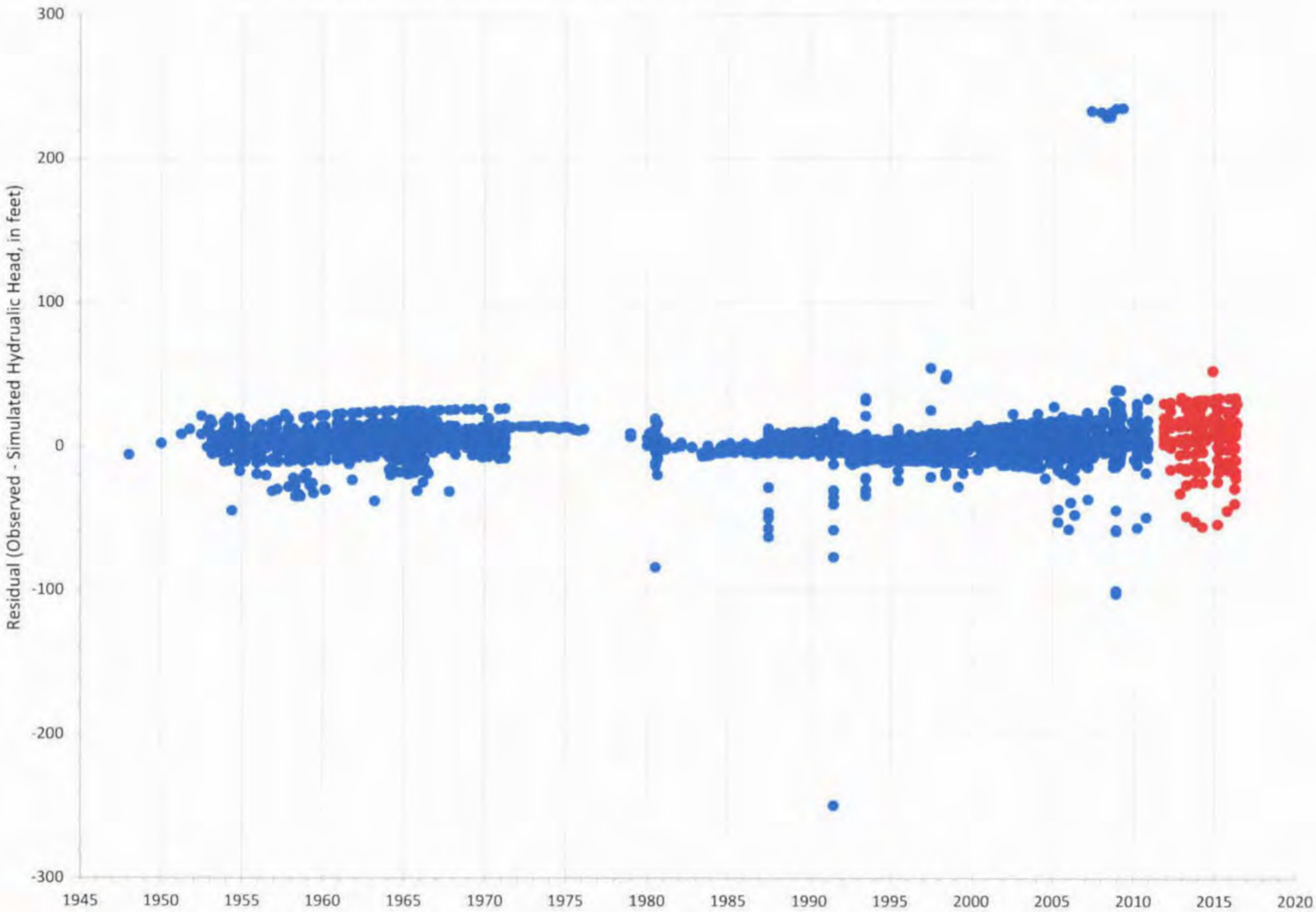
INTENTIONALLY LEFT BLANK

Figure 10. Observed vs. Simulated Hydraulic Heads in the Borrego Valley Groundwater Basin from 1945 to 2010



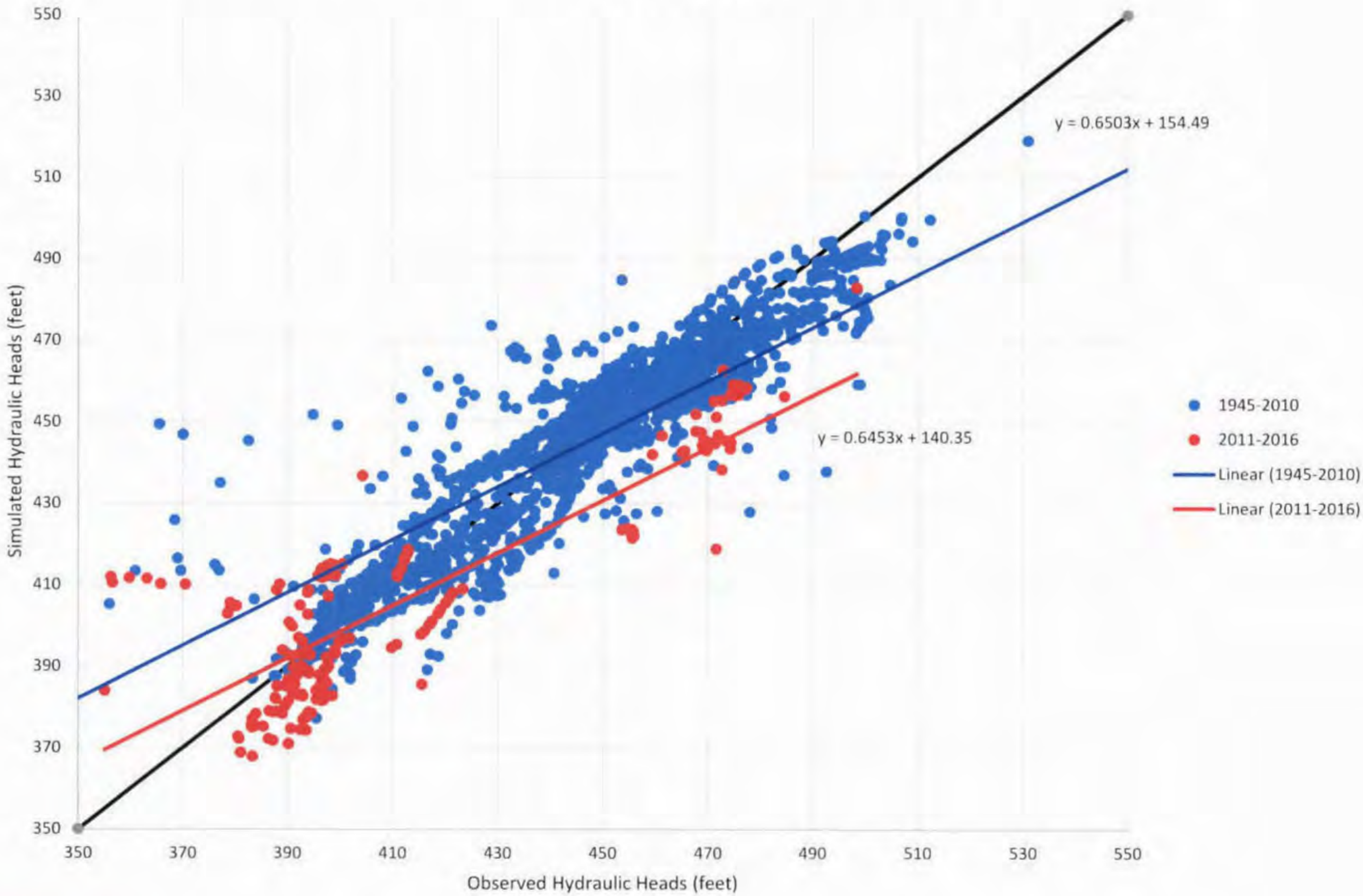
INTENTIONALLY LEFT BLANK

Figure 11. Observed - Simulated Hydraulic Heads (Residuals) from 1945 to 2016



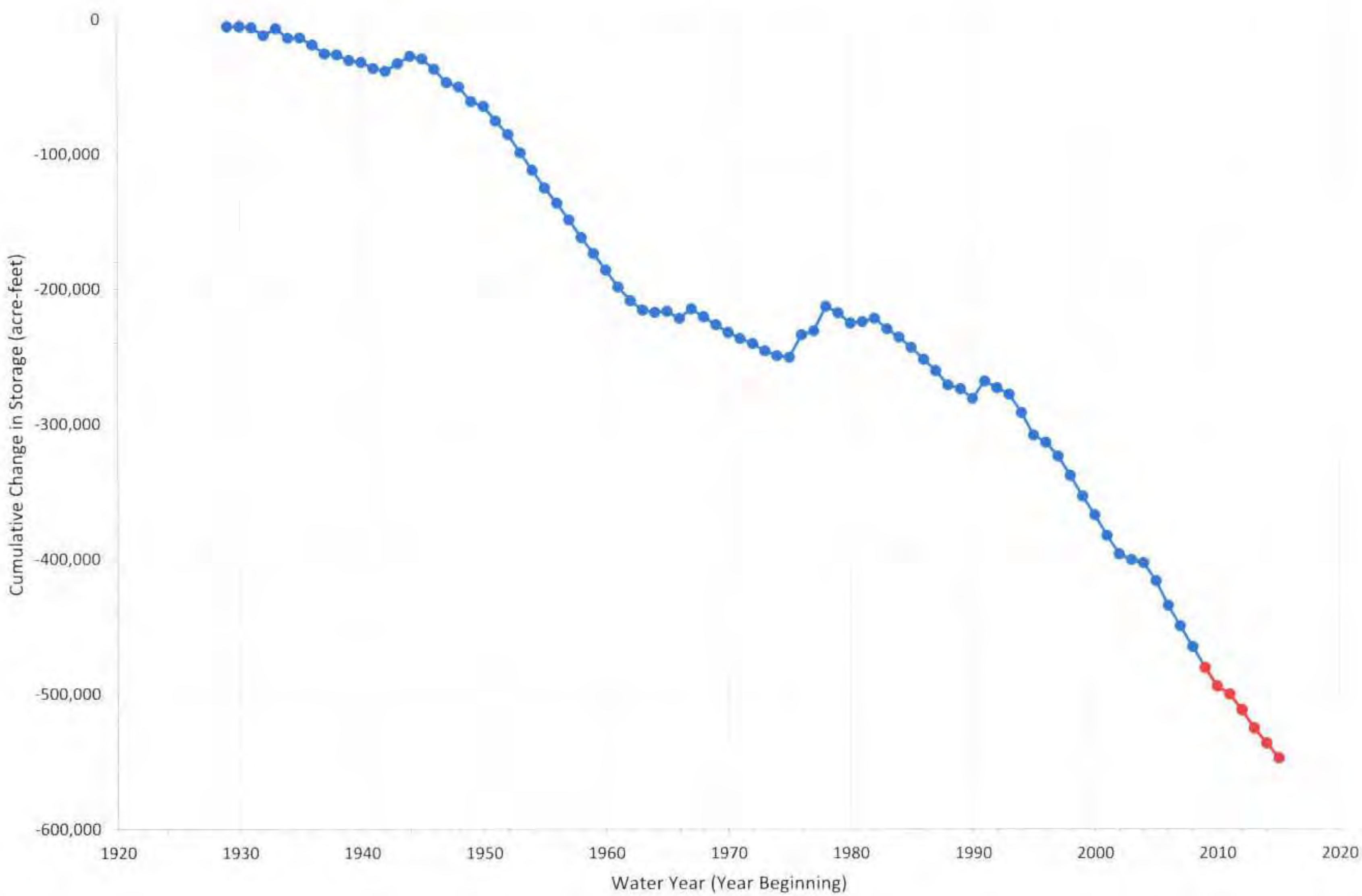
INTENTIONALLY LEFT BLANK

Figure 12. Observed vs. Simulated Hydraulic Heads in the Borrego Valley Groundwater Basin from 1945 to 2016



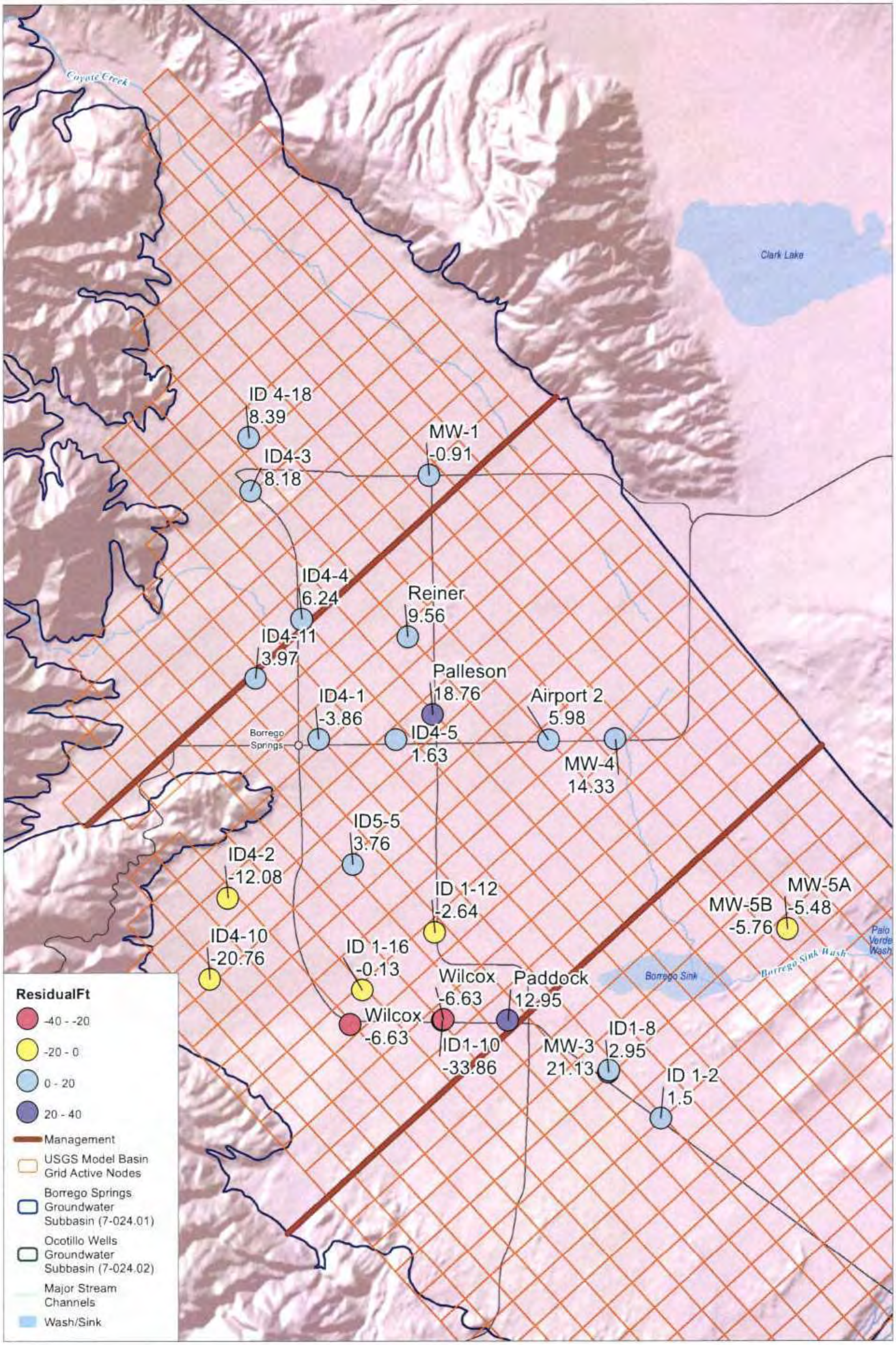
INTENTIONALLY LEFT BLANK

Figure 13. Cumulative Change in Storage in Borrego Valley Groundwater Basin from 1945 to 2016



DUDEK

INTENTIONALLY LEFT BLANK



SOURCE: Faunt et al. 2015

DUDEK January 2020

Figure 14
Spring 2016 Residuals from Key Wells in the BVHM
Update to United States Geologic Survey Borrego Valley Hydrologic Model

INTENTIONALLY LEFT BLANK

ATTACHMENT A

Annual Water Balance from 1929 to 2010 for Borrego Valley Hydrologic Model

Attachment A. Annual Water Balance for Borrego Valley Hydrologic Model

Water Year Beginning	INFLOWS							OUTFLOWS									Δ Storage[n]
	STORAGE (AF)[a]	SPECIFIED FLOWS (AF)[b]	STREAM LEAKAGE (AF)[c]	UZF RECHARGE (AF)[d]	MNW2 (AF)[e]	TOTAL IN (AFY)	Recharge (AF)[f]	STORAGE (AF)[g]	CONSTANT HEAD (AF)[h]	MNW2 (AF)[i]	FARM WELLS (AF)[j]	Total Pumping (AF)[k]	FARM NET RECH (AF)[l]	Total Out (AF)	Discharge (AF)[m]	
1930	11,164 65	1,366 27	97 40	5 702 64	0.00	18 330 95	7,166.30	5,730 49	573 29	0.00	0 00	0 00	11,822.97	18 126 75	12,396 26	-5,434 16
1931	6 564 56	1,366 27	4 006 82	4 815 95	0 00	16,753 60	10 189 04	6 587 16	566 45	0 00	0 00	0 00	9,589.55	16 743 15	10 155 99	22 60
1932	7,727 41	1,370 01	4,671 00	4,069 45	0 00	17,837 87	10,110 46	6,963 86	559 46	0.00	0.00	0 00	10,325 88	17,849 20	10,885 34	-763.55
1933	7,489 29	1,366 27	470 35	2,704 38	0 00	12,030 29	4,541.00	1,745 51	545 31	0 00	0.00	0 00	9,816.30	12,107.12	10,361 61	-5,743 78
1934	8,391 33	1,366 27	10,540 11	3,422 88	0.00	23,720 59	15,329 26	13,392 66	544.34	0 00	0 00	0 00	9,789.97	23,726 97	10,334 31	5,001 33
1935	8,687 88	1,366 27	259 12	1,869 70	0 00	12,182 96	3,495 08	1,670 78	535 83	0 00	0 00	0 00	10,028.54	12,235 15	10,564 36	-7,017 09
1936	7,055 88	1,370 01	5,893 96	2,154 58	0 00	16,474 44	9,418 56	7,207 68	537 00	0 00	0.00	0 00	8,739.95	16,484 63	9,276.95	151 80
1937	8 147 76	1,366 27	1,802.50	1,585.55	0 00	12,902 08	4,754 32	2,938 35	532 92	0 00	0 00	0 00	9,464 21	12,935 47	9,997 13	-5,209 41
1938	8,229 59	1,366 27	466.59	1,019 48	0 00	11,081 93	2,852.33	1,523 34	526 04	0 00	0.00	0 00	9,078.35	11,127 72	9,604.38	-6,706.25
1939	8 007 00	1,366 27	5 807 98	1,777 60	0 00	16,958 85	8 951 85	7,330 01	529 87	0 00	0.00	0 00	9,114 70	16,974 59	9,644 57	-676 99
1940	8,323 85	1,370 01	3,291 39	1,002 93	0.00	13,988.19	5,664 34	4,200 11	526 55	0 00	0 00	0 00	9,292 28	14,018 95	9,818 84	-4,123 74
1941	6,902 92	1,366 27	4,380 06	1,607.52	0.00	14,256 77	7,353 85	5,596 57	527 83	0.00	0 00	0 00	8,142.31	14,266 71	8,670 14	-1,306.35
1942	7,727 33	1,366 27	2,222 73	1,206 88	0 00	12,523 21	4,795 88	3,191 10	529 21	0 00	0 00	0 00	8,821 64	12,541 96	9,350 85	-4,536 23
1943	7,872 03	1,366 27	4,324 76	994 25	0 00	14,557 31	6,685 28	5,613 54	525 80	0 00	0 00	0 00	8,441 68	14,581 03	8,967 49	-2,258 49
1944	8 781 49	1,370 01	11 249 22	2 215 77	0 00	23 616 49	14 835 00	14 475 99	532 46	0 00	0.00	0 00	8 608 10	23 616 55	9 140 56	5,694 50
1945	6 743 86	1,366 27	9 181 62	3 212.55	1.27	20 505 56	13 760 43	12,220.58	532 26	88 63	0 00	88 63	7,658 60	20,500 07	8,279 49	5,476 72
1946	10,236 99	1,366 27	5,201 31	2,988.91	1 71	19,795 20	9,556.49	8,252 91	549 24	996 16	0 00	996 16	9,998 39	19,796 71	11,543 80	-1,984.08
1947	9 334 75	1,366 27	196.05	1,730 47	1 77	12 629 31	3 292 79	1,627 18	550 88	1,534.08	0 00	1,534 08	8 917 02	12 629 16	11,001 99	-7,707 57
1948	10,922 73	1,370 01	112.19	1 059 47	0 93	13,465 33	2,541.68	1,287 80	550 77	2,770 43	215 03	2,985 45	8 642 13	13,466 16	12,178 36	-9,634 93
1949	10,476 17	1,366 27	6,232 29	1,350 82	0 68	19,426 23	8,949 37	7,099 47	555 20	3,589 05	231.55	3,820 60	7,949 71	19,424 98	12,325 50	-3,376 70
1950	12,127 20	1,366 27	126 71	989 46	0 64	14,610 27	2,482.44	1,141 28	546 61	4,425 95	223.31	4,649 26	8,274 42	14,611 58	13,470 29	-10,985 91
1951	11,335 03	1,366 27	7,915 42	871 22	0.50	21,488 43	10,152 90	7,926 75	541 98	5,260.83	336 44	5,597 27	7,421.59	21,487 60	13,560 84	-3,408 27
1952	13,059 68	1,370 01	594 36	876 51	0 80	15,901.37	2,840 89	2,189 66	542 09	6 596 19	493 44	7,089 63	6 079 95	15 901 33	13,711 67	-10 870 02
1953	15,186 40	1,366 27	4,375 11	1,108 86	1 63	22,038 27	6,850 24	5,129 63	538 02	8,173 89	1,012.42	9,186.31	7,183 63	22,037 59	16 907 96	-10,056 76
1954	14,817 73	1,366 27	724 52	718 10	3 68	17,630 29	2,808.89	1,419 82	530 85	8,633 96	1,109 13	9,743 09	5,937.38	17,631 14	16,211 32	-13,397 90
1955	14,477 67	1,366 27	174 09	749 18	4 06	16,771 27	2,289 55	1,359 66	524 91	8,462.30	1,059 26	9,521 56	5,366 80	16,772 94	15,413 28	-13 118 00
1956	15,506 87	1,370 01	2,067 48	669 49	2.76	19,616 61	4,106 98	2,335 93	520 56	9 896 81	1,173 85	11,070 66	5,692 14	19 619 28	17,283 36	13,170 94
1957	14,959 72	1,366 27	3,565 63	656 46	2.78	20,550 86	5,588.36	3,745 89	515 57	9,945 73	1,371.60	11,317 32	4,972.94	20,551 72	16,805 83	-11,213 83
1958	14 065 91	1,366 27	828 34	676.13	2 99	16 939 64	2,870.74	1,605 74	512 90	8,979 94	1,443 77	10 423 71	4,397 77	16 940 12	15 334 38	12,460 18
1959	14,598 36	1,366 27	1,150 74	644 93	2.61	17,762.91	3,161.93	1,550 67	508 96	9,518 32	1,655 41	11,173 73	4,531 07	17,764 42	16 213 75	-13,047 69
1960	13,640 41	1,370 01	695 95	669 55	2.77	16,378 69	2,735.51	1,829 93	509 20	8,642.83	1,501 45	10,144 28	3,903.23	16,386.64	14,556 71	11,810 47
1961	13,760 82	1,366 27	835 39	607 24	2 18	16,571 90	2,808 90	1,378.33	504 82	9,197 43	1,598 39	10 795.83	3,905 18	16 584 16	15,205 82	-12,382 48
1962	13,546 30	1,366 27	162.71	572.10	2.19	15,649.57	2 101 08	970 00	501 92	9,071.85	1,568.97	10 640 82	3,538 32	15,651 06	14,681 06	-12,576 30
1963	12,212 91	1,366 27	1,741 39	622 76	2.04	15,945.36	3,730 41	2,279 58	498 78	8,628 29	1,469 48	10,097 77	3,075 17	15,951 29	13,671 72	-9 933 33
1964	12,227 76	1,370 01	3,785 26	1,438 11	3 15	18,824 29	6,593 38	5,239 41	515 77	8,152 32	1,471 47	9,623 79	3,444 70	18,823 67	13,584 26	-6 988 35
1965	11,695 82	1,366 27	9,204 15	820 80	5 73	23,092 77	11,391 22	9,935 95	510 02	8,163 31	1,494 93	9,658.23	2,988 73	23,092 93	13,156.98	-1,759.87
1966	8,827 72	1,366 27	7,548 36	1,165 22	7 21	18,914 78	10,079 85	9,702 20	516 95	4,400 06	1,441.40	5,841 46	2,852 77	18,913 38	9,211 18	874 48
1967	7,302 93	1,366 27	1,230 53	1,035 33	3 91	10,938 96	3,632.13	2,044 91	516 18	4,244 66	1,474 20	5,718 86	2,659 44	10,939 38	8,894 48	-5,258 02
1968	8,257 79	1,370 01	13,665 71	1,378 84	9 31	24,681 67	16,414 57	15,356 16	515 97	4,860 43	1,380 11	6,240.54	2,566.51	24,679 18	9,323 02	7,098 37
1969	8 646.63	1,366 27	458 96	933 04	5 98	11 410 88	2,758 27	2 671 12	514 10	4 493 98	1 338 48	5 832 46	2 404.05	11 421 73	8,750 62	-5,975 52
1970	6 974 17	1,366 27	337 26	951 13	4 10	9 632.93	2 654 66	1 014 47	512 40	4 193 85	1 602.89	5,796 74	2,318 17	9 641 78	8 627.31	-5,959 70
1971	6,678 45	1,366 27	330 25	1,016 85	3 59	9,395 42	2,713 37	948.17	508 73	4,065 23	1,654 84	5,720 07	2,227.37	9,404 34	8,456 17	-5,730 29
1972	6,932.95	1,370 01	2,192 97	1,076 44	3 21	11,575 57	4,639 41	2,519 07	509 38	4,578.80	1,720 91	6,299 70	2,250 31	11,578.45	9 059.38	-4,413.88
1973	6,091 90	1,366 27	1,511 96	1,211.05	3 28	10,184 47	4,089 29	2,135 59	506 74	3 976 97	1,593 72	5,570 68	1,977 73	10,190 74	8,055 16	-3,956 31
1974	6,402.21	1,366 27	670 80	1,139 95	4 02	9,583 24	3,177 01	1,145 68	504 91	4,317 47	1,641 45	5,958.92	1,987 13	9,596 64	8,450.96	-5,256 54
1975	6,105 25	1,366 27	2,215 20	1,170 82	3 47	10 861 01	4,752 29	2,528.92	503 19	4 358 26	1 598 76	5,957.02	1 888 94	10,878.07	8,349 14	-3,576 33
1976	6 430 62	1,370 01	4 482 20	1 432 99	4.53	13,720 35	7,285 19	5 220 02	505 38	4,678 19	1,488 74	6,166 93	1,828 76	13 721 09	8,501.07	-1,210 61
1977	7,221 49	1,366 27	21,545 32	2,910 56	10 00	33,053 63	25,822.15	23,955 63	514 80	4,975.02	1,558 62	6,533 64	2,056 57	33,060 65	9,105.02	16,734 15
1978	8 608.59	1,366 27	9 100 41	1,822 69	10 69	20,908 65	12 289 36	11 482 01	522 51	5,287 61	1,562.36	6,849 97	2 051.80	20 906.29	9,424 28	2 873 42
1979	9 980 94	1,366 27	22,504 37	3,706 44	12.78	37,570 81	27,577 08	28,103 65	521 61	5,569 13	1,456 47	7,025 60	1,931.97	37,582 82	9,479 17	18,122 71
1980	11,578 46	1,370 01	3,372 44	1,784 84	10 35	18,116 10	6,527 29	6,864 35	528.64	6,728 95	1,720.93	8,449.88	2,260 29	18,103 16	11,238.81	-4 714 11
1981	10,116 67	1,366 27	2,010 57	1,147 53	5 82	14,646 86	4,524 37	2,367 07	524 58	7,415.02	1,956 47	9,371 49	2,402 89	14,666 03	12,298.96	-7,749 60
1982	8 678.39	1,366 27	10,070 52	1,555 96	6 25	21,677.39	12,992.75	9 994 00	521 12	7,238 96	1,834.55	9,073 51	2,095 53	21,684 16	11,690 16	1,315 61
1983	8,301.78	1,366 27	8,442 66	2,562 94	20 54	20 694 18	12,371 87	10,715 07	529 12	6 183 12	1,427 62	7,610 74	1 838 47	20 693 41	9 978 34	2,413 29
1984	10,566.72	1,370 01	1,678 92	1,755 96	19 09	15,390 69	4 804 88	2,547 39	538 13	7,815 70	1,954 79	9,770 48	2,540 05	15 396 06	12 848.67	-8,019 32
1985	9,629 04	1,366 27	3,182 71	1,841 77	18.69	16,038 47	6,390 74	3,761 00	533 87	7,722 91	1,849 74	9,572 65	2,172 11	16,039 63	12,278 63	-5 868 03
1986	9 910.09	1,366 27	1,402 37	1,559 51	20 46	14,258 70	4 328 15	2,251 65	533 98	7 588 52	1 810 21	9,398 73	2 074 40	14 258.76	12,007 11	-7,658 44

Attachment A. Annual Water Balance for Borrego Valley Hydrologic Model

Water Year Beginning	INFLOWS							OUTFLOWS									Δ Storage[n]
	STORAGE (AF)[a]	SPECIFIED FLOWS (AF)[b]	STREAM LEAKAGE (AF)[c]	UZF RECHARGE (AF)[d]	MNW2 (AF)[e]	TOTAL IN (AFY)	Recharge (AF)[f]	STORAGE (AF)[g]	CONSTANT HEAD (AF)[h]	MNW2 (AF)[i]	FARM WELLS (AF)[j]	Total Pumping (AF)[k]	FARM NET RECH (AF)[l]	Total Out (AF)	Discharge (AF)[m]		
1987	10,375.36	1,366 27	926 43	1,454 34	19 45	14,141 85	3,747 04	1,266 15	530.20	8 282.97	1,966 51	10,249 48	2,096 30	14,142 13	12,875 97		-9,109 21
1988	10 934 85	1,370 01	2,038 69	1,654 10	22 53	16 020 18	5 062.80	2,820.28	531 26	8,983 53	1,822 15	10,805 67	1,863 77	16,020 97	13,200 70		-8,114 57
1989	11,506 53	1,366 27	233 41	1 364 98	23 74	14,494 92	2,964 65	1 064 87	524.27	9 030.12	2,005 64	11,035 76	1,872.89	14,497 78	13,432 91		10,441 66
1990	10,826 51	1,366 27	7,016 01	1,868 39	24 50	21,101 68	10,250 67	7,827 69	521 45	9 069 61	1,965 15	11,034 76	1,721 44	21,105.34	13 277 65		-2,998.81
1991	10 636 74	1,366 27	2,515.30	1,453 41	19.05	15,990 77	5,334 98	3,434 20	518 06	8,772.85	1,776 15	10,549 00	1,489 41	15,990 68	12,556 48		-7,202 54
1992	11,707.80	1,370 01	20,913 16	3,494 77	36.82	37,522 57	25,777.94	24,694 41	513 90	9 018.37	1,778.19	10 796 56	1,520 21	37,525 08	12,830 67		12 986 60
1993	14,569 90	1,366 27	5,915 43	2,785 29	44 27	24,681 15	10,066 99	9 666 34	521.54	10,959 33	1,755 96	12,715 29	1,777 29	24 680 47	15,014 12		-4 903 56
1994	12 610 91	1,366 27	8 347 66	1,978 52	29 77	24,333 13	11,692 44	7,845 73	517 77	12,333 54	1,847 84	14,181 38	1,788 13	24,333 00	16,487 28		-4,765 18
1995	15 805 11	1,366 27	787 19	1,592 92	31 50	19,582 99	3,746 37	1,903 71	516 31	13,780 52	1,828.68	15 609 20	1 553 51	19 582 72	17 679 01		-13 901 40
1996	17,536 31	1,370 01	656 24	1,277 18	30 93	20,870 67	3,303 42	973 73	515 34	15,772.36	2 022.79	17,795 15	1 581 69	20 865.91	19 892 18		-16 562 58
1997	14,585 62	1,366 27	9 087 98	1 834 52	28 05	26 902 44	12,288 78	9,214 69	511.86	14,041 17	1,826.88	15,868 05	1,307 77	26,902.36	17,687 67		-5,370 93
1998	14,384 23	1,366 27	2 625 43	1,909 47	36 17	20,321 56	5,901 16	4,221.20	523 49	12,565 50	1,718.59	14,284 08	1,292 65	20 321 42	16,100.23		-10,163 03
1999	15,335 63	1,366 27	317 60	1,268 15	27 95	18,315 60	2,952 01	935.58	520.86	13,650 77	1,926 98	15,577 76	1,291 44	18,325 64	17,390 05		-14 400 05
2000	16 190 26	1,370 01	450 22	1,280 74	34 00	19,325 23	3,100 97	1,014 02	519 23	14,507 72	2,155 29	16,663 01	1,146 80	19,343.05	18,329 04		-15,176 24
2001	15,569 67	1 366 27	283 49	1 362 17	29 63	18,611 23	3 011 93	1 659 64	515 78	13 413 67	2 067 40	15 481 07	950 13	18 606 61	16 946 98		-13,910 03
2002	16,905 68	1,366 27	428 29	1,434 40	33 98	20,168 62	3,228 96	1,292.43	512.82	15,108 61	2,320 53	17,429 14	934 45	20,168.84	18,876 41		15,613 25
2003	15,642 91	1,366 27	931 91	1,551 15	33 38	19,525 63	3,849 33	2 265.52	510 42	13 675 08	2,331 81	16,006 89	744 89	19,527 72	17,262 20		-13,377 39
2004	15,308 80	1,370 01	10,614 50	1,655 06	35 78	28,984 15	13,639.57	10 928 22	509 89	14 373 88	2 454 67	16,828 55	719 22	28,985 88	18,057 66		-4,380 58
2005	15,596 97	1,366 27	9 034 46	3,529.99	45 84	29,573 53	13,930 71	13,394 40	527 26	12,873 56	1,916.17	14,789 73	862.87	29,574 25	16,179 86		-2,202 58
2006	16,951 16	1,366 27	2,563 05	1,820 33	34 10	22,734 91	5,749 64	3 423 90	529 56	15 473 65	2,359 42	17 833 08	946 16	22,732 70	19,308.81		-13,527 26
2007	19,091 07	1,366 27	291 71	1,448 80	31 62	22,229 47	3,106 78	1 040 39	524 86	17,389 64	2,521.67	19 911 31	752.59	22,229 15	21,188 76		-18 050 68
2008	17,754 85	1,370 01	1,228.89	1,239.57	35 87	21,629 19	3,838 48	2,579 28	522 74	15,650 88	2,316.60	17,967 48	562.38	21,631.88	19,052.60		-15,175 57
2009	18,160 59	1,366 27	1,572 16	1,215 03	37 57	22,351 62	4,153 46	2,665 27	522 44	16 220 74	2 370.20	18 590 94	571 12	22 349 77	19 684 50		-15,495 32
2010	17,393 45	1,366 27	234 31	1,378 10	35 75	20,407 88	2,978 68	1,868 07	520 48	15,179 83	2 377 39	17,557 21	487 48	20 433 23	18,565 17		-15,525 38
MIN (1930 - 2010)	6 092	1,366	97	572	0	9,395	2,101	936	499	0	0	0	487	9 404	8,055		-18 051
MAX (1930 - 2010)	19,091	1,370	22,504	5,703	46	37,571	27,577	28,104	573	17,390	2,522	19 911	11,823	37,583	21,189		18,123
AVG (1930 - 2010)	11,292	1,367	4 016	1 657	12	18,344	7,040	5,358	525	6,982	1,271	8,253	4,212	18,348	12,990		5 814
STDEV (1930 - 2010)	3,556	2	4 853	973	14	5,681	5,363	5 487	15	5 053	824	5,780	3,798	5,676	3,577		7,138
MIN (1945 - 2010)	6,092	1 366	112	572	1	9 395	2,101	936	499	89	0	89	487	9,404	8,055		-18,051
MAX (1945 - 2010)	19,091	1,370	22,504	3,706	46	37,571	27,577	28,104	555	17,390	2,522	19,911	9 998	37 583	21,189		18 123
AVG (1945 - 2010)	12,024	1,367	4,028	1,486	15	18,919	6,881	5,240	522	8,569	1,560	10,128	3 032	18 922	13,682		-6,783
STDEV (1945 - 2010)	3,518	2	5,142	737	14	5,884	5 673	5 811	13	4 198	614	4 672	2,361	5,883	3,597		7,489

NOTES:

[a] Water into the aquifer system from storage (water is removed from storage)

[b] Inflow from adjacent basins

[c] Leakage from streams directly to groundwater (Stream Recharge)

[d] Flow from the unsaturated zone into groundwater. Includes precipitation recharge, leakage from some streams within the model domain, and irrigation return flows (Distributed Recharge)

[e] Flow within the borehole for wells screened across multiple aquifer layers

[f] Sum of major inflows: Specified flows, Stream Leakage, and Unsaturated Zone Flows

[g] Water out of the aquifer system into storage (water is added to storage)

[h] Flow out of the southern end of the basin

[i] Pumping from wells in the model with specific construction information, includes all municipal wells and most recreation and agricultural wells

[j] Pumping calculated by the Farm Process Package (FMP) in Modflow for wells with no construction information. Primarily agricultural and recreational pumping

[k] The Sum of MNW2 (Column K) pumping and Farm Wells (Column L) pumping

[l] Consumptive use of water calculated by the Farm Process Package for all land use type. Primarily represents evapotranspiration.

[m] Sum of major outflows: Constant Head, Pumping, and farm net recharge

[n] Change in storage calculated by subtracting Storage In (Column B) from Storage Out (Column I)

ATTACHMENT B

Annual Water Balance from 1929 to 2016 for Borrego Valley Hydrologic Model

Attachment B. Annual Water Budget from 1929 to 2016 for Borrego Valley Hydrologic Model

Water Year Beginning	INFLOWS							OUTFLOWS									Δ Storage[a]
	STORAGE (AF)[a]	SPECIFIED FLOWS (AF)[b]	STREAM LEAKAGE (AF)[c]	UZF RECHARGE (AF)[d]	MNW2 (AF)[e]	TOTAL IN (AFY)	Recharge (AF)[f]	STORAGE (AF)[g]	CONSTANT HEAD (AF)[h]	MNW2 (AF)[i]	FARM WELLS (AF)[j]	Total Pumping (AF)[k]	FARM NET RECH (AF)[l]	Total Out (AF)	Discharge (AF)[m]	
1930	11,164 65	1,366 27	97 40	5,702 64	0 00	18 330 95	7,166 30	5,730 49	573 29	0 00	0 00	0 00	11,822 97	18,126 75	12 396 26	-5,434 16
1931	6,564 56	1,366 27	4,006 82	4 815 95	0 00	16,753 60	10,189 04	6,587 16	566 45	0.00	0.00	0.00	9,589.55	16,743 15	10,155 99	22.60
1932	7,727 41	1,370 01	4 671 00	4,069 45	0 00	17,837.87	10,110 46	6,963.86	559 46	0 00	0 00	0 00	10 325 88	17,849 20	10,885 34	-763 55
1933	7,489 79	1,366 27	470 35	2,704 38	0 00	12 030 29	4,541 00	1,745.51	545 31	0.00	0.00	0.00	9,816.30	12,107 12	10,361 61	-5,743 78
1934	8,391.33	1,366 27	10,540 11	3,422 88	0 00	23 720 59	15,329 26	13 392 66	544 34	0.00	0.00	0 00	9,789 97	23,726 97	10,334.31	5,001 33
1935	8,687 88	1,366 27	259 12	1,869 70	0 00	12,182 96	3 495 08	1 670 78	535 83	0.00	0.00	0.00	10,078 54	12,235 15	10,564.36	-7,017 09
1936	7,055 88	1,370 01	5,893 96	2,154 58	0 00	16,474 44	9,418.56	7,207 68	537 00	0.00	0.00	0 00	8 739 95	16 484 63	9 276 95	151 80
1937	8 147 76	1,366 27	1 802 50	1 585 55	0 00	12,902.08	4 754 32	2 938 35	532 92	0.00	0.00	0.00	9 464.21	12 935 47	9 997 13	-5,209 41
1938	8,229 59	1,366 27	466 59	1,019 48	0 00	11,081 93	2,852.33	1,523.34	526 04	0 00	0.00	0 00	9 078.35	11,127 72	9 604 38	-6,706.25
1939	8,007 00	1 366 27	5,807 98	1,777 60	0 00	16,958.85	8 951 85	7,330.01	529 87	0.00	0.00	0.00	9,114 70	16,974 59	9 644 57	-676 99
1940	8,323 85	1,370 01	3 291 39	1,002 93	0 00	13,988 19	5,664 34	4,200 11	526 55	0.00	0 00	0 00	9 292.28	14 018 95	9 818 84	-4 123 74
1941	6 902 92	1 366.27	4 380 06	1 607 52	0 00	14 256 77	7 353 85	5 596 57	527 83	0 00	0 00	0 00	8,142.31	14 766 71	8,670 14	-1 306 35
1942	7,727 33	1,366 27	2,222.73	1,206.88	0 00	12,523 21	4,795 88	3,191 10	529 21	0.00	0.00	0 00	8 821.64	12,541.96	9 350 85	-4,536.23
1943	7 872.03	1,366.27	4 324 76	994 25	0 00	14 557 31	6 685 28	5 613 54	525 80	0 00	0 00	0.00	8 441 68	14 581.03	8 967 49	-2,258 49
1944	8,781.49	1,370 01	11,249 22	2,215 77	0 00	23,616 49	14,835 00	14,475 99	532 46	0.00	0.00	0.00	8,608 10	23,616.55	9,140 56	5,694 50
1945	6,743 86	1,366.27	9,181 62	3 212 55	1 27	20 505 56	13,760 43	12,220.58	532 26	88 63	0 00	88 63	7,658 60	20,500.07	8 279 49	5,476.72
1946	10,236 99	1,366 27	5,201.31	2,988 91	1 71	19,795 20	9,556 49	8,252 91	549 24	996 16	0.00	996 16	9,998.39	19,796 71	11,543.80	-1,984 08
1947	9 334 75	1,366 27	196 05	1,730 47	1 77	12 629 31	3 292 79	1 627 18	550.88	1,534 08	0 00	1,534 08	8 917 02	12,629 16	11 001 99	-7,707 57
1948	10,922 73	1,370 01	112 19	1,059 47	0 93	13,465.33	2,541 68	1,287.80	550 77	2,770 43	215 03	2,985 45	8,642 13	13,466 16	12,178.36	-9,634 93
1949	10 476 17	1,366.27	6,232 29	1 350 82	0 68	19 426 23	8 949 37	7,099.47	555 20	3,589 05	231 55	3,820 60	7,949 71	19,424.98	12,325 50	-3,376 70
1950	12,127 20	1,366.27	126 71	989 46	0 64	14,610 27	2,482 44	1,141.28	546.61	4,425 95	223 31	4,649 26	8,274 42	14,611.58	13,470 29	10,985 91
1951	11,335 03	1,366 27	7 915 42	871.22	0 50	21 488 43	10 152.90	7 926 75	541 98	5,260 83	336 44	5 597 27	7,421.59	21,487 60	13,560.84	-3 408 27
1952	13 059 68	1 370 01	594 36	876 51	0 80	15 901 37	2 840 89	2,189 66	542 09	6 596 19	493 44	7 089 63	6,079 95	15,901.33	13,711 67	10,870 02
1953	15,186 40	1,366 27	4,375 11	1,108.86	1 63	22,038 27	6,850.24	5,129 63	538 02	8,173 89	1,012 42	9,186.31	7,183 63	22,037.59	16,907 96	10,056 76
1954	14 817 73	1 366 27	724 52	718 10	3 68	17,630 29	2 808 89	1 419.82	530 85	8 633 96	1,109 13	9 743 09	5,937.38	17 631 14	16,211.32	-13 397 90
1955	14,477 67	1,366 27	174 09	749 18	4 06	16,771 27	2,289 55	1,359 66	524 91	8,462 30	1 059 26	9,521 56	5 366.80	16,772 94	15,413 28	-13 128 00
1956	15 506 87	1,370 01	2 067 48	669 49	2 76	19 616 61	4,106 98	2,335 93	520 56	9,896.81	1,173 85	11 070 66	5 692 14	19 619 28	17,283 36	-13 170 94
1957	14 959 72	1,366 27	3 565 63	656 46	2 78	20,550 86	5,588.36	3,745 89	515 57	9,945 73	1,371 60	11,317.32	4 972 94	20 551 72	16,805 83	-11,213 83
1958	14 065 91	1,366.27	828 34	676 13	2 99	16 939 64	2 870 74	1,605 74	512 90	8 979 94	1,443 77	10 423 71	4 397 77	16 940 12	15 334.38	-12 460 18
1959	14,598 36	1,366.27	1,150 74	644 93	2 61	17,762 91	3,161.93	1,550 67	508.96	9,518.32	1,655 41	11,173 73	4,531.07	17,764 42	16,213 75	13,047 69
1960	13 640.41	1,370.01	695 95	669 55	2 77	16,378 69	2,735.51	1,829 93	509 20	8,642 83	1,501 45	10,144 28	3 903 23	16 386 64	14,556 71	11,810 47
1961	13,760.82	1,366.27	835 39	607 24	2 18	16,571 90	2,808 90	1,378.33	504 82	9,197 43	1,598.39	10,795 83	3,905 18	16,584 16	15,205.82	-12,382 48
1962	13,546.30	1,366.27	162 71	572 10	2 19	15 649 57	2,101 08	970 00	501 92	9,071 85	1 568 97	10,640 82	3 538 32	15 651 06	14 681.06	-12 576 30
1963	12,212 91	1,366.27	1,741.39	622 76	2 04	15,945 36	3,730 41	2,279 58	498.78	8,628.29	1,469 48	10,097 77	3,075 17	15,951 29	13,671 72	-9,933 33
1964	12,227 76	1,370 01	3,785.26	1,438 11	3 15	18 824 29	6,593 38	5,239 41	515 77	8,152.32	1,471 47	9 623 79	3,444 70	18 823 67	13,584 26	-6 988 35
1965	11,695 82	1,366.27	9,204 15	820 80	5 73	23 092 77	11,391.22	9 935 95	510 02	8,163 31	1,494 93	9,658.23	2,988 73	23 092 93	13,156 98	1,759 87
1966	8 827 72	1,366 27	7,548.36	1,165 22	7 21	18 914 78	10 079.85	9 702 20	516 95	4 400 06	1,441 40	5 841 46	2,852 77	18 913 38	9,211.18	874 48
1967	7,302.93	1,366.27	1,230.53	1,035 33	3 91	10 938.96	3 632 13	2,044 91	516 18	4,244 66	1,474 20	5,718.86	2,659 44	10,939.38	8,894.48	-5,258 02
1968	8 257 79	1,370 01	13 665 71	1,378 84	9 31	24 681 67	16 414.57	15 356 16	515 97	4,860 43	1,380 11	6,240 54	2,566 51	24 679 18	9,323 02	7 098 37
1969	8,646 63	1,366.27	458.96	933 04	5 98	11,410 88	2,758 27	2,671 12	514 10	4,493 98	1,338 48	5,832.46	2,404.05	11,421 73	8,750 62	-5,975 52
1970	6 974 17	1,366 27	337 26	951 13	4 10	9 632 93	2,654 66	1,014 47	512 40	4 193 85	1 602.89	5,796 74	2,318 17	9 641 78	8 627 31	5 959 70
1971	6 678 45	1,366.27	330.25	1,016 85	3 59	9 395 42	2,713 37	948 17	508.73	4,065.23	1,654 84	5,720.07	2,227 37	9,404 34	8,456.17	5,730 29
1972	6,932 95	1,370 01	2,192 97	1,076 44	3 21	11,575 57	4,639 41	2,519 07	509 38	4 578.80	1,720.91	6,299 70	2,250 31	11,578 45	9,059 38	-4 413 88
1973	6,091 90	1,366 27	1 511 96	1 211 05	3 28	10 184 47	4 089 29	2 135 59	506.74	3 976 97	1 593 72	5 570 68	1 977 73	10 190 74	8,055.16	3 956 31
1974	6,402 21	1,366.27	670.80	1,139 95	4 02	9 583 24	3,177.01	1,145 68	504 91	4 317 47	1,641 45	5,958 92	1,987 13	9 596 64	8 450.96	5,256 54
1975	6 105 25	1,366.27	2 215.20	1,170 82	3 47	10 861 01	4 752 29	2,528 92	503 19	4 358.26	1,598 76	5 957 02	1,888 94	10 878 07	8,349 14	-3 576 33
1976	6 430 62	1,370 01	4,482.20	1,432 99	4 53	13,720 35	7,285 19	5,220 02	505 38	4 678.19	1,488 74	6,166 93	1,828 76	13,721 09	8,501.07	-1,210 61
1977	7,221 49	1,366 27	21,545 32	2 910 56	10 00	33 053 63	25 822 15	23 955 63	514 80	4 975 02	1,558 62	6 533 64	2,056 57	33 060 65	9,105.02	16 734 15
1978	8 608.59	1,366.27	9,100 41	1,822 69	10 69	20,908.65	12,289.36	11,482.01	522 51	5,287 61	1,562.36	6,849 97	2,051 80	20,906.29	9 424.28	2,873.42
1979	9 980 94	1 366 27	22 504 37	3 706 44	12 78	37 570 81	27,577.08	28 103 65	521 61	5 569 13	1 456 47	7,025 60	1,931 97	37,582 82	9 479 17	18 122 71
1980	11,578.46	1,370 01	3,372 44	1,784 84	10 35	18,116.10	6,527 29	6,864 35	528 64	6,728 95	1,720 93	8,449 88	2,260 29	18,103 16	11,238 81	-4,714 11
1981	10 116 67	1 366 27	2 010.57	1 147 53	5 82	14 646 86	4 524 37	2 367 07	524 58	7 415 02	1 956 47	9 371 49	2,402.89	14 666 03	12,298.96	7,749 60
1982	8,678.39	1,366 27	10,070 52	1,555 96	6 25	21,677 39	12,992 75	9 994 00	521 12	7,238 96	1,834 55	9,073.51	2,095 53	21,684 16	11,690.16	1,315 61
1983	8,301 78	1,366 27	8,442 66	2,562 94	20.54	20 694 18	12,371.87	10 715.07	529 12	6 183 12	1,427 62	7,610 74	1,838 47	20,693 41	9 978 34	2,413 29
1984	10,566.72	1,370 01	1,678 92	1,755 96	19 09	15,390 69	4,804 88	2,547 39	538 13	7,815 70	1,954 79	9,770 48	2,540 05	15,396 06	12,848 67	-8,019 32
1985	9 629 04	1 366 27	3 182 71	1 841 77	18 69	16 038 47	6,390 74	3,761 00	533 87	7 722.91	1 849 74	9 572 65	2 172 11	16 039 63	12,278.63	5 868 03
1986	9,910.09	1,366 27	1,402.37	1,559.51	20 46	14,258.70	4,328 15	2,251 65	533 98	7,588 52	1,810 21	9,398 73	2,074 40	14,258.76	12,007 11	-7,658 44
1987	10 375 36	1,366 27	926.43	1,454 34	19 45	14,141 85	3,747 04	1,266 15	530 20	8 282.97	1,966 51	10,249 48	2,096 30	14,142.13	12,875 97	-9,109 21
1988	10,934 85	1,370 01	2,038 69	1,654 10	22 53	16,020 18	5 062 80	2,820 28	531 26	8,983.53	1,822 15	10 805 67	1,863 77	16 020 97	13,200.70	-8,114.57
1989	11 506.53	1 366 27	233 41	1 364 98	23 74	14 494 92	2,964 65	1 064 87	524 27	9 030 12	2,005 64	11 035 76	1,872 89	14 497 78	13 432 91	-10 441 66
1990	10,826.51	1,366 27	7,016.01	1,868.39	24 50	21,101.68	10,250 67	7,827 69	521 45	9,069 61	1,965 15	11 034 76	1,721 44	21,105 34	13,277 65	2,998 81
1991	10 636.74	1 366 27	2,515 30	1 453 41	19 05	15 990 77	5 334 98	3 434 20	518 06	8 772 85	1,776 15	10 549 00	1,489 41	15 990 68	12,556 48	-7 202.54
1992	11,707 80	1,370 01	20 913 16	3,494 77	36.82	37,522 57	25,777 94	24 694 41	513 90	9,018.37	1,778 19	10 796.56	1,520.71	37,525 08	12,830 67	12 986 60

Attachment 8 Annual Water Budget from 1929 to 2016 for Borrego Valley Hydrologic Model

Water Year Beginning	INFLOWS STORAGE (AF)[a]	INFLOWS SPECIFIED FLOWS (AF)[b]	INFLOWS STREAM LEAKAGE (AF)[c]	INFLOWS UZF RECHARGE (AF)[d]	INFLOWS MNW2 (AF)[e]	INFLOWS TOTAL IN (AFY)	INFLOWS Recharge (AF)[f]	OUTFLOWS STORAGE (AF)[g]	OUTFLOWS CONSTANT HEAD (AF)[h]	OUTFLOWS MNW2 (AF)[i]	OUTFLOWS FARM WELLS (AF)[j]	OUTFLOWS Total Pumping (AF)[k]	OUTFLOWS FARM NET RECH (AF)[l]	OUTFLOWS Total Out (AF)	OUTFLOWS Discharge (AF)[m]	Δ Storage[n]
1993	14,569 90	1,366 27	5 915 43	2,785 29	44 27	24,681 15	10 066.99	9 666 34	521 54	10 959 33	1,755 96	12,715 29	1,777 29	24,680.47	15,014 12	-4,903 56
1994	12 610 91	1 366 27	8 347 66	1 978 52	29 77	24,333 13	11,692 44	7,845 73	517 77	12,333 54	1,847 84	14,181 38	1,788 13	24 333 00	16,487 28	-4,765 18
1995	15 805 11	1,366 27	787 19	1,592 92	31 50	19,582 99	3 746.37	1,903 71	516 31	13,780 52	1,828 68	15,609 20	1,553 51	19,582.72	17,679 01	-13,901 40
1996	17,536.31	1 370 01	656 24	1,277 18	30 93	20,870 67	3 303 42	973 73	515 34	15,772 36	2,022 79	17,795 15	1 581 69	20 865 91	19 892 18	-16,562 58
1997	14,585 62	1,366.27	9 087 98	1,834.52	28 05	26,902 44	12,288 78	9,214 69	511 86	14,041 17	1,826.88	15,868 05	1,307 77	26,902.36	17,687 67	-5,370 93
1998	14 384 23	1 366 27	2,625 43	1 909 47	36 17	20 321 56	5 901 16	4,221.20	523 49	12,565 50	1,718 59	14,284 08	1,292 65	20 321 42	16,100 23	-10 163 03
1999	15 335.63	1 366 27	317 60	1 268 15	27 95	18 315 60	2 952 01	935.58	520 86	13 650.77	1,926 98	15,577 76	1,291 44	18,325 64	17,390 05	14,400 05
2000	16 190 26	1 370 01	450 22	1,280 74	34 00	19,325 23	3,100 97	1 014 02	519 23	14 507 72	2,155 29	16 663 01	1,146 80	19 343 05	18 329.04	15,176 24
2001	15 569 67	1 366.27	283 49	1,362 17	29 63	18 611 23	3 011 93	1 659 64	515 78	13 413 67	2,067 40	15,481 07	950 13	18,606 61	16,946 98	13,910 03
2002	16,905 68	1,366.27	428 29	1,434 40	33 98	20 168 62	3,228 96	1 292 43	512 82	15,108.61	2,320 53	17,429 14	934 45	20,168 84	18 876 41	15 613 25
2003	15 642 91	1,366 27	931 91	1 551 15	33 38	19 525 63	3 849 33	2,265 52	510 42	13,675 08	2,331 81	16,006 89	744.89	19,527 72	17,262 20	13,377 39
2004	15,308.80	1,370 01	10,614 50	1,655.06	35 78	28 984 15	13,639 57	10,928 22	509 89	14 373 88	2,454 67	16,828 55	719 22	28 985 88	18.057 66	-4,380 58
2005	15,596 97	1,366 27	9,034 46	3,529 99	45 84	29 573 53	13 930 71	13,394 40	527 26	12,873 56	1,916 17	14,789 73	862.87	29,574 25	16,179 86	-2,202.58
2006	16 951 16	1,366 27	2,563 05	1,820.33	34 10	22 734 91	5,749 64	3 423 90	529 56	15 473 65	2,359 42	17,833 08	946 16	22 732 70	19 308 81	-13 527 26
2007	19 091.07	1 366 27	291 71	1 448.80	31 62	22,229 47	3 106.78	1 040.39	524 86	17,389 64	2,521 67	19 911 31	752.59	22 229 15	21,188 76	18,050 68
2008	17,754.85	1,370 01	1,228 89	1,239.57	35 87	21 629 19	3,838.48	2 579 28	522 74	15,650 88	2,316 60	17,967 48	562.38	21 631 88	19 052 60	15 175 57
2009	18 160 59	1,366 27	1,572 16	1 215 03	37 57	22 351 62	4 153 46	2 665 27	522 44	16,220.74	2,370 20	18,590 94	571 12	22,349 77	19,684 50	-15,495 32
2010	17,393 45	1,366 27	234 31	1,378 10	35 75	20 407 88	2,978.68	1 868 07	520 48	15 179 83	2,377 39	17,557 21	487 48	20 433 23	18,565 17	15 525 38
2011	16,130 33	1,366 27	1,181 97	1 302 35	34 87	20,015 79	3 850.58	2 417 32	516 93	14 400 91	2,294 19	16,695 10	424 42	20,051.78	17,636 46	-13,713 01
2012	13,210.35	1,370.01	6,492 76	1,919 11	35 17	23,027 41	9,781.88	7,214 16	528 96	12,638 51	2,126 67	14 765 18	494 37	23,002.67	15 788 51	-5 996 20
2013	14 318 19	1,366 27	1 947 54	1,801 13	29 37	19 462 48	5,114 93	2 682 44	524 77	13 544 96	2,246.37	15,791.33	488 45	19 486 99	16 804 55	-11,635 75
2014	14 970 90	1,366 27	1 617 06	1,542 79	29 50	19 526 52	4 526 12	1 596 00	522 11	14 584 80	2,380 29	16 965 08	464 46	19 547 65	17 951 66	13 374 90
2015	13 948 97	1 366 27	2 312 90	1 594 99	35 10	19 258 23	5 274 16	2,819 32	520 15	13 388.54	2,166.69	15,555 23	364 41	19,259 11	16 439 79	-11,129 64
2016	14,067 64	1,370 01	1,768.14	1,603 61	29 27	18,838 67	4,741 76	3,184 87	522 85	12,634 53	2,124 42	14 758 95	373 53	18,840 20	15 655 32	10 882 77

MIN (2011 - 2016)	13,210	1,366	1,182	1,302	29	18,839	3,851	1,596	517	12,635	2,124	14,759	364	18 840	15 655	-11 614 36
MAX (2011 - 2016)	16 130	1,370	6 493	1 919	35	23 027	9,782	7,214	529	14 585	2,380	16 965	494	23 003	17 952	-8 916 18
AVG (2011 - 2016)	14 441	1,368	2,553	1,627	32	20,022	5,548	3,319	523	13,532	2,223	15,755	435	20,032	16,713	-11 122 05
STDEV (2011 - 2016)	1 005	2	1,966	214	3	1,521	2,134	1 981	4	835	102	934	57	1 508	943	976 70
MIN (1945 2016)	6 092	1,366	112	572	1	9,395	2,101	936	499	89	0	89	364	9 404	8,055	-5,156
MAX (1945 - 2016)	19 091	1,370	22,504	3,706	46	37,571	27,577	28,104	555	17,390	2,522	19,911	9,998	37,583	21 189	9 013
AVG (1945 - 2016)	12,225	1,367	3 905	1,497	17	19 011	6 770	5 080	522	8 983	1,615	10 597	2 815	19 015	13 934	7,145
STDEV (1945 - 2016)	3 443	2	4 965	708	14	5 653	5 470	5 610	12	4,253	617	4,744	2,372	5,652	3,552	2,167
MIN (1997 - 2016)	13,210	1 366	234	1 215	28	18,316	2 952	936	510	12,565	1,719	14,284	364	18,326	15,655	-12,273
MAX (1997 2016)	19,091	1,370	10,615	3,530	46	29,574	13,931	13 394	530	17,390	2,522	19 911	1,308	29,574	21 189	5,697
AVG (1997 - 2016)	15 776	1 367	2 749	1 635	34	21 561	5,751	3 821	520	14,266	2 200	16,466	759	21,566	17,745	7,435
STDEV (1997 - 2016)	1,550	2	3,270	502	4	3,319	3,614	3,530	6	1,290	218	1 453	319	3 314	1 436	1,981

NOTES:

[a] Water into the aquifer system from storage (water is removed from storage)

[b] Inflow from adjacent basins

[c] Leakage from streams directly to groundwater (Stream Recharge)

[d] Flow from the unsaturated zone into groundwater. Includes precipitation recharge, leakage from some streams within the model domain, and irrigation return flows (Distributed Recharge)

[e] Flow within the borehole for wells screened across multiple aquifer layers

[f] Sum of major inflows: Specified flows, Stream Leakage, and Unsaturated Zone Flows

[g] Water out of the aquifer system into storage (water is added to storage)

[h] Flow out of the southern end of the basin.

[i] Pumping from wells in the model with specific construction information; includes all municipal wells and most recreation and agricultural wells

[j] Pumping calculated by the Farm Process Package (FMP) in Modflow for wells with no construction information. Primarily agricultural and recreational pumping.

[k] The Sum of MNW2 (Column K) pumping and Farm Wells (Column L) pumping

[l] Consumptive use of water calculated by the Farm Process Package for all land use type. Primarily represents evapotranspiration.

[m] Sum of major outflows: Constant Head, Pumping, and farm net recharge

[n] Change in storage calculated by subtracting Storage In (Column B) from Storage Out (Column I)

ATTACHMENT C

Residuals

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
7/21/1965	145.59	144.07	-1.52	5E25R010008
7/21/1965	145.04	144.02	-1.02	5E36A010009
4/27/1987	142.49	142.86	0.37	5E36A010010
7/27/1987	142.26	142.77	0.51	5E36A010011
11/19/1987	142.00	142.37	0.37	5E36A010012
1/20/1988	141.90	142.22	0.32	5E36A010013
4/1/1988	141.77	142.04	0.27	5E36A010014
6/8/1988	141.63	141.92	0.29	5E36A010015
10/25/1988	141.24	141.55	0.31	5E36A010016
8/8/1989	140.61	140.82	0.21	5E36A010017
10/26/1989	140.42	140.64	0.21	5E36A010018
2/6/1990	140.21	140.82	0.61	5E36A010019
9/1/1990	141.06	139.75	-1.31	5E36A010020
1/14/1991	140.66	140.27	-0.39	5E36A010021
2/19/1991	140.52	140.27	-0.25	5E36A010022
3/5/1991	140.48	140.27	-0.21	5E36A010023
3/19/1991	140.43	140.24	-0.19	5E36A010024
4/11/1991	140.37	140.24	-0 13	5E36A010025
5/9/1991	140.29	139.48	-0.81	5E36A010026
5/30/1991	140.24	139.51	-0.73	5E36A010027
7/23/1991	140.69	139.36	-1.34	5E36A010028
1/7/1992	140.52	139.26	-1.26	5E36A010029
3/12/1992	140.29	139.33	-0.97	5E36A010030
5/12/1992	140.37	139.11	-1.26	5E36A010031
7/7/1992	142.37	139.02	-3.35	5E36A010032
9/2/1992	142.62	138.87	-3.75	5E36A010033
10/13/1992	142.39	138.87	-3.53	5E36A010034
12/8/1992	142.06	138.69	-3.37	5E36A010035
1/12/1993	141.94	138.93	-3.01	5E36A010036
2/3/1993	142.03	139.02	-3.01	5E36A010037
2/12/1993	142.04	139.08	-2.96	5E36A010038
2/24/1993	142.03	139.17	-2.85	5E36A010039
3/11/1993	141.98	139.26	-2.71	5E36A010040
3/27/1993	141.91	139.39	-2.52	5E36A010041
4/16/1993	141.83	139.36	-2.47	5E36A010042
5/11/1993	141.72	139.42	-2.30	5E36A010043
7/2/1993	141.49	139.30	-2.19	5E36A010044
8/19/1993	141.28	139.23	-2.05	5E36A010045
10/20/1993	141.03	139.08	-1.95	5E36A010046
12/24/1993	140.79	139.08	-1.71	5E36A010047
2/11/1994	140.63	139.02	-1.61	5E36A010048
3/25/1994	140.51	139.26	-1.25	5E36A010049
5/25/1994	140.94	139.36	-1.58	5E36A010050
8/24/1994	142.13	138.84	-3.29	5E36A010051
10/6/1994	142.01	138.66	-3.35	5E36A010052
12/21/1994	141.57	138.44	-3.13	5E36A010053
2/24/1995	141.24	138.38	-2.86	5E36A010054
4/4/1995	141.07	138.56	-2.51	5E36A010055
6/21/1995	140.75	138.53	-2.21	5E36A010056
10/2/1995	140.31	138.20	-2.11	5E36A010057

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
12/28/1995	139.95	137.86	-2.09	5E36A010058
4/11/1996	139.59	137.53	-2.06	5E36A010059
8/9/1996	139.17	137.16	-2.01	5E36A010060
10/23/1996	138.88	136.67	-2.20	5E36A010061
1/3/1997	138.60	136.67	-1.93	5E36A010062
9/3/1997	139.12	135.79	-3.33	5E36A010063
12/3/1997	138.88	135.64	-3.24	5E36A010064
5/13/1998	138.27	135.30	-2.97	5E36A010065
11/12/1998	137.60	135.09	-2.51	5E36A010066
3/12/1999	137.20	135.09	-2.11	5E36A010067
5/17/1999	137.02	134.24	-2.78	5E36A010068
11/22/1999	136.48	133.38	-3.10	5E36A010069
3/24/2000	136.15	133.14	-3.01	5E36A010070
6/29/2000	135.92	132.71	-3.21	5E36A010071
12/18/2000	135.45	132.10	-3.35	5E36A010072
11/14/2001	134.65	130.76	-3.89	5E36A010073
2/22/2002	134.40	130.49	-3.91	5E36A010074
8/30/2002	133.95	129.88	-4.07	5E36A010075
12/13/2002	133.66	129.48	-4.18	5E36A010076
3/17/2003	133.42	129.45	-3.97	5E36A010077
6/30/2003	133.18	128.93	-4.25	5E36A010078
10/6/2003	132.96	128.57	-4.40	5E36A010079
12/29/2003	132.76	128.20	-4.56	5E36A010080
2/12/2004	132.65	128.17	-4.48	5E36A010081
4/8/2004	132.55	128.14	-4.41	5E36A010082
7/23/2004	134.47	127.74	-6.73	5E36A010083
8/23/2005	133.46	127.74	-5.72	5E36A010084
1/5/2006	133.09	127.68	-5.41	5E36A010085
6/14/2006	132.60	129.11	-3.49	5E36A010086
2/24/1993	139.54	137.45	-2.09	6E04Q010087
6/25/1998	130.43	145.68	15.25	6E04Q010088
4/10/2005	125.43	123.74	-1.69	6E04Q010089
2/23/2006	123.62	122.53	-1.09	6E04Q010090
5/12/2008	119.40	118.22	-1.18	6E04Q010091
12/1/2008	118.12	118.08	-0.04	6E04Q010092
12/2/2008	118.14	118.22	0.08	6E04Q010093
10/1/1951	158.23	161.84	3.61	6E05F010094
12/4/2008	118.69	122.31	3.63	6E05F010095
11/28/1955	149.19	150.99	1.79	6E08B010096
11/16/1956	147.78	151.70	3.91	6E08B010097
11/16/1956	147.78	138.26	-9.53	6E08B010098
11/26/1957	147.02	150.98	3.96	6E08B010099
3/15/1958	147.30	150.95	3.66	6E08B010100
11/5/1958	145.92	144.76	-1.16	6E08B010101
11/24/1959	144.60	148.64	4.04	6E08B010102
2/27/1960	144.90	149.08	4.19	6E08B010103
11/22/1960	143.51	148.36	4.85	6E08B010104

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
3/8/1961	143.54	148.11	4.58	6E08B010105
10/26/1961	142.20	147.15	4.94	6E08B010106
3/15/1962	142.46	142.10	-0.36	6E08B010107
11/2/1962	141.13	143.05	1.92	6E08B010108
3/15/1963	141.30	146.39	5.08	6E08B010109
10/31/1963	140.42	143.04	2.62	6E08B010110
3/20/1964	140.63	144.42	3.79	6E08B010111
11/12/1964	139.55	145.24	5.69	6E08B010112
3/19/1965	139.81	145.74	5.94	6E08B010113
7/23/1965	140.61	144.81	4.20	6E08B010114
10/26/1965	140.68	144.79	4.10	6E08B010115
3/3/1966	141.28	144.78	3.49	6E08B010116
10/26/1966	142.55	144.57	2.01	6E08B010117
3/23/1967	142.35	144.63	2.28	6E08B010118
10/24/1967	142.02	144.57	2.56	6E08B010119
3/13/1968	141.60	144.82	3.23	6E08B010120
11/8/1968	143.92	144.56	0.65	6E08B010121
3/27/1969	143.86	145.13	1.27	6E08B010122
10/28/1969	142.87	145.09	2.22	6E08B010123
3/23/1970	142.71	145.33	2.63	6E08B010124
11/12/1970	141.91	145.17	3.26	6E08B010125
3/30/1971	141.77	145.32	3.56	6E08B010126
12/5/2008	117.90	122.52	4.62	6E08F010127
3/12/2009	118.29	122.52	4.23	6E08F010128
3/25/2010	116.71	121.31	4.60	6E08F010129
11/18/2010	114.98	120.54	5.56	6E08F010130
12/2/2008	117.95	116.81	-1.15	6E09C010129
7/26/1965	140.59	141.92	1.33	6E09L010130
5/26/1983	142.61	140.51	-2.09	6E09L010131
9/30/1983	142.39	140.39	-2.00	6E09L010132
12/11/1983	142.27	140.51	-1.76	6E09L010133
4/6/1984	142.02	140.73	-1.30	6E09L010134
7/19/1984	141.53	140.27	-1.26	6E09L010135
2/18/1985	141.16	140.82	-0 35	6E09L010136
5/26/1985	140.86	140.58	-0 29	6E09L010137
1/20/1986	140.38	140.36	-0.02	6E09L010138
4/22/1986	140.30	140.06	-0.25	6E09L010139
9/11/1986	139.65	139.42	-0.23	6E09L010140
12/8/1986	139.51	139.78	0.27	6E09L010141
4/27/1987	139.30	139.75	0.46	6E09L010142
7/27/1987	138.84	139.42	0.58	6E09L010143
11/15/1987	138.59	139.54	0.95	6E09L010144
1/20/1988	138.62	139.78	1.17	6E09L010145
4/1/1988	138.47	139.63	1.16	6E09L010146
6/8/1988	138.12	139.42	1 30	6E09L010147
10/25/1988	137.39	138.93	1.54	6E09L010148
2/3/1989	137.36	139.14	1.79	6E09L010149

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
8/8/1989	136.51	138.47	1.96	6E09L010150
10/26/1989	136.22	138.23	2.01	6E09L010151
2/6/1990	136.16	139.23	3.07	6E09L010152
9/1/1990	137.35	137.53	0.18	6E09L010153
1/14/1991	136.76	138.20	1.43	6E09L010154
2/19/1991	136.75	138.26	1.51	6E09L010155
3/5/1991	136.76	138.44	1.68	6E09L010156
3/19/1991	136.73	138.47	1.75	6E09L010157
4/11/1991	136.60	138.38	1.78	6E09L010158
5/9/1991	136.35	138.17	1.82	6E09L010159
5/30/1991	136.17	137.19	1.02	6E09L010160
7/23/1991	135.71	136.64	0.93	6E09L010161
10/31/1991	135.43	136.84	1.41	6E09L010162
1/7/1992	135.65	137.25	1.61	6E09L010163
3/12/1992	135.83	137.41	1.57	6E09L010164
5/12/1992	136.30	136.86	0.56	6E09L010165
7/7/1992	139.64	136.51	-3.13	6E09L010166
9/2/1992	139.03	136.06	-2.97	6E09L010167
10/13/1992	138.69	135.94	-2.75	6E09L010168
12/8/1992	138.47	136.43	-2.04	6E09L010169
1/21/1993	138.63	136.61	-2.01	6E09L010170
2/3/1993	138.70	136.52	-2.18	6E09L010171
2/12/1993	138.69	136.80	-1.89	6E09L010172
2/24/1993	138.67	136.70	-1.96	6E09L010173
3/11/1993	138.51	136.55	-1.96	6E09L010174
3/27/1993	138.31	136.43	-1.88	6E09L010175
4/16/1993	138.03	136.22	-1.81	6E09L010176
5/11/1993	137.68	136.06	-1.61	6E09L010177
7/2/1993	136.92	135.58	-1.34	6E09L010178
8/19/1993	136.29	135.12	-1.17	6E09L010179
10/20/1993	135.92	135.00	-0.92	6E09L010180
12/24/1993	135.93	135.24	-0.69	6E09L010181
2/11/1994	135.84	135.06	-0.78	6E09L010182
3/25/1994	135.67	135.03	-0.64	6E09L010183
5/25/1994	136.15	135.03	-1.12	6E09L010184
8/24/1994	135.14	133.99	-1.15	6E09L010185
10/6/1994	134.87	133.87	-1.00	6E09L010186
12/21/1994	134.99	134.21	-0.79	6E09L010187
2/24/1995	135.15	134.54	-0.61	6E09L010188
4/12/1995	134.89	134.33	-0.56	6E09L010189
6/21/1995	133.84	133.87	0.03	6E09L010190
10/2/1995	132.59	132.80	0.21	6E09L010191
12/26/1995	132.61	132.83	0.23	6E09L010192
4/11/1996	132.22	132.71	0.49	6E09L010193
8/9/1996	130.45	131.43	0.98	6E09L010194
10/23/1996	130.09	131.43	1.34	6E09L010195
1/3/1997	130.34	131.74	1.40	6E09L010196
9/3/1997	130.22	130.85	0.64	6E09L010197
12/3/1997	130.49	131.19	0.70	6E09L010198
5/13/1998	130.40	131.16	0.76	6E09L010199

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/12/1998	129.05	130 03	0.98	6E09L010200
3/12/1999	129.12	129.88	0.76	6E09L010201
5/17/1999	128.63	130.09	1.46	6E09L010202
11/22/1999	127.53	128.47	0.94	6E09L010203
2/17/2000	127.71	129.63	1.93	6E09L010204
3/24/2000	127.66	129.05	1.40	6E09L010205
6/29/2000	126.58	128.02	1.44	6E09L010206
9/15/2000	126.04	127.77	1.73	6E09L010207
12/18/2000	126.27	128.05	1.78	6E09L010208
10/17/2001	124.89	126.98	2.09	6E09L010209
11/14/2001	124.99	127.23	2.24	6E09L010210
2/22/2002	125.17	127.65	2.48	6E09L010211
8/30/2002	123.41	125.12	1.71	6E09L010212
9/27/2002	123 42	125.15	1.73	6E09L010213
12/13/2002	123.79	125.70	1.91	6E09L010214
3/17/2003	124.09	126.49	2.40	6E09L010215
6/30/2003	123.00	124.60	1.60	6E09L010216
12/29/2003	122.97	124.97	2.00	6E09L010217
2/12/2004	123.11	125.46	2.35	6E09L010218
4/8/2004	122.92	124.63	1.72	6E09L010219
11/18/2004	124.41	124.15	-0.27	6E09L010220
2/10/2005	125.18	124.85	-0.33	6E09L010221
1/5/2006	123.33	123.60	0.26	6E09L010222
	140.31	134.49	-5.82	6E09N010223
2/12/2004	124.50	127.38	2.88	6E10L010224
2/10/2005	125.93	126.77	0.84	6E10L010225
1/5/2006	124.39	129.66	5.28	6E10L010226
8/23/1980	143 33	148.15	4.81	6E10M010227
2/12/2004	124.21	131.22	7.01	6E10M010228
2/10/2005	125.83	134.33	8.50	6E10M010229
5/5/2005	125.33	130.77	5.43	6E10M010230
8/24/2005	124.09	130.40	6.31	6E10M010231
1/5/2006	124.14	129.85	5.71	6E10M010232
5/15/2009	119.20	122.61	3.41	6E17J010235
6/30/1987	138.54	140.96	2.42	6E18J010236
6/30/1991	135.31	138.52	3.21	6E18J010237
6/30/1993	136.04	136.08	0.04	6E18J010238
6/30/1995	134.09	135.29	1.20	6E18J010239
6/30/1997	130.49	133.22	2.73	6E18J010240
6/2/1998	130.71	132.03	1.32	6E18J010241
6/29/1999	128.76	130.93	2.17	6E18J010242
6/5/2000	127.71	129.74	2.03	6E18J010243
6/8/2001	126.65	128.98	2.33	6E18J010244
7/29/2002	124.77	128.22	3.45	6E18J010245
7/31/2003	123.81	126.66	2.86	6E18J010246

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
2/10/2004	123.64	122.95	-0.69	6E18J010247
2/12/2005	125.18	125.81	0.63	6E18J010248
3/3/2006	123.78	124.68	0.91	6E18J010249
5/21/2006	123.42	120.96	-2.46	6E18J010250
3/8/2007	122.15	123.01	0.85	6E18J010251
12/1/2008	119.48	121.47	1.98	6E18J010252
12/3/2008	119.50	122.29	2.79	6E18J010253
3/25/2010	118.48	122.37	3.89	6E18J010254
10/12/2010	117.14	121.48	4.34	6E18J010255
4/9/2013	115.06	119.96	4.90	6E18J010256
10/18/2013	114.12	119.62	5.50	6E18J010257
3/28/2014	114.07	119.96	5.89	6E18J010258
3/10/2015	113.09	118.92	5.83	6E18J010259
10/12/2015	112.13	116.82	4.69	6E18J010260
3/23/2016	112.42	116.12	3.70	6E18J010261
6/30/1980	142.69	144.68	1.99	6E18R010254
6/30/1987	138.40	140.72	2.32	6E18R010255
6/30/1991	135.33	138.28	2.95	6E18R010256
6/30/1993	136.02	134.62	-1.40	6E18R010257
6/30/1995	134.26	134.95	0.69	6E18R010258
6/30/1997	131.16	133.86	2.70	6E18R010259
6/2/1998	130.91	131.88	0.97	6E18R010260
6/29/1999	129.60	130.96	1.36	6E18R010261
6/5/2000	128.30	132.82	4.52	6E18R010262
7/31/2003	124.55	128.10	3.55	6E18R010263
5/13/2005	125.21	124.87	-0.34	6E18R010264
3/3/2006	124.23	124.62	0.39	6E18R010265
5/21/2006	123.87	116.91	-6.96	6E18R010266
3/8/2007	122.84	122.88	0.04	6E18R010267
12/1/2008	120.74	121.93	1.20	6E18R010268
12/3/2008	120.75	122.64	1.89	6E18R010269
5/14/2009	120.67	123.24	2.57	6E18R010270
3/25/2010	119.72	122.86	3.14	6E18R010271
11/18/2010	118.44	122.13	3.69	6E18R010272
11/14/2012	116.36	120.98	4.62	6E18R010273
4/9/2013	116.30	120.88	4.58	6E18R010274
11/13/2013	115.37	120.26	4.89	6E18R010275
11/25/2013	115.39	120.26	4.87	6E18R010276
2/5/2014	115.44	120.10	4.66	6E18R010277
4/9/2014	115.25	120.00	4.75	6E18R010278
6/3/2014	114.90	119.77	4.87	6E18R010279
4/15/2015	114.21	119.05	4.84	6E18R010280
11/19/2015	113.33	118.02	4.69	6E18R010281
4/12/2016	113.44	117.74	4.30	6E18R010282
7/27/1987	138.41	140.73	2.32	6E20L010271
11/19/1987	138.23	140.54	2.31	6E20L010272
1/20/1988	138.26	141.06	2 81	6E20L010273
4/1/1988	138.15	140.30	2.15	6E20L010274

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/8/1988	137.87	140.33	2.46	6E20L010275
10/25/1988	137.31	140.24	2.93	6E20L010276
2/3/1989	137.26	140.30	3.04	6E20L010277
8/8/1989	136.66	139.69	3.04	6E20L010278
10/26/1989	136.46	139.63	3.17	6E20L010279
2/6/1990	136.40	139.57	3.17	6E20L010280
9/1/1990	135.84	139.23	3.39	6E20L010281
1/14/1991	135.94	139.84	3.90	6E20L010282
2/19/1991	136.06	139.78	3.73	6E20L010283
3/5/1991	136.09	139.87	3.79	6E20L010284
3/19/1991	136.09	139.81	3.73	6E20L010285
4/11/1991	136.07	139.72	3.65	6E20L010286
5/30/1991	135.95	138.87	2.92	6E20L010287
7/23/1991	135.80	137.53	1.73	6E20L010288
10/31/1991	135.68	137.44	1.76	6E20L010289
1/7/1992	135.75	138.11	2.36	6E20L010290
3/12/1992	135.83	138.41	2.59	6E20L010291
5/12/1992	135.72	137.53	1.81	6E20L010292
7/7/1992	135.75	137.04	1.29	6E20L010293
9/2/1992	135.79	137.01	1.22	6E20L010294
12/8/1992	136.16	137.47	1.31	6E20L010295
1/21/1993	136.43	138.02	1.58	6E20L010296
2/3/1993	136.52	138.02	1.49	6E20L010297
2/12/1993	136.56	138.08	1.52	6E20L010298
2/24/1993	136.62	138.11	1.49	6E20L010299
3/11/1993	136.65	138.02	1.37	6E20L010300
3/27/1993	136.67	137.83	1.17	6E20L010301
4/16/1993	136.67	137.50	0.83	6E20L010302
5/11/1993	136.65	137.19	0.54	6E20L010303
7/2/1993	136.52	136.98	0.46	6E20L010304
8/19/1993	136.35	136.89	0.54	6E20L010305
10/20/1993	136.21	136.95	0.74	6E20L010306
12/24/1993	136.17	137.19	1.02	6E20L010307
2/11/1994	136.15	137.34	1.19	6E20L010308
3/25/1994	136.11	137.71	1.60	6E20L010309
5/25/1994	135.92	137.10	1.18	6E20L010310
8/24/1994	135.67	136.67	1.01	6E20L010311
10/6/1994	135.60	136.64	1.04	6E20L010312
12/21/1994	135.61	136.67	1.07	6E20L010313
2/24/1995	135.66	137.01	1.35	6E20L010314
4/12/1995	135.60	136.70	1.10	6E20L010315
6/21/1995	135.29	136.16	0.86	6E20L010316
10/2/1995	134.74	135.94	1.20	6E20L010317
12/25/1995	134.53	136.06	1.53	6E20L010318
4/11/1996	134.26	135.82	1.56	6E20L010319
8/9/1996	133.52	134.97	1.45	6E20L010320
10/23/1996	133.16	134.94	1.78	6E20L010321
1/3/1997	132.99	135.09	2.10	6E20L010322
5/9/1997	132.60	134.48	1.87	6E20L010323
9/3/1997	132.16	134.05	1.89	6E20L010324

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
12/3/1997	132.21	134.24	2.02	6E20L010325
5/13/1998	132.20	133.93	1.73	6E20L010326
11/12/1998	131.61	133.23	1.62	6E20L010327
3/12/1999	131.45	133.17	1.72	6E20L010328
5/17/1999	131.24	132.74	1.50	6E20L010329
11/22/1999	130.54	131.98	1.44	6E20L010330
2/17/2000	130.40	131.98	1.58	6E20L010331
3/24/2000	130.33	132.01	1.68	6E20L010332
6/29/2000	129.89	131.16	1.26	6E20L010333
9/15/2000	129.56	131.25	1.69	6E20L010334
12/18/2000	129.39	131.04	1.64	6E20L010335
5/17/2001	129.12	130.88	1.76	6E20L010336
10/17/2001	128.49	130.67	2.18	6E20L010337
11/14/2001	128.44	129.48	1.04	6E20L010338
2/22/2002	128.30	129.88	1.58	6E20L010339
8/30/2002	127.50	128.63	1.13	6E20L010340
12/13/2002	127.31	128.66	1.34	6E20L010341
3/17/2003	127.21	128.78	1.57	6E20L010342
6/30/2003	126.80	128.05	1.25	6E20L010343
10/6/2003	126.42	127.93	1.51	6E20L010344
12/29/2003	126.31	127.83	1.53	6E20L010345
2/12/2004	126.27	127.80	1.54	6E20L010346
7/23/2004	125.91	126.80	0.89	6E20L010347
2/10/2005	126.38	127.35	0.97	6E20L010348
8/23/2005	125.93	126.34	0.41	6E20L010349
1/5/2006	125.74	126.34	0.60	6E20L010350
6/14/2006	125.28	125.46	0.18	6E20L010351
1/10/2007	124.53	125.09	0.57	6E20L010352
6/4/2007	123.97	123.60	-0.37	6E20L010353
9/21/2007	123.39	122.47	-0.92	6E20L010354
1/8/2008	123.18	122.44	-0.74	6E20L010355
5/8/2008	122.84	122.32	-0.53	6E20L010356
8/12/2008	122.36	122.32	-0.05	6E20L010357
12/1/2008	122.06	122.73	0.67	6E20L010358
12/3/2008	122.06	123.08	1.02	6E20L010359
4/15/2009	121.87	123.13	1.27	6E20L010360
2/5/2014	116.63	119.77	3.14	6E20L010361
6/24/1952	150.88	153.37	2.48	6E21A010361
1/3/1953	150.70	155.14	4.44	6E21A010362
5/1/1953	150.33	152.56	2.23	6E21A010363
5/15/1953	150.20	152.25	2.05	6E21A010364
5/28/1953	150.09	152.03	1.94	6E21A010365
6/11/1953	149.96	151.83	1.86	6E21A010366
6/25/1953	149.83	151.62	1.78	6E21A010367
7/1/1953	149.78	148.42	-1.37	6E21A010368
7/3/1953	149.75	151.50	1.75	6E21A010369
7/11/1953	149.63	151.29	1.66	6E21A010370
7/25/1953	149.43	151.14	1.71	6E21A010371
8/3/1953	149.33	151.41	2.08	6E21A010372

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
8/5/1953	149.31	148.82	-0.49	6E21A010373
8/19/1953	149.23	150.39	1.16	6E21A010374
9/2/1953	149.15	151.36	2.21	6E21A010375
9/17/1953	149.14	151.45	2.31	6E21A010376
10/1/1953	149.13	151.81	2.68	6E21A010377
10/16/1953	149.17	151.96	2.79	6E21A010378
10/21/1953	149.18	149.60	0.42	6E21A010379
10/29/1953	149.20	152.28	3.09	6E21A010380
11/11/1953	149.23	152.47	3.24	6E21A010381
11/19/1953	149.24	150.03	0.79	6E21A010382
11/25/1953	149.26	152.70	3.44	6E21A010383
12/10/1953	149.29	152.92	3.63	6E21A010384
12/17/1953	149.31	150.27	0.97	6E21A010385
12/21/1953	149.31	152.93	3.61	6E21A010386
1/6/1954	149.36	152.74	3.38	6E21A010387
1/7/1954	149.36	152.72	3.36	6E21A010388
1/21/1954	149.42	152.40	2.98	6E21A010389
2/3/1954	149.46	152.55	3.09	6E21A010390
2/18/1954	149.46	150.95	1.50	6E21A010391
2/24/1954	149.46	152.62	3.17	6E21A010392
3/4/1954	149.45	152.26	2.81	6E21A010393
3/17/1954	149.43	152.20	2.77	6E21A010394
4/2/1954	149.41	152.39	2.98	6E21A010395
4/15/1954	149.29	151.23	1.94	6E21A010396
5/17/1954	149.01	150.08	1.07	6E21A010397
5/28/1954	148.92	149.62	0.70	6E21A010398
8/13/1954	148.18	148.11	-0.07	6E21A010399
8/27/1954	148.08	148.08	0.00	6E21A010400
10/21/1954	148.05	149.60	1.55	6E21A010401
11/9/1954	148.09	149.76	1.67	6E21A010402
11/19/1954	148.13	150.03	1.90	6E21A010403
12/17/1954	148.18	150.27	2.10	6E21A010404
1/12/1955	148.23	150.49	2.26	6E21A010405
2/10/1955	148.29	149.66	1.37	6E21A010406
3/7/1955	148.25	149.30	1.05	6E21A010407
3/16/1955	148.20	149.39	1.20	6E21A010408
4/14/1955	148.02	147.32	-0.71	6E21A010409
5/19/1955	147.76	146.34	-1.42	6E21A010410
6/29/1955	147.42	145.73	-1.69	6E21A010411
7/20/1955	147.18	145.92	-1.26	6E21A010412
8/3/1955	147.04	146.10	-0.94	6E21A010413
9/20/1955	146.85	146.80	-0.05	6E21A010414
10/25/1955	146.85	149.18	2.32	6E21A010415
11/28/1955	146.89	150 09	3.20	6E21A010416
11/29/1955	146.89	150.12	3.23	6E21A010417
1/4/1956	146.97	150.73	3.76	6E21A010418
2/7/1956	147.00	149.76	2.76	6E21A010419
3/8/1956	146.95	148.84	1.89	6E21A010420
3/18/1956	146.89	148.23	1.34	6E21A010421
4/4/1956	146.80	148.51	1.71	6E21A010422

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
5/3/1956	146.61	146.83	0.22	6E21A010423
6/6/1956	146.32	145.82	-0.49	6E21A010424
7/2/1956	146.09	145.67	-0.43	6E21A010425
8/2/1956	145.71	145.55	-0.16	6E21A010426
9/4/1956	145.51	146.74	1.23	6E21A010427
10/3/1956	145.49	148.20	2.71	6E21A010428
11/1/1956	145.55	148.84	3.29	6E21A010429
11/16/1956	145.58	149.21	3.63	6E21A010430
12/3/1956	145.61	149.51	3.90	6E21A010431
1/3/1957	145.68	149.91	4.23	6E21A010432
2/4/1957	145.80	149.39	3.59	6E21A010433
3/1/1957	145.80	149.63	3.84	6E21A010434
3/15/1957	145.72	147.87	2.15	6E21A010435
3/27/1957	145.67	147.29	1.62	6E21A010436
4/25/1957	145.48	145.70	0.22	6E21A010437
5/27/1957	145.25	145.34	0.09	6E21A010438
6/26/1957	144.99	144.24	-0.76	6E21A010439
7/24/1957	144.65	143.75	-0.90	6E21A010440
8/22/1957	144.42	143.75	-0.67	6E21A010441
9/3/1957	144.35	151.10	6.75	6E21A010442
9/26/1957	144.36	146.04	1.68	6E21A010443
11/6/1957	144.51	147.50	2.99	6E21A010444
11/26/1957	144.56	147.98	3.42	6E21A010445
12/11/1957	144.60	148.29	3.69	6E21A010446
1/7/1958	144.68	148.57	3.89	6E21A010447
2/11/1958	144.78	148.14	3.36	6E21A010448
3/15/1958	144.84	148.62	3.78	6E21A010449
4/21/1958	144.74	145.70	0.96	6E21A010450
5/5/1958	144.66	145.55	0.89	6E21A010451
6/23/1958	144.28	143.78	-0.50	6E21A010452
7/23/1958	143.99	143.54	-0.45	6E21A010453
8/14/1958	143.81	143.26	-0.55	6E21A010454
9/23/1958	143.67	143.11	-0.56	6E21A010455
10/20/1958	143.70	145.64	1.94	6E21A010456
11/5/1958	143.72	146.21	2.49	6E21A010457
11/12/1958	143.73	146.13	2.40	6E21A010458
12/3/1958	143.76	145.55	1.79	6E21A010459
1/5/1959	143.82	147.10	3.28	6E21A010460
1/26/1959	143.87	146.49	2.62	6E21A010461
2/18/1959	143.95	146.28	2.34	6E21A010462
3/12/1959	143.93	147.29	3.36	6E21A010463
3/19/1959	143.89	147.26	3.36	6E21A010464
4/16/1959	143.77	146.25	2.48	6E21A010465
5/12/1959	143.64	144.60	0.97	6E21A010466
6/11/1959	143.46	144.00	0.53	6E21A010467
7/28/1959	143.09	144.09	1.00	6E21A010468
8/11/1959	143.01	143.05	0.04	6E21A010469
9/8/1959	142.90	141.89	-1.01	6E21A010470
10/6/1959	142.88	144.97	2.09	6E21A010471
11/10/1959	142.94	145.76	2.83	6E21A010472

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/24/1959	142.95	145.76	2.81	6E21A010473
12/10/1959	142.99	145.76	2.77	6E21A010474
12/29/1959	143.05	146.25	3.20	6E21A010475
1/13/1960	143.09	145.70	2.61	6E21A010476
2/11/1960	143.15	144.85	1.69	6E21A010477
2/27/1960	143.18	145.13	1.96	6E21A010478
3/8/1960	143.15	146.37	3.23	6E21A010479
3/23/1960	143.08	146.22	3.14	6E21A010480
4/4/1960	143.04	144.76	1.72	6E21A010481
4/21/1960	142.95	143.81	0.86	6E21A010482
5/2/1960	142.90	142.38	-0.52	6E21A010483
5/17/1960	142.81	142.59	-0.21	6E21A010484
6/2/1960	142.71	142.84	0.12	6E21A010485
6/16/1960	142.62	141.83	-0.79	6E21A010486
6/30/1960	142.54	142.20	-0.34	6E21A010487
7/14/1960	142.40	142.23	-0.17	6E21A010488
8/11/1960	142.18	142.59	0.41	6E21A010489
9/19/1960	142.07	143.63	1.56	6E21A010490
10/21/1960	142.07	144.12	2.05	6E21A010491
11/17/1960	142.11	144.48	2.37	6E21A010492
11/22/1960	142.12	144.53	2.41	6E21A010493
12/16/1960	142.15	145.06	2.92	6E21A010494
1/16/1961	142.18	144.88	2.70	6E21A010495
2/14/1961	142.20	143.60	1.40	6E21A010496
3/8/1961	142.17	143.78	1.61	6E21A010497
3/13/1961	142.15	144.94	2.79	6E21A010498
5/5/1961	141.90	141.62	-0.29	6E21A010499
5/29/1961	141.77	141.62	-0.15	6E21A010500
6/28/1961	141.58	140.73	-0.84	6E21A010501
8/20/1961	141.17	137.35	-3.82	6E21A010502
10/8/1961	141.09	143.05	1.96	6E21A010503
10/26/1961	141.10	143.43	2.33	6E21A010504
11/30/1961	141.12	143.02	1.90	6E21A010505
12/28/1961	141.19	143.14	1.95	6E21A010506
1/30/1962	141.25	141.83	0.58	6E21A010507
3/6/1962	141.28	144.18	2.90	6E21A010508
3/15/1962	141.24	144.12	2.88	6E21A010509
4/6/1962	141.16	141.74	0.58	6E21A010510
6/28/1962	140.68	140.58	-0.10	6E21A010511
7/25/1962	140.43	140.34	-0.09	6E21A010512
8/23/1962	140.24	140.31	0.07	6E21A010513
9/25/1962	140.16	141.53	1.36	6E21A010514
10/22/1962	140.18	142.90	2.72	6E21A010515
11/2/1962	140.18	143.26	3.07	6E21A010516
1/10/1963	140.28	142.62	2.34	6E21A010517
2/12/1963	140.32	141.82	1.50	6E21A010518
3/11/1963	140.30	143.81	3.51	6E21A010519
3/15/1963	140.29	144.07	3.78	6E21A010520
4/10/1963	140.20	142.29	2.09	6E21A010521
5/7/1963	140.07	141.17	1.10	6E21A010522

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/18/1963	139.81	140.49	0.68	6E21A010523
7/2/1963	139.73	139.97	0.24	6E21A010524
7/9/1963	139.66	140.12	0.47	6E21A010525
7/15/1963	139.59	140.15	0.56	6E21A010526
7/16/1963	139.58	140.28	0.69	6E21A010527
8/1/1963	139.44	139.97	0.54	6E21A010528
8/8/1963	139.42	140.18	0.76	6E21A010529
8/15/1963	139.40	139.70	0.29	6E21A010530
9/1/1963	139.35	140.00	0.65	6E21A010531
9/4/1963	139.35	140.31	0.96	6E21A010532
9/16/1963	139.38	141.22	1.84	6E21A010533
10/3/1963	139.40	142.01	2.61	6E21A010534
10/8/1963	139.43	142.26	2.82	6E21A010535
10/15/1963	139.48	142.01	2.54	6E21A010536
10/31/1963	139.56	143.47	3.91	6E21A010537
11/1/1963	139.56	142.65	3.09	6E21A010538
11/12/1963	139.59	142.93	3.34	6E21A010539
11/15/1963	139.59	142.87	3.28	6E21A010540
12/1/1963	139.62	143.14	3.52	6E21A010541
12/5/1963	139.63	143.37	3.74	6E21A010542
12/15/1963	139.64	145.15	5.51	6E21A010543
1/2/1964	139.67	143.17	3.50	6E21A010544
1/6/1964	139.68	142.74	3.07	6E21A010545
1/15/1964	139.69	142.93	3.23	6E21A010546
2/1/1964	139.72	142.01	2.29	6E21A010547
2/5/1964	139.72	142.00	2.28	6E21A010548
2/18/1964	139.73	140.83	1.09	6E21A010549
3/1/1964	139.74	143.08	3.34	6E21A010550
3/9/1964	139.72	143.31	3.59	6E21A010551
3/15/1964	139.71	143.17	3.46	6E21A010552
3/20/1964	139.70	144.02	4.32	6E21A010553
4/1/1964	139.67	141.07	1.40	6E21A010554
4/3/1964	139.66	141.07	1.41	6E21A010555
4/15/1964	139.60	141.71	2.11	6E21A010556
5/1/1964	139.53	140.64	1.12	6E21A010557
5/8/1964	139.48	140.37	0.88	6E21A010558
5/11/1964	139.47	141.34	1.88	6E21A010559
5/15/1964	139.44	140.06	0.62	6E21A010560
6/1/1964	139.35	139.73	0.38	6E21A010561
6/3/1964	139.34	139.61	0.27	6E21A010562
6/15/1964	139.27	139.42	0.16	6E21A010563
6/30/1964	139.18	139.15	-0.03	6E21A010564
7/7/1964	139.12	140.25	1.13	6E21A010565
7/23/1964	138.96	139.48	0.52	6E21A010566
8/5/1964	138.86	139.48	0.61	6E21A010567
9/11/1964	138.73	140.58	1.85	6E21A010568
9/30/1964	138.72	141.51	2.79	6E21A010569
11/2/1964	138.76	142.54	3.78	6E21A010570
12/1/1964	138.87	143.14	4.27	6E21A010571
1/6/1965	138.89	143.18	4.29	6E21A010572

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
2/1/1965	138.92	142.72	3.80	6E21A010573
3/3/1965	138.93	143.40	4.47	6E21A010574
3/16/1965	138.97	141.80	2.84	6E21A010575
4/5/1965	139.15	143.47	4.33	6E21A010576
5/5/1965	139.37	140.93	1.56	6E21A010577
5/24/1965	139.38	141.71	2.33	6E21A010578
6/29/1965	139.30	141.48	2 18	6E21A010579
7/7/1965	139.25	141.72	2 47	6E21A010580
7/20/1965	139.15	140.28	1.12	6E21A010581
7/22/1965	139.14	138.39	-0.75	6E21A010582
8/3/1965	139.06	140.89	1.82	6E21A010583
10/4/1965	138.94	142.66	3.72	6E21A010584
10/25/1965	138.96	142.72	3 76	6E21A010585
10/26/1965	138.96	142.82	3.87	6E21A010586
11/5/1965	138.98	143.00	4.02	6E21A010587
12/10/1965	139.14	143.18	4.03	6E21A010588
1/4/1966	139.23	143.00	3.77	6E21A010589
2/1/1966	139.31	143.00	3.68	6E21A010590
3/3/1966	139.38	142.93	3.55	6E21A010591
3/10/1966	139.40	142 94	3.55	6E21A010592
4/5/1966	139.46	142.32	2.86	6E21A010593
5/3/1966	139.66	142.39	2.73	6E21A010594
6/2/1966	139.94	141.13	1.19	6E21A010595
7/6/1966	140.12	142.32	2.20	6E21A010596
8/1/1966	140.18	142.67	2.49	6E21A010597
9/7/1966	140.21	142.82	2.61	6E21A010598
10/5/1966	140.22	143.11	2.90	6E21A010599
10/26/1966	140.22	143.32	3.11	6E21A010600
1/13/1967	140.23	143.72	3.49	6E21A010601
2/13/1967	140.24	143.84	3.60	6E21A010602
3/7/1967	140.24	143.75	3.51	6E21A010603
3/23/1967	140.24	143.87	3.64	6E21A010604
4/24/1967	140.23	143.78	3.55	6E21A010605
8/17/1967	140.14	143.45	3.30	6E21A010606
10/13/1967	140.10	143.78	3.68	6E21A010607
3/13/1968	140.07	144.33	4.26	6E21A010608
6/27/1968	141.15	144.12	2.96	6E21A010609
11/8/1968	142.08	144.15	2.07	6E21A010610
3/26/1969	141.76	144.39	2.63	6E21A010611
3/27/1969	141.76	144.60	2.85	6E21A010612
10/3/1969	141.32	144.48	3.16	6E21A010613
10/28/1969	141.27	144.79	3.51	6E21A010614
1/29/1970	141.14	144.45	3.32	6E21A010615
3/23/1970	141.07	144.76	3.68	6E21A010616
4/3/1970	141.06	144.51	3.45	6E21A010617
8/6/1970	140.89	144.42	3.54	6E21A010618
11/10/1970	140.74	144.48	3.74	6E21A010619
3/30/1971	140.61	144.60	3.99	6E21A010620
5/19/1971	140.56	144.54	3.99	6E21A010621
9/1/1971	140.41	144.48	4.07	6E21A010622

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
3/1/1972	140.22	144.42	4.20	6E21A010623
6/15/1972	140.11	144.33	4.22	6E21A010624
9/7/1972	139.99	144.18	4.19	6E21A010625
12/20/1972	139.90	144.21	4.30	6E21A010626
3/16/1973	139.89	144.24	4.35	6E21A010627
6/21/1973	139.86	143.66	3.80	6E21A010628
9/25/1973	139.78	143.90	4.13	6E21A010629
12/14/1973	139.72	143.90	4.18	6E21A010630
3/20/1974	139.67	143.84	4.17	6E21A010631
6/20/1974	139.57	143.54	3.97	6E21A010632
8/6/1974	139.50	143.29	3.79	6E21A010633
10/29/1974	139.40	143.48	4.07	6E21A010634
1/30/1975	139.36	143.45	4.09	6E21A010635
5/8/1975	139.28	143.14	3.86	6E21A010636
8/5/1975	139.16	142.62	3.47	6E21A010637
10/31/1975	139.08	142.44	3.36	6E21A010638
2/17/1976	139.04	142.72	3.67	6E21A010639
12/26/1978	140.80	142.86	2.06	6E21A010640
7/22/1980	142.20	140.70	-1.50	6E21A010641
8/25/1980	142.00	140.76	-1.24	6E21A010642
2/12/1981	141.76	141.19	-0.57	6E21A010643
9/22/1981	140.77	140.53	-0.23	6E21A010644
2/4/1982	140.84	140.86	0.02	6E21A010645
10/1/1982	140.23	140.12	-0.11	6E21A010646
9/27/1983	140.56	140.31	-0.25	6E21A010647
9/17/1984	139.92	139.66	-0.25	6E21A010648
2/26/1985	140.03	140.19	0.15	6E21A010649
9/12/1985	139.28	139.28	0.00	6E21A010650
5/7/1986	139.24	139.33	0.09	6E21A010651
2/18/1987	138.75	139.43	0.68	6E21A010652
9/17/1987	137.91	138.16	0.26	6E21A010653
3/10/1988	138.09	138.70	0.62	6E21A010654
9/27/1988	137.16	137.55	0.40	6E21A010655
3/31/1989	137.05	137.74	0.69	6E21A010656
9/27/1989	136.20	137.21	1.00	6E21A010657
3/13/1990	136.16	137.51	1.35	6E21A010658
9/27/1990	136.28	136.65	0.37	6E21A010659
3/11/1991	136.44	137.12	0.68	6E21A010660
9/23/1991	135.47	136.22	0.76	6E21A010661
3/16/1992	135.61	136.60	0.99	6E21A010662
9/24/1992	137.42	135.75	-1.67	6E21A010663
4/12/1993	137.40	135.65	-1.75	6E21A010664
9/17/1993	136.21	135.20	-1.00	6E21A010665
4/28/1994	135.60	135.00	-0.60	6E21A010666
7/15/2004	125.40	124.56	-0.84	6E21A020667
8/1/2004	125.35	124.23	-1.12	6E21A020668
8/15/2004	125.33	124.20	-1.13	6E21A020669
9/1/2004	125.30	124.02	-1.28	6E21A020670
9/15/2004	125.32	124.59	-0.72	6E21A020671

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/1/2004	125.33	124.41	-0.92	6E21A020672
10/15/2004	125.46	124.41	-1.05	6E21A020673
11/5/2004	125.65	124.83	-0.83	6E21A020674
11/15/2004	125.72	124.98	-0.74	6E21A020675
12/1/2004	125.81	124.98	-0.83	6E21A020676
12/15/2004	125.90	125.53	-0.37	6E21A020677
1/1/2005	126.01	126.11	0.10	6E21A020678
1/15/2005	126.08	126.30	0 21	6E21A020679
2/1/2005	126.17	126.00	-0.17	6E21A020680
2/10/2005	126.21	125.68	-0.53	6E21A020681
2/15/2005	126.23	126.08	-0.15	6E21A020682
3/1/2005	126.29	126.33	0.03	6E21A020683
3/15/2005	126.23	124.99	-1.24	6E21A020684
4/1/2005	126.15	124.19	-1.96	6E21A020685
4/16/2005	126.06	124.39	-1 67	6E21A020686
5/1/2005	125.97	124.23	-1 73	6E21A020687
5/16/2005	125.84	124.45	-1.39	6E21A020688
5/31/2005	125.72	124.29	-1.43	6E21A020689
6/15/2005	125.60	124.20	-1.40	6E21A020690
7/1/2005	125.47	123.54	-1.93	6E21A020691
7/15/2005	125.37	123.09	-2.27	6E21A020692
8/1/2005	125.25	123.09	-2.16	6E21A020693
8/15/2005	125.19	123.99	-1.19	6E21A020694
9/1/2005	125.11	122.73	-2.38	6E21A020695
9/15/2005	125.07	122.72	-2.35	6E21A020696
9/30/2005	125.02	122.83	-2.19	6E21A020697
10/15/2005	125.08	123.32	-1.76	6E21A020698
10/25/2005	125.12	123.97	-1.15	6E21A020699
12/23/2005	125.17	124.13	-1.04	6E21A020700
12/31/2005	125.17	123.95	-1.22	6E21A020701
1/15/2006	125.15	124 12	-1.03	6E21A020702
1/26/2006	125.13	123.90	-1.23	6E21A020703
2/16/2006	125.09	123.81	-1.28	6E21A020704
3/1/2006	125.06	123.96	-1.10	6E21A020705
3/15/2006	125.04	124.60	-0.44	6E21A020706
3/30/2006	125.01	123.44	-1.57	6E21A020707
5/6/2006	124.80	122.88	-1.93	6E21A020708
5/15/2006	124.72	122.83	-1.90	6E21A020709
6/1/2006	124.59	122.04	-2.54	6E21A020710
6/15/2006	124.47	121.84	-2.63	6E21A020711
7/1/2006	124.34	122.10	-2.23	6E21A020712
7/15/2006	124.22	122.13	-2.09	6E21A020713
8/1/2006	124.08	121.75	-2.33	6E21A020714
8/9/2006	124.03	121.72	-2.31	6E21A020715
10/6/2006	123.81	122.11	-1.70	6E21A020716
10/20/2006	123.80	123.26	-0.54	6E21A020717
10/31/2006	123.78	123.33	-0.45	6E21A020718
11/15/2006	123.79	122.25	-1.54	6E21A020719
11/30/2006	123.79	122.42	-1.37	6E21A020720
12/15/2006	123.79	122.47	-1.32	6E21A020721

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
12/31/2006	123.78	122.52	-1.27	6E21A020722
1/15/2007	123.77	122.13	-1.64	6E21A020723
1/31/2007	123.76	122.36	-1.40	6E21A020724
2/15/2007	123.72	122.14	-1.58	6E21A020725
2/28/2007	123.69	122.37	-1.32	6E21A020726
3/15/2007	123.62	121.63	-1.99	6E21A020727
3/27/2007	123.57	121.77	-1.80	6E21A020728
4/12/2007	123.47	121.39	-2.07	6E21A020729
5/16/2007	123.19	121.13	-2.06	6E21A020730
5/21/2007	123.14	121.04	-2.10	6E21A020731
5/31/2007	123.05	121.35	-1.71	6E21A020732
6/14/2007	122.92	121.14	-1.78	6E21A020733
6/30/2007	122.78	120.47	-2.31	6E21A020734
7/12/2007	122.67	120.82	-1.86	6E21A020735
8/9/2007	122.44	120.86	-1.58	6E21A020736
8/14/2007	122.41	120.91	-1.49	6E21A020737
8/31/2007	122.29	121.19	-1.10	6E21A020738
9/13/2007	122.25	121.05	-1.20	6E21A020739
12/5/2007	122.21	123.32	1.11	6E21A020740
12/14/2007	122.23	123.61	1.39	6E21A020741
12/31/2007	122.25	122.49	0.23	6E21A020742
1/15/2008	122.32	122.83	0.51	6E21A020743
1/31/2008	122.40	123.20	0.81	6E21A020744
2/14/2008	122.37	122.80	0.43	6E21A020745
2/21/2008	122.35	122.53	0.18	6E21A020746
2/29/2008	122.33	122.10	-0.23	6E21A020747
3/14/2008	122.26	121.82	-0.44	6E21A020748
3/20/2008	122.23	121.81	-0.43	6E21A020749
4/11/2008	122.09	121.41	-0.68	6E21A020750
4/15/2008	122.06	121.57	-0.49	6E21A020751
4/30/2008	121.95	120.91	-1.04	6E21A020752
5/14/2008	121.85	121.25	-0.59	6E21A020753
5/31/2008	121.73	120.73	-0.99	6E21A020754
6/14/2008	121.60	120.64	-0.96	6E21A020755
6/30/2008	121.45	120.85	-0.61	6E21A020756
7/15/2008	121.33	120.92	-0.41	6E21A020757
7/31/2008	121.21	120.74	-0.47	6E21A020758
8/14/2008	121.12	120.39	-0.73	6E21A020759
8/31/2008	121.02	120.31	-0.71	6E21A020760
9/11/2008	120.98	120.80	-0.19	6E21A020761
9/16/2008	120.97	120.54	-0.43	6E21A020762
9/30/2008	120.92	120.54	-0.38	6E21A020763
10/14/2008	120.91	120.00	-0.90	6E21A020764
10/31/2008	120.89	120.44	-0.45	6E21A020765
11/15/2008	120.90	120.82	-0.08	6E21A020766
11/30/2008	120.92	121.58	0 66	6E21A020767
12/1/2008	120.92	120.88	-0.04	6E21A020768
12/2/2008	120.93	120.87	-0.06	6E21A020769
12/5/2008	120.94	120.88	-0.07	6E21A020770
12/14/2008	121.00	121.22	0.22	6E21A020771

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
12/29/2008	121.09	121.82	0.74	6E21A020772
1/14/2009	121.09	121.48	0.39	6E21A020773
1/29/2009	121.07	121.48	0.41	6E21A020774
2/14/2009	121.07	122.09	1.02	6E21A020775
2/28/2009	121.08	121.38	0.30	6E21A020776
3/14/2009	121 03	120.88	-0.15	6E21A020777
3/31/2009	120.96	120.72	-0.24	6E21A020778
4/14/2009	120.86	120.79	-0.07	6E21A020779
4/30/2009	120.76	120.99	0.24	6E21A020780
5/15/2009	120.62	120.52	-0.10	6E21A020781
5/31/2009	120.47	120.35	-0.11	6E21A020782
6/15/2009	120.34	120.48	0.14	6E21A020783
6/30/2009	120.21	120.68	0.47	6E21A020784
7/14/2009	120.09	120.54	0.45	6E21A020785
7/31/2009	119.94	120.04	0.10	6E21A020786
8/14/2009	119.85	120.01	0.16	6E21A020787
8/31/2009	119.73	120.11	0.38	6E21A020788
9/14/2009	119.70	120.08	0.38	6E21A020789
9/30/2009	119.66	119.88	0.22	6E21A020790
10/14/2009	119.66	120.03	0.38	6E21A020791
10/31/2009	119.65	120.28	0.63	6E21A020792
11/15/2009	119.67	120.34	0.67	6E21A020793
11/30/2009	119.69	120.72	1.03	6E21A020794
12/25/2009	119.77	120.89	1.12	6E21A020795
12/31/2009	119.79	120.99	1.20	6E21A020796
1/15/2010	119.78	120.46	0.68	6E21A020797
1/31/2010	119.77	121.20	1.43	6E21A020798
2/15/2010	119.78	121.54	1.76	6E21A020799
2/28/2010	119.79	121.31	1.51	6E21A020800
3/15/2010	119.75	121.31	1 56	6E21A020801
3/31/2010	119.69	120.53	0.85	6E21A020802
4/15/2010	119.59	120.39	0.80	6E21A020803
4/30/2010	119.50	120.25	0.75	6E21A020804
5/14/2010	119.37	119.92	0.55	6E21A020805
5/31/2010	119.22	120.06	0.83	6E21A020806
6/15/2010	119.10	119.88	0.78	6E21A020807
6/30/2010	118.98	119.50	0.52	6E21A020808
7/15/2010	118.86	119.31	0.46	6E21A020809
7/31/2010	118.72	119.30	0.58	6E21A020810
8/15/2010	118.63	118.91	0.28	6E21A020811
8/31/2010	118.53	119.22	0.69	6E21A020812
9/15/2010	118.49	118.91	0.42	6E21A020813
9/30/2010	118.46	119.29	0.83	6E21A020814
10/15/2010	118.45	119.32	0.87	6E21A020815
10/31/2010	118.44	119.67	1.22	6E21A020816
11/15/2010	118.46	119.70	1.23	6E21A020817
11/18/2011	117.50	119.29	1.79	6E21A020818
4/17/2012	117.49	118.78	1.29	6E21A020819
5/3/2012	117.38	118.26	0.88	6E21A020820
11/14/2012	116.51	118.15	1.64	6E21A020821

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
4/9/2013	116.44	118.18	1.75	6E21A020822
11/13/2013	115.46	118.02	2.56	6E21A020823
11/25/2013	115.48	118.25	2.78	6E21A020824
2/5/2014	115.52	117.79	2.27	6E21A020825
4/9/2014	115.32	117.02	1.70	6E21A020826
6/3/2014	114.94	116.80	1.86	6E21A020827
8/6/2014	114.45	116.75	2.30	6E21A020828
12/9/2014	114.37	117.44	3.07	6E21A020829
3/30/2015	114.40	116.97	2.57	6E21A020830
4/15/2015	114.31	116.78	2.47	6E21A020831
11/19/2015	113.46	116.03	2.57	6E21A020832
4/12/2016	113.62	115.97	2.35	6E21A020833
11/9/1954	148.23	147.74	-0.49	6E21B010817
2/12/2004	125.38	127.62	2.25	6E21B010818
8/25/1980	142.05	139.41	-2.64	6E21B020819
2/12/2004	125.60	124.06	-1.54	6E21B020820
2/10/2005	125.79	123.51	-2.28	6E21B020821
5/5/2005	125.73	123.48	-2.26	6E21B020822
8/23/2005	125.06	122.53	-2.52	6E21B020823
1/5/2006	124.99	122.68	-2.31	6E21B020824
6/14/2006	124.46	121.86	-2.60	6E21B020825
8/25/1980	142.04	141.92	-0.12	6E21F010826
7/26/1965	138.91	141.93	3.02	6E23M010827
3/25/1994	136.72	134.68	-2.05	6E23M010828
8/24/1994	136.35	134.34	-2.01	6E23M010829
10/6/1994	136.27	134.40	-1.86	6E23M010830
12/21/1994	136.13	134.22	-1.91	6E23M010831
4/12/1995	135.60	134.25	-1.35	6E23M010832
6/21/1995	135.02	134.13	-0.89	6E23M010833
10/2/1995	134.61	133.92	-0.69	6E23M010834
12/28/1995	134.55	134.07	-0.48	6E23M010835
4/11/1996	134.29	133.31	-0.98	6E23M010836
8/9/1996	133.64	133.18	-0.46	6E23M010837
10/23/1996	133.50	134.01	0.51	6E23M010838
1/3/1997	133.49	133.28	-0.21	6E23M010839
5/9/1997	132.97	132.30	-0.67	6E23M010840
9/3/1997	132.67	132.15	-0.53	6E23M010841
12/3/1997	132.97	132.36	-0.61	6E23M010842
5/13/1998	132.74	132.21	-0.54	6E23M010843
11/12/1998	132.32	131.90	-0.41	6E23M010844
3/12/1999	132.16	123.67	-8.48	6E23M010845
5/17/1999	131.91	131.26	-0.64	6E23M010846
11/12/1999	131.56	130.99	-0.57	6E23M010847
9/15/2000	131.04	129.89	-1.15	6E23M010848
12/18/2000	130.85	129.80	-1.05	6E23M010849
5/17/2001	130.29	130.38	0.09	6E23M010850

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/17/2001	130.17	129.65	-0.53	6E23M010851
11/14/2001	130.13	129.83	-0.30	6E23M010852
2/12/2002	129.82	129.19	-0.63	6E23M010853
8/30/2002	129.28	129.16	-0.12	6E23M010854
12/13/2002	129.12	129.04	-0.08	6E23M010855
3/17/2003	128.77	128.86	0.08	6E23M010856
6/30/2003	128.30	128.79	0.50	6E23M010857
10/6/2003	128.36	128.76	0.40	6E23M010858
12/29/2003	128.18	128.64	0.46	6E23M010859
2/12/2004	128.01	128.86	0.85	6E23M010860
4/8/2004	127.57	128.25	0.67	6E23M010861
11/18/2004	127.81	128.15	0.34	6E23M010862
2/10/2005	127.95	128.49	0.54	6E23M010863
8/24/2005	127.27	127.79	0.52	6E23M010864
1/5/2006	127.04	127.94	0.90	6E23M010865
6/14/2006	126.08	127.21	1.13	6E23M010866
8/17/2006	126.28	126.14	-0.13	6E23M010867
1/10/2007	125.93	126.42	0.48	6E23M010868
6/1/2007	124.94	125.87	0.93	6E23M010869
9/21/2007	125.07	126.11	1.05	6E23M010870
5/8/2008	123.86	126.17	2.31	6E23M010871
8/12/2008	123.96	125.62	1.66	6E23M010872
5/13/1998	134.68	135.31	0.62	6E25R010890
11/12/1998	134.40	135.15	0.75	6E25R010891
3/12/1999	134.20	134.97	0.77	6E25R010892
5/17/1999	134.10	134.94	0.84	6E25R010893
11/22/1999	133.77	134.39	0.62	6E25R010894
3/24/2000	133.55	134.48	0.93	6E25R010895
6/29/2000	133.37	134.24	0.87	6E25R010896
9/15/2000	133.22	133.99	0.77	6E25R010897
12/18/2000	133.04	134.03	0.98	6E25R010898
5/17/2001	132.75	133.81	1.06	6E25R010899
10/17/2001	132.45	135.79	3.35	6E25R010900
11/17/2001	132.39	135.76	3.38	6E25R010901
2/12/2002	132.21	135.64	3.43	6E25R010902
8/20/2002	131.82	133.29	1.47	6E25R010903
12/13/2002	131.57	133.20	1.63	6E25R010904
3/17/2003	131.37	133.05	1.68	6E25R010905
6/30/2003	131.15	132.87	1.72	6E25R010906
10/6/2003	130.94	132.75	1.80	6E25R010907
12/29/2003	130.77	132.56	1.79	6E25R010908
2/12/2004	130.67	132.47	1.80	6E25R010909
4/8/2004	130.55	132.38	1.83	6E25R010910
11/18/2004	130.22	132.17	1.95	6E25R010911
5/5/2005	129.98	131.80	1.82	6E25R010912
8/23/2005	129.77	131.59	1.82	6E25R010913
10/12/2005	129.67	131.54	1.87	6E25R010914
1/5/2006	129.56	130.61	1.05	6E25R010915
2/22/2006	129.47	131.37	1.90	6E25R010916

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/12/2006	129.25	131.22	1.98	6E25R010917
6/14/2006	129.24	131.31	2.07	6E25R010918
8/17/2006	129.11	131.31	2.21	6E25R010919
1/10/2007	128.79	130.89	2.10	6E25R010920
2/12/2004	128.59	129.71	1.11	6E28Q010921
2/21/2008	124.89	127.45	2.56	6E28Q010922
12/1/2008	123.96	126.91	2.95	6E28Q010923
12/3/2008	123.97	127.11	3.14	6E28Q010924
5/20/2016	116.66	121.47	4.81	6E28Q010925
6/30/1980	140.65	140.99	0.33	6E29K020925
6/30/1987	138.11	141.90	3.79	6E29K020926
6/30/1991	135.99	139.46	3.47	6E29K020927
6/30/1993	136.61	134.71	-1.90	6E29K020928
6/30/1997	133.46	150.13	16.67	6E29K020929
6/2/1998	133.18	147.66	14.48	6E29K020930
6/29/1999	132.22	132.15	-0.07	6E29K020931
6/5/2000	131.25	131.60	0.35	6E29K020932
6/8/2001	130.27	130.62	0.36	6E29K020933
7/29/2002	129.42	128.58	-0.84	6E29K020934
7/31/2003	127.98	127.97	-0.01	6E29K020935
2/10/2004	127.75	127.67	-0.08	6E29K020936
2/12/2005	127.73	126.91	-0.82	6E29K020937
2/17/2006	126.90	126.57	-0.33	6E29K020938
5/21/2006	126.44	126.51	0.07	6E29K020939
3/8/2007	125.23	125.20	-0.03	6E29K020940
12/1/2008	122.92	123.13	0.21	6E29K020941
12/3/2008	122.91	123.45	0.54	6E29K020942
3/25/2010	121.68	122.51	0.83	6E29K020943
10/12/2010	120.70	121.53	0.83	6E29K020944
4/9/2013	118.37	119.49	1.12	6E29K020945
10/18/2013	118.39	119.49	1.10	6E29K020946
3/28/2014	117.58	119.15	1.57	6E29K020947
3/10/2015	116.27	118.91	2.64	6E29K020948
3/23/2016	115.33	118.57	3.24	6E29K020949
11/19/1952	152.31	156.15	3.84	6E29N010943
11/19/1953	151.26	154.34	3.08	6E29N010944
2/3/1954	151.21	153.37	2.16	6E29N010945
2/24/1954	151.16	153.57	2.41	6E29N010946
11/9/1954	150.11	153.34	3.23	6E29N010947
11/29/1955	148.96	150.85	1.89	6E29N010948
3/18/1956	148.80	151.40	2.60	6E29N010949
11/16/1956	147.82	150.97	3.15	6E29N010950
3/15/1957	147.76	149.29	1.53	6E29N010951
11/26/1957	146.90	149.96	3.06	6E29N010952
3/15/1958	146.86	149.30	2.44	6E29N010953
11/5/1958	145.81	145.78	-0 03	6E29N010954
11/24/1959	144.68	148.04	3.37	6E29N010955

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
2/27/1960	144.76	147.75	2.99	6E29N010956
11/22/1960	143.71	147.19	3.48	6E29N010957
3/8/1961	143.65	146.75	3.10	6E29N010958
10/26/1961	142.69	146.33	3.63	6E29N010959
3/15/1962	142.69	146.09	3.41	6E29N010960
11/2/1962	141.68	146.34	4.66	6E29N010961
3/15/1963	141.65	145.58	3.93	6E29N010962
10/31/1963	140.95	146.14	5.19	6E29N010963
3/20/1964	140.94	145.87	4.93	6E29N010964
11/12/1964	140.03	144.91	4.88	6E29N010965
3/19/1965	140.45	145.32	4.87	6E29N010966
7/29/1965	140.40	141.27	0.87	6E29N010967
7/30/1965	140.39	141.27	0.88	6E29N010968
10/26/1965	140.05	144.41	4.37	6E29N010969
3/3/1966	140.24	144.58	4.34	6E29N010970
10/26/1966	140.14	144.36	4.22	6E29N010971
3/23/1967	140.23	144.46	4.24	6E29N010972
10/24/1967	139.98	144.33	4.35	6E29N010973
3/13/1968	140.07	144.35	4.27	6E29N010974
11/8/1968	140.69	144.34	3.65	6E29N010975
3/27/1969	140.77	144.51	3.74	6E29N010976
10/28/1969	140.54	144.57	4.03	6E29N010977
3/23/1970	140.62	144.68	4.07	6E29N010978
11/10/1970	140.33	144.59	4.26	6E29N010979
3/30/1971	140.39	144.65	4.26	6E29N010980
3/10/2009	123.60	125.67	2.07	6E29N020981
6/30/1995	137.68	137.69	0.01	6E32D010982
6/30/1997	135.19	135.55	0.36	6E32D010983
6/2/1998	135.04	134.46	-0.59	6E32D010984
6/29/1999	133.19	133.51	0.32	6E32D010985
6/5/2000	132.54	132.38	-0.16	6E32D010986
6/8/2001	131.75	131.35	-0.40	6E32D010987
7/29/2002	129.19	130.07	0.88	6E32D010988
7/31/2003	128.19	128.24	0.04	6E32D010989
5/13/2005	127.13	127.60	0.47	6E32D010990
5/21/2006	127.42	126.99	-0.44	6E32D010991
10/12/2010	120.61	122.24	1.63	6E32D010992
4/9/2013	119.52	121.15	1.63	6E32D010993
10/18/2013	116.67	121.15	4.48	6E32D010994
3/28/2014	117.65	121.15	3.50	6E32D010995
3/10/2015	117.08	120.54	3.46	6E32D010996
3/23/2016	116.38	120.54	4.16	6E32D010997
6/30/1980	139.95	138.93	-1.02	6E32R010992
5/10/1983	140.23	138.81	-1.42	6E32R010993
5/26/1983	140.21	138.75	-1.46	6E32R010994
9/30/1983	140.46	138.81	-1.65	6E32R010995
12/11/1983	140.34	138.87	-1.47	6E32R010996

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
4/6/1984	140.26	138.90	-1.36	6E32R010997
7/19/1984	140.11	138.75	-1.36	6E32R010998
9/21/1984	140.01	138.72	-1.29	6E32R010999
2/16/1985	140.00	138.90	-1.10	6E32R011000
5/26/1985	139.89	138.59	-1.29	6E32R011001
1/20/1986	139.65	138.44	-1.20	6E32R011002
4/22/1986	139.60	138.41	-1.19	6E32R011003
9/11/1986	139.33	137.77	-1.56	6E32R011004
12/8/1986	139.24	137.92	-1.32	6E32R011005
4/27/1987	139.13	137.83	-1.30	6E32R011006
6/30/1987	139.01	138.02	-0.99	6E32R011007
7/27/1987	138.95	137.74	-1.21	6E32R011008
11/19/1987	138.83	137.89	-0.94	6E32R011009
1/20/1988	138.81	137.92	-0.88	6E32R011010
4/1/1988	138.75	137.34	-1.40	6E32R011011
6/8/1988	138.63	137.28	-1.35	6E32R011012
10/25/1988	138.33	137.10	-1.23	6E32R011013
2/3/1989	138.21	137.25	-0.95	6E32R011014
8/8/1989	137.90	136.40	-1.50	6E32R011015
10/26/1989	137.73	136.31	-1.42	6E32R011016
2/6/1990	137.59	136.49	-1.10	6E32R011017
9/1/1990	137.78	135.85	-1.93	6E32R011018
1/14/1991	137.36	136.73	-0.63	6E32R011019
2/19/1991	137.30	136.40	-0.90	6E32R011020
3/5/1991	137.28	136.61	-0 67	6E32R011021
3/19/1991	137.27	136.49	-0.78	6E32R011022
4/11/1991	137.24	136.48	-0.76	6E32R011023
5/30/1991	137.16	135.63	-1.52	6E32R011024
6/30/1991	137.10	135.58	-1.52	6E32R011025
10/31/1991	136.88	135.67	-1.21	6E32R011026
1/7/1992	136.81	135.85	-0.96	6E32R011027
3/12/1992	136.78	135.97	-0.80	6E32R011028
5/12/1992	136.91	135.55	-1.37	6E32R011029
7/7/1992	137.73	135.39	-2.34	6E32R011030
9/2/1992	137.44	135.23	-2.22	6E32R011031
10/13/1992	137.26	135.21	-2.05	6E32R011032
12/8/1992	137.10	135.30	-1.80	6E32R011033
1/21/1993	137.32	135.52	-1.80	6E32R011034
2/3/1993	137.48	135.52	-1.96	6E32R011035
2/12/1993	137.49	135.52	-1.97	6E32R011036
2/24/1993	137.48	135.55	-1.94	6E32R011037
3/11/1993	137.45	135.39	-2.06	6E32R011038
3/27/1993	137.41	135.18	-2.23	6E32R011039
4/16/1993	137.35	135.09	-2.27	6E32R011040
5/11/1993	137.29	135.09	-2.20	6E32R011041
6/30/1993	137.16	135.58	-1.58	6E32R011042
7/2/1993	137.15	134.88	-2.28	6E32R011043
8/19/1993	137.03	134 81	-2.22	6E32R011044
10/20/1993	136.91	134.75	-2.16	6E32R011045
12/24/1993	136.85	134.75	-2.10	6E32R011046

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
2/11/1994	136.82	134.97	-1.86	6E32R011047
3/25/1994	136.81	134.85	-1.96	6E32R011048
5/25/1994	137.13	134.54	-2.59	6E32R011049
8/24/1994	137.00	134.36	-2.65	6E32R011050
10/6/1994	136.87	134.36	-2.52	6E32R011051
12/21/1994	136.74	134.27	-2.47	6E32R011052
2/24/1995	136.71	134.36	-2.35	6E32R011053
4/4/1995	136.68	134.21	-2.48	6E32R011054
6/21/1995	136.57	133.96	-2.61	6E32R011055
10/2/1995	136.36	133.84	-2.52	6E32R011056
12/28/1995	136.24	133.75	-2.49	6E32R011057
4/11/1996	136.10	133.47	-2.62	6E32R011058
8/9/1996	135.76	133.14	-2.62	6E32R011059
10/23/1996	135.53	133.14	-2.39	6E32R011060
1/3/1997	135.36	133.11	-2.25	6E32R011061
5/9/1997	135.11	132.71	-2.40	6E32R011062
9/3/1997	135.23	132.32	-2.92	6E32R011063
12/3/1997	135.04	132.38	-2.66	6E32R011064
5/13/1998	134.78	132.04	-2.74	6E32R011065
6/2/1998	134.72	132.19	-2.53	6E32R011066
11/12/1998	134.20	131.61	-2.59	6E32R011067
3/12/1999	133.92	131.49	-2.43	6E32R011068
2/22/2002	130.87	129.48	-1.38	6E32R011069
12/5/2008	124.16	123.96	-0.19	6E32R011070
3/11/2009	124.02	123.96	-0.06	6E32R011071
2/9/2010	122.90	123.51	0.61	6E32R011072
3/25/2010	122.80	123.29	0.49	6E32R011073
11/18/2010	121.93	122.49	0.56	6E32R011074
11/18/2011	120.97	122.48	1.51	6E32R011075
2/6/2012	120.88	122.08	1.20	6E32R011076
5/3/2012	120.67	121.88	1.21	6E32R011077
11/14/2012	120.07	121.64	1.57	6E32R011078
4/9/2013	119.83	121.66	1.83	6E32R011079
11/13/2013	119.18	121.24	2.06	6E32R011080
4/9/2014	118.84	121.26	2.42	6E32R011081
6/3/2014	118.67	121.05	2 37	6E32R011082
12/9/2014	118.09	120.94	2.86	6E32R011083
3/30/2015	117.87	121.00	3.13	6E32R011084
4/15/2015	117.83	120.91	3 08	6E32R011085
11/18/2015	117.23	120.85	3.62	6E32R011086
3/23/2016	117.04	108.22	-8.82	6E32R011087
4/12/2016	117.00	120.53	3.53	6E32R011088
2/12/2004	128.49	126.19	-2.30	6E33C021072
2/10/2005	127.92	126.16	-1.76	6E33C021073
12/1/2008	123.45	122.77	-0.68	6E33C021074
12/3/2008	123.48	123.30	-0.18	6E33C021075
2/12/2004	128.54	131.85	3.31	6E33J011076
2/10/2005	127.90	132.88	4.98	6E33J011077

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/12/2005	127.27	132.18	4.91	6E33J011078
2/17/2006	127.08	129.98	2.91	6E33J011079
2/22/2006	127.07	132.22	5.15	6E33J011080
6/12/2006	126.80	131.87	5.07	6E33J011081
1/23/2007	126.07	131.72	5.65	6E33J011082
1/26/2007	126.07	131.75	5.69	6E33J011083
2/22/2007	126.04	131.76	5.72	6E33J011084
9/28/2007	125.28	131.02	5.74	6E33J011085
2/13/2008	125.05	131.13	6.08	6E33J011086
2/21/2008	125.05	131.08	6.03	6E33J011087
12/1/2008	124.16	130.61	6.45	6E33J011088
12/2/2008	124.16	131.05	6.89	6E33J011089
4/14/2009	124.03	130.57	6.53	6E33J011090
3/25/2010	123.05	130.02	6.97	6E33J011091
5/20/2016	117.50	126.65	9.15	6E33J011092
6/30/1980	138.70	140.20	1.50	6E33Q011090
6/30/1987	137.73	140.81	3.08	6E33Q011091
6/30/1991	135.92	134.41	-1.51	6E33Q011092
6/30/1993	135.92	132.89	-3.04	6E33Q011093
6/30/1995	135.45	132.89	-2.57	6E33Q011094
2/12/2004	127.45	125.66	-1.79	6E33Q011095
2/10/2005	127.23	125.36	-1.88	6E33Q011096
2/21/2008	123.81	122.88	-0.93	6E33Q011097
12/1/2008	122.74	122.50	-0.24	6E33Q011098
3/25/2010	121.74	121.56	-0.18	6E33Q011099
11/18/2010	120.06	120.80	0.74	6E33Q011100
11/18/2011	119.72	120.19	0.47	6E33Q011101
4/17/2012	119.76	119.52	-0.24	6E33Q011102
12/21/2012	118.87	119.70	0.83	6E33Q011103
4/9/2013	118.77	119.24	0.47	6E33Q011104
11/13/2013	117.87	118.91	1.03	6E33Q011105
6/25/2014	117.36	118.80	1.44	6E33Q011106
12/9/2014	116.79	119.15	2.36	6E33Q011107
3/30/2015	116.76	119.71	2.95	6E33Q011108
4/15/2015	116.70	119.56	2.86	6E33Q011109
11/19/2015	115.93	118.73	2.80	6E33Q011110
4/12/2016	115.94	118.72	2.78	6E33Q011111
2/16/1985	139.15	139.82	0.67	6E34D011099
5/26/1985	139.10	138.42	-0.68	6E34D011100
1/20/1986	138.86	139.48	0.62	6E34D011101
4/22/1986	138.83	138.08	-0.75	6E34D011102
9/11/1986	138.66	138.51	-0.15	6E34D011103
12/8/1986	138.56	138.97	0.40	6E34D011104
4/27/1987	138.46	138.57	0.11	6E34D011105
7/27/1987	138.34	138.63	0.29	6E34D011106
11/19/1987	138.18	138.72	0.54	6E34D011107
1/20/1988	138.15	139.30	1.15	6E34D011108
4/1/1988	138.11	137.78	-0.33	6E34D011109

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/8/1988	138.03	137.14	-0.89	6E34D011110
10/25/1988	137.80	136.31	-1.49	6E34D011111
2/3/1989	137.67	137.20	-0.47	6E34D011112
8/8/1989	137.37	137.56	0.19	6E34D011113
10/26/1989	137.22	138.17	0.96	6E34D011114
2/6/1990	137.08	137.99	0.91	6E34D011115
9/1/1990	136.74	137.81	1.06	6E34D011116
1/14/1991	136 61	139.00	2.38	6E34D011117
2/19/1991	136.60	138.78	2.18	6E34D011118
3/5/1991	136.59	139.21	2.62	6E34D011119
3/19/1991	136.59	138.65	2.06	6E34D011120
4/11/1991	136.58	138.91	2.33	6E34D011121
5/9/1991	136.56	138.95	2.39	6E34D011122
5/30/1991	136.53	138.36	1.82	6E34D011123
7/23/1991	136.46	138.48	2.02	6E34D011124
10/31/1991	136.32	138.69	2.38	6E34D011125
1/7/1992	136.25	138.69	2.44	6E34D011126
3/12/1992	136.21	138.65	2.43	6E34D011127
5/12/1992	136.16	138.45	2 29	6E34D011128
7/7/1992	136.18	137.84	1.66	6E34D011129
9/2/1992	136.25	137.84	1.59	6E34D011130
10/13/1992	136 30	137.78	1.47	6E34D011131
12/8/1992	136.38	137.96	1.58	6E34D011132
1/21/1993	136.46	138.30	1.84	6E34D011133
2/3/1993	136.49	138.20	1.72	6E34D011134
2/12/1993	136.51	138.23	1.73	6E34D011135
2/24/1993	136.53	138.20	1 67	6E34D011136
3/11/1993	136.56	137.96	1.40	6E34D011137
3/27/1993	136.58	137.90	1.32	6E34D011138
4/16/1993	136.61	137.44	0.84	6E34D011139
5/11/1993	136.63	137.69	1.06	6E34D011140
7/2/1993	136.63	137.72	1.08	6E34D011141
8/19/1993	136.61	137.87	1.26	6E34D011142
10/20/1993	136.57	137.99	1.42	6E34D011143
12/24/1993	136.55	138.05	1.51	6E34D011144
2/11/1994	136.53	138.05	1.52	6E34D011145
3/25/1994	136.52	137.29	0.77	6E34D011146
5/25/1994	136.48	136.71	0.23	6E34D011147
8/24/1994	136.39	136.68	0.29	6E34D011148
10/6/1994	136.33	136.95	0.62	6E34D011149
12/21/1994	136.25	136.95	0.70	6E34D011150
2/24/1995	136.21	137.35	1.14	6E34D011151
4/12/1995	136.17	137.17	1.00	6E34D011152
6/21/1995	136.07	137.26	1.19	6E34D011153
10/2/1995	135.84	137.35	1 51	6E34D011154
12/28/1995	135.66	137.41	1.76	6E34D011155
4/11/1996	135.47	138.08	2.61	6E34D011156
8/9/1996	135.18	137.05	1.86	6E34D011157
10/23/1996	134.97	137.08	2.11	6E34D011158
1/3/1997	134.80	137.14	2.34	6E34D011159

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
5/9/1997	134.55	136.92	2.38	6E34D011160
9/3/1997	134.27	136.80	2.54	6E34D011161
12/3/1997	134.10	136.83	2.74	6E34D011162
5/13/1998	133.92	135.46	1.54	6E34D011163
11/12/1998	133.54	135.31	1.77	6E34D011164
3/12/1999	133.33	135.67	2.35	6E34D011165
11/22/1999	132.73	134.76	2.03	6E34D011166
3/24/2000	132.49	134.94	2.45	6E34D011167
6/29/2000	132.27	134.70	2.43	6E34D011168
9/15/2000	132.03	134.58	2.55	6E34D011169
5/17/2001	131.50	135.00	3.50	6E34D011170
10/17/2001	131.07	134.88	3.82	6E34D011171
11/14/2001	130.99	134.85	3.86	6E34D011172
2/12/2002	130.79	134.76	3.97	6E34D011173
8/30/2002	130.28	134.61	4.33	6E34D011174
12/13/2002	129.98	133.21	3.23	6E34D011175
3/17/2003	129.79	133.02	3.23	6E34D011176
6/30/2003	129.53	132.63	3.09	6E34D011177
10/6/2003	129.22	132.81	3.59	6E34D011178
12/29/2003	129.00	132.96	3.96	6E34D011179
4/8/2004	128.80	132.66	3.86	6E34D011180
10/7/2004	128.30	132.47	4.17	6E34D011181
2/10/2005	128.16	131.80	3.64	6E34D011182
1/5/2006	127.48	131.68	4.21	6E34D011183
6/14/2006	127.12	131.04	3.92	6E34D011184
8/17/2006	126.88	130.92	4.04	6E34D011185
1/10/2007	126.49	131.10	4.61	6E34D011186
6/4/2007	126.16	130.92	4.76	6E34D011187
8/12/2007	125.89	130.10	4.21	6E34D011188
9/21/2007	125.74	130.58	4.85	6E34D011189
1/8/2008	125.48	130.89	5.41	6E34D011190
5/8/2008	125.26	130.52	5.26	6E34D011191
12/1/2008	124.57	130.42	5.85	6E34D011192
12/4/2008	124.57	130.83	6.26	6E34D011193
6/26/1952	147.43	153.83	6.39	6E34K011194
2/24/1954	146.48	152.52	6.04	6E34K011195
11/9/1954	145.99	151.82	5.83	6E34K011196
7/29/1965	139.19	145.49	6.30	6E34K011197
8/27/1980	139.39	141.37	1.98	6E34K011198
12/1/2008	125.17	130.07	4.90	6E34K011199
12/4/2008	125.16	130.57	5.40	6E34K011200
7/19/1984	139.14	139.02	-0.11	6E34M011202
2/16/1985	139.05	139.30	0.25	6E34M011203
5/26/1985	138.98	137.71	-1.27	6E34M011204
1/20/1986	138.75	139.08	0.33	6E34M011205
4/22/1986	138.73	137.92	-0.81	6E34M011206
9/11/1986	138.53	137.89	-0.63	6E34M011207
12/8/1986	138.44	138.53	0.09	6E34M011208

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
4/27/1987	138.36	138.23	-0.13	6E34M011209
7/27/1987	138.21	138.29	0.08	6E34M011210
11/19/1987	138.06	138.75	0.69	6E34M011211
1/20/1988	138.06	138.87	0.81	6E34M011212
4/1/1988	138.03	137.53	-0.50	6E34M011213
6/8/1988	137.93	137.59	-0.34	6E34M011214
10/25/1988	137.68	138.14	0.46	6E34M011215
2/3/1989	137.56	138.35	0.79	6E34M011216
8/8/1989	137.22	137.71	0.49	6E34M011217
10/26/1989	137.06	138.14	1.08	6E34M011218
2/6/1990	136.95	137.92	0.97	6E34M011219
9/1/1990	136.62	136.49	-0.13	6E34M011220
1/14/1991	136.52	139.11	2.59	6E34M011221
2/19/1991	136.52	138.96	2.44	6E34M011222
3/5/1991	136.52	139.19	2.66	6E34M011223
3/19/1991	136.52	138.78	2.25	6E34M011224
4/11/1991	136.52	138.88	2.37	6E34M011225
5/9/1991	136.49	138.75	2.26	6E34M011226
5/30/1991	136.46	138.14	1.68	6E34M011227
7/23/1991	136.37	138.08	1.71	6E34M011228
10/31/1991	136.21	138.08	1.86	6E34M011229
1/7/1992	136.16	138.08	1.91	6E34M011230
3/12/1992	136.14	138.29	2.15	6E34M011231
5/12/1992	136.10	137.83	1.74	6E34M011232
7/7/1992	136.12	137.50	1.38	6E34M011233
9/2/1992	136.18	137.65	1.47	6E34M011234
9/13/1992	136.19	137.62	1.42	6E34M011235
12/8/1992	136.29	137.83	1.54	6E34M011236
1/21/1993	136.38	138.11	1.73	6E34M011237
2/3/1993	136.41	138.05	1.63	6E34M011238
2/12/1993	136.44	138.08	1.64	6E34M011239
2/24/1993	136.46	138.05	1.58	6E34M011240
3/11/1993	136.49	137.86	1.37	6E34M011241
3/27/1993	136.52	137.77	1.25	6E34M011242
4/16/1993	136.54	137.47	0.93	6E34M011243
5/11/1993	136.55	137.59	1.04	6E34M011244
7/2/1993	136.53	137.56	1.03	6E34M011245
8/19/1993	136.48	137.53	1.04	6E34M011246
10/20/1993	136.43	137.68	1.25	6E34M011247
12/24/1993	136.41	137.74	1.33	6E34M011248
2/11/1994	136.42	137.83	1.42	6E34M011249
3/25/1994	136.41	137.80	1.39	6E34M011250
5/25/1994	136.38	137.56	1.18	6E34M011251
8/24/1994	136.29	137.50	1.21	6E34M011252
10/6/1994	136.23	137.50	1.27	6E34M011253
12/21/1994	136.17	137.50	1.33	6E34M011254
2/24/1995	136.15	137.53	1.38	6E34M011255
4/12/1995	136.11	137.41	1.29	6E34M011256
6/21/1995	136.00	137.25	1.25	6E34M011257
10/2/1995	135.76	137.28	1.52	6E34M011258

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
12/26/1995	135.61	137.28	1.68	6E34M011259
4/11/1996	135.44	137.10	1.66	6E34M011260
8/9/1996	135.11	136.95	1.83	6E34M011261
10/23/1996	134.89	136.92	2.03	6E34M011262
1/3/1997	134.74	136.95	2.21	6E34M011263
5/9/1997	134.51	136.73	2.22	6E34M011264
9/3/1997	134.23	136.58	2.36	6E34M011265
12/3/1997	134.08	136.73	2.66	6E34M011266
5/13/1998	133.93	136.58	2.65	6E34M011267
11/12/1998	133.48	136.34	2.86	6E34M011268
3/12/1999	133.28	136.25	2.96	6E34M011269
11/22/1999	132.62	135.73	3.10	6E34M011270
2/17/2000	132.47	135.73	3.26	6E34M011271
3/24/2000	132.41	135.67	3.25	6E34M011272
6/29/2000	132.15	135.30	3.15	6E34M011273
9/15/2000	131.87	135.24	3.37	6E34M011274
12/18/2000	131.62	135.27	3.66	6E34M011275
5/17/2001	131.37	135.18	3.81	6E34M011276
10/17/2001	130.87	135.03	4.16	6E34M011277
11/17/2001	130.79	135.00	4.21	6E34M011278
2/12/2002	130.62	134.88	4.26	6E34M011279
8/30/2002	130.06	134.69	4.63	6E34M011280
12/13/2002	129.76	134.57	4.81	6E34M011281
3/17/2003	129.61	134.48	4.87	6E34M011282
6/30/2003	129.34	133.96	4.62	6E34M011283
10/6/2003	128.99	134.14	5.15	6E34M011284
12/29/2003	128.78	133.96	5.18	6E34M011285
2/12/2004	128.71	133.93	5.22	6E34M011286
4/8/2004	128.62	133.75	5.13	6E34M011287
7/23/2004	128.33	133.29	4.96	6E34M011288
11/16/2004	128.01	133.44	5.43	6E34M011289
2/10/2005	128.03	133.35	5.32	6E34M011290
8/23/2005	127.60	132.99	5.38	6E34M011291
10/20/2005	127.41	130.04	2.63	6E34M011292
1/5/2006	127.29	131.71	4.41	6E34M011293
6/12/2006	126.95	132.32	5.37	6E34M011294
6/14/2006	126.95	131.95	5.00	6E34M011295
8/17/2006	126.67	132.22	5.55	6E34M011296
1/10/2007	126.27	132.10	5.83	6E34M011297
9/21/2007	125.51	128.44	2.94	6E34M011298
12/1/2008	124.35	128.31	3.96	6E34M011299
12/4/2008	124.35	128.77	4.42	6E34M011300
12/21/1954	145.09	149.48	4.39	6E35N011301
3/7/1955	145.03	149.26	4.23	6E35N011302
11/28/1955	144.63	148.44	3.81	6E35N011303
3/18/1956	144.51	147.19	2.68	6E35N011304
11/16/1956	144.04	148.05	4.00	6E35N011305
3/15/1957	143.90	145.78	1.88	6E35N011306
11/26/1957	143.42	144.30	0.89	6E35N011307

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
3/15/1958	143.29	145.59	2.30	6E35N011308
4/21/1958	143.25	145.30	2.06	6E35N011309
5/5/1958	143.22	146.31	3.09	6E35N011310
6/23/1958	143.13	141.31	-1.82	6E35N011311
7/22/1958	143.08	142.01	-1.06	6E35N011312
8/14/1958	143.03	141.34	-1.69	6E35N011313
9/23/1958	142.95	141.49	-1.45	6E35N011314
10/20/1958	142.90	142.65	-0.25	6E35N011315
11/12/1958	142.86	144.21	1.34	6E35N011316
1/5/1959	142.79	146.22	3.43	6E35N011317
1/26/1959	142.76	146.64	3.88	6E35N011318
2/18/1959	142.74	146.71	3.97	6E35N011319
3/12/1959	142.71	144.33	1.62	6E35N011320
3/19/1959	142.70	144.42	1.72	6E35N011321
5/12/1959	142.60	142.07	-0.53	6E35N011322
6/11/1959	142.54	142.86	0.32	6E35N011323
11/24/1959	142.23	144.95	2.72	6E35N011324
2/27/1960	142.15	143.41	1 26	6E35N011325
11/22/1960	141.69	144.74	3.05	6E35N011326
3/8/1961	141.56	143.07	1 51	6E35N011327
10/26/1961	141.14	133.97	-7.17	6E35N011328
3/15/1962	140.97	145.39	4.42	6E35N011329
11/2/1962	140.55	144.31	3.76	6E35N011330
1/23/1963	140.45	145.55	5.10	6E35N011331
2/12/1963	140.42	145.39	4.97	6E35N011332
3/15/1963	140.38	128.78	-11.61	6E35N011333
4/10/1963	140.35	142.41	2.07	6E35N011334
8/8/1963	140.13	144.84	4.71	6E35N011335
9/4/1963	140.08	144.15	4.07	6E35N011336
10/31/1963	140.05	144.59	4.54	6E35N011337
11/12/1963	140.05	144.69	4.64	6E35N011338
12/5/1963	140 04	144.56	4.52	6E35N011339
1/6/1964	140.02	145.03	5.01	6E35N011340
2/5/1964	139.99	137.65	-2.34	6E35N011341
3/9/1964	139.96	133.80	-6.17	6E35N011342
3/20/1964	139.95	144.40	4.45	6E35N011343
4/3/1964	139.94	135.41	-4.53	6E35N011344
7/7/1964	139.80	143.70	3.90	6E35N011345
7/17/1964	139.78	143.69	3.91	6E35N011346
8/5/1964	139.75	139.61	-0 14	6E35N011347
11/2/1964	139.61	144.51	4.91	6E35N011348
12/1/1964	139.58	144.62	5.04	6E35N011349
1/6/1965	139.54	141.76	2.22	6E35N011350
2/1/1965	139.51	134.25	-5.27	6E35N011351
4/5/1965	139.44	144.48	5.04	6E35N011352
5/24/1965	139.37	144.37	5.00	6E35N011353
6/24/1965	139.33	144.50	5.18	6E35N011354
6/29/1965	139.32	144.50	5.18	6E35N011355
7/30/1965	139.27	144.22	4.95	6E35N011356
8/3/1965	139.27	141.61	2.35	6E35N011357

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/4/1965	139.18	144.41	5.23	6E35N011358
10/26/1965	139.15	129.70	-9.45	6E35N011359
12/10/1965	139.14	144.39	5.25	6E35N011360
1/10/1966	139.13	142.50	3.37	6E35N011361
2/1/1966	139.12	144.39	5.27	6E35N011362
3/4/1966	139.10	143.97	4.87	6E35N011363
3/10/1966	139.09	131.43	-7.66	6E35N011364
7/6/1966	138.94	144.19	5.25	6E35N011365
8/1/1966	138.91	144.58	5.67	6E35N011366
10/26/1966	138.82	138.56	-0.25	6E35N011367
1/13/1967	138.80	144 14	5.35	6E35N011368
3/23/1967	138.77	140.83	2.06	6E35N011369
10/24/1967	138.58	128.96	-9.62	6E35N011370
11/8/1968	138.39	138.14	-0.25	6E35N011371
3/27/1969	138.49	140.41	1.92	6E35N011372
10/28/1969	138.43	137.50	-0.93	6E35N011373
3/23/1970	138.48	142.99	4.51	6E35N011374
11/12/1970	138.39	136.33	-2.06	6E35N011375
3/30/1971	138.40	142.97	4.58	6E35N011376
12/26/1978	137.92	140.68	2.76	6E35N011377
8/8/1980	139.04	140.27	1.23	6E35N011378
2/12/2004	129.96	131.40	1.44	6E35N011379
2/10/2005	129.33	131.10	1.77	6E35N011380
5/5/2005	129.25	130.58	1.33	6E35N011381
10/12/2005	128.91	130.26	1.35	6E35N011382
6/12/2006	128.45	129.90	1.44	6E35N011383
6/9/2009	125.91	128.68	2.76	6E35N011384
11/19/2015	120.48	125.21	4.73	6E35N011385
4/12/2016	120.25	124.91	4.66	6E35N011386
12/11/2008	127.10	130.08	2.98	6E35Q011385
12/1/2009	126.31	129.45	3.14	6E35Q011386
5/4/2010	125.96	129.11	3.15	6E35Q011387
11/18/2010	125.47	129.06	3.59	6E35Q011388
11/18/2011	124.66	129.04	4.38	6E35Q011389
4/11/2012	124.38	128.47	4.09	6E35Q011390
11/14/2012	123.91	128.23	4.31	6E35Q011391
4/9/2013	123.60	128.04	4.44	6E35Q011392
11/13/2013	123.11	127.75	4.64	6E35Q011393
4/10/2014	122.79	127.60	4.80	6E35Q011394
12/9/2014	122.23	127.24	5.01	6E35Q011395
3/30/2015	121.99	127.14	5.15	6E35Q011396
4/15/2015	121.96	127.09	5.13	6E35Q011397
11/19/2015	121.50	126.82	5.32	6E35Q011398
4/12/2016	121.22	126.60	5.38	6E35Q011399
4/4/1951	145.55	148.10	2.55	6E36Q011387
11/19/1953	144.72	146.68	1.96	6E36Q011388
2/24/1954	144.62	146.54	1.93	6E36Q011389
11/9/1954	144.30	144.34	0.04	6E36Q011390

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
3/7/1955	144 21	145.57	1.37	6E36Q011391
11/28/1955	143.89	144.20	0.31	6E36Q011392
3/18/1956	143.78	143.42	-0.36	6E36Q011393
7/2/1956	143.61	143.85	0.23	6E36Q011394
11/16/1956	143.38	143.69	0.30	6E36Q011395
3/15/1957	143.24	143.32	0.08	6E36Q011396
11/26/1957	142.84	142.63	-0.21	6E36Q011397
3/15/1958	142.72	143.27	0.55	6E36Q011398
4/21/1958	142.67	142.43	-0.24	6E36Q011399
5/5/1958	142.65	141.39	-1.26	6E36Q011400
6/23/1958	142.59	140.81	-1.77	6E36Q011401
7/22/1958	142.54	142.00	-0.54	6E36Q011402
8/14/1958	142.51	140.42	-2.09	6E36Q011403
9/23/1958	142.45	140.51	-1 94	6E36Q011404
10/20/1958	142.41	140.39	-2.02	6E36Q011405
11/5/1958	142.39	141.02	-1.36	6E36Q011406
11/12/1958	142.38	140.94	-1.44	6E36Q011407
1/5/1959	142.31	142.67	0.37	6E36Q011408
1/26/1959	142.28	143.19	0.91	6E36Q011409
3/12/1959	142.22	143.34	1.12	6E36Q011410
3/19/1959	142.22	142.67	0.46	6E36Q011411
5/12/1959	142.14	141.51	-0.62	6E36Q011412
6/11/1959	142.09	140.87	-1.21	6E36Q011413
11/24/1959	141.82	141.74	-0.07	6E36Q011414
2/27/1960	141.72	141.71	-0.01	6E36Q011415
11/22/1960	141.34	141.47	0.13	6E36Q011416
3/8/1961	141.21	142.43	1.22	6E36Q011417
10/26/1961	140.85	141.86	1.01	6E36Q011418
3/15/1962	140.67	142.43	1.77	6E36Q011419
11/2/1962	140.32	141.90	1.58	6E36Q011420
1/10/1963	140.23	142.79	2.57	6E36Q011421
2/12/1963	140.19	142.62	2.43	6E36Q011422
3/11/1963	140.15	142.22	2.06	6E36Q011423
3/15/1963	140.15	142.32	2.18	6E36Q011424
4/10/1963	140.11	141.79	1.68	6E36Q011425
5/7/1963	140.08	141.62	1.54	6E36Q011426
6/18/1963	140.01	140.88	0.87	6E36Q011427
7/9/1963	139.98	141.03	1.04	6E36Q011428
8/8/1963	139.94	140.93	0.99	6E36Q011429
9/4/1963	139.89	140.92	1.03	6E36Q011430
10/8/1963	139.86	141.15	1.28	6E36Q011431
10/31/1963	139.87	142.18	2.30	6E36Q011432
11/12/1963	139.88	141.89	2.01	6E36Q011433
12/5/1963	139.87	142.03	2.16	6E36Q011434
1/6/1964	139.84	142.89	3.05	6E36Q011435
2/5/1964	139.81	142 30	2.49	6E36Q011436
3/9/1964	139.78	141.80	2.02	6E36Q011437
3/20/1964	139.77	142.39	2.62	6E36Q011438
4/3/1964	139.76	141.60	1.84	6E36Q011439
5/8/1964	139.72	141.04	1.32	6E36Q011440

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/3/1964	139.69	140.31	0.62	6E36Q011441
7/7/1964	139.65	139.91	0.26	6E36Q011442
8/5/1964	139.61	139.89	0.28	6E36Q011443
9/11/1964	139.56	140.24	0.67	6E36Q011444
9/30/1964	139.54	140.42	0.89	6E36Q011445
11/2/1964	139.49	141.28	1.79	6E36Q011446
12/1/1964	139.46	141.78	2.33	6E36Q011447
1/6/1965	139.41	141.98	2.56	6E36Q011448
2/1/1965	139.38	142.04	2.66	6E36Q011449
3/3/1965	139.35	141.93	2.58	6E36Q011450
4/5/1965	139.31	141.29	1.98	6E36Q011451
5/5/1965	139.28	141.03	1.76	6E36Q011452
5/24/1965	139.25	140.78	1.53	6E36Q011453
6/29/1965	139.21	140.88	1.68	6E36Q011454
7/23/1965	139.18	140.73	1.55	6E36Q011455
8/3/1965	139.16	140.56	1.40	6E36Q011456
9/7/1965	139.12	140.28	1.16	6E36Q011457
10/4/1965	139.09	140.49	1.40	6E36Q011458
10/26/1965	139.06	141.02	1.96	6E36Q011459
11/5/1965	139.05	141.29	2.24	6E36Q011460
12/10/1965	139.03	141.42	2.40	6E36Q011461
1/10/1966	139.01	141.86	2.85	6E36Q011462
2/1/1966	139.00	141.85	2.85	6E36Q011463
3/4/1966	138.98	141.63	2.65	6E36Q011464
3/10/1966	138.97	141.39	2.42	6E36Q011465
4/5/1966	138.95	141.39	2.44	6E36Q011466
5/3/1966	138.93	141.11	2.18	6E36Q011467
6/2/1966	138.90	140.97	2.07	6E36Q011468
7/6/1966	138.86	140.56	1.69	6E36Q011469
8/1/1966	138.84	140.48	1.64	6E36Q011470
10/26/1966	138.75	141.36	2.61	6E36Q011471
1/13/1967	138.68	141.73	3.04	6E36Q011472
3/23/1967	138.64	141.82	3.18	6E36Q011473
10/24/1967	138.47	141.60	3.13	6E36Q011474
3/13/1968	138.39	141.83	3.44	6E36Q011475
11/8/1968	138.27	141.64	3.37	6E36Q011476
3/27/1969	138.26	141.74	3.48	6E36Q011477
10/28/1969	138.23	141.42	3.19	6E36Q011478
3/23/1970	138.21	141.62	3.42	6E36Q011479
11/12/1970	138.15	141.29	3.14	6E36Q011480
3/30/1971	138.12	141.05	2.93	6E36Q011481
8/8/1980	138.87	138.41	-0.46	6E36Q011482
2/12/2004	130.99	128.26	-2.73	6E36Q011483
10/12/2005	130.02	127.98	-2.04	6E36Q011484
3/10/2009	127.55	124.84	-2.70	6E36Q011485
1/7/1953	145.14	150.70	5.56	6E01C011522
11/19/1953	144.79	149.85	5.06	6E01C011523
1/1/1980	138.86	140.64	1.78	6E01C011524
5/5/2005	130.17	132.16	1.98	6E01C011525

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/12/2005	129.90	131.92	2.01	6E01C011526
1/5/2006	129.79	112.29	-17.50	6E01C011527
2/22/2006	129.70	131.74	2.03	6E01C011528
6/12/2006	129.51	131.59	2.08	6E01C011529
9/26/2007	128.54	130.89	2.35	6E01C011530
2/13/2008	128.23	130.76	2.52	6E01C011531
12/2/2008	127.60	130.27	2.67	6E01C011532
3/24/2009	127.37	130.14	2.77	6E01C011533
12/8/1992	136.77	134.64	-2.13	6E02C031534
1/12/1993	136.78	134.85	-1.93	6E02C031535
2/3/1993	136.82	134.88	-1.93	6E02C031536
2/12/1993	136.82	134.88	-1.94	6E02C031537
2/24/1993	136.83	134.88	-1.95	6E02C031538
3/11/1993	136.84	134.82	-2.01	6E02C031539
3/27/1993	136.84	134.61	-2.23	6E02C031540
4/16/1993	136.83	134.43	-2.40	6E02C031541
5/11/1993	136.82	134.34	-2 48	6E02C031542
7/2/1993	136.78	134.18	-2.59	6E02C031543
8/19/1993	136.73	134.09	-2.64	6E02C031544
10/20/1993	136.67	134.00	-2.67	6E02C031545
12/24/1993	136.63	134.00	-2.62	6E02C031546
2/11/1994	136.59	134.15	-2.44	6E02C031547
3/25/1994	136.57	134.15	-2.41	6E02C031548
5/25/1994	136.53	133.91	-2.62	6E02C031549
8/24/1994	136.45	133.67	-2.79	6E02C031550
10/6/1994	136.40	133.54	-2.86	6E02C031551
12/21/1994	136.33	133.48	-2.84	6E02C031552
2/24/1995	136.27	133.70	-2.58	6E02C031553
4/12/1995	136.23	133.48	-2.75	6E02C031554
6/21/1995	136.15	133.24	-2.91	6E02C031555
10/2/1995	136.01	132.99	-3.01	6E02C031556
12/28/1995	135.89	132.93	-2.95	6E02C031557
4/11/1996	135.73	132.78	-2.95	6E02C031558
8/9/1996	135.50	132.42	-3.09	6E02C031559
10/23/1996	135.34	132.32	-3.02	6E02C031560
1/3/1997	135.21	132.29	-2.92	6E02C031561
5/9/1997	134.99	131.96	-3.03	6E02C031562
9/3/1997	134.77	131.53	-3.24	6E02C031563
12/3/1997	134.64	131.59	-3.05	6E02C031564
5/13/1998	134.45	131.38	-3.07	6E02C031565
11/12/1998	134.11	130.74	-3.37	6E02C031566
3/12/1999	133.91	130.71	-3.20	6E02C031567
5/17/1999	133.80	130.47	-3.33	6E02C031568
11/22/1999	133.39	129.95	-3.44	6E02C031569
3/24/2000	133.17	129.98	-3.19	6E02C031570
9/15/2000	132.74	129.43	-3.31	6E02C031571
12/18/2000	132.52	129.12	-3.40	6E02C031572
5/17/2001	132.25	129.18	-3.06	6E02C031573
10/17/2001	131.87	128.85	-3.02	6E02C031574

Attachment C. Residuals

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/14/2001	131.80	128.58	-3.22	6E02C031575
2/22/2002	131.60	128.58	-3.03	6E02C031576
8/30/2002	131.16	127.78	-3.37	6E02C031577
12/13/2002	130.90	127.69	-3.21	6E02C031578
3/17/2003	130.72	127.90	-2.82	6E02C031579
11/18/2004	129.38	125.95	-3.43	6E02C031580
2/10/2005	129.34	126.26	-3.08	6E02C031581
2/22/2006	128.70	128.06	-0.65	6E02C031582
1/10/2007	127.94	123.97	-3.97	6E02C031583
2/12/2004	125.20	130.09	4.89	6E04F011584
2/10/2005	126.42	129.94	3.52	6E04F011585
4/6/2006	123.01	128.83	5.82	6E04F011586
2/22/2007	122.00	128.43	6.43	6E04F011587
2/26/2008	121.32	128.11	6.79	6E04F011588
12/2/2008	119.61	127.62	8.02	6E04F011589
3/26/2009	119.76	127.16	7.39	6E04F011590
3/25/2010	118.58	126.98	8.40	6E04F011591
2/18/1953	150.07	148.40	-1.67	6E05P011590
11/19/1953	149.59	147.33	-2.26	6E05P011591
2/3/1954	149.45	147.15	-2.30	6E05P011592
2/24/1954	149.42	147.11	-2.30	6E05P011593
11/9/1954	148.98	146.30	-2.68	6E05P011594
3/7/1955	148.78	146.13	-2.65	6E05P011595
11/29/1955	148.33	145.43	-2.90	6E05P011596
3/18/1956	148.15	145.32	-2.82	6E05P011597
11/16/1956	147.72	144.79	-2.93	6E05P011598
3/15/1957	147.50	144.71	-2.79	6E05P011599
11/26/1957	147.04	144.08	-2.96	6E05P011600
3/15/1958	146.85	144.02	-2.83	6E05P011601
11/5/1958	146.40	143.42	-2.98	6E05P011602
3/12/1959	146.14	143.35	-2.80	6E05P011603
11/24/1959	145.63	142.98	-2.65	6E05P011604
2/28/1960	145.45	142.64	-2.82	6E05P011605
11/22/1960	144.96	142.37	-2.59	6E05P011606
3/8/1961	144.75	142.40	-2.36	6E05P011607
10/26/1961	144.31	142.22	-2.09	6E05P011608
3/15/1962	144.03	142.26	-1.77	6E05P011609
11/2/1962	143.60	142.08	-1.53	6E05P011610
3/15/1963	143.35	142.15	-1.20	6E05P011611
10/31/1963	143.44	141.99	-1.44	6E05P011612
3/20/1964	143.30	142.03	-1.27	6E05P011613
11/12/1964	142.73	141.74	-1.00	6E05P011614
3/19/1965	142.45	141.79	-0.66	6E05P011615
8/11/1965	142.19	141.53	-0.66	6E05P011616
10/26/1965	142.06	141.33	-0.73	6E05P011617
3/3/1966	142.15	141.33	-0.82	6E05P011618
10/26/1966	141.75	140.43	-1.31	6E05P011619
3/23/1967	141.54	141.07	-0.47	6E05P011620

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/24/1967	141.23	140.79	-0.44	6E05P011621
3/13/1968	141.06	140.76	-0.29	6E05P011622
11/8/1968	140.89	140.74	-0.15	6E05P011623
3/27/1969	140.78	140.52	-0.26	6E05P011624
10/28/1969	140.61	140.26	-0.35	6E05P011625
3/23/1970	140.47	140.19	-0.29	6E05P011626
11/10/1970	140.27	139.95	-0.32	6E05P011627
3/30/1971	140.14	139.86	-0.28	6E05P011628
8/7/1980	139.86	137.61	-2.25	6E05P011629
6/30/1980	137.76	133.68	-4.08	6E07K031630
6/30/1987	136.14	135.20	-0.93	6E07K031631
6/30/1991	134.99	133.99	-1.00	6E07K031632
6/30/1993	134.28	131.91	-2.37	6E07K031633
6/30/1995	132.24	131.55	-0.69	6E07K031634
6/30/1997	130.80	128.29	-2.51	6E07K031635
6/2/1998	131.14	127.83	-3.31	6E07K031636
6/29/1999	130.01	127.25	-2.76	6E07K031637
6/8/2001	128.07	125.48	-2.58	6E07K031638
7/29/2002	127.17	124.51	-2.67	6E07K031639
7/31/2003	126.47	123.87	-2.61	6E07K031640
5/13/2005	126.14	121.88	-4.25	6E07K031641
3/3/2006	126.00	121.61	-4.39	6E07K031642
5/21/2006	125.92	121.70	-4 22	6E07K031643
3/8/2007	125.58	121.52	-4.06	6E07K031644
12/1/2008	124.57	120.25	-4.32	6E07K031645
12/3/2008	124.57	120.90	-3.67	6E07K031646
3/25/2010	124.10	121.60	-2.50	6E07K031647
11/18/2010	125.77	125.61	-0.16	6E07K031648
4/17/2012	126.43	121.57	-4.86	6E07K031649
11/14/2012	126.52	122.07	-4.45	6E07K031650
4/9/2013	126.52	121.38	-5.14	6E07K031651
11/13/2013	126.44	121.30	-5.14	6E07K031652
11/25/2013	126.44	121.29	-5.15	6E07K031653
2/5/2014	126.41	121.22	-5.19	6E07K031654
4/9/2014	126.38	121.16	-5.22	6E07K031655
6/3/2014	126.36	121.38	-4.98	6E07K031656
3/30/2015	126.18	120.87	-5.31	6E07K031657
4/15/2015	126.17	120.91	-5.26	6E07K031658
11/19/2015	126.08	120.99	-5.09	6E07K031659
4/13/2016	126 05	120.82	-5.23	6E07K031660
2/12/2004	126.14	124.77	-1.37	6E09E011647
4/13/2007	123.32	122.43	-0 89	6E09E011648
2/22/2008	122.75	122.02	-0.74	6E09E011649
10/12/2010	119.56	120.41	0.85	6E09E011650
4/9/2013	118.33	120.11	1.78	6E09E011651
10/18/2013	118.48	120.11	1.63	6E09E011652
11/13/2013	118.47	119.57	1.10	6E09E011653
3/28/2014	118.66	121.14	2.48	6E09E011654

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
4/9/2014	118.60	119.85	1.25	6E09E011655
3/10/2015	118.21	120.72	2.51	6E09E011656
4/15/2015	118.10	119.35	1.25	6E09E011657
11/19/2015	117.41	119.15	1.74	6E09E011658
3/23/2016	117.50	120.80	3.30	6E09E011659
2/18/1953	146.19	146.46	0.28	6E10N011650
12/8/1953	145.79	144.64	-1.16	6E10N011651
2/28/1960	143.00	140.49	-2.51	6E10N011652
11/22/1960	142.53	140.49	-2.04	6E10N011653
3/8/1961	142.42	141.22	-1.20	6E10N011654
10/26/1961	141.98	140.99	-0.99	6E10N011655
3/15/1962	141.89	141.56	-0.33	6E10N011656
11/2/1962	141.45	141.25	-0.20	6E10N011657
3/15/1963	141.35	141.62	0.27	6E10N011658
10/31/1963	141.10	141.49	0.39	6E10N011659
3/20/1964	141.00	141.64	0.64	6E10N011660
11/12/1964	140.61	140.53	-0.08	6E10N011661
3/19/1965	140.47	140.94	0.47	6E10N011662
8/4/1965	140.18	140.12	-0.06	6E10N011663
10/25/1965	140.08	140.17	0.09	6E10N011664
3/3/1966	140.12	140.52	0.40	6E10N011665
10/26/1966	139.75	140.17	0.43	6E10N011666
3/23/1967	139.65	140.76	1.11	6E10N011667
10/24/1967	139.33	140.11	0.77	6E10N011668
3/12/1968	139.29	140.45	1.16	6E10N011669
11/8/1968	139.01	140.20	1.19	6E10N011670
3/27/1969	139.03	140.44	1.42	6E10N011671
10/28/1969	138.74	140.12	1.37	6E10N011672
3/23/1970	138.87	140.29	1.42	6E10N011673
11/12/1970	138.74	139.95	1.22	6E10N011674
3/30/1971	138.72	139.92	1.19	6E10N011675
8/13/1980	137.99	138.41	0.43	6E10N011676
3/11/2009	122.65	123.25	0.61	6E10N011677
3/11/2009	122.69	121.67	-1.03	6E10N041678
11/16/1953	144.68	146.46	1.78	6E11D021679
2/24/1954	144.60	145.86	1.27	6E11D021680
5/14/1954	144.38	130.69	-13.69	6E11D021681
11/8/1954	144.27	138.94	-5.33	6E11D021682
3/7/1955	144.25	145.79	1.54	6E11D021683
11/29/1955	143.93	138.03	-5.90	6E11D021684
3/18/1956	143.75	144.46	0.71	6E11D021685
7/2/1956	143.49	137.25	-6.24	6E11D021686
11/16/1956	143.41	144.07	0.65	6E11D021687
3/14/1957	143.31	134.17	-9.14	6E11D021688
11/27/1957	142.93	134.28	-8.65	6E11D021689
3/15/1958	142.87	136.10	-6.77	6E11D021690
4/21/1958	142.75	134.34	-8.41	6E11D021691

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
5/1/1958	142.73	132.08	-10.65	6E11D021692
6/23/1958	142.57	131.90	-10.67	6E11D021693
7/22/1958	142.53	132.29	-10.23	6E11D021694
8/14/1958	142.45	131.81	-10.64	6E11D021695
9/23/1958	142.43	139.46	-2.97	6E11D021696
10/20/1958	142.42	135.68	-6.74	6E11D021697
11/5/1958	142.41	140.25	-2.17	6E11D021698
11/12/1958	142.42	140.01	-2.42	6E11D021699
1/5/1959	142.42	136.56	-5.86	6E11D021700
1/26/1959	142.40	143.85	1.45	6E11D021701
2/18/1959	142.39	143.66	1.27	6E11D021702
3/12/1959	142.32	134.46	-7.86	6E11D021703
3/19/1959	142.28	133.97	-8 31	6E11D021704
5/12/1959	142.12	134.24	-7.87	6E11D021705
6/11/1959	142.05	132.08	-9.97	6E11D021706
11/24/1959	141.93	142.17	0.25	6E11D021707
2/28/1960	141.92	132.68	-9 24	6E11D021708
11/22/1960	141.46	141.45	-0.01	6E11D021709
3/8/1961	141.33	142.03	0.70	6E11D021710
10/26/1961	140.91	141.55	0.65	6E11D021711
3/15/1962	140.82	140.67	-0.15	6E11D021712
11/2/1962	140.39	141.62	1.23	6E11D021713
3/15/1963	140.31	142.30	1.99	6E11D021714
10/31/1963	140.19	142.02	1.83	6E11D021715
1/6/1964	140.09	142.52	2.43	6E11D021716
2/5/1964	140.06	135.08	-4.98	6E11D021717
3/9/1964	140.01	141.39	1.38	6E11D021718
3/20/1964	139.98	142.23	2.25	6E11D021719
4/3/1964	139.95	135.13	-4.82	6E11D021720
5/8/1964	139.83	138.22	-1.61	6E11D021721
7/7/1964	139.70	139.48	-0.22	6E11D021722
9/11/1964	139.57	136.57	-3.00	6E11D021723
9/30/1964	139.58	134.02	-5.56	6E11D021724
11/2/1964	139.55	141.65	2.10	6E11D021725
12/1/1964	139.63	142.11	2.48	6E11D021726
1/6/1965	139.57	141.90	2.34	6E11D021727
2/1/1965	139.54	142.28	2.74	6E11D021728
3/3/1965	139.49	141.36	1.86	6E11D021729
4/2/1965	139.43	133.49	-5.94	6E11D021730
4/5/1965	139.43	133.49	-5.93	6E11D021731
5/24/1965	139.30	133.84	-5 45	6E11D021732
6/29/1965	139.24	134.53	-4 72	6E11D021733
7/1/1965	139.24	142.28	3.05	6E11D021734
7/30/1965	139 19	133.51	-5.68	6E11D021735
8/3/1965	139.18	135.19	-3 99	6E11D021736
9/7/1965	139.10	133.52	-5 58	6E11D021737
10/4/1965	139.11	140.51	1.39	6E11D021738
10/25/1965	139.09	136.71	-2.38	6E11D021739
11/5/1965	139.12	141.44	2.32	6E11D021740
12/10/1965	139.28	141.73	2.45	6E11D021741

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
2/1/1966	139.22	135.98	-3.23	6E11D021742
3/4/1966	139.18	134.06	-5.12	6E11D021743
3/10/1966	139.16	135.33	-3.83	6E11D021744
4/5/1966	139.11	136.24	-2.87	6E11D021745
5/3/1966	139.03	134.15	-4.88	6E11D021746
6/2/1966	138.95	133.67	-5.28	6E11D021747
7/6/1966	138.90	133.10	-5.79	6E11D021748
10/27/1966	138.80	141.47	2.68	6E11D021749
1/13/1967	138.83	141.78	2.95	6E11D021750
3/23/1967	138.73	141.82	3.09	6E11D021751
6/22/1967	138.56	141.46	2.90	6E11D021752
9/26/1967	138.49	141.52	3.03	6E11D021753
9/27/1967	138.49	141.52	3.03	6E11D021754
10/24/1967	138.46	141.45	2.99	6E11D021755
3/13/1968	138.46	141.86	3.39	6E11D021756
11/8/1968	138.25	141.51	3.26	6E11D021757
3/27/1969	138.30	142.06	3.76	6E11D021758
10/28/1969	138.11	141.30	3.19	6E11D021759
3/13/1970	138.20	138.55	0.35	6E11D021760
3/23/1970	138.20	138.55	0.35	6E11D021761
11/12/1970	138.06	141.20	3.14	6E11D021762
3/30/1971	138.07	141.30	3.23	6E11D021763
12/26/1978	137.50	139.52	2.02	6E11D021764
12/27/1978	137.50	139.52	2.02	6E11D021765
7/22/1980	138.22	138.57	0.35	6E11D021766
8/13/1980	138.18	132.14	-6.03	6E11D021767
2/12/1981	138.30	139.20	0.90	6E11D021768
2/4/1982	138.23	139.00	0.77	6E11D021769
10/1/1982	138.08	137.87	-0.21	6E11D021770
9/27/1983	138.29	138.49	0.20	6E11D021771
9/17/1984	137.98	138.28	0.30	6E11D021772
2/26/1985	138.06	138.55	0.49	6E11D021773
9/13/1985	137.79	137.59	-0.20	6E11D021774
5/7/1986	137.71	136.76	-0.95	6E11D021775
2/18/1987	137.55	137.87	0.32	6E11D021776
9/17/1987	137.23	137.09	-0.14	6E11D021777
3/10/1988	137.29	136.97	-0.31	6E11D021778
9/27/1988	136.94	136.71	-0.23	6E11D021779
3/31/1989	136.92	136.74	-0.18	6E11D021780
9/27/1989	136.67	136.19	-0.48	6E11D021781
3/13/1990	136.51	136.33	-0.18	6E11D021782
9/29/1990	136.30	135.33	-0.98	6E11D021783
3/11/1991	136.12	136.21	0.09	6E11D021784
9/23/1991	135.85	135.56	-0.29	6E11D021785
3/16/1992	135.72	135.93	0.21	6E11D021786
9/24/1992	136.18	135.24	-0.94	6E11D021787
4/12/1993	136.34	134.86	-1.48	6E11D021788
9/17/1993	136.17	134.67	-1.50	6E11D021789
4/28/1994	136.09	134.66	-1.43	6E11D021790
2/10/2005	128.91	129.03	0.12	6E11D021791

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
3/3/2006	128.21	128.12	-0.09	6E11D021792
3/10/2009	125.76	126.36	0.60	6E11D021793
3/18/2009	125.75	126.26	0.51	6E11D021794
2/18/1953	144.44	146.60	2.16	6E11M011795
12/8/1953	144.03	146.25	2.22	6E11M011796
2/3/1954	143.98	146.27	2.29	6E11M011797
2/24/1954	143.85	145.42	1.57	6E11M011798
11/8/1954	143.62	144.97	1.35	6E11M011799
3/7/1955	143.60	145.46	1.87	6E11M011800
11/29/1955	143.39	144.02	0.63	6E11M011801
3/18/1956	143.13	144.12	0.99	6E11M011802
11/16/1956	142.91	143.71	0.79	6E11M011803
3/14/1957	142.81	142.19	-0.62	6E11M011804
11/27/1957	142.54	141.74	-0.80	6E11M011805
3/15/1958	142.44	142.71	0.27	6E11M011806
11/4/1958	142.08	140.85	-1.23	6E11M011807
3/12/1959	141.99	141.94	-0 04	6E11M011808
11/24/1959	141.67	142.25	0.59	6E11M011809
2/28/1960	141.69	140.64	-1.05	6E11M011810
11/22/1960	141.26	141.52	0.27	6E11M011811
3/8/1961	141.15	141.89	0.74	6E11M011812
10/26/1961	140.77	141.24	0.47	6E11M011813
3/15/1962	140.70	141.77	1.07	6E11M011814
11/2/1962	140.32	141.10	0.78	6E11M011815
3/15/1963	140.24	141.67	1.43	6E11M011816
10/31/1963	140.23	141.38	1.15	6E11M011817
3/20/1964	140.02	141.59	1.57	6E11M011818
11/13/1964	139.63	141.02	1.40	6E11M011819
3/19/1965	139.51	140.94	1.43	6E11M011820
7/30/1965	139.27	139.41	0.14	6E11M011821
10/25/1965	139.17	140.06	0.89	6E11M011822
3/4/1966	139.28	140.60	1.32	6E11M011823
10/27/1966	138.91	140.29	1.38	6E11M011824
3/23/1967	138.84	140.69	1.84	6E11M011825
10/24/1967	138.58	139.77	1.19	6E11M011826
3/13/1968	138.56	140.32	1.77	6E11M011827
3/27/1969	138.35	140.23	1.88	6E11M011828
10/28/1969	138.14	139.26	1.11	6E11M011829
3/23/1970	138.19	136.85	-1.34	6E11M011830
3/30/1970	138.19	139.59	1.41	6E11M011831
11/12/1970	138.06	139.19	1.13	6E11M011832
8/13/1980	137.99	135.90	-2.09	6E11M011833
7/31/1965	138.64	137.27	-1.36	6E12G011834
3/13/1968	137.96	136.22	-1.74	6E12G011835
3/27/1969	137.76	135.80	-1.96	6E12G011836
10/28/1969	137.65	135.32	-2.33	6E12G011837
3/23/1970	137.62	135.40	-2.22	6E12G011838
11/12/1970	137.53	134.93	-2.60	6E12G011839

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
3/30/1971	137.51	135.01	-2.50	6E12G011840
3/10/2009	128.76	127.13	-1.63	6E12G011841
3/26/2009	128.74	127.26	-1.47	6E12G011842
12/9/1953	145.55	144.88	-0.68	6E15E021843
9/17/1954	145.21	143.37	-1.83	6E15E021844
3/26/1956	144.75	142.15	-2.59	6E15E021845
3/29/1957	144.31	142.76	-1.54	6E15E021846
6/1/1961	142.36	141.51	-0.84	6E15E021847
6/25/1961	142.31	141.64	-0.68	6E15E021848
10/17/1963	141.30	140.22	-1.08	6E15E021849
8/4/1965	140.55	140.33	-0.22	6E15E021850
12/8/1986	136.35	135.81	-0.54	6E15E021851
4/27/1987	136.54	135.91	-0.64	6E15E021852
7/27/1987	135.92	135.78	-0.13	6E15E021853
11/19/1987	136.07	135.75	-0.32	6E15E021854
1/20/1988	136.22	135.72	-0.50	6E15E021855
4/1/1988	135.87	135.66	-0.21	6E15E021856
6/8/1988	135.30	135.51	0.21	6E15E021857
10/25/1988	134.85	135.39	0.54	6E15E021858
2/3/1989	135.29	135.36	0.07	6E15E021859
8/8/1989	134.61	134.99	0.38	6E15E021860
10/26/1989	134.39	134.81	0.42	6E15E021861
2/6/1990	134.63	134.78	0.15	6E15E021862
9/1/1990	134.03	134.50	0.47	6E15E021863
1/14/1991	133.86	135.08	1.22	6E15E021864
2/19/1991	133.98	134.81	0.83	6E15E021865
3/5/1991	133.98	134.84	0.86	6E15E021866
3/19/1991	133.98	134.75	0.76	6E15E021867
4/11/1991	133.94	134.69	0.75	6E15E021868
5/9/1991	133.83	134.47	0.65	6E15E021869
7/23/1991	133.49	133.64	0.14	6E15E021870
10/31/1991	133.33	133.56	0.23	6E15E021871
1/7/1992	133.31	133.83	0.52	6E15E021872
3/12/1992	133.88	134.02	0.14	6E15E021873
5/12/1992	133.95	133.62	-0.33	6E15E021874
7/7/1992	134.00	133.41	-0.59	6E15E021875
9/2/1992	133.94	133.32	-0.62	6E15E021876
10/13/1992	133.74	133.25	-0.49	6E15E021877
12/8/1992	133.83	133.35	-0.48	6E15E021878
1/21/1993	134.20	133.50	-0.70	6E15E021879
2/3/1993	134.42	133.53	-0.89	6E15E021880
2/12/1993	134.49	133.53	-0.96	6E15E021881
2/24/1993	134.56	133.56	-1.00	6E15E021882
3/11/1993	134.58	133.50	-1.08	6E15E021883
3/27/1993	134.59	133.44	-1.15	6E15E021884
4/16/1993	134.57	133.38	-1.19	6E15E021885
5/11/1993	134.54	133.28	-1.26	6E15E021886
7/2/1993	134.38	133.13	-1.25	6E15E021887
8/19/1993	134.23	133.01	-1.22	6E15E021888

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/20/1993	134.13	132.83	-1 30	6E15E021889
12/24/1993	134.15	132.89	-1.27	6E15E021890
2/11/1994	134.30	132.92	-1 38	6E15E021891
3/25/1994	134.40	132.95	-1 45	6E15E021892
5/25/1994	134.31	132.77	-1.54	6E15E021893
8/24/1994	134.21	132.28	-1.93	6E15E021894
10/6/1994	134.18	132.13	-2.06	6E15E021895
12/2/1994	133.92	131.91	-2.00	6E15E021896
2/24/1995	134.26	132.22	-2.04	6E15E021897
4/12/1995	134.25	131.94	-2.31	6E15E021898
6/21/1995	134.07	131.61	-2.46	6E15E021899
10/2/1995	133.72	131.12	-2.59	6E15E021900
12/28/1995	133.67	130.85	-2.83	6E15E021901
4/11/1996	133.65	130.66	-2.98	6E15E021902
8/9/1996	133.30	130.39	-2.91	6E15E021903
10/23/1996	133.21	130.24	-2.98	6E15E021904
1/3/1997	133.02	130.15	-2.87	6E15E021905
5/9/1997	133.07	130.08	-2.98	6E15E021906
9/3/1997	132.71	129.57	-3.14	6E15E021907
12/3/1997	132.61	129.47	-3.13	6E15E021908
5/13/1998	132.47	129.23	-3.24	6E15E021909
11/12/1998	131.96	128.56	-3.40	6E15E021910
3/12/1999	132.02	128.56	-3 46	6E15E021911
5/17/1999	131.72	128.59	-3.13	6E15E021912
11/12/1999	131.11	127.86	-3.25	6E15E021913
3/24/2000	131.08	127.89	-3.19	6E15E021914
6/30/2000	130.67	127.52	-3.15	6E15E021915
9/15/2000	130.33	127.22	-3.11	6E15E021916
12/18/2000	130.03	127.10	-2.93	6E15E021917
5/17/2001	129.85	127.16	-2.69	6E15E021918
10/17/2001	129.33	126.67	-2.66	6E15E021919
11/14/2001	129.23	126.64	-2.59	6E15E021920
2/22/2002	128.94	126.52	-2.42	6E15E021921
8/30/2002	127.75	126.00	-1.75	6E15E021922
12/13/2002	127.49	125.76	-1.74	6E15E021923
3/17/2003	127.48	125.79	-1.70	6E15E021924
6/30/2003	126.76	125.48	-1.28	6E15E021925
10/6/2003	126.17	124.87	-1.30	6E15E021926
12/29/2003	126.46	124.63	-1.83	6E15E021927
2/12/2004	126.48	124.60	-1.88	6E15E021928
4/8/2004	126.39	124.54	-1.85	6E15E021929
7/23/2004	125.86	124.17	-1.69	6E15E021930
11/18/2004	126.03	123.74	-2.28	6E15E021931
1/2/1950	146.84	147.41	0.57	6E15F011932
2/19/1953	145.84	146.26	0.42	6E15F011933
12/8/1953	145.50	144.76	-0.74	6E15F011934
3/7/1955	145.11	144.04	-1.07	6E15F011935
11/29/1955	144.79	143.50	-1.30	6E15F011936
3/18/1956	144.73	144.06	-0.67	6E15F011937

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/16/1956	144.38	141.62	-2.76	6E15F011938
3/15/1957	144.31	143.16	-1.15	6E15F011939
11/27/1957	143.95	142.55	-1.40	6E15F011940
3/5/1958	143.89	142.90	-0.99	6E15F011941
11/4/1958	143.57	140.62	-2.95	6E15F011942
8/5/1965	140.73	140.30	-0.43	6E15F011943
3/11/2009	125.52	124.83	-0.70	6E15G011944
6/30/1987	136.29	134.92	-1.37	6E16A021945
6/30/1991	133.42	138.58	5.16	6E16A021946
6/30/1993	133.70	136.38	2.68	6E16A021947
6/30/1995	133.15	131.05	-2.10	6E16A021948
6/30/1997	131.72	129.74	-1.98	6E16A021949
6/2/1998	131.44	128.70	-2.74	6E16A021950
6/29/1999	130.15	127.55	-2.61	6E16A021951
6/5/2000	129.51	127.00	-2.52	6E16A021952
7/29/2002	126.39	125.11	-1.29	6E16A021953
7/31/2003	124.60	124.56	-0.05	6E16A021954
5/13/2005	125.20	123.86	-1.34	6E16A021955
5/21/2006	124.33	123.16	-1.18	6E16A021956
3/8/2007	123.51	122.00	-1.51	6E16A021957
3/10/2008	122.91	121.51	-1.40	6E16A021958
12/1/2008	121.35	121.08	-0.27	6E16A021959
10/12/2010	120.35	119.74	-0.61	6E16A021960
4/9/2013	121.01	119.52	-1.49	6E16A021961
10/18/2013	120.07	118.58	-1.49	6E16A021962
3/28/2014	120.72	119.74	-0.98	6E16A021963
3/10/2015	119.80	119.77	-0.03	6E16A021964
10/12/2015	119.64	119.06	-0.58	6E16A021965
3/23/2016	120.05	120.01	-0.04	6E16A021966
6/30/1991	136.82	135.23	-1.59	6E16N011960
6/30/1993	128.06	134.62	6.56	6E16N011961
6/30/1995	126.67	129.81	3.14	6E16N011962
6/30/1997	125.57	128.40	2.84	6E16N011963
6/2/1998	126.83	127.25	0.42	6E16N011964
6/29/1999	126.05	126.79	0.74	6E16N011965
6/5/2000	123.73	124.84	1.11	6E16N011966
6/8/2001	126.41	125.23	-1.17	6E16N011967
7/29/2002	122.56	124.32	1.76	6E16N011968
7/31/2003	122.24	124.02	1.77	6E16N011969
2/10/2005	124.40	123.69	-0.71	6E16N011970
5/13/2005	123.44	122.83	-0.61	6E16N011971
5/21/2006	124.02	123.25	-0.77	6E16N011972
3/8/2007	123.11	121.27	-1.84	6E16N011973
3/20/2008	121.49	120.75	-0.74	6E16N011974
12/1/2008	119.37	119.41	0.04	6E16N011975
12/2/2008	119.42	119.93	0.51	6E16N011976
3/25/2010	120.76	121.86	1.10	6E16N011977

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
10/12/2010	119.85	118.78	-1.07	6E16N011978
10/18/2013	123.42	119.60	-3.82	6E16N011979
3/10/2015	121.85	119.15	-2.70	6E16N011980
10/12/2015	122.15	118.97	-3.18	6E16N011981
3/23/2016	122.74	120 06	-2.68	6E16N011982
6/30/1991	139.24	138.27	-0.97	6E18L011976
6/30/1993	137.51	136.14	-1.37	6E18L011977
6/30/1995	134.29	135.53	1.24	6E18L011978
6/30/1997	133.09	133.33	0.24	6E18L011979
6/2/1998	131.80	126.35	-5.45	6E18L011980
6/29/1999	130.02	126.23	-3.79	6E18L011981
6/5/2000	129.39	125.56	-3.83	6E18L011982
6/8/2001	128.04	125.29	-2.76	6E18L011983
7/29/2002	126.79	124.83	-1.96	6E18L011984
7/31/2003	125.66	124.16	-1.51	6E18L011985
5/13/2005	127.96	123.00	-4.96	6E18L011986
3/3/2006	127.62	121.08	-6.54	6E18L011987
5/21/2006	127.42	122.88	-4.54	6E18L011988
3/8/2007	126.81	122.39	-4.42	6E18L011989
12/1/2008	125.91	94.67	-31.24	6E18L011990
12/3/2008	125.91	95.33	-30.57	6E18L011991
3/25/2010	125.53	121.64	-3.89	6E18L011992
10/12/2010	124.85	119.23	-5.62	6E18L011993
4/9/2013	123.62	115.52	-8.10	6E18L011994
10/18/2013	123.38	115.88	-7.50	6E18L011995
3/28/2014	123.21	115.52	-7.69	6E18L011996
3/10/2015	122.82	115.36	-7.46	6E18L011997
4/20/2016	124.12	121.25	-2 87	6E18L011998
6/5/2000	125.44	127.90	2.46	6E20A011992
6/8/2001	127.88	125.89	-1 99	6E20A011993
7/29/2002	124.57	127.35	2.78	6E20A011994
7/31/2003	124.29	126.56	2.27	6E20A011995
2/12/2004	125.02	126.37	1.35	6E20A011996
2/10/2005	126.48	125.49	-0.99	6E20A011997
5/5/2005	125.78	124.91	-0.87	6E20A011998
5/13/2005	125.88	127.11	1.22	6E20A011999
2/17/2006	127.04	124.67	-2.37	6E20A012000
5/21/2006	126.45	126.86	0.41	6E20A012001
3/20/2008	123.99	122.66	-1.33	6E20A012002
3/12/2009	123.39	120.92	-2.47	6E20A012003
3/25/2010	122.95	121.66	-1.29	6E20A012004
10/12/2010	122.38	121.38	-1.00	6E20A012005
4/9/2013	125.49	120.89	-4.60	6E20A012006
10/18/2013	125.61	121.11	-4.50	6E20A012007
11/13/2013	125.63	120.64	-4 99	6E20A012008
3/28/2014	125.69	121.66	-4.03	6E20A012009
4/9/2014	125.70	120.95	-4.75	6E20A012010
4/15/2015	124.37	120.04	-4.33	6E20A012011

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/19/2015	124.58	120.08	-4.50	6E20A012012
4/13/2016	124.58	118.24	-6.34	6E20A012013
4/22/2016	125.00	118.40	-6.60	6E20A012014
1/1/1948	146.33	144.52	-1.81	6E22A012004
2/19/1953	145.30	146.72	1.42	6E22A012005
11/30/1953	145.00	146.78	1.77	6E22A012006
2/24/1954	144.97	145.55	0.58	6E22A012007
11/10/1954	144.67	145.75	1.08	6E22A012008
3/7/1955	144.65	145.93	1.28	6E22A012009
11/29/1955	144.38	144.76	0.38	6E22A012010
3/18/1956	144.33	145.78	1.44	6E22A012011
11/16/1956	144.03	145.58	1 55	6E22A012012
3/14/1957	144.00	145.78	1.78	6E22A012013
11/27/1957	143.69	145.60	1.92	6E22A012014
3/15/1958	143.65	145.65	2.00	6E22A012015
11/4/1958	143.38	144.90	1.53	6E22A012016
1/5/1959	143.36	144.98	1.62	6E22A012017
1/26/1959	143.35	144.98	1.63	6E22A012018
2/18/1959	143.33	145.01	1.68	6E22A012019
3/12/1959	143.32	145.16	1.84	6E22A012020
3/19/1959	143.31	145.04	1.73	6E22A012021
5/12/1959	143.24	144.98	1.74	6E22A012022
6/11/1959	143.19	144.98	1.79	6E22A012023
11/24/1959	142.98	144.86	1.88	6E22A012024
2/27/1960	142.98	144.97	1.99	6E22A012025
11/22/1960	142.64	144.66	2.02	6E22A012026
3/8/1961	142.59	144.74	2.15	6E22A012027
10/26/1961	142.27	144.28	2.01	6E22A012028
3/15/1962	142.19	144.31	2.12	6E22A012029
11/2/1962	141.88	143.88	2.01	6E22A012030
3/14/1963	141.81	143.85	2.04	6E22A012031
10/31/1963	141.73	143.81	2.08	6E22A012032
1/6/1964	141.72	143.57	1.85	6E22A012033
2/5/1964	141.72	143.44	1.72	6E22A012034
3/9/1964	141.71	143.50	1.79	6E22A012035
3/20/1964	141.70	143.85	2.14	6E22A012036
4/3/1964	141.69	143.42	1.73	6E22A012037
5/8/1964	141.65	143.31	1.66	6E22A012038
6/3/1964	141.61	143.14	1.52	6E22A012039
7/7/1964	141.56	143.15	1.59	6E22A012040
8/5/1964	141.51	143.04	1.53	6E22A012041
9/11/1964	141.46	142.87	1.41	6E22A012042
9/30/1964	141.44	142.85	1.41	6E22A012043
11/2/1964	141.40	142.90	1.50	6E22A012044
12/1/1964	141.38	142.99	1.61	6E22A012045
1/6/1965	141.37	143.07	1.70	6E22A012046
2/1/1965	141.36	143.08	1.72	6E22A012047
3/3/1965	141.34	143.09	1.75	6E22A012048
4/5/1965	141.32	143.09	1.77	6E22A012049

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
5/5/1965	141.28	142.94	1.66	6E22A012050
5/24/1965	141.25	142.91	1.66	6E22A012051
6/29/1965	141.19	142.67	1.48	6E22A012052
8/2/1965	141.14	142.76	1.63	6E22A012053
8/3/1965	141.14	142.71	1.58	6E22A012054
9/7/1965	141.09	142.71	1.62	6E22A012055
10/4/1965	141.05	142.69	1.63	6E22A012056
10/25/1965	141.03	142.71	1.69	6E22A012057
11/5/1965	141.02	142.69	1.67	6E22A012058
12/10/1965	141.05	142.83	1.78	6E22A012059
1/10/1966	141.07	142.94	1.88	6E22A012060
2/1/1966	141.07	142.85	1.78	6E22A012061
3/3/1966	141.06	143.04	1.98	6E22A012062
3/10/1966	141.06	142.81	1.75	6E22A012063
4/5/1966	141.05	142.77	1.72	6E22A012064
5/3/1966	141.01	142.66	1.64	6E22A012065
6/2/1966	140.97	142.61	1.63	6E22A012066
7/6/1966	140.92	142.73	1 81	6E22A012067
8/1/1966	140.88	142.68	1.80	6E22A012068
10/26/1966	140.77	142.64	1.87	6E22A012069
1/13/1967	140.74	142.69	1.95	6E22A012070
3/23/1967	140.71	142.71	2 00	6E22A012071
6/22/1967	140.58	142.53	1.95	6E22A012072
9/26/1967	140.44	142.09	1.65	6E22A012073
10/24/1967	140.41	142.11	1.70	6E22A012074
3/12/1968	140.36	142.34	1.98	6E22A012075
11/8/1968	140.06	142.08	2.02	6E22A012076
3/27/1969	140.03	140.34	0.31	6E22A012077
10/28/1969	139.75	142.00	2.25	6E22A012078
3/23/1970	139.69	141.64	1.95	6E22A012079
11/10/1970	139.42	141.23	1.82	6E22A012080
3/30/1971	139.39	141.33	1.93	6E22A012081
3/24/2009	130.06	136.05	5.99	6E22A012082
6/30/1980	136.98	111.39	-25.59	6E22A022083
6/30/1987	135.75	116.58	-19.18	6E22A022084
6/30/1991	134.97	125.72	-9.25	6E22A022085
6/30/1993	135.29	128.65	-6.65	6E22A022086
6/2/1998	135.18	135.53	0.36	6E22A022087
6/29/1999	134.83	136.54	1.71	6E22A022088
6/5/2000	134.46	136.84	2.38	6E22A022089
6/8/2001	133.99	136.66	2.67	6E22A022090
7/29/2002	133.37	135.38	2.02	6E22A022091
7/31/2003	132.81	135.50	2.69	6E22A022092
3/11/2009	130.30	139.12	8.82	6E22A022093
3/24/2009	130.28	137.29	7.01	6E22A022094
6/30/1987	136.89	121.76	-15.13	6E22B012095
6/30/1991	135.92	59.88	-76.04	6E22B012096
6/2/1998	135.61	134.87	-0.75	6E22B012097

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
2/12/2004	132.18	137.15	4.97	6E22B012098
2/10/2005	132.44	137.52	5.07	6E22B012099
2/17/2006	131.98	137.70	5.72	6E22B012100
2/22/2007	131.45	138.17	6.72	6E22B012101
2/21/2008	130.51	137.92	7.41	6E22B012102
12/1/2008	129.76	138.39	8.63	6E22B012103
3/25/2010	129.16	138.31	9.15	6E22B012104
11/18/2011	129.09	138.27	9.18	6E22B012105
4/17/2012	129.17	138.60	9.43	6E22B012106
12/21/2012	129.08	138.74	9.66	6E22B012107
4/9/2013	129.12	138.84	9.72	6E22B012108
5/3/2013	129.11	138.79	9.69	6E22B012109
11/25/2013	129.01	138.84	9.82	6E22B012110
2/5/2014	128.99	138.92	9.93	6E22B012111
4/9/2014	128.97	138.94	9.97	6E22B012112
6/3/2014	128.92	138.90	9.98	6E22B012113
12/9/2014	128.67	138.86	10.18	6E22B012114
3/30/2015	128.62	138.95	10.33	6E22B012115
4/15/2015	128.61	138.97	10.36	6E22B012116
11/18/2015	128.53	138.86	10.33	6E22B012117
4/13/2016	128.47	138.87	10.40	6E22B012118
6/30/1980	136.30	141.76	5.47	6E22D012103
6/30/1987	133.09	124.39	-8.70	6E22D012104
6/30/1991	132.60	114.94	-17.66	6E22D012105
6/30/1993	135.21	145.54	10.33	6E22D012106
6/30/1995	134.68	127.56	-7.12	6E22D012107
6/30/1997	132.90	126.46	-6 44	6E22D012108
6/2/1998	133.60	127.53	-6.07	6E22D012109
6/29/1999	132.36	126.77	-5.60	6E22D012110
6/5/2000	131.73	126.89	-4.84	6E22D012111
6/8/2001	129.18	126.86	-2.32	6E22D012112
2/12/2004	127.76	126.49	-1.27	6E22D012113
5/5/2005	125.99	110.00	-15.99	6E22D012114
5/13/2005	126.01	112.66	-13.36	6E22D012115
2/17/2006	126.45	114.64	-11.82	6E22D012116
5/21/2006	126.94	112.47	-14.47	6E22D012117
3/8/2007	126.03	114.88	-11.15	6E22D012118
12/1/2008	122.71	104.76	-17.95	6E22D012119
12/2/2008	122.72	105.11	-17.61	6E22D012120
3/25/2010	123.31	106.11	-17.20	6E22D012121
10/12/2010	123.51	108.49	-15.02	6E22D012122
4/9/2013	125.42	110.69	-14.73	6E22D012123
10/18/2013	125.49	109.65	-15.84	6E22D012124
3/28/2014	125.56	108.58	-16.98	6E22D012125
3/10/2015	125.11	108.67	-16.44	6E22D012126
10/12/2015	125.02	111.49	-13.53	6E22D012127
3/23/2016	124.98	112.92	-12.06	6E22D012128
6/30/1980	139.23	142.90	3.67	6E23E012121

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/30/1987	137.69	120.34	-17.35	6E23E012122
6/30/1991	136.83	126.13	-10.69	6E23E012123
6/30/1993	137.45	128.39	-9.06	6E23E012124
6/2/1998	137.54	136.16	-1.37	6E23E012125
6/29/1999	137.12	136.86	-0.26	6E23E012126
6/5/2000	136.76	137.14	0.38	6E23E012127
6/8/2001	136.41	137.99	1.58	6E23E012128
7/29/2002	135.81	137.23	1.42	6E23E012129
7/31/2003	135.42	138.66	3.24	6E23E012130
5/13/2005	135.53	139.24	3.71	6E23E012131
3/20/2008	134.01	139.36	5.36	6E23E012132
1/9/2009	133.80	139.23	5.43	6E23E012133
3/12/2009	133.67	139.75	6.07	6E23E012134
11/14/2012	133.13	123.23	-9.90	6E23E012135
6/30/1980	139.82	145.71	5.89	6E23J012135
6/30/1987	136.98	128.33	-8.65	6E23J012136
6/30/1991	136.21	112.79	-23.42	6E23J012137
6/30/1993	138.31	131.50	-6.81	6E23J012138
6/30/1995	138.95	133.91	-5 04	6E23J012139
6/30/1997	138.49	136.96	-1.54	6E23J012140
6/2/1998	139.33	138.30	-1.03	6E23J012141
6/29/1999	139.04	137.57	-1.47	6E23J012142
6/5/2000	138.83	139.88	1.05	6E23J012143
6/8/2001	138.67	139.82	1.15	6E23J012144
7/29/2002	138.19	140.55	2.36	6E23J012145
7/31/2003	138.15	140.83	2.68	6E23J012146
2/10/2004	138.26	139.58	1.32	6E23J012147
2/12/2005	138.93	142.11	3.17	6E23J012148
5/13/2005	138.56	142.41	3.85	6E23J012149
5/21/2006	138.20	140.43	2.23	6E23J012150
3/8/2007	137.32	138.39	1.07	6E23J012151
3/10/2008	136.72	137.51	0.78	6E23J012152
12/1/2008	136.30	139.40	3.10	6E23J012153
3/25/2010	136.75	141.39	4.64	6E23J012154
10/12/2010	136.52	140.39	3.87	6E23J012155
4/9/2013	136.14	140.60	4.46	6E23J012156
10/18/2013	136.38	142.85	6.47	6E23J012157
3/10/2015	135.63	143.46	7.83	6E23J012158
10/12/2015	135.38	142.92	7.54	6E23J012159
3/23/2016	135.43	143.31	7.88	6E23J012160
5/19/2004	137.73	140.41	2.68	6E23J022154
2/10/2005	138.33	143.27	4.94	6E23J022155
2/17/2006	137.83	141.44	3.61	6E23J022156
6/12/2006	137.59	141.26	3.66	6E23J022157
9/26/2008	135.72	139.79	4.07	6E23J022158
2/26/2009	136.19	140.44	4.25	6E23J022159
12/1/2009	136.01	141.35	5.34	6E23J022160
5/4/2010	136.17	141.53	5.36	6E23J022161

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/18/2010	135.70	141.26	5.56	6E23J022162
11/18/2011	136.46	142.54	6.08	6E23J022163
4/17/2012	136.20	143.85	7.65	6E23J022164
12/21/2012	133.58	144.05	10.46	6E23J022165
4/9/2013	135.55	143.65	8.10	6E23J022166
11/13/2013	135.80	143.01	7.21	6E23J022167
11/25/2013	135.79	144.26	8.46	6E23J022168
2/5/2014	135.77	143.07	7.30	6E23J022169
4/9/2014	135.69	144.48	8.79	6E23J022170
12/9/2014	135.16	144.53	9.37	6E23J022171
3/30/2015	135.07	143.18	8.11	6E23J022172
4/15/2015	135.04	143.12	8.08	6E23J022173
11/19/2015	134.91	141.75	6.84	6E23J022174
12/23/2015	135.01	141.90	6.89	6E23J022175
4/13/2016	134.74	140.04	5.30	6E23J022176
6/30/1980	141.97	138.48	-3.49	6E25A012158
6/30/1987	141.10	140.61	-0.49	6E25A012159
6/30/1991	139.81	136.04	-3.77	6E25A012160
6/30/1993	130.48	140.31	9.83	6E25A012161
6/30/1995	140.48	144.27	3.79	6E25A012162
6/30/1997	134.17	141.92	7.75	6E25A012163
6/2/1998	140.90	142.35	1.45	6E25A012164
6/29/1999	140.69	142.72	2.03	6E25A012165
6/5/2000	139.49	142.17	2.68	6E25A012166
6/8/2001	140.44	142.01	1.57	6E25A012167
7/29/2002	134.52	141.50	6 98	6E25A012168
7/31/2003	139.31	141.13	1.82	6E25A012169
2/12/2004	140.13	143.75	3.62	6E25A012170
5/21/2006	140.55	144.54	3.99	6E25A012171
6/12/2006	140.38	144.21	3.83	6E25A012172
2/22/2007	140.17	147.43	7.26	6E25A012173
3/8/2007	140.18	144.06	3.88	6E25A012174
1/20/2008	139.36	143.87	4 51	6E25A012175
9/26/2008	137.41	146.87	9.46	6E25A012176
12/1/2008	133.93	143.56	9.63	6E25A012177
2/26/2009	139.63	146.95	7.32	6E25A012178
11/18/2010	136.72	146.95	10.23	6E25A012179
4/17/2012	139.42	144.69	5.27	6E25A012180
11/14/2012	139.36	144.76	5.40	6E25A012181
4/9/2013	139.19	145.01	5 81	6E25A012182
11/25/2013	139.15	144.87	5.72	6E25A012183
2/5/2014	139.08	147.69	8 61	6E25A012184
4/9/2014	135.65	144.57	8 91	6E25A012185
11/20/2014	127.65	143.72	16.07	6E25A012186
6/30/1980	142.34	144.36	2.02	6E25C012176
6/30/1987	140.96	126.99	-13.97	6E25C012177
6/30/1991	139.83	127.60	-12.23	6E25C012178
6/30/1993	139.45	129.12	-10.33	6E25C012179

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
6/30/1995	140.73	138.21	-2.52	6E25C012180
6/30/1997	139.87	140.22	0.34	6E25C012181
6/2/1998	141.22	141.96	0.73	6E25C012182
6/29/1999	141.06	142.84	1.78	6E25C012183
6/5/2000	140.85	141.26	0.41	6E25C012184
6/8/2001	140.84	141.53	0.69	6E25C012185
7/29/2002	139.92	140.83	0.91	6E25C012186
7/31/2003	140.30	140.92	0.62	6E25C012187
2/12/2004	140.58	141.68	1.10	6E25C012188
2/17/2006	141.24	141.80	0.56	6E25C012189
6/12/2006	141.07	143.10	2.02	6E25C012190
2/22/2007	140.60	137.79	-2.81	6E25C012191
3/8/2007	140.58	142.05	1.46	6E25C012192
3/10/2008	140.15	142.44	2.29	6E25C012193
9/26/2008	139.35	135.00	-4.35	6E25C012194
12/1/2008	138.94	125.44	-13.50	6E25C012195
2/26/2009	140.01	136.55	-3.46	6E25C012196
3/25/2010	139.88	142.01	2.13	6E25C012197
11/18/2011	141.05	144.13	3.08	6E25C012198
4/17/2012	139.98	144.72	4.74	6E25C012199
11/14/2012	139.92	145.08	5.16	6E25C012200
4/9/2013	139.75	145.32	5.57	6E25C012201
11/13/2013	139.76	145.48	5.72	6E25C012202
11/25/2013	139.73	144.87	5.14	6E25C012203
2/5/2014	139.66	145.42	5.76	6E25C012204
4/9/2014	139.22	144.57	5.35	6E25C012205
11/20/2014	137.54	143.72	6.18	6E25C012206
2/5/2015	138.77	144.03	5.26	6E25C012207
11/9/2015	137.73	142.54	4.81	6E25C012208
4/28/2016	138.73	143.61	4.88	6E25C012209
1/1/1980	146.65	146.81	0.15	6E34A012194
5/5/2005	150.60	150.03	-0.57	6E34A012195
8/23/2005	150.47	150.34	-0.13	6E34A012196
10/12/2005	150.47	150.27	-0.19	6E34A012197
1/5/2006	150.71	150.47	-0.24	6E34A012198
2/22/2006	150.66	150.26	-0.40	6E34A012199
6/12/2006	150.48	150.35	-0.13	6E34A012200
2/22/2007	150.01	150.59	0.58	6E34A012201
2/13/2008	149.32	150.90	1.58	6E34A012202
12/1/2008	148.75	151.19	2.44	6E34A012203
3/25/2009	149.09	151.21	2.12	6E34A012204
11/13/2013	147.23	151.90	4.67	6E34A012205
11/20/1953	141.61	138.29	-3.32	7E07N012205
2/24/1954	141.57	138.44	-3.13	7E07N012206
11/8/1954	141.52	138.04	-3.48	7E07N012207
3/7/1955	141.52	138.21	-3.31	7E07N012208
11/29/1955	141.39	137.85	-3.54	7E07N012209
3/18/1956	141.12	137.96	-3.16	7E07N012210

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/16/1956	140.97	137.65	-3.32	7E07N012211
3/14/1957	140.87	137.47	-3.40	7E07N012212
11/27/1957	140.71	137.38	-3.32	7E07N012213
3/15/1958	140.57	137.52	-3.05	7E07N012214
11/4/1958	140.40	137.06	-3.34	7E07N012215
3/12/1959	140.22	137.27	-2.95	7E07N012216
11/24/1959	140.01	136.85	-3.16	7E07N012217
2/28/1960	140.01	136.98	-3.03	7E07N012218
11/22/1960	139.70	136.86	-2.84	7E07N012219
3/8/1961	139.53	136.95	-2.57	7E07N012220
10/26/1961	139.25	136.66	-2.60	7E07N012221
3/15/1962	139.14	136.75	-2.38	7E07N012222
11/2/1962	138.88	136.48	-2.41	7E07N012223
3/15/1963	138.74	136.56	-2.18	7E07N012224
3/20/1964	138.58	136.48	-2.10	7E07N012225
11/13/1964	138.36	135.38	-2.99	7E07N012226
3/19/1965	138.21	135.31	-2.91	7E07N012227
10/25/1965	138.00	136.09	-1.91	7E07N012228
10/3/2008	129.88	126.68	-3.20	7E07R012229
12/1/2008	129.81	127.17	-2.63	7E07R012230
12/4/2008	129.80	127.07	-2.73	7E07R012231
11/18/2010	128.69	126.26	-2.43	7E07R012232
11/14/2012	127.58	125.85	-1.73	7E07R012233
4/9/2013	127.34	125.84	-1.50	7E07R012234
11/13/2013	127.01	125.66	-1.35	7E07R012235
4/9/2014	126.76	125.62	-1.14	7E07R012236
4/15/2015	126.15	125.44	-0.71	7E07R012237
11/19/2015	125.81	125.25	-0.56	7E07R012238
3/23/2016	125.60	125.24	-0.36	7E07R012239
10/3/2008	129.88	126.68	-3.20	7E07R022231
12/1/2008	129.80	127.16	-2.65	7E07R022232
12/4/2008	129.80	127.06	-2.74	7E07R022233
1/12/2010	129.19	126.45	-2.74	7E07R022234
11/18/2010	128.69	126.26	-2.43	7E07R022235
11/14/2012	127.58	125.85	-1.73	7E07R022236
4/9/2013	127.34	125.84	-1.50	7E07R022237
11/13/2013	127.00	125.66	-1.34	7E07R022238
4/9/2014	126.76	125.62	-1.14	7E07R022239
4/15/2015	126.15	125.44	-0.71	7E07R022240
11/19/2015	125.81	125.26	-0.55	7E07R022241
3/23/2016	125.60	125.24	-0.36	7E07R022242
2/18/1953	147.06	151.91	4.85	7E20P012233
12/9/1953	146.91	149.80	2.90	7E20P012234
2/23/1954	146.84	151.61	4.77	7E20P012235
2/24/1954	146.84	151.68	4.84	7E20P012236
11/8/1954	146.75	148.99	2.24	7E20P012237
3/7/1955	146.66	149.58	2.92	7E20P012238

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
11/29/1955	146.55	148.69	2.14	7E20P012239
3/18/1956	146.44	151.08	4.63	7E20P012240
11/16/1956	146.35	151.39	5.04	7E20P012241
3/15/1957	146.26	151.72	5.46	7E20P012242
11/27/1957	146.17	152.00	5.83	7E20P012243
11/4/1958	146.00	152.00	6.00	7E20P012244
3/12/1959	145.88	152.13	6.25	7E20P012245
11/24/1959	145.79	152 26	6.47	7E20P012246
2/28/1960	145.73	152.31	6 58	7E20P012247
11/23/1960	145.61	152.34	6.73	7E20P012248
3/8/1961	145.51	152.37	6.87	7E20P012249
10/26/1961	145.42	152.42	7.00	7E20P012250
3/15/1962	145.31	152.44	7.13	7E20P012251
11/1/1962	145.22	152.43	7.21	7E20P012252
3/14/1963	145.11	152.46	7.35	7E20P012253
10/31/1963	145.08	152.47	7.39	7E20P012254
3/20/1964	144.95	152.54	7.59	7E20P012255
11/13/1964	144.90	152.35	7.45	7E20P012256
3/19/1965	144.79	152.25	7.46	7E20P012257
7/28/1965	144.76	152.33	7.58	7E20P012258
10/25/1965	144.73	152.32	7.59	7E20P012259
3/4/1966	144.67	152.04	7.36	7E20P012260
10/26/1966	144.61	152.23	7.62	7E20P012261
3/23/1967	144.50	152.20	7.70	7E20P012262
10/24/1967	144.45	152.13	7.68	7E20P012263
3/12/1968	144.35	152.13	7.78	7E20P012264
11/8/1968	144.28	152.11	7.83	7E20P012265
3/27/1969	144.18	152.04	7.86	7E20P012266
10/28/1969	144.11	151.97	7.86	7E20P012267
3/23/1970	144.01	149.94	5.93	7E20P012268
11/10/1970	143.93	151.88	7.95	7E20P012269
3/30/1971	143.82	151.85	8.03	7E20P012270
12/1/2008	139.98	151.95	11.97	7E20P012271
12/5/2008	139.99	152.09	12.10	7E20P012272
3/13/2009	139.99	151.95	11.96	7E20P012273
12/1/2008	141.32	147.40	6.08	7E30G042274
12/4/2008	141.33	147.73	6.40	7E30G042275
11/2/1952	152.60	152.37	-0.23	7E32Q012276
12/10/1953	152.48	154.51	2.03	7E32Q012277
11/10/1954	152.26	154.47	2.22	7E32Q012278
7/29/1965	150.46	153.22	2.76	7E32Q012279
2/20/1980	148.98	151.81	2.83	7E32Q012280
12/5/2008	149.28	153.28	4.00	7E32Q012281
3/12/2009	148.32	147.87	-0.46	7E03M022282
6/4/2007	127.99	199.11	71.13	6E31E030001
1/8/2008	126.78	197.63	70.85	6E31E030002

Attachment C. Residuals

Date	SIMULATED EQUIVALENT (meters)	OBSERVED VALUE (meters)	Residual (Observed - Simulated)	OBSERVATION NAME
5/8/2008	126.91	196.69	69.78	6E31E030003
8/11/2008	126.83	197.64	70.82	6E31E030004
8/12/2008	126.82	196.66	69.84	6E31E030005
12/5/2008	126.06	197.64	71.59	6E31E030006
5/13/2009	125.35	197.01	71.66	6E31E030007

APPENDIX D2

BWD Water Quality Review and Assessment

WATER QUALITY REVIEW AND ASSESSMENT: BORREGO WATER DISTRICT (BWD) WATER SUPPLY WELLS

OVERVIEW

The purpose of this Report is to review water quality data for active Borrego Water District (BWD) water supply production wells to

1) Provide an overview of water quality conditions among the wells and assess spatial variations;
2) Examine how water quality has changed over time due to overdraft;
3) Evaluate the potential relationships among multiple water quality parameters as a means to support trend analyses for the five primary chemicals of concern (COCs) that include arsenic, total dissolved solids (TDS), nitrate, sulfate, and fluoride (As, TDS, NO_3, SO_4, and F);
4) Determine how well water quality trends may (or may not) be able to be identified among BWD water supply wells; and,

The Borrego Springs Subbasin (Subbasin) of the Borrego Valley Groundwater Basin is in a state of critical overdraft and subject to the Sustainable Groundwater Management Act (SGMA). As defined under SGMA[1] "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts."

Pursuant to SGMA a Groundwater Sustainability Plan (GSP) is currently under development for the Subbasin. This work updates and extends beyond prior work done by Dudek to assess water quality trends for BWD wells as described in the Draft Borrego Springs Subbasin Groundwater Quality Risk Assessment presented to the BWD Board on 6/28/2017.[2]

The analyses included herein will be used in subsequent ENSI reports to examine potential BWD water supply impacts and costs associated with current and future water quality conditions.

[1] See: https://water.ca.gov/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins

[2] The data used in the Report were located and compiled by Dudek staff as part of the GSP preparation process. The analyses presented in this Report would not have been possible without their support.

Preparation of the GSP is underway and it is understood that the draft GSP will be available for public review by January 2019[3]. The GSP will include a range of potential options for Projects and Managements Actions (PMAs), including PMAs to address water quality and water quality optimization. Among the direct impacts of degraded groundwater quality to BWD include:

- Need for Water Treatment to achieve drinking water standards (on a per well basis)
- Impact of water quality on the choice and design of replacement wells at existing well locations
- Potential need for Intra-Subbasin Transfer of Potable water from new or existing wells due to degraded water quality due to natural or anthropogenic sources

Groundwater quality data also have a role in the assessment of potential water management options that include but are not limited to:

- Options for Enhanced Natural Recharge (understood to be limited)[4]
- Artificial Recharge using Treated Wastewater

Of primary concern to BWD is the ability of historical data combined with ongoing water quality monitoring program to assess water quality trends. The data are needed to support management of their water system, for example to assess the probability of MCL (maximum contaminant level) exceedances and to plan for water treatment, if needed.

[3] The GSP is being developed by the Groundwater Sustainability Agency (GSA) that consists of the County of San Diego and the Borrego Water District. See overview at: https://www.sandiegocounty.gov/pds/SGMA.html
[4] It is understood that that recharge basins within the floodplains where much of Borrego Springs' residential population is located are likely not permittable due to County Flood Control Management concerns. Similarly managed artificial recharge areas located along mountain fronts within or nearby to the Anza Borrego State Park are also not likely permittable given their potential impact on the State Park.

This report includes the following sections:

1.0 HYDROLOGIC CONDITIONS

A brief summary of the hydrologic conditions of the Subbasin is provided here to support review of the water chemistry data. Included is a description of groundwater recharge, pre- and post-development groundwater levels, and aquifer conditions. Many of the figures and much of the discussion included in this section was derived from the USGS Model Report prepared in 2015 entitled *Hydrogeology, hydrologic effects of development, and simulation of groundwater flow in the Borrego Valley, San Diego County, California*: U.S. Geological Survey Scientific Investigations Report 2015–5150[5]. For reference the *simulation of groundwater flow* refers to the use of a numerical model (in this case the USGS Modflow Model as described in the 2015 report) to examine the groundwater levels, recharge, and overall hydrologic conditions for the period of 1945 to 2010. The GSP contains additional detailed hydrologic information, and updates the USGS modeling work.

1.1 Basin Location and Setting: Contributory Watersheds

The Borrego Springs Subbasin (Subbasin) of the Borrego Valley Groundwater Basin is located at the western-most extent of the Sonoran Desert. The primary source of water to the Subbasin is surface water (storm water and ephemeral stream flow) that flows into the valley from adjacent mountain watersheds and infiltrates within the valley. The contributory watersheds are approximately 400 square miles (mi^2) and much larger in area than the approximately 98mi^2 Subbasin as illustrated in **Figure 1**.

Direct recharge by rainfall within the valley is very low compared to surface water inflows as the annual rainfall averages 5.8 inches per year (in/yr.) [USGS Model Report, page 43]. Stream and flood flows from the adjacent watersheds provide the bulk of the water that enters the Subbasin.

[5] Referenced herein as the "USGS Model Report": Faunt, C.C., Stamos, C.L., Flint, L.E., Wright, M.T., Burgess, M.K., Sneed, Michelle, Brandt, Justin, Martin, Peter, and Coes, A.L., 2015, Hydrogeology, hydrologic effects of development, and simulation of groundwater flow in the Borrego Valley, San Diego County, California: U.S. Geological Survey Scientific Investigations Report 2015–5150, 135 p.
See: http://dx.doi.org/10.3133/sir20155150

FIGURE 1 (from USGS Model Report)

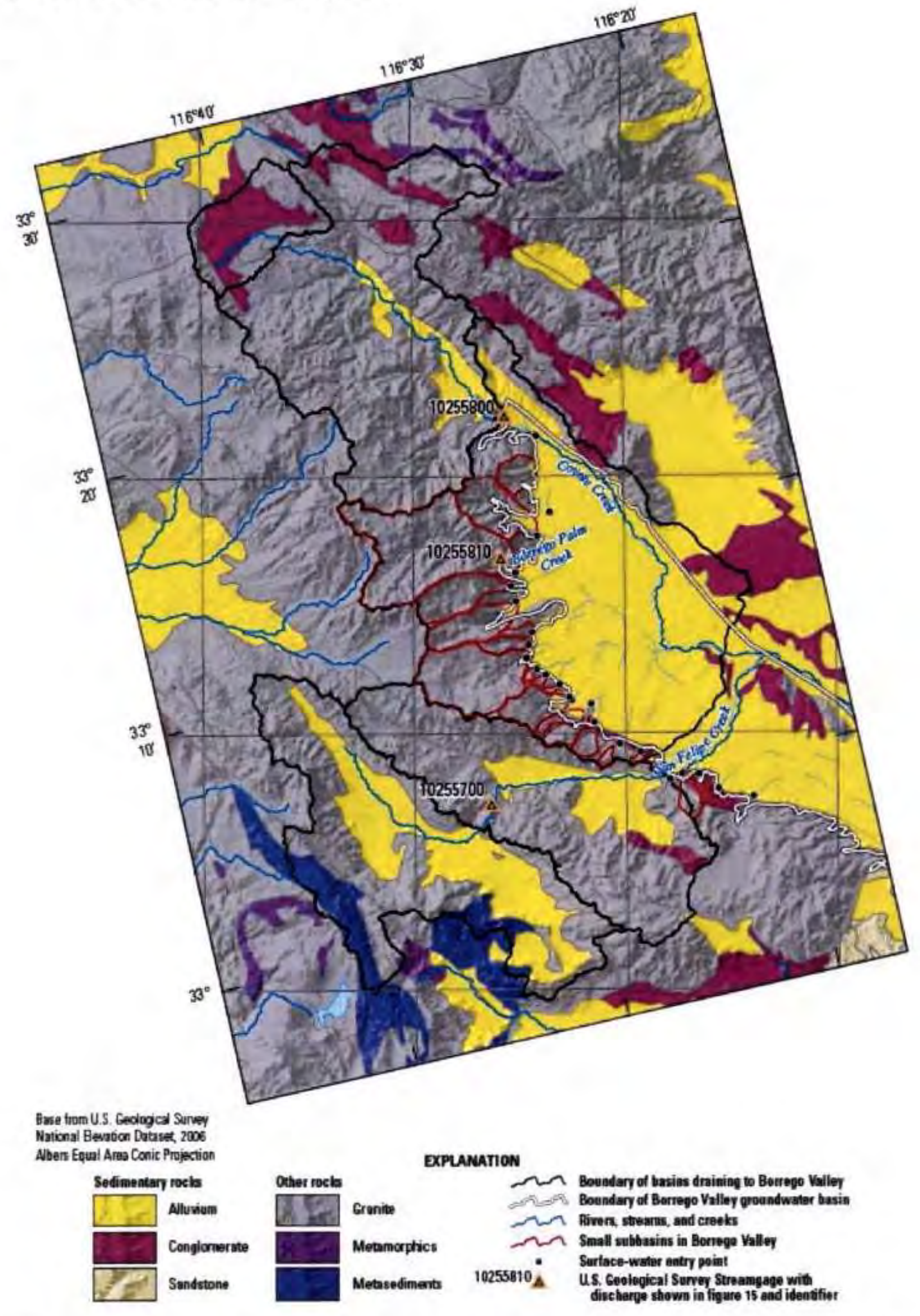


Figure 16. Drainage basin boundaries and geology used in the Basin Characterization Model to estimate climate-driven natural recharge in the Borrego Valley, California.

Note: The Subbasin lies within the area defined by alluvium. The tributary watersheds (e.g. that support Coyote Creek, Borrego Palm Creek, and San Felipe Creek) are outside of the Subbasin.

1.2 Historical Groundwater Conditions

The Subbasin receives recharge waters from the adjacent watersheds that include Coyote Creek, watersheds along the northwestern edge of the valley such as Borrego Palm Canyon, and San Felipe Creek that enters the south side of the valley (**Figure 1**).

Two water level maps from the USGS Model Report are included in **Figures 2A** and **2B** that depict pre- and post- development water levels (1945 and 2010). In both cases the Subbasin can be generally described as "closed" where surface water flows typically do not discharge from the valley but instead, if sufficient flows occur, terminate at the Borrego Sink.

Prior to development (**Figure 2A**) groundwater flow within the northern and central portions of the valley can generally be described as moving from northwest to southeast towards the Borrego Sink. Flow in the southern portion of the Subbasin is directed northeast towards the Borrego Sink. Pumping since 1945 has lowered groundwater levels and led the development of significant depressions of the water table associated with 'pumping centers' (see **Figure 2B**). From a groundwater perspective the overall flow patterns in the northern and central areas of the valley have changed from a roughly uniform flow (generally towards the Borrego Sink) to a condition where groundwater flow is reversed in some areas and now flows toward the pumping centers. The rate of pumping has greatly exceeded groundwater recharge rates and water levels have dropped well over 100 feet in some areas. Because the current rate of groundwater use continues to cause significant water level decline and loss of water from subsurface storage the Subbasin is now classified as being in critical overdraft.

Further description of historical and current groundwater conditions is included in the GSP.

FIGURE 2A (from USGS Model Report)

44 Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley

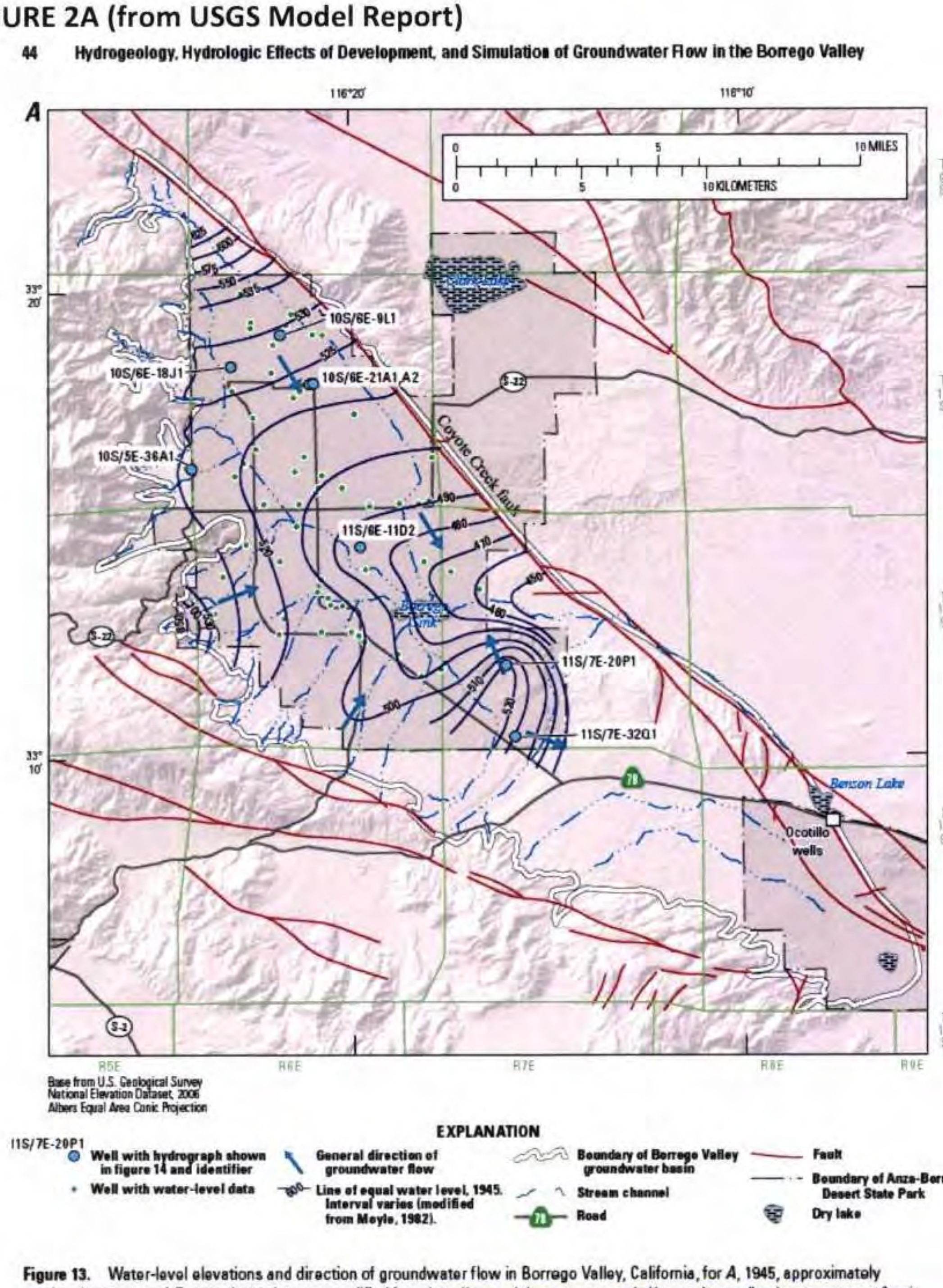


Figure 13. Water-level elevations and direction of groundwater flow in Borrego Valley, California, for *A*, 1945, approximately predevelopment, and *B*, 2010. (2010 data are modified from http://www.dpla.water.ca.gov/sd/groundwater/basin_assessment/basin_assment.html).

Note: The arrows indicating groundwater flow are roughly coincident with intermittent surface water channels (dashed blue lines) that enter from adjacent watersheds and flow towards the Borrego Sink.

FIGURE 2B (from USGS Model Report)

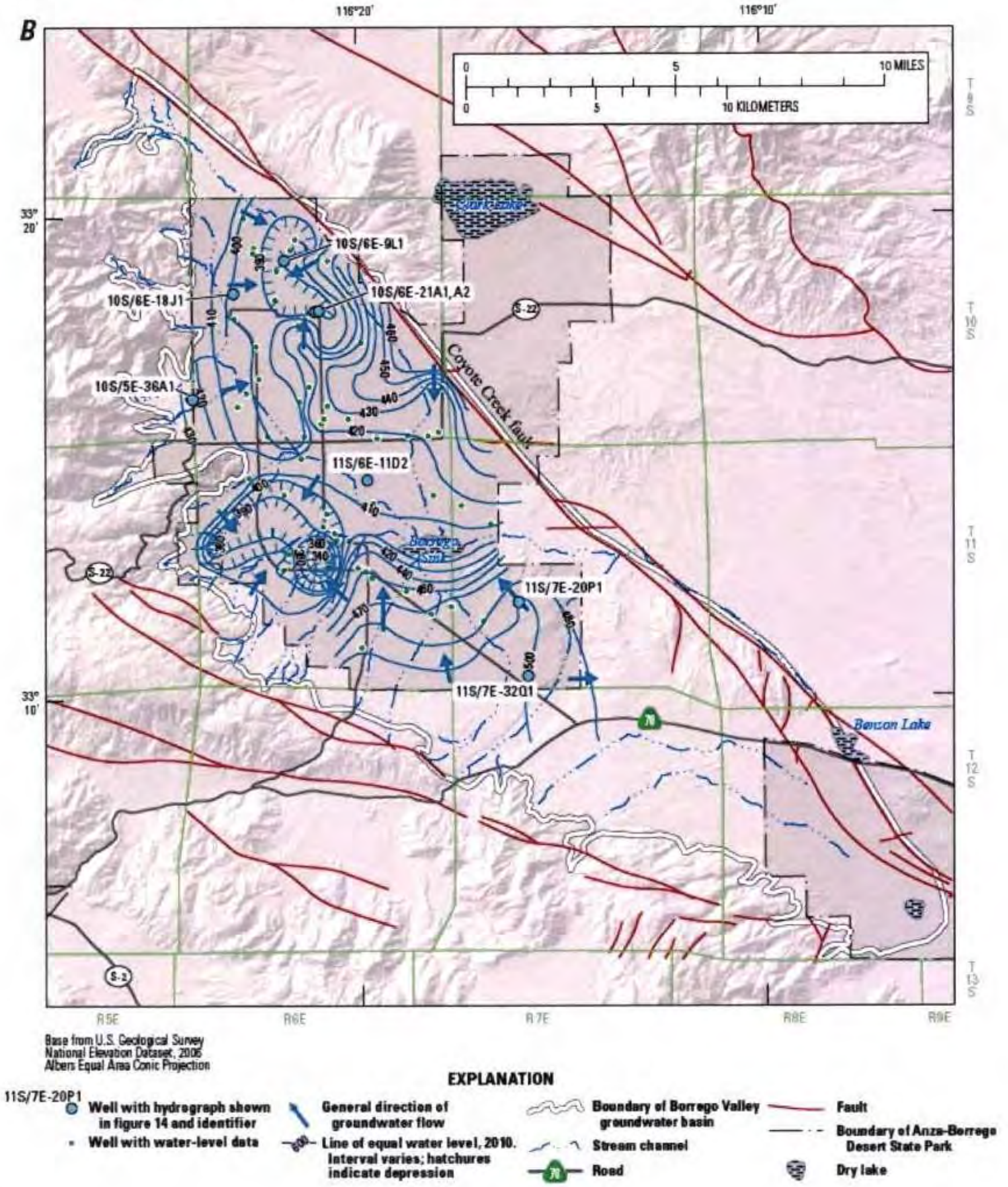


Figure 13. —Continued

NOTE: Hachured areas show the two major pumping centers in the Subbasin. The influence of northern pumping center has caused groundwater to reverse flow direction (see arrow at well 10S/6E-21A1). The central pumping center captures groundwater that was previously flowing south and southeastward towards the Borrego Sink.

1.3 Stratigraphy and Aquifer Conceptual Model

The current conceptual model for the aquifer system as incorporated in the USGS Model is that it consists of three unconfined aquifers named the upper, middle and lower aquifers. The upper and middle aquifers are the primary sources of water currently and are typically comprised of unconsolidated sediments. However, with time, the upper aquifer has become or is expected to become dewatered and the lower aquifer will become a more important source of water as overdraft continues.

The lower aquifer sediments become consolidated with depth and have been subject to folding and faulting. The lower aquifer provides water supply for some pumpers, especially in the southern area of the Subbasin. **Figure 3** (Figure 7 of the USGS Model Report) depicts the Borrego Valley Groundwater Basin as described by Moyle, 1982.[6] Additional work has been done by Mitten et al (1989),[7] and by Netto (2001).[8] Of these, Netto (2001) provides the most detailed analysis of basin stratigraphy based on well log review and interpretation. Review of their work supports that locally confined aquifer conditions are expected to occur.

In brief there are a number of geologic features relevant to groundwater conditions and water quality:

- The Subbasin, as exemplified by the flow of water and sediment toward the current-day Borrego Sink, has historically been the locus of sediment deposition. Sedimentation initially occurred in a marine environment (with sediment sources located to the east) and transitioned to terrestrial environments as seen today.[9]
- The Borrego Sink, similar to dry lake beds that occur in the desert, is a location where water evaporates and minerals will accumulate and can form evaporite deposits. Historically similar conditions occurred as sediments were deposited. Thus, the middle and upper aquifers have the potential to include evaporite deposits that can re-dissolve and lead to elevated concentrations of sulfates and carbonates that result in corresponding increase in TDS.

---

[6] Moyle, W. R., 1982, Water resources of Borrego Valley and vicinity, California; Phase 1, Definition of geologic and hydrologic characteristics of basin: U.S. Geological Survey Open-File Report 82–855, 39 p.
[7] Mitten, H.T., Lines, G.C., Berenbrock, Charles., and Durbin, T.J., 1988, Water resources of Borrego Valley and vicinity, California, San Diego County, California; Phase 2, Development of a groundwater flow model: U.S. Geological Survey Water-Resources Investigation Report 87–4199, 27 p.
[8] Netto, S.P., 2001, Water Resources of Borrego Valley San Diego County, California: Master's Thesis, San Diego State University, 143 p.
[9] See GSP. For general reference see: Dorsey, R.J., 2005. Stratigraphy, Tectonics, and Basin Evolution in the Anza-Borrego Desert Region. In "Fossil Treasures of the Anza-Borrego Desert", George T. Jefferson and Lowell Lindsay, editors, Sunbelt Publications, San Diego California, 2006
https://pages.uoregon.edu/rdorsey/Downloads/DorseyChaperNov05.pdf

- Structural features such as the Coyote Creek Fault, the Desert Lodge anticline, and the effect of basement uplift and exposure of lower aquifer sediments along the southeastern portion of the Subbasin (cross-section A-A' in **Figure 3**) limit groundwater flow within and out of the basin. The Coyote Creek Fault is assumed to be a 'no flow' boundary condition in the USGS Groundwater Model and as such serves to contain groundwater within the basin and direct flow to the southeast towards the Borrego Sink. The current-day topography combined with the geologic structure creates a 'closed' groundwater condition where ongoing evaporation of water will lead to the long-term accumulation of minerals (often referred to as 'salts') in soil and groundwater.
- While the lower aquifer is quite deep and contains a significant volume of groundwater, the sediments have less storage capacity than the upper and middle aquifers as quantified in the USGS Model by lower specific storage and specific yield. The lower aquifer is also expected to have poor water quality with depth.
- Waters that flow into the Subbasin from the adjacent watersheds will have varying chemistry depending on the geologic and hydrologic conditions encountered in the watersheds. For example, water that flows in Borrego Palm Creek from nearby crystalline rock of the San Ysidro Mountains (see **Figure 1**) will be different than the waters of San Felipe Creek that drain from an alluvial desert valley and more likely to accumulate dissolved minerals.

Please refer to the GSP for additional details.

FIGURE 3

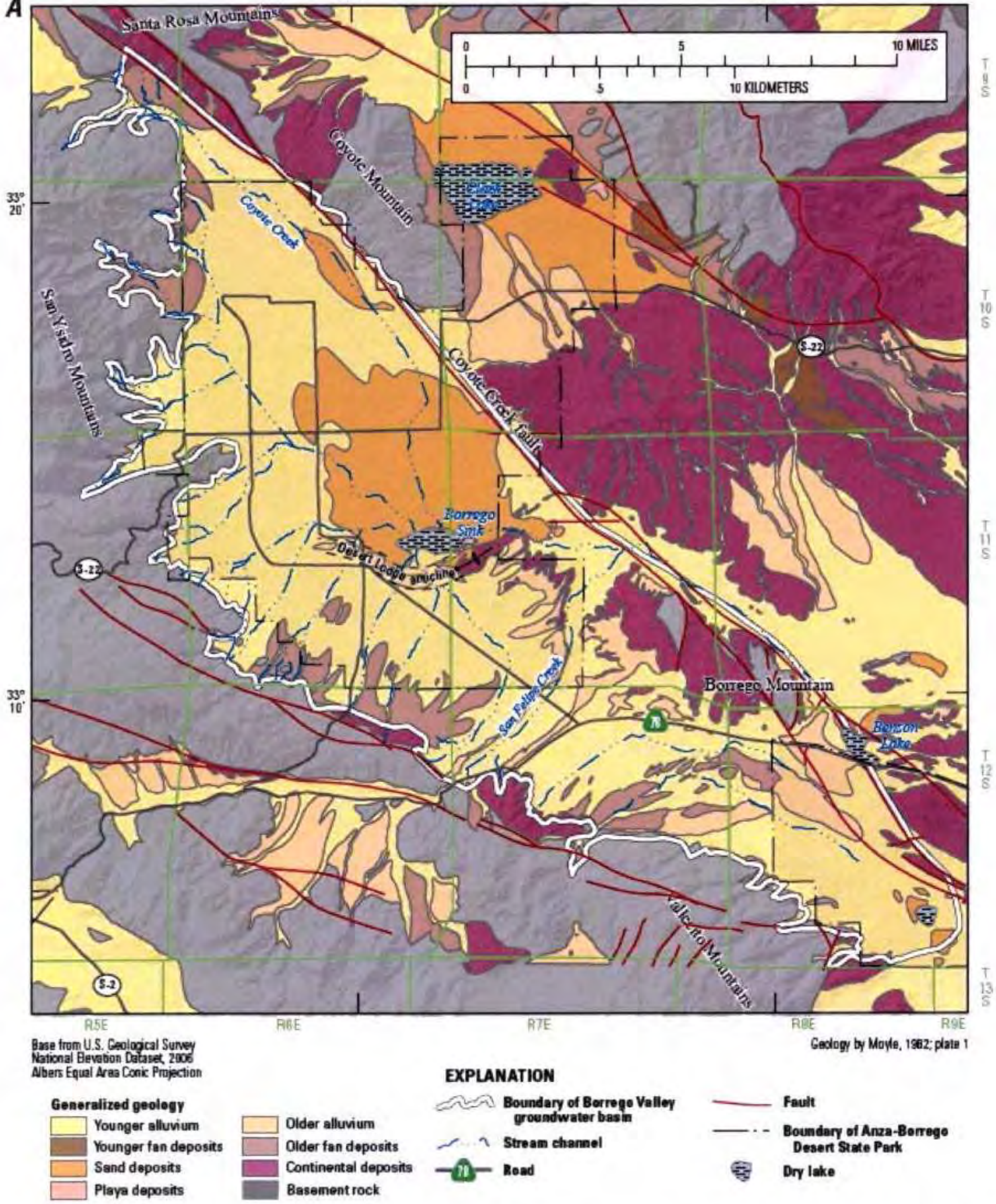


Figure 7. Maps showing Borrego Valley, California, showing *A*, geology; *B*, hydrogeology; and *C*, generalized hydrogeologic cross sections A-A' and B-B'. (Lines of section are shown in figure 7B.)

FIGURE 3, continued

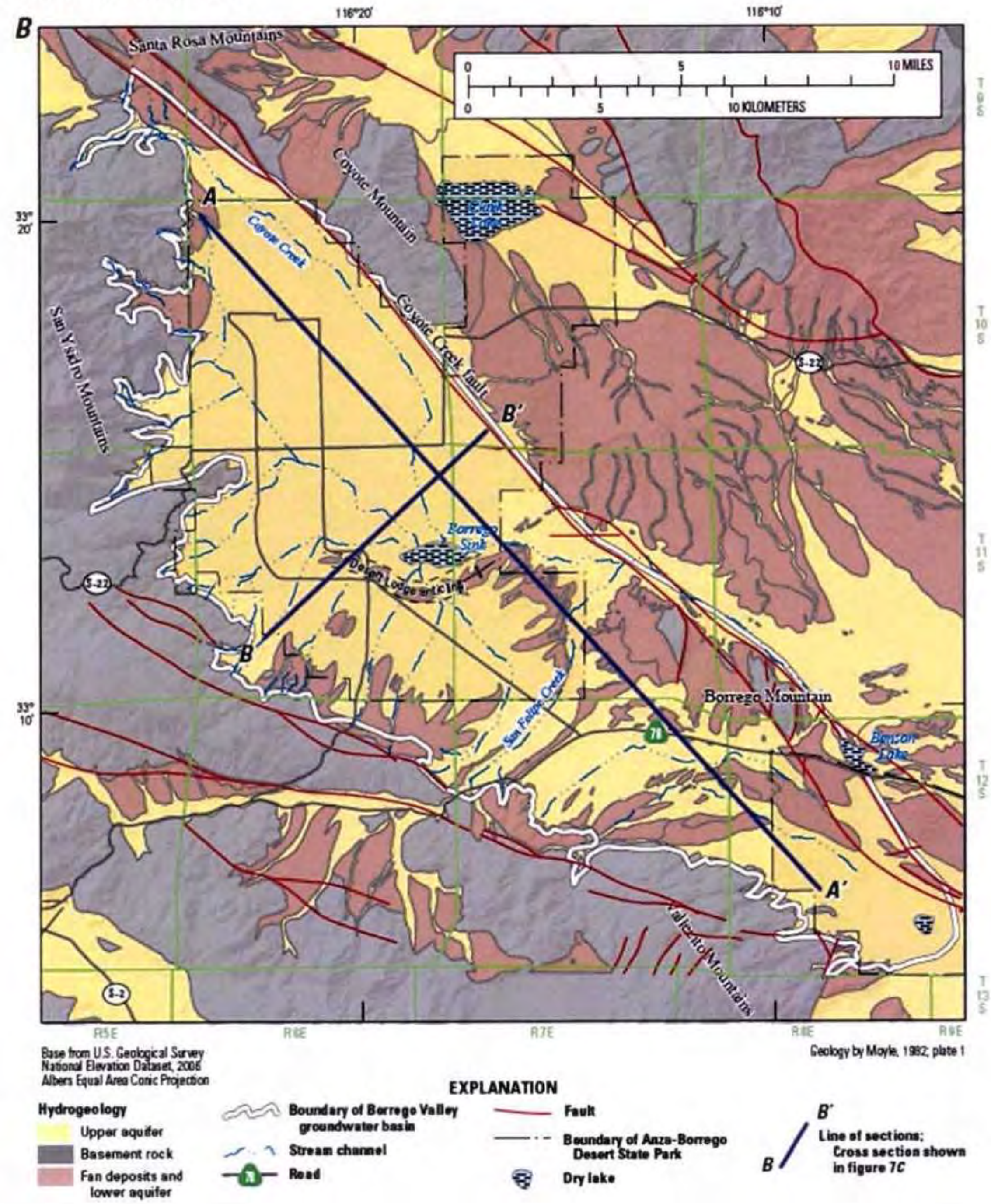
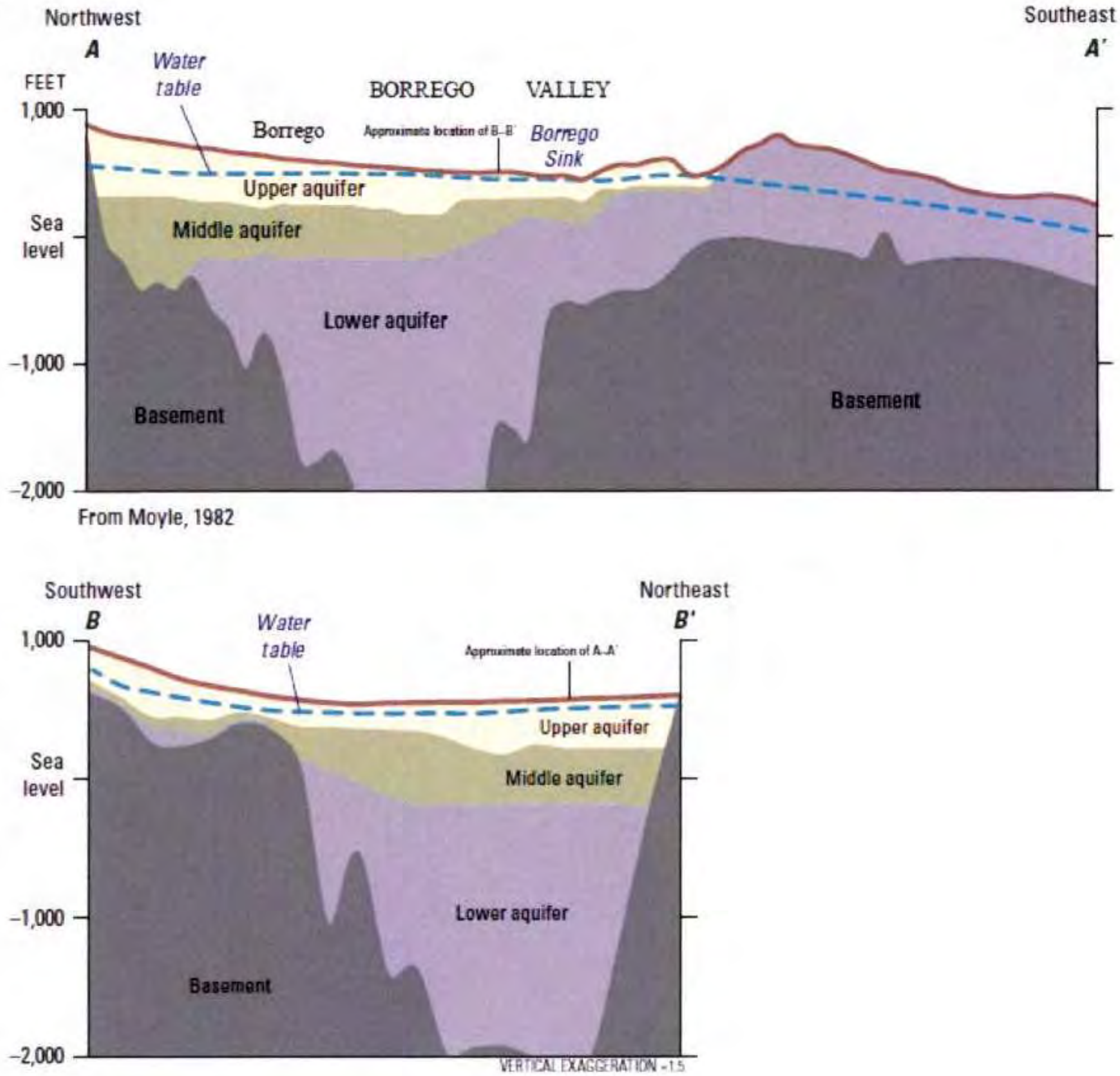


Figure 7. —Continued

FIGURE 3, continued

C



2.0 WELLS AND DATA USED IN THIS ANALYSIS

A total of 23 wells were included in this water quality analysis. Of these eight are active BWD supply wells and a ninth is used for emergency supply. The data for the wells were compiled and tabulated by Dudek staff as part of the GSP preparation process.

It is important to note that the wells were typically completed with long screened sections and can be open to flow from the upper, middle, and/or lower aquifers depending on the well construction, current groundwater levels, and well hydraulics. As a result, the data were not segregated by aquifer or depth.

Table 1A lists the active BWD wells and indicates the time periods when general minerals data were obtained. The wells have been segregated into three management areas (North, Central, and South) as established in prior work by Dudek.

TABLE 1A: BWD Water Supply Wells

Plot ID	Area	Well Name	GSA GWM Well	Year Inst.	gpm	Static Water Level (ft)	Draw Down (ft)	gpm/ft ***	Plant Eff.****	Well Depth (ft)	Sampling Period	
											start	end
4	North	ID4-4*	Yes	1979**	365	205.4	63.5	6	71	802	1954**	2017
5		ID4-11	Yes	1995	620	223.2	5.8	107	73	770	1995	2017
2		ID4-18*	Yes	1982	130	311.2	7.6	17	50	570	1984	2017
14	Central	ID1-10*	Yes	1972	317	213.9	11.5	28	54	392	1972	2017
9		ID1-12	No	1984	890	145.5	10.4	86	72	580	1988	2018
12		ID1-16	Yes	1989	848	230.9	24.3	35	71	550	1993	2016
8		ID5-5	Yes	2000	542	182.1	16.1	34	62	700	2004	2016
13		Wilcox	Yes	1981	205	305.2	5.8	35	NA	502	2000	2017
15	South	ID1-8	Yes	1972	448	71.2	47.7	9	51	830	1972	2018
	Notes:	Data from 2018 Pump Check Results (in Dudek New Wellsite Feasibility Report, in process)										
		*, wells being considered for replacement (3)										
		**, ID4-4 was redrilled in 1979.										
		***, gpm/ft calculated from Pump Check data										
		****, Plant Efficiency from Pump Check, in percent. Values less than 60% are viewed to be of concern.										

The 'plot ID' listed in **Tables 1A and 1B** supports the map-based location of the wells and roughly proceeds from north to south.

TABLE 1B

Plot ID (Figure 7)	Management Area	In GWM program?	TDS (500/1000 mg/L)	F (2 mg/L)	NO3 (as N, 10 mg/L)	SO4 (250/500 mg/L)	As (10 ug/L)	Well Name		gpm	TD (msl)	Year Inst.	notes	anion/cation trend over time (see Piper Diagram)
		Water Quality: 2Q 2018 (MCL as indicated)												
3	North	-					<2	ID4-3	IA	no data			last tested 2007	Percent Sulfate Increased, may be stable; Calcium has been variable
4		yes	330	0.16	0.5	110	2.2	ID4-4	A*	365	-204	1979	(redrilled 1979)	Fairly stable (new well),
1		-					0	ID4-7/ Anza#4	IA	no data			last tested 1983	Percent Sulfate Increased (1973 to 1983)
5		yes	380	0.23	0.56	90	1.2J	ID4-11	A	620	-156	1995		Fairly stable
2		yes	630	0.87	0.54	270	<1.2	ID4-18	A*	130	-121	1982		Percent Sulfate Increasing
14	Central	yes	340	0.48	1.3	67	2.8	ID1-10	A*	317	-203	1972		Variable over time, no clear trend
9		yes	300	0.35	0.34	95	2.5	ID1-12	A	890	-48	1984		Fairly stable
12		yes	300	0.44	1	58	2.0	ID1-16	A	848	40	1989		Fairly stable
7A		-					<3	ID4-1	IA	no data			last tested 1980	Becoming more Calcium dominant (last gen min data 1980)
10		-					2.3	ID4-2	IA	no data			last tested 2010	Large change in 2010 (dec Sodium), no recent data to assess trend
7		-					2	ID4-5	IA	no data			last tested 1994	Limited data to assess trend
11		-					<2	ID4-10	IA	69?	200	1989	last tested 2012	Fairly stable
8		yes	330	0.8	0.39	100	2.1	ID5-5	A	542	-124	2000		Percent Sulfate Increased (2001 to 2013), may now be stable
6		-					6.4	Cocopah	A	1166	-393	2005	last tested 2013	Limited data to assess trend
13		yes	230	0.64	1.00	19	3.8	Wilcox	(A)	205	198	1981		Increasing bicarbonate, decreasing Calcium
20	South	yes	1600	0.18	0.76	700	<1.2	ID1-1	IA	200	-75	1972		Major changes 1972 to 2017: Increasing sulfate and Calcium; dec bicarbonate
21		yes	320	0.49	2.9	36	5.5	ID1-2	IA	200	-157	1972		Major changes 1972 to 2017: Increasing bicarbonate
15		yes	490	0.62	1.6	86	4	ID1-8	A	448	-335	1972		Increasing Sulfate and Chloride, Increasing Calcium
22		yes	830	0.56	0.5	350	15	Jack Crosby	(A)	10	194	2004		Limited data to assess trend
-		yes	640	0.37	20	100	2.5	WWTP	mw	mw	404	2009		Gen min data failed QA/ not assessed
16		yes	nm	nm	nm	nm	15	RH-3 (2017 data)	A	230	-323	2014		Limited data to assess trend
17		yes	400	1	0.49	110	6.3	RH-4	A	260	-147	2014		Limited data to assess trend
18		yes	480	1.3	3.6	100	15	RH-5	A	350	-169	2015		Increasing Bicarbonate
19		yes	330	1.2	3.3	31	13	RH-6	A	350	-312	2015		Limited data to assess trend
-		yes	450	0.51	1.2	76	2.8	MW-3	mw	mw	197	2005		Limited data to assess trend

xx exceeds the MCL

note: Secondary MCLs apply to TDS and Sulfate Reccomended and maximum values are listed for TDS and Sulfate

A* active BWD Production Well, * indicates wells currently slate for replacement due to condition

A active non-BWD Production Well

IA inactive BWD Well

mw Monitoring Well

Figure 4 shows the well locations and names used in this Report. Review of **Figure 4** shows that the well locations are spatially biased along the western portion of the valley and the Subbasin. This is because the BWD wells are located in populated areas within their historical service areas (or Improvement Districts [ID] as indicated by the well names).

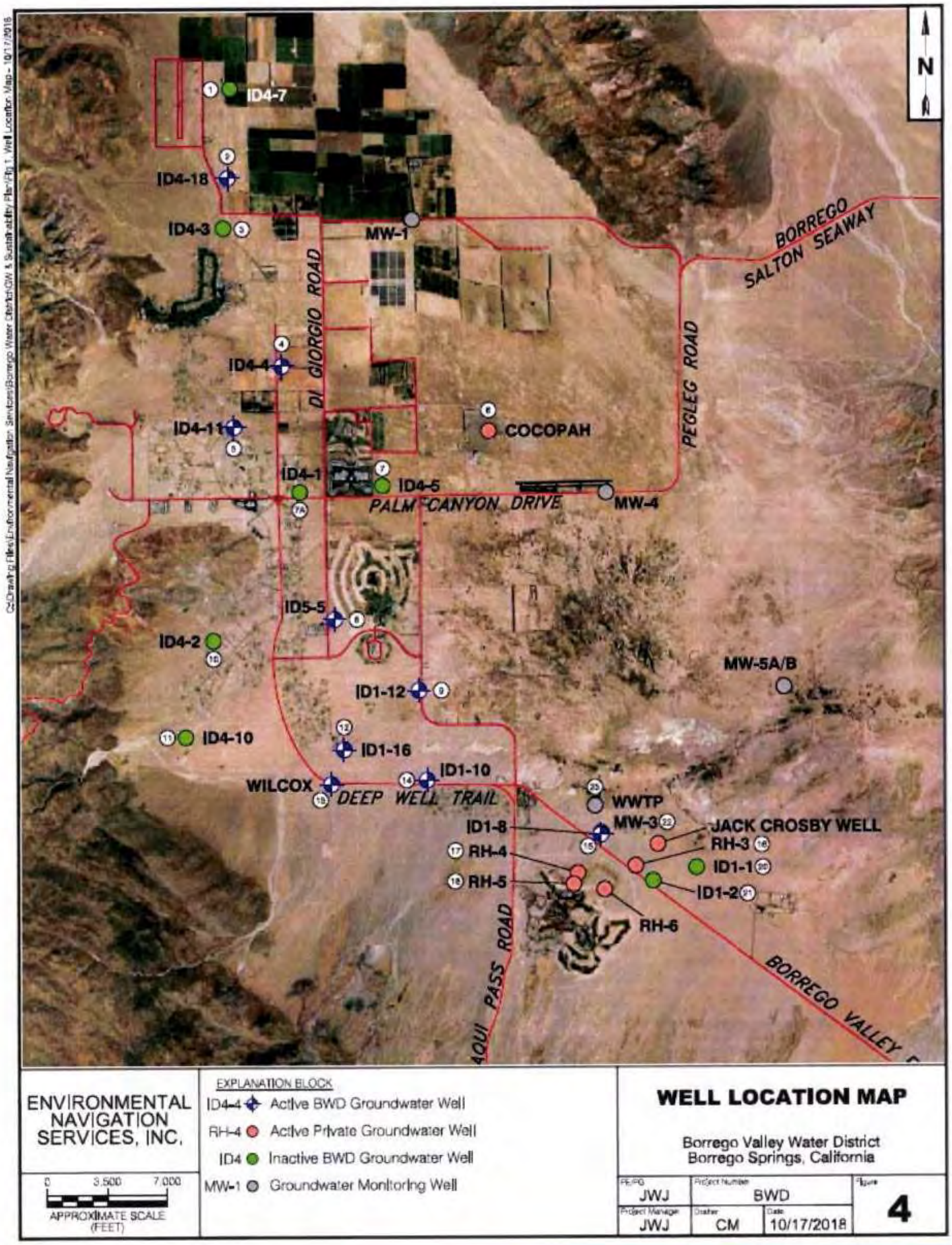
The analytical data used in the Report were located and compiled by Dudek staff from multiple sources as part of the GSP preparation process. The data base used here is from July 2018- the GSP data base is updated and revised on an ongoing basis. This Report focuses on:

- Chemicals of Concern (COCs) that include arsenic, TDS, nitrate, sulfate, and fluoride (As, TDS, NO_3, SO_4, and F).
- General Minerals: comprised of four cations- calcium (Ca^{+2}), sodium (Na^{+}), magnesium (Mg^{+2}), and potassium (K^{+}); and four anions- sulfate (SO_4^{-2} [also a COC]), chloride (Cl^{-}), carbonate (CO_3^{-2}) and bicarbonate (HCO_3^{-}).
- Hardness and pH.

The overall intent of this Report is to assess the use of multiple water quality parameters to examine how the primary COCs at BWD wells vary over time and to examine the likelihood that drinking water quality criteria will be exceeded. Of primary concern are arsenic and nitrate. Sulfate is also of concern.

Other COCs not examined in this Report include pesticides, herbicides, naturally-occurring radionuclides, and unregulated contaminants for which monitoring is required. Per State Law the Borrego Water District tests their water supply wells in accordance with California Code of Regulations Title 22 for a wide variety of potential contaminants because they operate a publicly-regulated water system. For additional information refer to their Consumer Confidence Report (CCR, available at http://www.bvgsp.org/sgma-blank.html).

FIGURE 4



January 2020

3.0 SUBBASIN-WIDE WATER QUALITY: GENERAL MINERALS, ARSENIC, AND NITRATE

The term "general minerals" is a descriptor that includes the eight anions and cations that typically comprise most of the minerals, by mass, dissolved in groundwater. Anions are negatively charged and cations are positively charged. The eight dominant ions include four cations- calcium (Ca^{+2}), sodium (Na^{+}), magnesium (Mg^{+2}), and potassium (K^{+}); and four anions- sulfate ($SO4^{-2}$), chloride (Cl^{-}), carbonate ($CO3^{-2}$) and bicarbonate ($HCO3^{-}$). Of these, sulfate is a COC. TDS is also a COC and represents the sum all of the anions and cations in solution.

Table 2. Common Cations and Anions Analyzed in the Subbasin

Common Cations	Common Anions
calcium (Ca^{+2})	sulfate (SO_4^{-2})
sodium (Na^{+})	chloride (Cl^{-})
magnesium (Mg^{+2})	carbonate (CO_3^{-2})
potassium (K^{+})	bicarbonate (HCO_3^{-})

The dominant anions and cations can be used to examine how the chemistry of groundwater varies in time at a well, or spatially among wells. Because they occur as a result of rock and mineral dissolution, they can also be diagnostic of minerals such as sulfates and carbonates that occur in the subsurface, or that occur in water being recharged to the aquifer system.

Graphical methods used to depict multiple anions and cations include Stiff Diagrams and Trilinear or Piper Diagrams.[10] Both are used in this Report and will be explained in more detail in Sections 3.1 and 3.2, respectively.

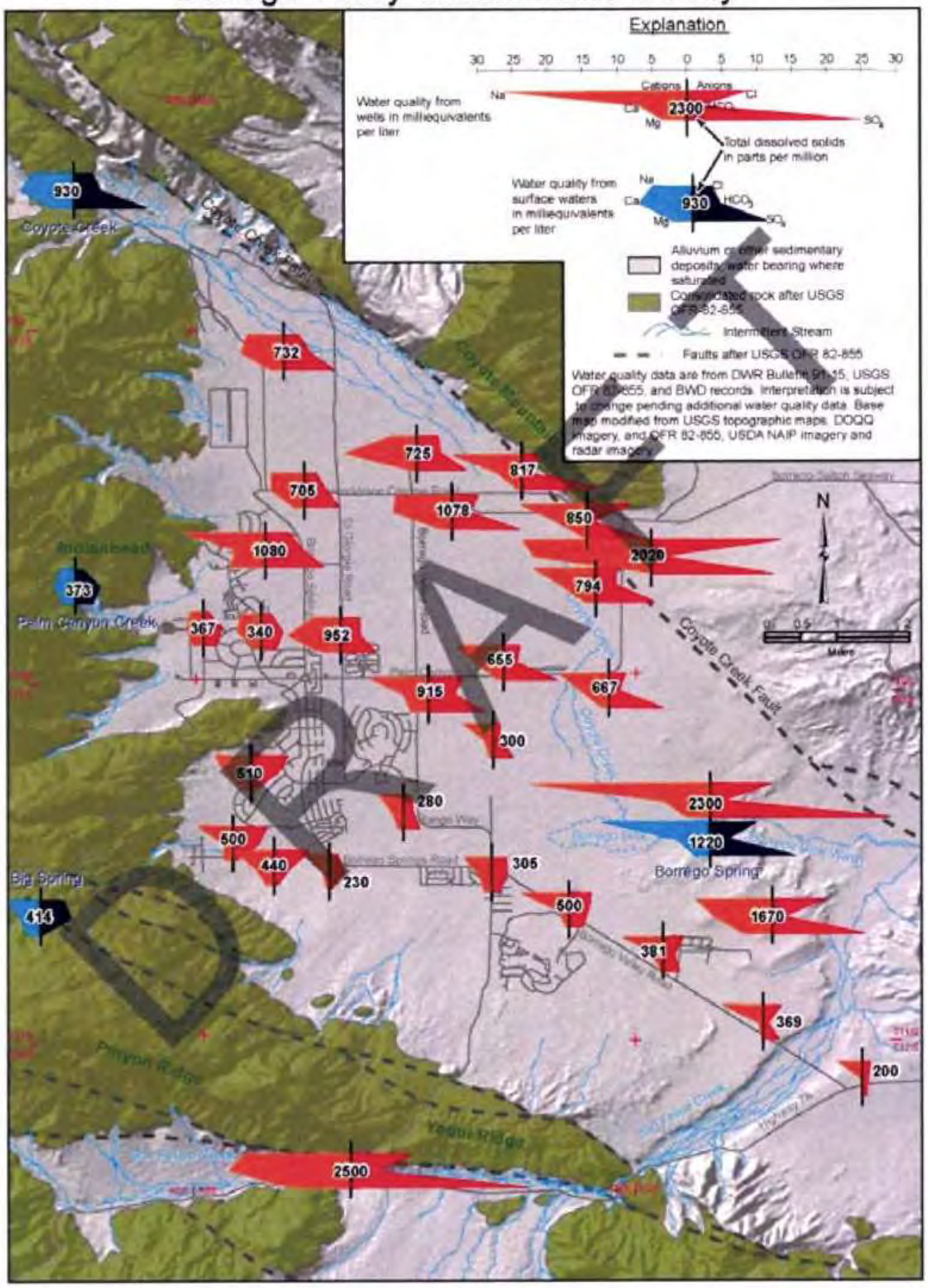
3.1 Spatial Overview (DWR, 2014; Stiff Diagrams)

Stiff diagrams graphically depict the relative concentrations of three dominant anions (Cl, HCO3, and SO4) together with three dominant cations (Na, Ca, and Mg) determined from water samples.[11] A 2014 groundwater quality study was conducted by the California Department of Water Resources (DWR)[12] based on the compilation of DWR, BWD, and USGS water quality data generally obtained between 1950 and 2014. A map depicting Stiff Diagrams of water quality is depicted in **Figure 5**.

[10] An overview summary is provided by: Hem, J.D., 1989, Study and interpretation of the chemical characteristics of natural water: U.S.
Geological Survey Water-Supply Paper 2254, 3rd edition, Washington D.C., 263 p.
[11] Stiff, H.A., Jr., 1951, The interpretation of chemical water analysis by means of patterns: Journal of Petroleum Technology, v. 3, no. 10, p. 15-17.
[12] DWR, 2014. Powerpoint presentation by Dr. Tim Ross dated May 2014. A copy is included for reference in **Appendix A**.

FIGURE 5

Borrego Valley Groundwater Quality



January 2020

An explanation of how the analytes are depicted using Stiff Diagrams is also included in **Figure 5**. The 'legs' and overall size of the diagrams increase as the analytes increase in concentration and allow visual comparison of each of the sample results. Also included in the diagrams is the TDS in milligrams per liter. For reference the TDS of drinking water should be no more than 1,000 mg/L and ideally less than 500 mg/L (the recommended and maximum secondary MCLs, respectively).

DWR noted based on comparison of surface water and groundwater chemistry that "*The high proportion of Sulfate in the surface water of Coyote Creek appears to dominate the character of groundwater in the northern and eastern parts of the basin. The more Bicarbonate waters of Borrego Palm Canyon and Big Spring influence the groundwater along the western and southern parts of the basin.*" For reference, the surface water watersheds are shown in **Figure 1**.

Additional observations that can be made from the Stiff Diagrams include:

- Surface water inflows that enter the along the edges of the valley are the primary source of recharge. The highest quality groundwater (TDS < 500 mg/L) generally occurs near recharge areas.
- Groundwater quality tends to increase in TDS towards the Borrego Sink with distance from the recharge areas. Ongoing evaporation and accumulation of minerals is occurring within the Subbasin. The Subbasin is effectively a closed basin and has been a closed basin during much of the time that alluvial sediments have been deposited from current watersheds. (Please refer to the GSP for a detailed description of the Subbasin geology and sedimentology.)
- Elevated concentrations of sulfate in surface waters are of concern from a water quality standpoint. Groundwater within the San Felipe Creek watershed that potentially recharges the South Management Area contains relatively high concentrations of sulfate, calcium and sodium.
- The Stiff Diagrams highlight the dominance of sulfate in groundwater (lower right portion of the diagrams). Sodium and chloride (upper right and upper left 'legs') also occur at significant concentrations in many samples.

The DWR presentation also reviewed TDS trends with time and depth at selected wells. No consistent trends were identified. The data were not evaluated in terms of the upper, middle, or lower aquifer.

DWR also assessed nitrate. Review of their results is included in **Section 3.5**.

3.2 General Minerals: Spatial Variability Based on Piper Diagrams

The eight dominant anions and cations can also be analyzed using Piper trilinear diagrams (Piper, 1944).[13] In brief, the Piper plot is a visualization technique for groundwater chemistry data. It is based on a combination of ternary diagrams for the major anions and cations that are then projected onto a central diamond. The concentration data on (milligrams/liter) are converted to milliequivalent (meq/L), a measure of the number of electrochemically active ions in the solution.[14] The analytes are plotted as relative proportions in order to examine the relative percentages of each of the dissolved minerals, primarily to show clustering or patterns of samples. The diagrams also support interpretation of trends and potential mixing of waters that have different chemistry.

Figure 6A provides a brief explanation of the Piper diagram. The methodology is explained in more detail in **Appendix B**, together with the Piper trilinear diagrams for all of the wells as noted in **Table 1B.** Ternary diagrams present a combination of three values that add up to 100 percent. The three values are 'picked off of' the sides of triangle by projection along a triangular grid. Please refer to **Appendix B** as needed for additional explanation.

Recent general minerals data, dating from 2004 to present, were used to represent the water chemistry at each of the wells. Review of the data supported the use of two data subsets. The North and Central Management Area wells have been combined and the South Management Area wells are presented as a second set. **Figure 6** depicts the data. Each of the wells are numbered per **Figure 4** and **Table 1** to simplify the data presentation. The numbering generally follows from north to south along the axis of the valley.

3.2.1 Data Quality Review: General Minerals

The data presented in the Piper diagrams underwent a data quality review based on the ion chemistry. Groundwater under natural conditions should be at or near electrochemical equilibrium. Here the sum of the negatively charged anions (in meq/L) was checked versus the sum of the positively charged cations. The sums should be similar (within ~5%) for a solution that is in equilibrium. Not all of the data were used because in some cases not all of the eight general minerals data were analyzed and in other cases the anion/cation balance test failed. As explained above, the anion/cation balance test may fail as a result of less common anions or cations being present within the water quality sample that were not analyzed. Charge imbalance may also indicate laboratory error.

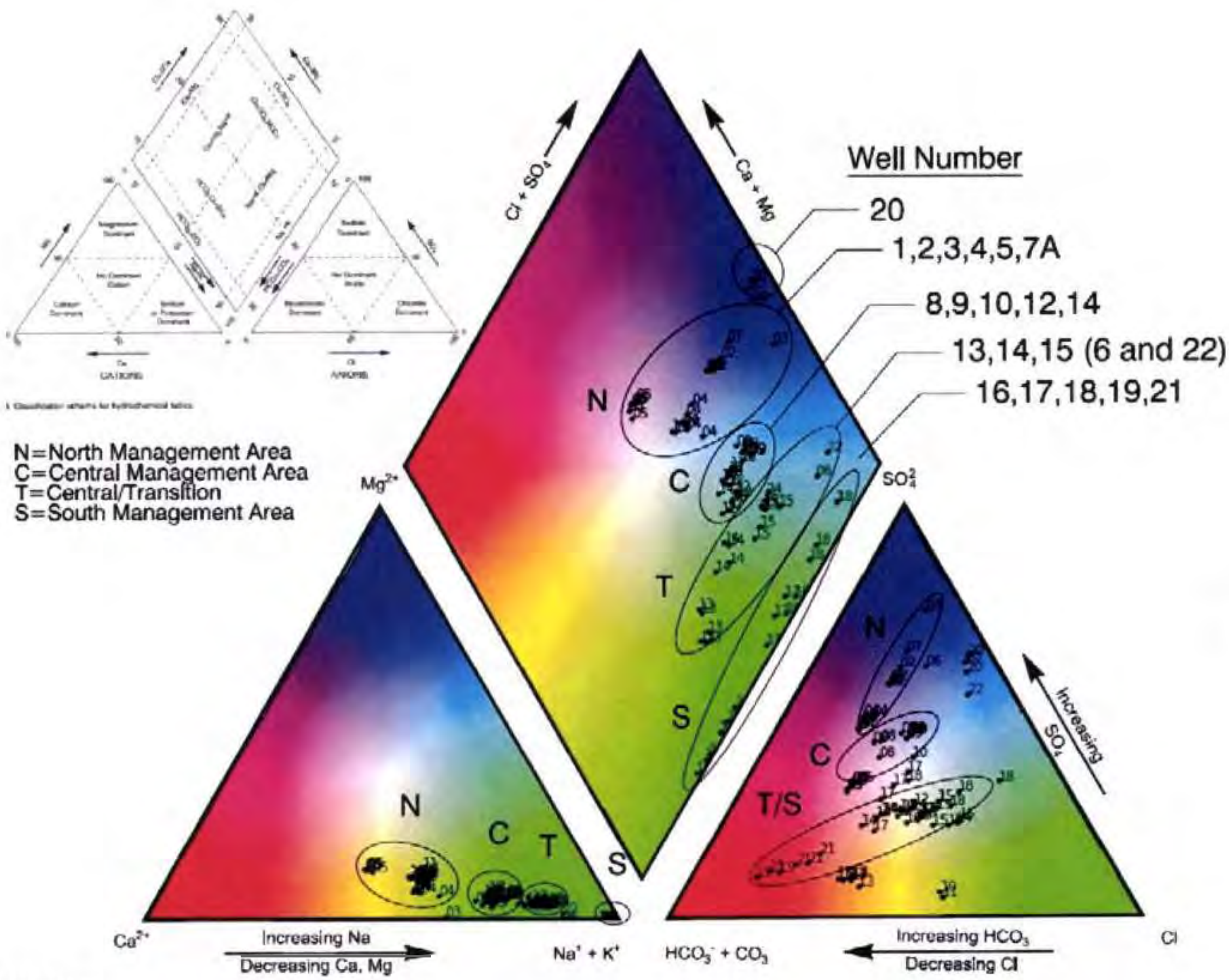
[13] Piper, A.M. 1944. A graphic procedure in the geochemical interpretation of water-analyses. Transactions-American Geophysical Union 25, no. 6: 914–923

[14] The number of ions in a solution is expressed in terms of moles, a unit widely used in chemistry as a convenient way to express amounts of reactants and products of chemical reactions. An equivalent is the number of moles of an ion in a solution, multiplied by the valence of that ion. For example, if 1 mole of NaCl and 1 mole of $CaCl_2$ are dissolved in a solution, there is 1 equivalent of Na, 2 equivalents of Ca, and 3 equivalents of Cl in that solution. The calculation is based on: mEq/L = (mg/L × valence) ÷ molecular weight.

The eight anions and cations generally comprise the bulk of the minerals that comprise TDS. Sodium and calcium are the dominant cations; bicarbonate, sulfate, and chloride are the dominant anions. The long-term average concentrations, in mg/L, for the nine BWD wells were TDS (378), calcium (39), sodium (82), magnesium (5.4), and potassium (5), sulfate (112), chloride (56), carbonate (0.6) and bicarbonate (124). Nitrate averaged 1.8 mg/L.

A calculation of TDS was made by summing the concentrations of the eight anions and cations and comparing it to the TDS for all samples that met a 5% or less charge imbalance criteria. On average the sum was less than the TDS by 40 mg/L, where the mass of cations exceeded the mass of anions. Other anionic COCs not included in the calculation include fluoride and nitrate, but when these were added into the calculations the mass of anions remained lower than the mass of cations. While the mass balances remained within tolerance, the results suggest that additional anions occur in groundwater that have not been tested. Phosphates are one type of anion that may occur but have not been included in the analytical program.

FIGURE 6: Piper Diagram, recent data for all wells (2004 to 2018)



Notes:

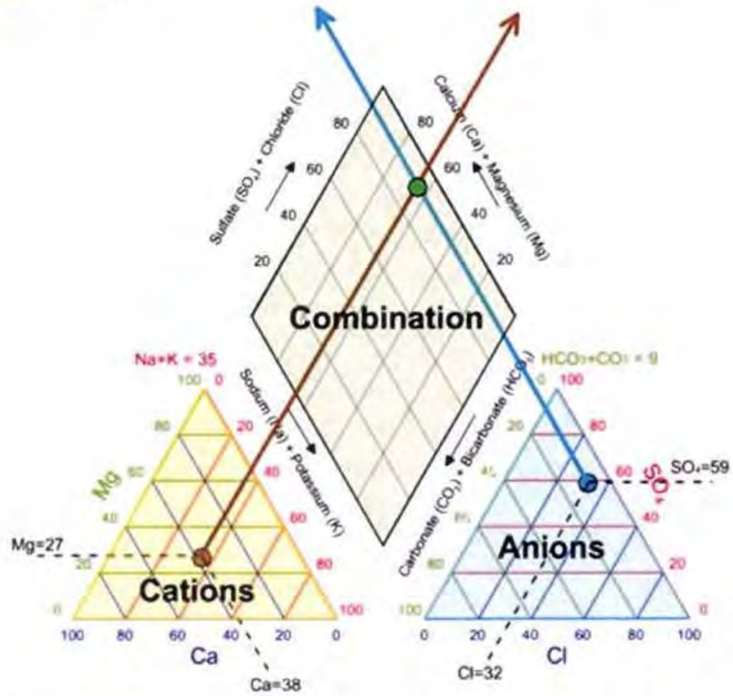
1. Numbers correspond to IDs shown in Figure 4. These generally increase from north to south.

2. The wells by management area include:

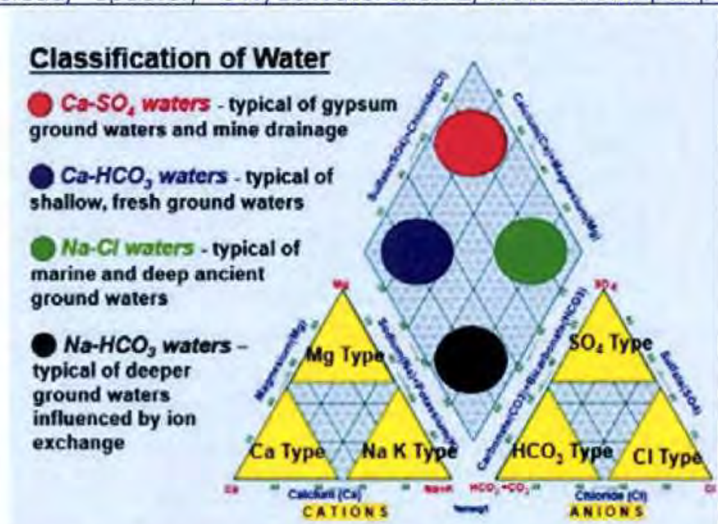
North Management Area: Wells # 1 to 5, #7, and #11
Central Management Area: Wells #8, #9, #10, and 12
"Transitional": Wells #6, #13, #15, #16, #22
South Management Area: Wells #17 to 21, #23

FIGURE 6A

The Piper diagram is used to plot the 8 general minerals based on two ternary diagrams (triangles, at the base) that are projected onto a central diamond area. From (www.goldensoftware.com)



Where the subregions generally depict the chemical characteristics of the water (from http://inside.mines.edu/~epoeter/_GW/18WaterChem2/WaterChem2pdf.pdf)



Here colors are used to show subareas following a methodology presented by Peeters, 2014. (A Background Color Scheme for Piper Plots to Spatially Visualize Hydrochemical Patterns by Luk Peeters, Vol. 52, No. 1–Groundwater–January-February 2014). Also see **Appendix B**.

No distinction was made regarding well completion by aquifer because of a lack of water quality data as a function of depth. However, while the wells include a range of ell completions, the data do not indicate that any differentiation can be made among wells based on recent data (2004 to present). Review of the Piper Diagrams indicates that a systematic variation of water quality can be observed from north to south, and that the water quality in the South Management Area is sufficiently different to support segregation of the data into two data sets. Inorganic water quality depicted in the central Piper diagrams (**Figure 7**) indicates the data generally group by management area (MA): North MA (Wells # 1 to 7, and 11), Central MA (Wells #8, #9, #10, and 12), "Transitional" between the Central and South MAs (#13, #15, #16, #22), and South MA (#17 to 21, #23). Data from sets of wells align on the Piper diagram (**Figure 6**) indicative of waters that are mixing. Some general observations follow:

North and Central Management Areas

- A subset of the wells in the northern part of the basin (#1, #2, #3, and #4) occur along a line of anion data where high sulfate occurs.
- The North and Central Management Areas subdivide into two groups within the Piper diagram. With distance towards the south a general trend occurs where chloride decreases, bicarbonate increases, and sulfate decreases. Two mixing lines may occur where the waters go from sulfate dominant to a mixed condition (no dominant anion).

South Management Area

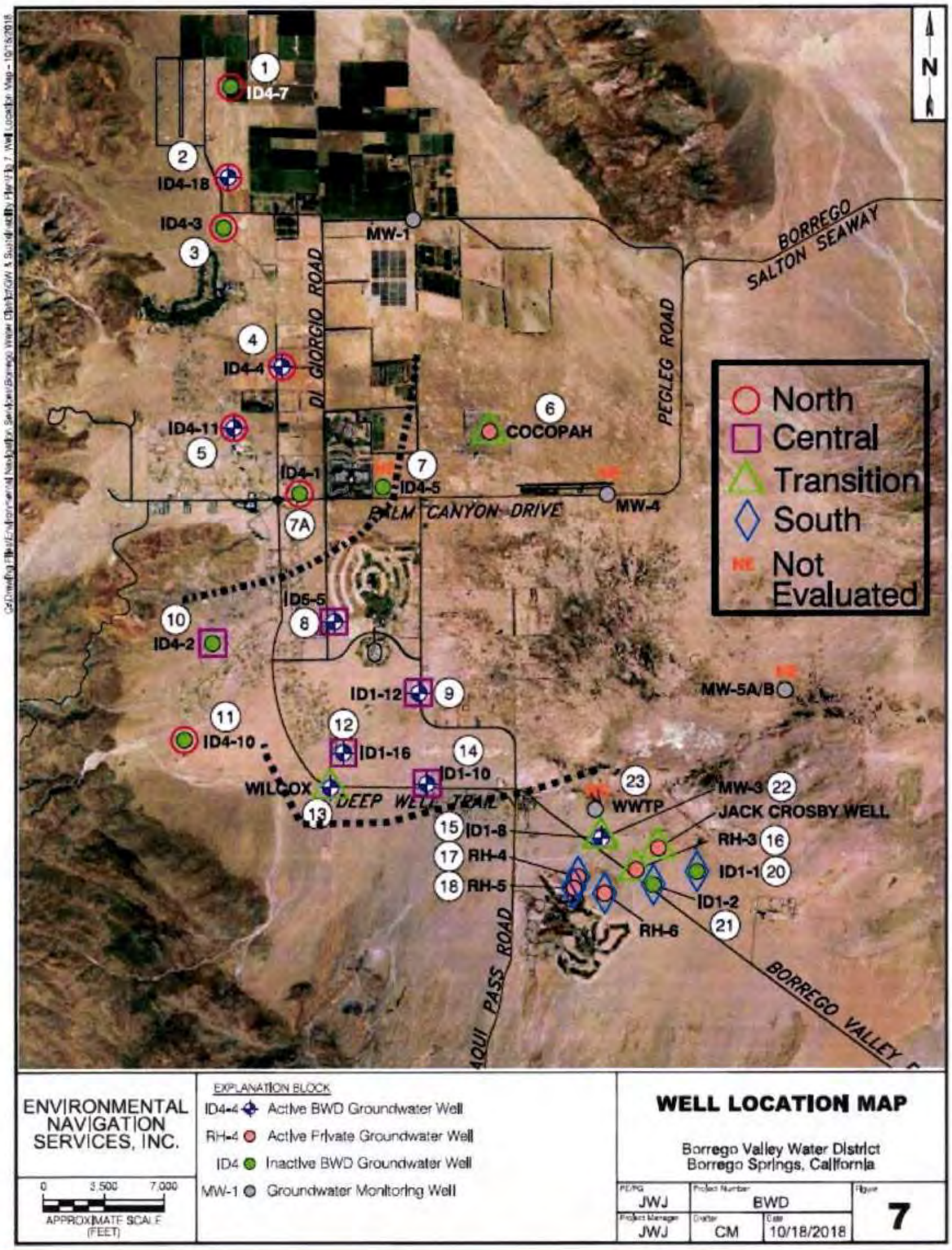
- A transitional zone occurs roughly coincident with the location of the Desert Lodge anticline (as depicted in **Figure 3**). The anticline is regarded as a structure that influences groundwater flow (refer to the GSP for further details).
- Mixing lines are observed for both cations and anions. For anions: as chloride decreases, bicarbonate increases, and sulfate decreases. For cations: as calcium decreases, sodium and magnesium increase.
- As also noted by the Stiff diagrams, the North Management Area has high sulfate as indicated by points that occur in the upper part of the cation ternary diagram. In contrast the South Management Area wells either have no dominant anion or become bicarbonate dominant (the lower left portion of the ternary diagram for anions).

Overall the Piper diagrams support that the inorganic water chemistry systematically varies across the Subbasin. The primary observations are summarized in **Figure 7**:

- Water quality gradually changes from north to south within the North and Central Management Areas, consistent with pre-development groundwater flow patterns.
- For both areas the cation relationships (calcium, magnesium, and sodium) are similar and are generally sodium dominant. In both cases the water quality is characterized by decreasing calcium and increasing percentages of sodium and magnesium.
- The South Management Area anionic water chemistry is different than the North and Central Management Areas, likely due to the difference in the San Felipe Creek recharge water and potential differences in aquifer mineralogy.

FIGURE 7

Shows water chemistry classified into the three Management Areas North, Central, and South. Also notes Transition (between central and south)



3.3 General Minerals: Variations Over Time at Wells, Piper Trilinear Diagrams

Of central concern to BWD and all other users of groundwater within the Subbasin is water quality degradation over time due to ongoing overdraft, irrigation and septic-related return flows, and loss of higher quality water due to dewatering of the upper aquifer. Piper trilinear diagrams were constructed for each of the wells using available historical data (compiled in **Appendix B**). Two examples are included as **Figures 8** and **9** where one well has had significant changes in water quality over time versus another that has been relatively stable.

The Piper diagrams depict relative ratios of the anions and cations, not the total concentrations. Also included in the figures are graphs of the anions and cations that present the measured concentrations (in mg/L).

<u>ID1-8 (South Management Area, Well#15 on **Figure 7**)</u>
Water chemistry has significantly changed over time at ID1-8. This well is in the South Management Area as depicted as Well #15 on **Figure 7**. It has been sampled since 1972. **Figure 8** includes a Piper Diagram and charts depicting TDS, cations, and anion concentrations over time.

Observed is historically decreasing bicarbonate, increasing chloride, and increasing calcium. Recent data indicates that water quality may be stabilizing.

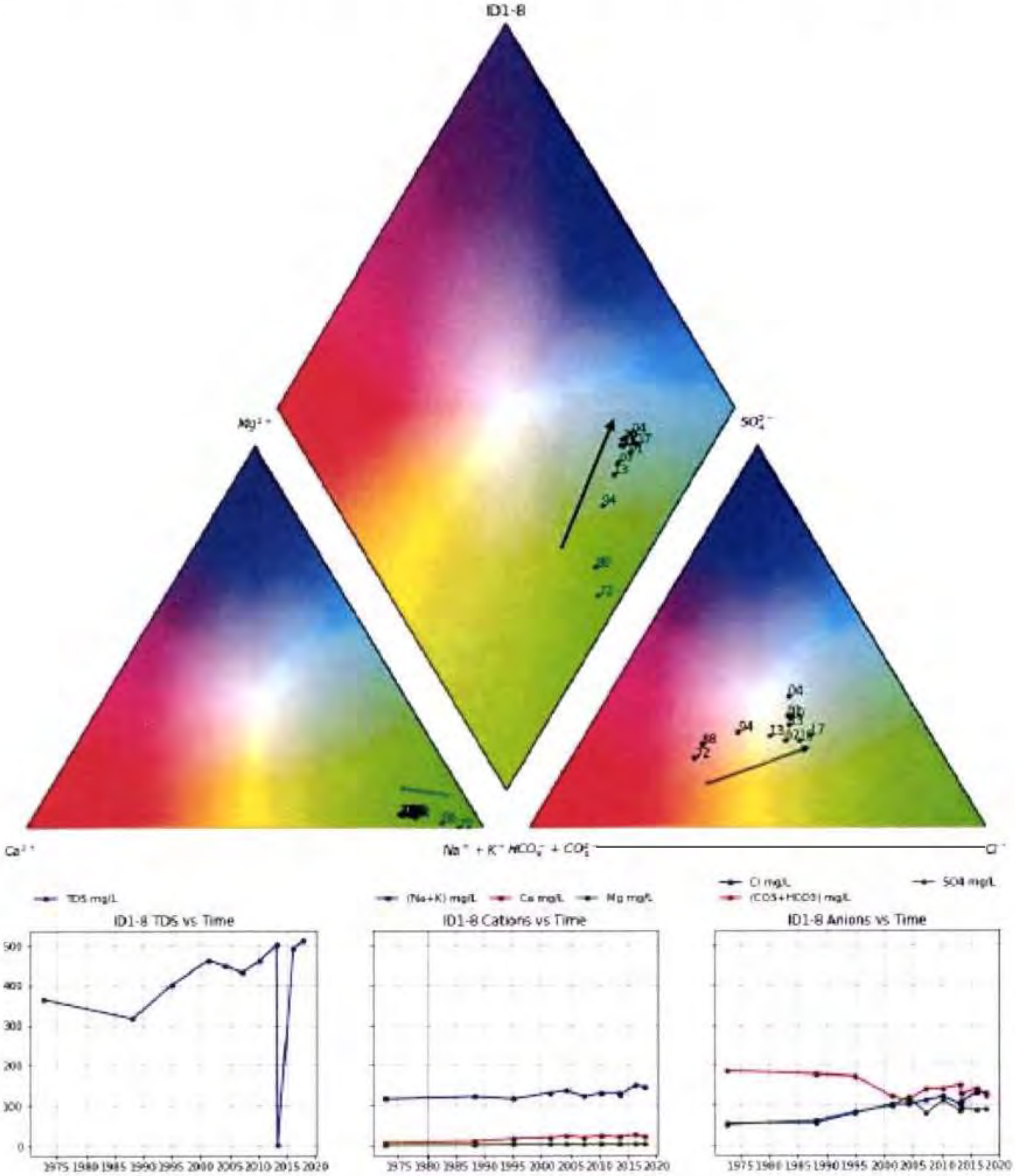
In terms of overall chemistry (see **Figure 6A**) the water in this well in now described as sodium chloride dominant, typical of marine and deep ancient groundwater.

<u>ID4-18 (North Management Area, Well #2 on **Figure 7**)</u>
This well is in the North Management Area as depicted as Well #2 on **Figure 7**. It also has been sampled since 1972. **Figure 9** includes a Piper Diagram and charts depicting TDS, cations, and anion concentrations over time.

There is much less overall change with time compared to ID1-8, but the sampling data do show sulfate is increasing. The change is subtle change but significant since concentrations are above the recommended secondary MCL of 250 mg/L, but do remain below the upper MCL of 500 mg/L. Sulfate is increasing as bicarbonate decreases over time. The points in the anion portion of the diagram (lower right triangle) occur along a line indicative of increasing sulfate.

In terms of anion chemistry (see Figure 6A) the water in this well in now described as sulfate dominant. Sulfate is a COC.

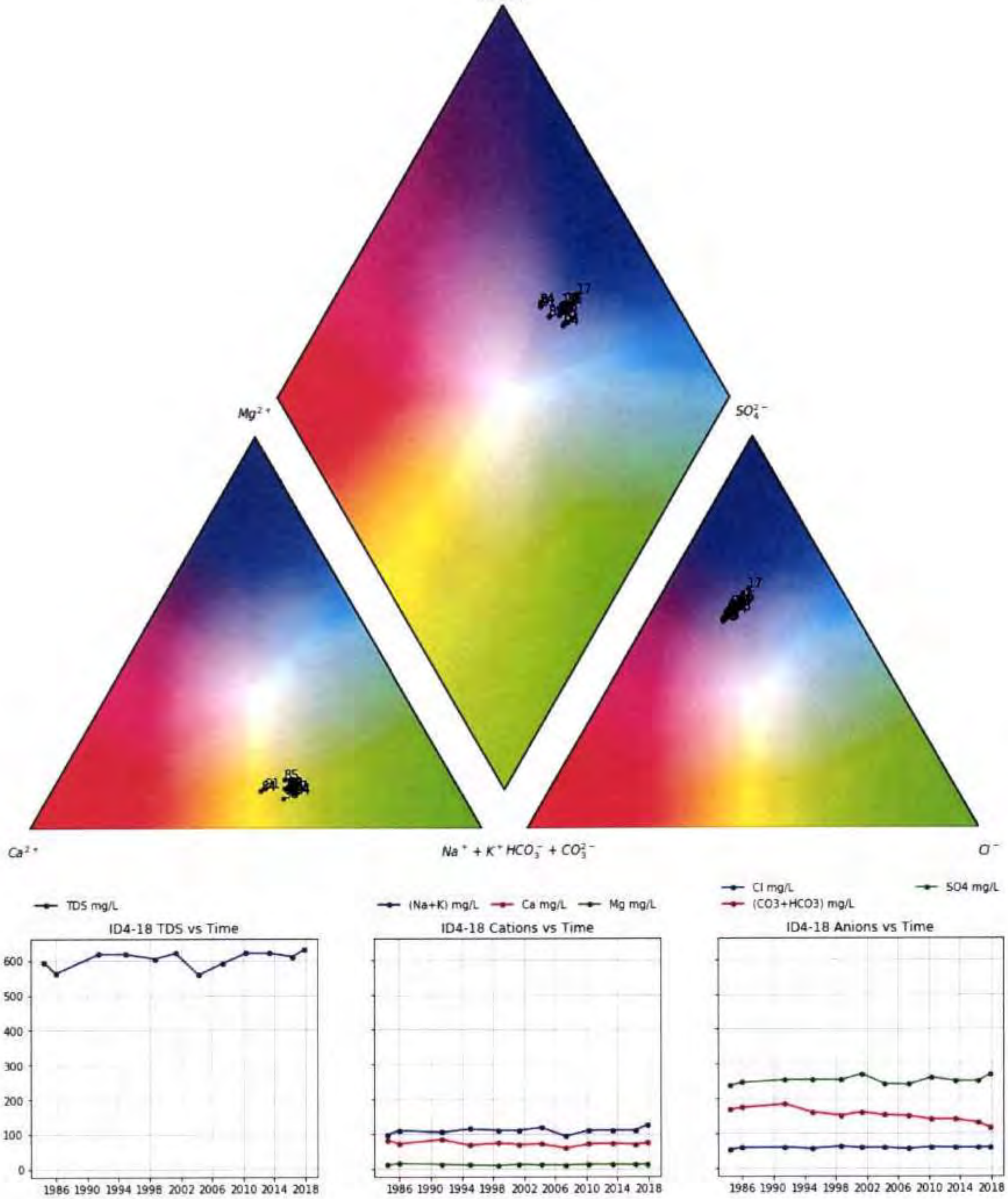
FIGURE 8: ID1-8 (see Figure 8A for explanation of the diagram and axes)



Notes:

1. The last two digits of the year the samples were taken are shown in the Piper diagram.
2. Chemistry has changed due to increases in sulfate, chloride, and sodium; and decreased bicarbonate. The change from 1970s to the 2000s is evident. TDS is also increasing.

FIGURE 9: ID4-18



Note:

1. The last two digits of the year the samples were taken are shown in the Piper diagram.

2. Water chemistry is fairly stable with a slow increase in sulfate and decrease in bicarbonate.

3.4 TDS with Depth

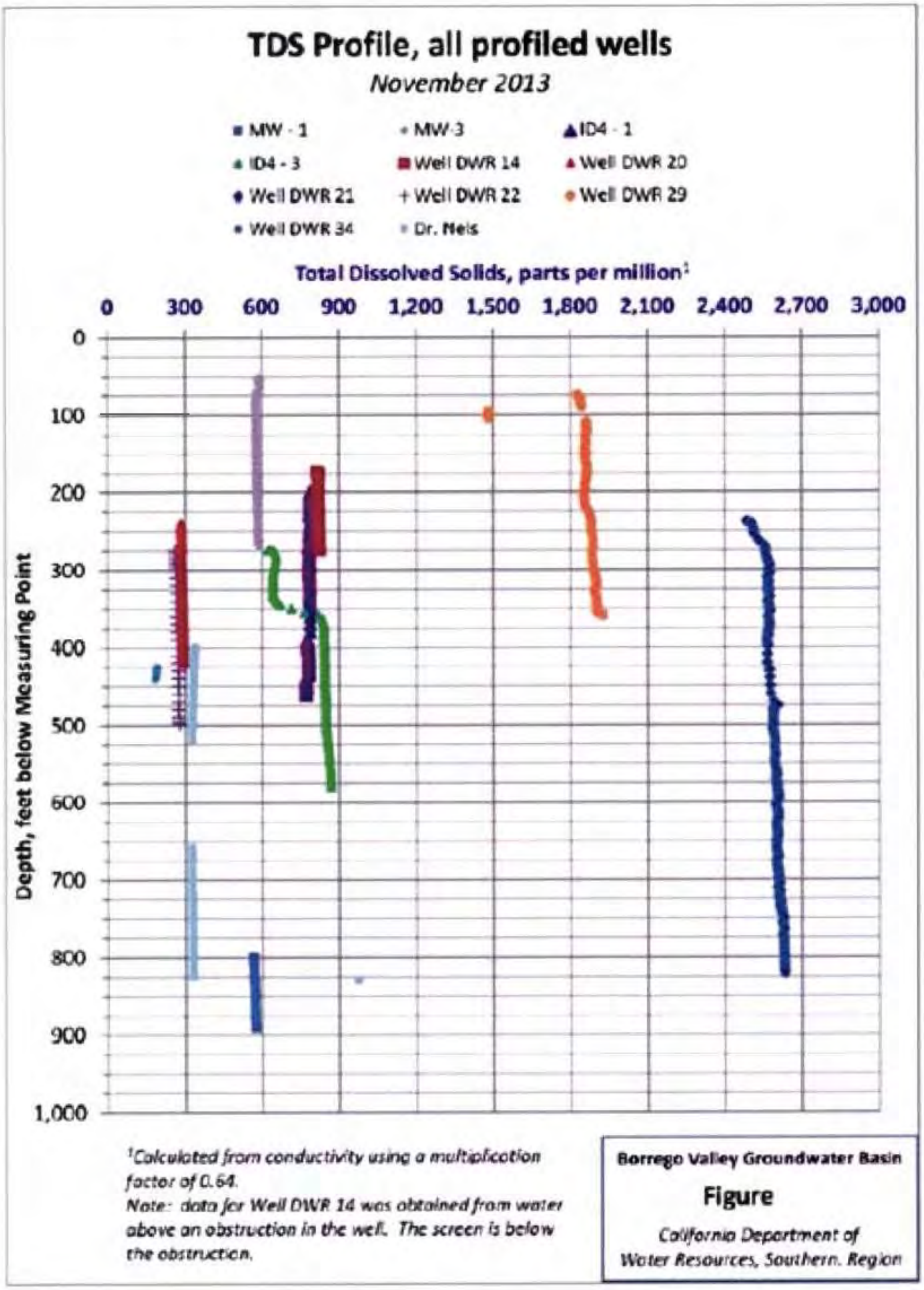
Well profiles based on TDS and temperature were presented by the DWR in a 2014 presentation (as referenced in footnote #11, a copy is included in **Appendix A**). **Figure 10** presents the profile data obtained from eleven wells that ranged in depth from 280 to 900 feet. For reference BWD water supply wells currently range in depth from 392 to 830 feet (Table 1).

Review of **Figure 10** supports the following:

- TDS varied by well, with linear increase with depth at each well. The exception is well ID4-3 where a step-wise increase in TDS was observed at a depth of approximately 350 feet.
- Groundwater temperature was relatively warm, ranging from approximately 80 to 90 °F. All wells exhibited increasing temperature with depth.

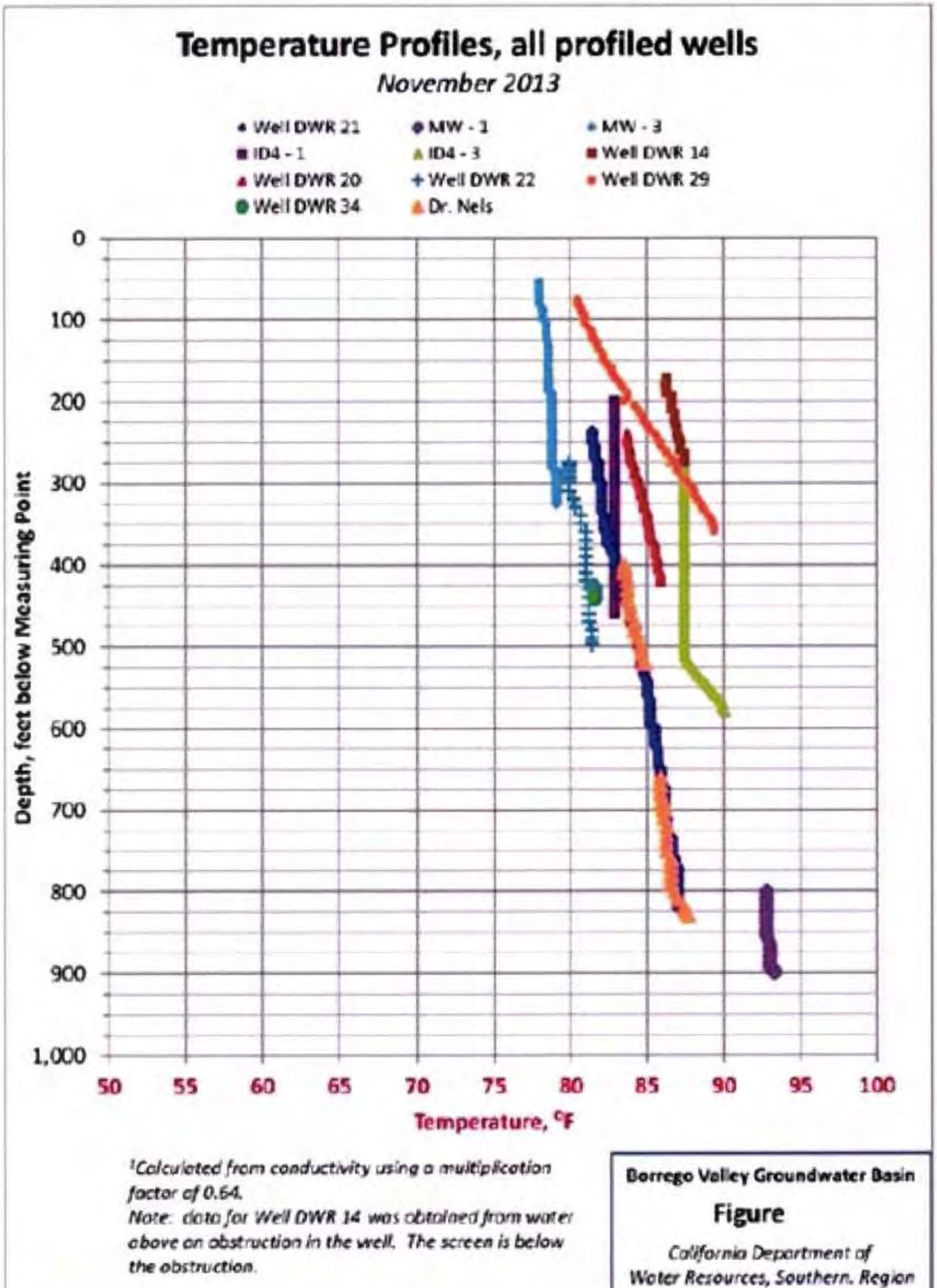
Geologic conditions and lithologies do change with depth, and it is generally expected that water quality change will decrease with depth. While quite important towards understanding the effect of overdraft on water quality, relatively few depth-specific groundwater chemistry data have been obtained in the Subbasin. The data presented in **Figure 10** are obtained by lowering measurement probes into the wells and are relatively inexpensive to collect provided there are no obstructions in the well. Additional discussion of well profiling methods is included in the report recommendations.

FIGURE 10



TDS Profile, all profiled wells
November 2013
MW - 1
MW-3
ID4 - 1
ID4 - 3
Well DWR 14
Well DWR 20
Well DWR 21
Well DWR 22
Well DWR 29
Well DWR 34
Dr. Neis
Total Dissolved Solids, parts per million¹
0
300
600
900
1,200
1,500
1,800
2,100
2,400
2,700
3,000
Depth, feet below Measuring Point
0
100
200
300
400
500
600
700
800
900
1,000
¹Calculated from conductivity using a multiplication factor of 0.64.
Note: data for Well DWR 14 was obtained from water above an obstruction in the well. The screen is below the obstruction.
Borrego Valley Groundwater Basin
Figure
California Department of Water Resources, Southern Region

FIGURE 10, continued



3.5 Nitrate

Nitrate (NO_3) is a groundwater contaminant that is commonly detected in drinking water supplies obtained from alluvial basins throughout the southwestern US (see, for example, USGS NAWQA[15], CA SWRCB GAMA[16], and others). Nitrate in groundwater has many natural sources, but nitrate concentrations in groundwater underlying agricultural and urban areas are commonly higher than in other areas. The primary sources of nitrate in the Subbasin include fertilizers associated with agriculture and turf grasses (golf courses), and septic systems.

The relationship between groundwater quality and overlying land uses was examined by DWR (DWR, 2014; in **Appendix A**). **Figure 11** shows *"the distribution of nitrate analyses for the Borrego Basin. Maximum content is shown per section and sections are colored according to the number of analyses in the section. Sections where the maximum contaminant level (MCL) are exceeded are shown in hatched patterns."* The DWR analysis shows that nitrates occur above MCLs in multiple wells.

The USGS reviewed nitrate data and stated that *"TDS and nitrate concentrations were generally highest in the upper aquifer and in the northern part of the Borrego Valley where agricultural activities are primarily concentrated." (USGS Model Report, p.2) ... "Water-quality samples from wells distributed throughout the valley show that NO_3-N concentrations ranged from less than 1 mg/L to almost 67 mg/L. NO_3-N concentrations were highest in the shallow aquifer and exceeded the CA-MCL of 10 mg/L in some samples from the shallow and middle aquifers in the northwestern part of the basin (fig. 26). NO_3-N concentrations in samples from the lower aquifer did not exceed 6.7 mg/L."* (USGS Model Report p.64)

Further spatial analysis of the occurrence of nitrate relative to land use is not included in this report. Additional review of nitrate data is included in **Section 3.7**, and in the GSP.

[15] Thiros, S.A., Paul, A.P., Bexfield, L.M., and Anning, D.W., 2014, The quality of our Nation's waters—Water quality in basin-fill aquifers of the southwestern United States: Arizona, California, Colorado, Nevada, New Mexico, and Utah, 1993–2009: U.S. Geological Survey Circular 1358, 113 p., http://dx doi.org/10.3133/cir1358. National Ambient Water Quality Assessment (NAWQA)
[16] Groundwater Ambient Monitoring and Assessment Program (GAMA See:)https://www.waterboards.ca.gov/gama/

3.5.1 Supporting Information Regarding Nitrate

Historical groundwater quality impairment for nitrates is noted in the GSP to predominantly occur in the upper aquifer of the North Management Area underlying the agricultural areas, and near areas with a high density of septic point sources. The primary source of nitrates is likely associated with either fertilizer applications.

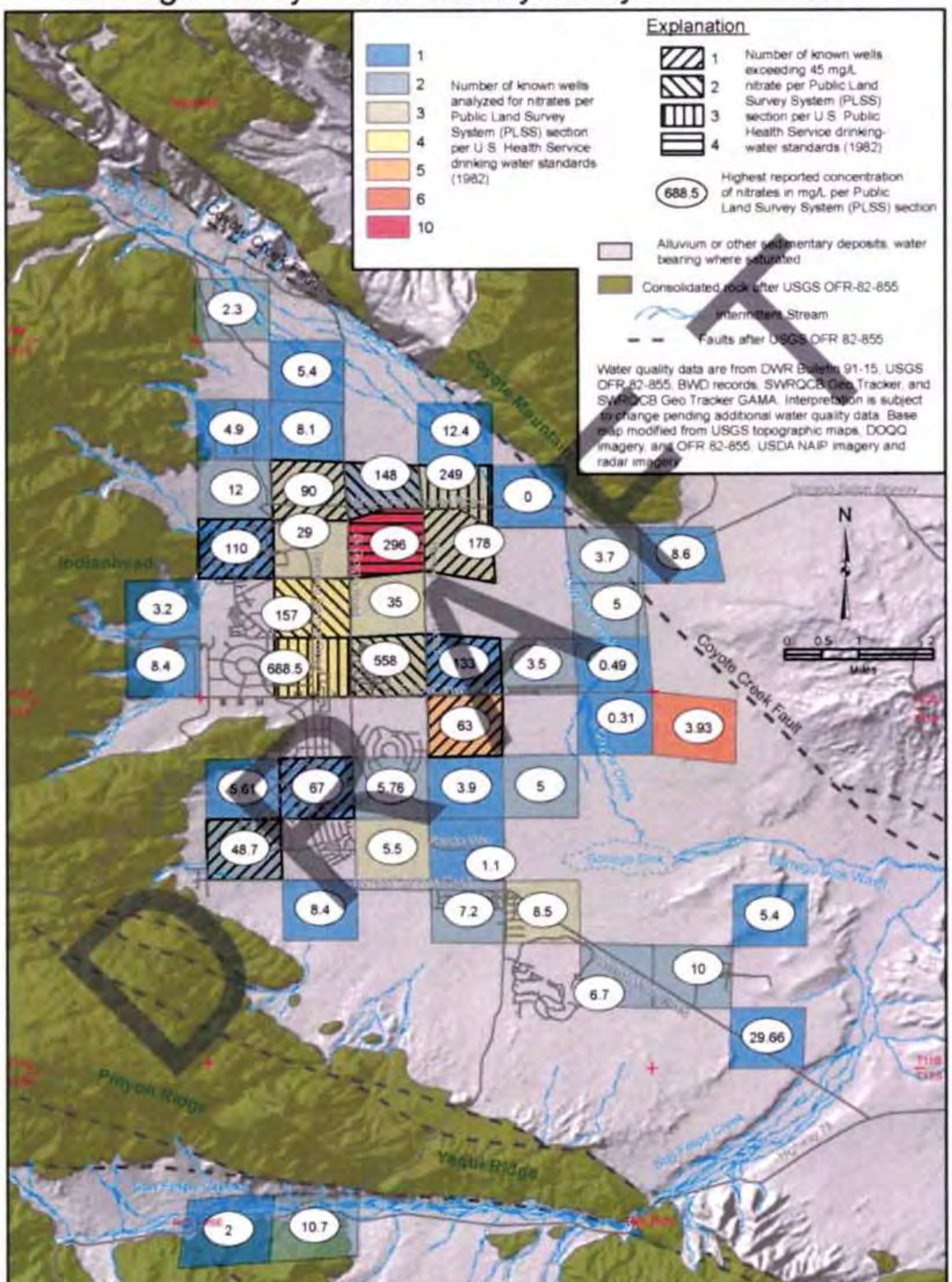
Information provided by Dudek in the GSP supports that nitrates have historically impacted multiple wells as follows. It is understood that the BWD Improvement District 4 (ID4) well 1 and 4, Borrego Springs Water Company Well No. 1 (located at the BWD office), the Roadrunner Mobile Home Park, and Santiago Estates wells were all taken out of potable service due to elevated nitrate. The latter two developments were connected to municipal wells operated by the BWD as an alternative source of supply. Well ID4-4 was re-drilled and screened deeper at the same location and successfully accessed good water quality not impacted by nitrates. The DiGiorgio wells 11, 14 and 15 located north of Henderson Road have historical detections of nitrate and TDS above drinking water standards. The existing groundwater network indicates elevated nitrate currently occurs at the Fortiner well No.1 in the North Management Area and at the BWD's WWTP monitoring well (see map, **Figure 4**).

Nitrate contamination enters the unconfined aquifer system via irrigation return flows and septic system discharge. An unconfined aquifer is directly open to the downward percolation of water. Thus, the uppermost portion of the aquifer is the most susceptible to nitrate impacts. However, as noted in **Table 1B**, nitrate impacts have been observed at low concentrations in all of the active BWD water supply wells.

There are two factors that can facilitate the downward migration of nitrates within the aquifer system- both caused by wells. The first is that ongoing pumping from deeper portions of the aquifer can actively draw shallow groundwater deeper into the aquifer system. The second is that inactive wells can act as conduits for groundwater flow and facilitate the drainage of water from the upper aquifer into deeper aquifers because of downward hydraulic gradients induced by ongoing pumping and overdraft (see Recommendations, Section 5.2, for additional discussion).

FIGURE 11

Borrego Valley Water Quality Analyses of Nitrates

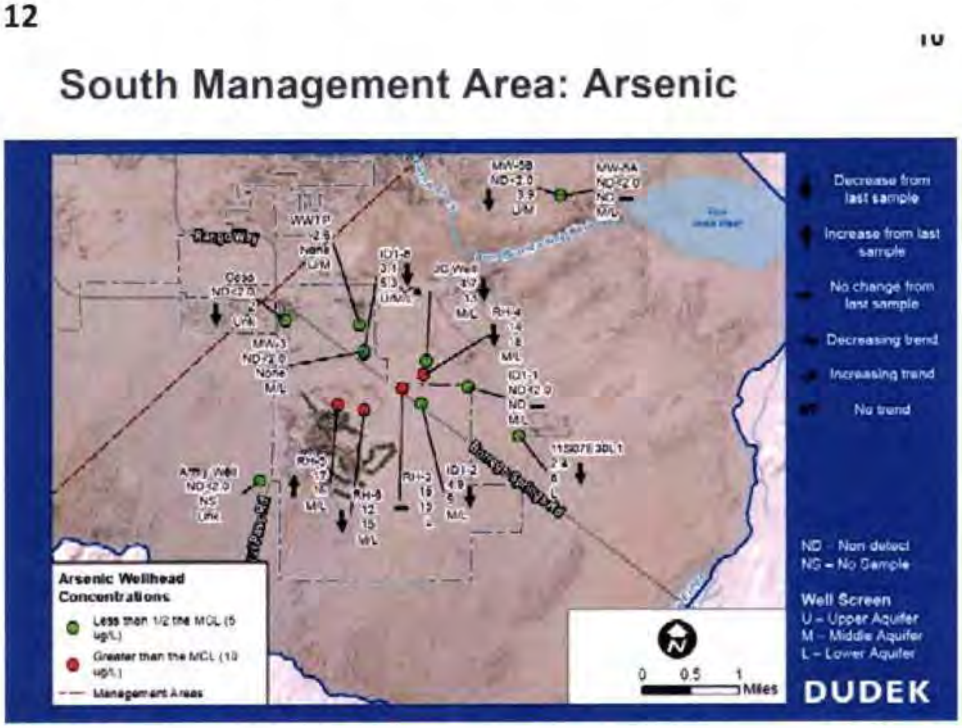


3.6 Arsenic

Arsenic is the primary drinking water COC identified throughout alluvial basins across the desert southwest (see, for example, previously cited USGS NWQA Report, 2014). The fate and transport of arsenic highly depends on the hadrochemical environment. Chemical conditions control the chemical state (valence) of the ion in solution- here arsenic can occur as either arsenate (As^{+3}) or arsenate (As^{+5}). The chemical behavior of arsenic in groundwater depends on multiple factors including the pH and the relative state of oxidation (i.e., chemically oxidizing or reducing, or 'redox' state). Arsenate (As^{+5}) for example, tends to become more soluble as pH increases. Microbial processes are also known to be involved in the oxidation and mobility of arsenic.[17]

Arsenic concentrations above MCLs currently occur in groundwater in the South Management Area, primarily in wells installed for the Ram's Hill Golf Course. **Figure 12**, from BWD Board presentation by Dudek dated 1/25/2018, shows prior sampling results. Sampling results for the remainder of the Subbasin indicate arsenic to occur at less than half the MCL (5 micrograms per liter [µg/L]). The sampling results for active BWD wells are summarized in **Section 4**.

FIGURE 12



---

[17] Sun 2010. The Role of Denitrification on Arsenite Oxidation and Arsenic Mobility in An Anoxic Sediment Column Model with Activated Alumina. In Bioengineering and Biotechnology. https://onlinelibrary.wiley.com/doi/abs/10.1002/bit.22883 This work is cited because it supports that Nitrate, an alternative electron acceptor, can support oxidation of As^{+3} to As^{+5} (arsenate) by denitrifying bacteria in the absence of oxygen. Arsenate is generally considered to be mobile in groundwater at pH levels greater than 8.

3.6.1 Supporting Information Regarding Arsenic

To date all water quality testing has reported 'total arsenic'. While this is consistent with the reporting requirements for drinking water testing, the current monitoring program does not speciate arsenic by valence. The species that occur in groundwater can generally be inferred based on knowledge of water conditions- specifically the pH and Eh (or redox state).

A study of arsenic and nitrate in the Subbasin done in cooperation with the BWD was published by Rezaie-Boroon et al, in 2014.[18] The study was based on data from six BWD wells (ID4-18, ID4-11, ID1-12, ID4-10, ID1-10, and Wilcox) for the period of 2006 to 2014. Their trend analyses are not summarized here because four more years of data have since been collected and the trends have changed. Their work emphasized the following:

- The chemical environment as determined by pH and Eh is important. Both pH and Eh conditions control how dissolved arsenic occurs in aqueous environment (see reference).[19] Arsenic is more soluble in an alkaline (high pH) and anoxic environments. The relative mobility of arsenic depends on its valence, typically occurring as either arsenite (As^{+3}) or arsenate (As^{+5}). As^{+3} is typically more mobile than As^{+5} in anoxic groundwater.
- The presence of iron oxide coatings on soil and sediment particles supports arsenic adsorbtion and can cause the concentration of arsenic in solution to decrease. This will typically occur under oxidizing conditions where As^{+5} will generally occur versus As^{+3}, and where iron oxides will occur.
- *"The most common forms of arsenic in groundwater are their oxy-anions, arsenite (As+3) and arsenate (As^{+5}). Both cations are capable of adsorbing to various subsurface materials, such as iron oxides and clay particles. Iron oxides are particularly important to arsenate fate and transport"* because…*"arsenate [ed: As+5] strongly adsorbs to these surfaces in acidic to neutral waters."* Thus, increases in pH will support the desorption or release of arsenate into groundwater.

The interaction of arsenic with soil and aquifer material containing iron oxide is summarized in a 2015 report by the Water Research Foundation.[20] This study is potentially relevant to the use of arsenic-bearing irrigation water, because it shows that arsenic can be removed from water when passed through soil. The Water Research Foundation report concluded that "Results of this study provide an inexpensive arsenic treatment method for water utilities", while

[18] Rezaie-Boroon et al, 2014. The Source of Arsenic and Nitrate in Borrego Valley Groundwater Aquifer. Journal of Water Resource and Protection, 5, p1589-1602.
https://www.scirp.org/journal/PaperInformation.aspx?PaperID=51944

[19] Stein, C.L., Brandon, W.C. and McTigue, D.F. (2005) Arsenic Behavior under Sulfate-Reducing Conditions: Beware of the "Danger Zone". EPA Science Forum 2005: Collaborative Science for Environmental Solutions, 16-18 May 2005, Washington DC.

[20] Water Research Foundation, 2015. In-situ Arsenic Removal During Groundwater Recharge Through Unsaturated Alluvium. Web Report #4299.

recognizing that the work was a pilot study and that a good understanding of site conditions is necessary to achieve similar results.

Arsenic may also be released from the dewatering or release of water in from clays. A recent study published in 2018 for the San Joaquin Valley of California examined the potential release of arsenic from the Corcoran Clay, a regionally extensive clay deposit that is being compressed as a result of land subsidence due to groundwater overdraft.[21] Their results "support the premise that arsenic can reside within pore water of clay strata within aquifers and is released due to overpumping".

Four factors were seen to contribute to the occurrence of arsenic in groundwater that included clay thickness, dissolved manganese (Mn) concentrations, elevation (depth), and recent subsidence. As stated in their report "We highlighted four of the most important variables describing arsenic concentration within the Tulare Basin in the recent model, shown in Fig. 2a-d [of their report]. Of these, the thickness of the Corcoran Clay (a confining unit that overlies a lower aquifer) shows a positive correlation with arsenic concentrations due to increased clay content. Elevation has a negative correlation, as lower areas are more likely to have been water-saturated and thus anaerobic. A positive correlation was found between $\log_{10}$(Mn) and arsenic concentrations, as the presence of manganese indicates an anoxic environment, in which arsenic tends to be more soluble. Significantly, recent subsidence from InSAR[22] [ed: land surface elevation data] showed a positive correlation, as over-pumping leads to increased pore water drainage from clays. The first three variables are well-known from the literature and not related to human activity. The quantitative link between pumping-induced subsidence and arsenic concentrations has not been shown before, and is directly related to human activity."

Their analysis supports that geochemical data that include measurements of oxidation-reduction potential (redox) and oxygen content, and testing for minerals that are indicative of geochemical conditions (such as ferrous and ferric iron, and manganese) can support assessment of the potential for arsenic to become mobile in the aquifer system. A recent USGS publication provides further explanation of the role of iron oxides under varying pH and redox conditions (USGS Scientific Investigations Report 2012–5065[23]). A key point made by the USGS is that arsenic becomes mobile at a pH greater than 8 under oxidizing and neutral/transitional

---

[21] Overpumping leads to California groundwater arsenic threat. By Ryan Smith, Rosemary Knight, and Scott Fendorf. June 2018. In Nature Communications (2018) 9:2089, DOI: 10.1038/s41467-018-04475, www.nature.com/naturecommunications. or at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5988660/pdf/41467_2018_Article_4475.pdf

[22] "InSAR (Interferometric Synthetic Aperture Radar) is a technique for mapping ground deformation using radar images of the Earth's surface that are collected from orbiting satellites". see https://volcanoes.usgs.gov/vhp/insar.html

[23] Predicted Nitrate and Arsenic Concentrations in Basin-Fill Aquifers of the Southwestern United States, by David W. Anning, Angela P. Paul, Tim S. McKinney, Jena M. Huntington, Laura M. Bexfield, and Susan A. Thiros; https://pubs.usgs.gov/sir/2012/5065/pdf/sir20125065.pdf

redox conditions, and is potentially mobile under strongly reducing conditions where both arsenite and iron can be in solution.

The USGS Model Report evaluated land subsidence in the Subbasin for the period of the 1960s to 2010 (page 70 of their report) and concluded that "...land subsidence attributed to aquifer-system compaction is not currently a problem in the Borrego Valley and is unlikely to be a significant problem in the future". However, this does not preclude the potential release or extraction of arsenic from clay-rich portions of the aquifer system that may occur under current or future pumping absent subsidence, or as a result of changes in geochemical conditions that could mobilize arsenic from clay-rich sediments that may contain arsenic.

Overall the occurrence, nature, and extent of arsenic in the Subbasin is not well understood. It is more prevalent in South Management Area wells. While currently water quality conditions are good relative to arsenic, it was observed to be at or near drinking water MCLs in multiple BWD water supply wells during the last decade and could affect BWD's water supply in the future.

3.7 Correlations Among Water Quality Parameters (Combined Data Assessment)

One of the goals of this Report is to evaluate whether multiple chemical parameters can be used to better define and predict COC trends at BWD water supply wells. Piper diagrams presented in **Section 3.2** were used to examine spatial trends and also illustrate that there are definable relationships among the general minerals seen in the trilinear diagrams. In this section the water chemistry data are combined for all wells to examine general relationships and correlations. The data set also includes pH, hardness. Other potentially important geochemical parameters such as iron and manganese were not included because they were not uniformly obtained for the water quality samples historically collected.

3.7.1 Water Quality Data Correlations

Water quality data obtained since 2004 were used to examine potential correlations and relationships. The recent data were selected to represent current conditions as water quality has changed over time in many wells. Among the parameters that were tested include anions (HCO_3, Cl, SO_4), cations (Ca, Mg, and Na [potassium was not included as less data were collected]), pH, TDS, Ca+ Na, Cl+HCO_3, As, F, and NO_3. Also included in the correlation analysis were two parameters named Midst and Low Sat that represented the percentage of well screen open to flow per aquifer unit as described in each of the wells (for example if a well is completed with the same amount of screen length per aquifer then both values would be 50 percent).

Correlations greater than 0.5 or less than -0.5 are highlighted in **Table 3**. Values between 0.5 and 0.7 are underlined, and values greater than 0.7 are in bold. The South Management Area data have been separated from the North and Central Management Areas.

Selected data are shown in graphical form in this section. The data set used in the correlations was limited to those samples where the general minerals charge balance was within 10 percent. The graphs further restrict the data to only include higher quality data with a +/- 5 % charge balance. Hem (1985) considers data with 5% charge balance to be of good quality[24].

[24] John Hem, 1985. Study and Interpretation of the Chemical Characteristics of Natural Water. USGS Water-Supply Paper 2254. From page 163: "Under optimum conditions, the analytical results for major constituents of water have an accuracy of +/-2 - +/- 10 percent. That is, the difference between the reported result and the actual concentration in the sample at the time of analysis should be between 2 and 10 percent of the actual value. Solutes present in concentrations above 100 mg/L generally can be determined with an accuracy of better than +/- 5 percent. Limits of precision (reproducibility) are similar."

Table 3

NORTH and CENTRAL

	Bicarbonate HCO3	Chloride Cl	Sulfate SO4	Fluoride F	Calcium Ca	Magnesium Mg	Sodium Na	pH	TDS	cation Ca+Na	anion Cl+HCO3	pct middle MidSat	pct lower LowSat	Arsenic As	Nitrate NO3
HCO3	1.00	0.73	-0.38	-0.30	0.46	0.76	-0.10	-0.69	0.27	0.18	0.94	-0.48	0.30	-0.28	0.49
Cl		1.00	-0.26	-0.09	0.28	0.54	0.31	-0.53	0.43	0.36	0.92	-0.40	0.15	-0.13	0.72
SO4			1.00	0.26	0.46	0.07	0.67	0.16	0.70	0.70	-0.35	0.01	0.09	0.23	-0.43
F				1.00	-0.30	-0.23	0.54	0.48	0.15	0.21	-0.21	-0.43	0.47	0.66	-0.14
Ca					1.00	0.79	0.34	-0.60	0.72	0.77	0.40	-0.31	0.25	-0.32	0.14
Mg						1.00	0.23	-0.75	0.57	0.58	0.70	-0.48	0.40	-0.33	0.37
Na							1.00	0.03	0.83	0.86	0.10	-0.39	0.38	0.31	0.22
pH								1.00	-0.31	-0.30	-0.65	0.24	-0.12	0.68	-0.46
TDS									1.00	0.95	0.37	-0.41	0.33	0.04	0.21
Ca+Na										1.00	0.28	-0.43	0.39	0.04	0.23
Cl+HCO3											1.00	-0.47	0.24	-0.23	0.65
MidSat												1.00	-0.86	-0.30	-0.43
LowSat													1.00	0.30	0.22
As														1.00	-0.18
NO3															1.00

SOUTH

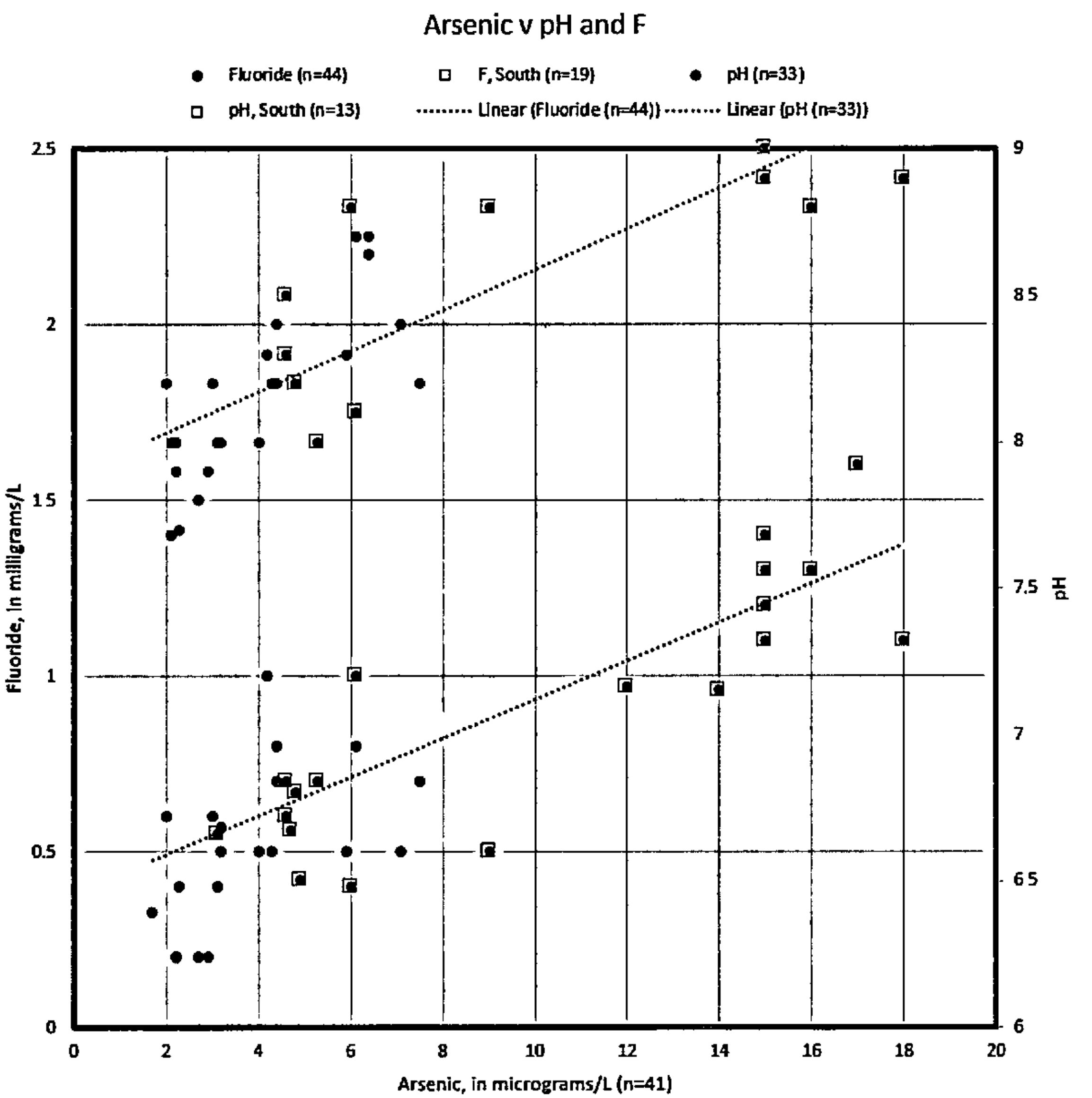
	Bicarbonate HCO3	Chloride Cl	Sulfate SO4	Fluoride F	Calcium Ca	Magnesium Mg	Sodium Na	pH	TDS	Ca+Na	Cl+HCO3	pct middle MidSat	pct lower LowSat	Arsenic As	Nitrate NO3
HCO3	1.00	-0.45	-0.44	0.14	-0.37	-0.31	-0.16	0.27	-0.33	-0.25	0.14	0.31	-0.33	0.10	0.19
Cl		1.00	0.87	-0.31	0.80	0.36	0.83	-0.34	0.92	0.84	0.47	0.17	-0.19	-0.08	0.11
SO4			1.00	-0.37	0.95	0.46	0.73	-0.31	0.96	0.86	0.37	-0.03	0.04	-0.01	0.01
F				1.00	-0.48	-0.16	-0.14	0.56	-0.40	-0.41	-0.33	-0.23	0.23	0.73	-0.22
Ca					1.00	0.42	0.60	-0.46	0.92	0.78	0.29	0.05	-0.05	-0.13	0.08
Mg						1.00	-0.03	-0.13	0.42	0.16	0.07	-0.11	0.11	0.06	-0.05
Na							1.00	-0.10	0.81	0.86	0.49	0.24	-0.24	0.09	0.19
pH								1.00	-0.35	-0.25	-0.13	-0.18	0.19	0.55	-0.30
TDS									1.00	0.89	0.44	0.14	-0.14	-0.03	0.18
Ca+Na										1.00	0.70	0.18	-0.19	-0.06	0.15
Cl+HCO3											1.00	0.27	-0.30	-0.14	0.05
MidSat												1.00	-1.00	-0.15	0.46
LowSat													1.00	0.17	-0.45
As														1.00	-0.06
NO3															1.00

COC	North and Central	South
Arsenic	pH (.68), F (.66)	F (.73), pH (.55)
Nitrate	Cl (.72)	-none-
Sulfate	TDS (.70), Na (.67)	TDS (.96), Ca (.95), Cl (.87), Na (.73)
Fluoride	As (.66), Na (.54)	As (.73), pH (.56)
TDS	Na (.83), Ca (.72), SO_4 (.70), Mg (.57)	SO_4(.96), Cl (.92), Ca (.92), Na (.81)

Arsenic and Fluoride

Arsenic and fluoride concentrations are correlated and both increase with pH. **Figure 13** depicts arsenic versus fluoride and pH. (pH versus As is in the upper portion of the graph and the y-axis label is to the right; fluoride versus As is in the lower portion and the y-axis is to the left). In both cases the correlations are influenced by the higher arsenic concentrations observed in the South Management Area (as noted by squares drawn around the data points). Every occurrence of arsenic above the MCL of 10 µg/L is associated with pH values greater than 8.5 (upper portion of the graph).

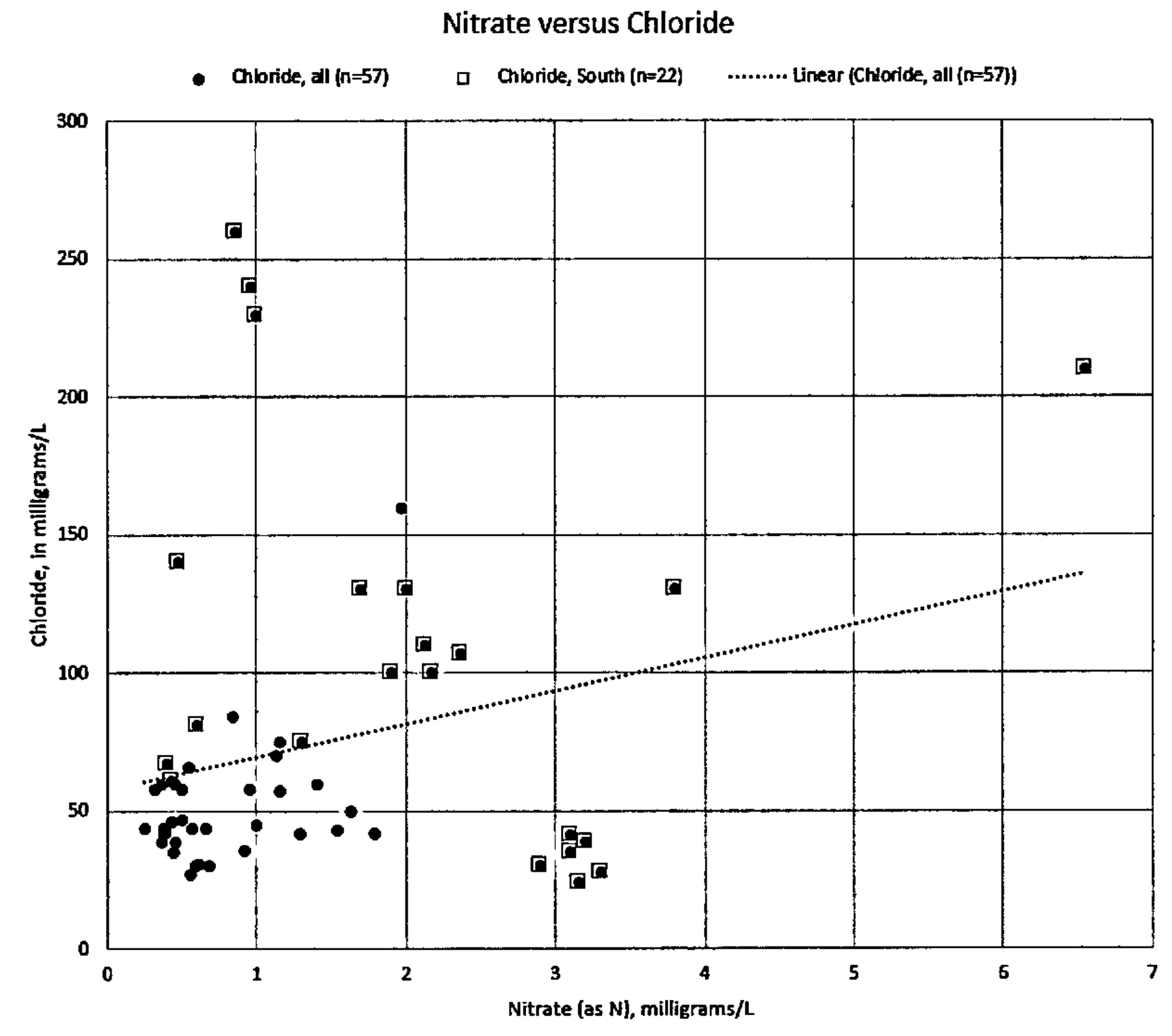
FIGURE 13



Nitrate

Nitrate had few water quality parameter correlations. Nitrate versus chloride is depicted in **Figure 14**. While there was a statistically-indicated correlation in **Table 3** for the North and Central Management Areas, chloride does not appear to be a globally useful predictor of nitrate.

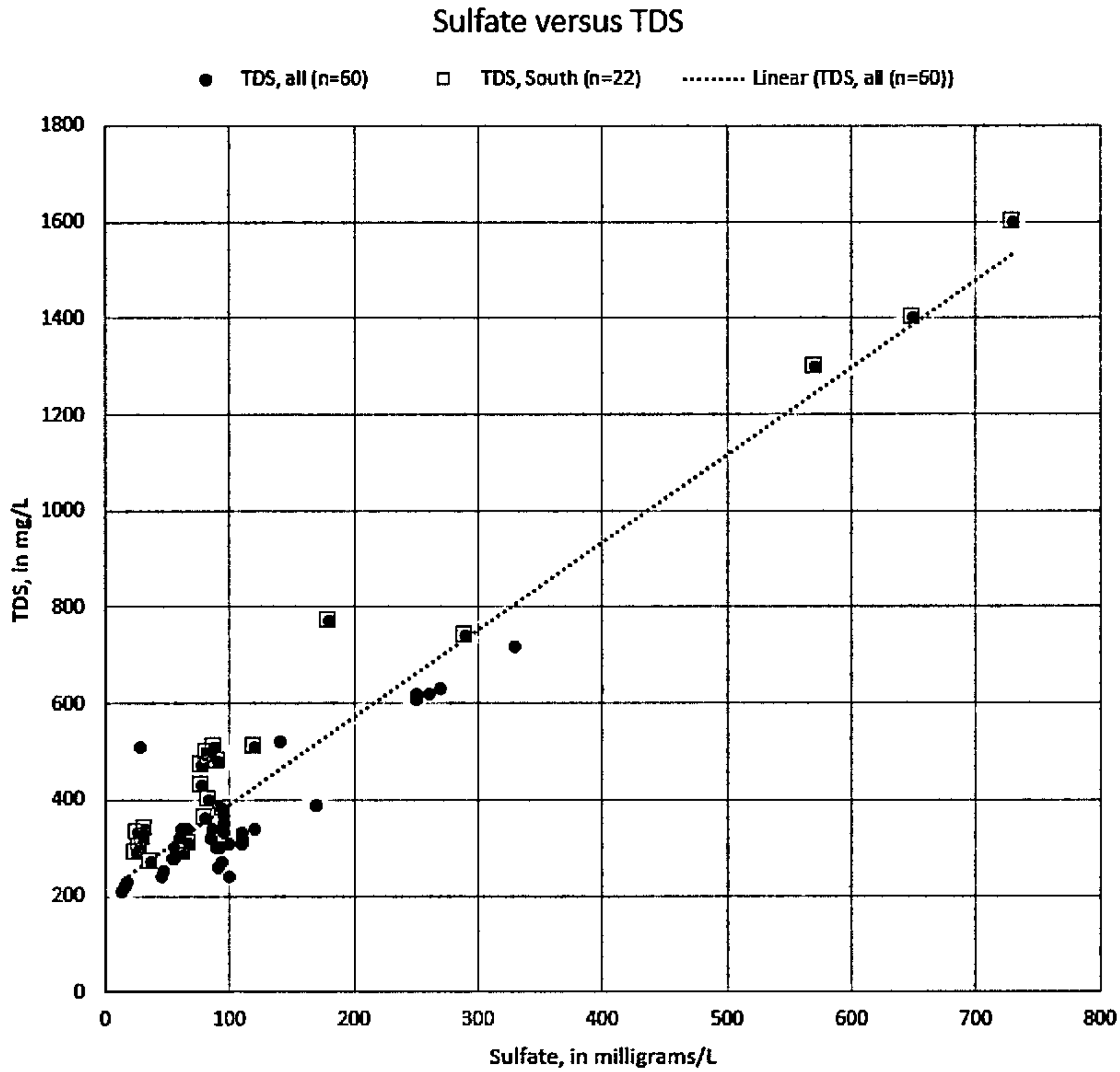
FIGURE 14



Sulfate

The correlation of sulfate with TDS is depicted in **Figure 15.** The three high sulfate values (> 500 mg/L) from the South Management Area strongly influence the correlation.

FIGURE 15

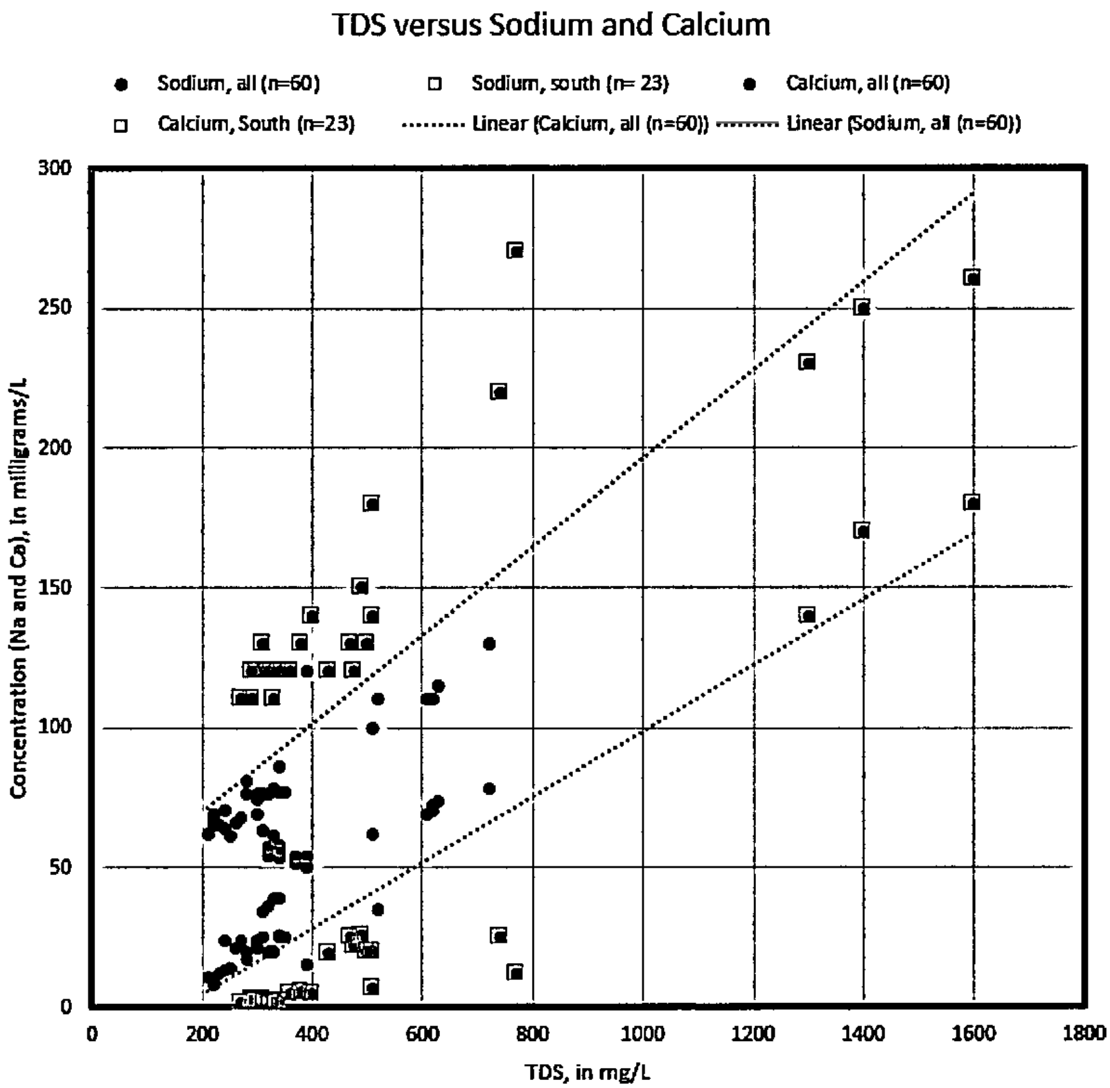


TDS

Multiple analytes correlated with TDS. Sulfate is shown in the previous figure. Sodium and calcium are shown versus TDS in **Figure 16**, and chloride versus TDS is shown in **Figure 17**. Both figures show that the South Management Area water chemistry is different than that observed to the north. The regression lines in **Figure 16** effectively split the two sets of data by management area.

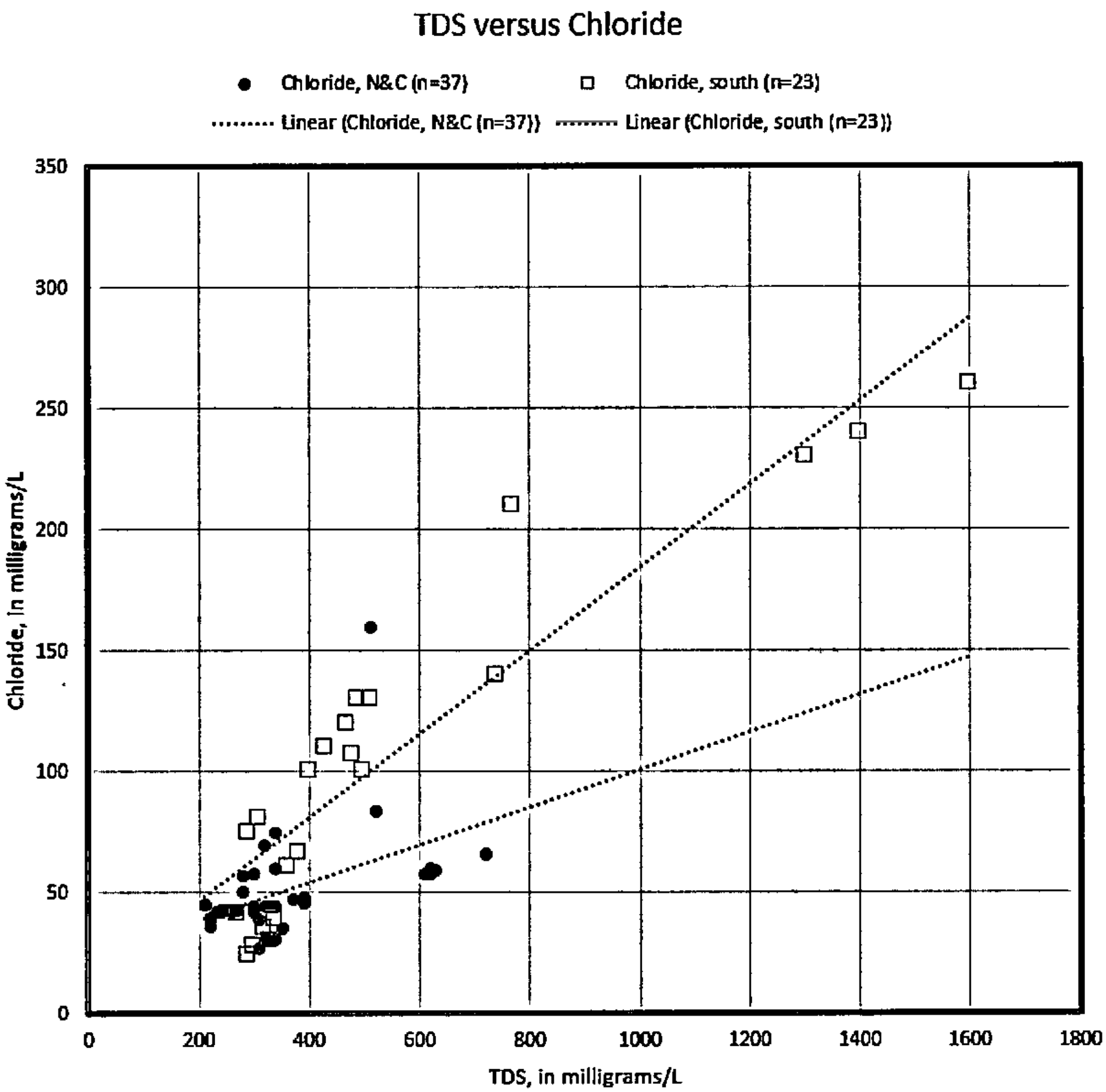
While correlations exist for all three analytes, sodium and chloride represents a higher percentage of TDS and calcium represents a smaller percentage of TDS in the South Management Area.

FIGURE 16



Chloride data segregated by management area are depicted in **Figure 17**. The highest chloride concentrations typically occur in the South Management Area.

FIGURE 17



3.8 General Minerals: Summary of Observations

A summary of the Piper diagram analyses for the 23 wells used in this Report is included in **Table 1B**.

- Water quality has clearly changed over time. Of the 23 wells, six had insufficient general minerals data to assess trends. Of the 17 wells with sufficient temporal data, approximately 70 percent showed a change in natural water chemistry over time.
- Sulfate is the general mineral most commonly observed to be increasing in groundwater (as a relative percentage per the Piper diagrams).
- Groundwater quality systematically varies with distance along the valley, with water in the South Management Area being noticeably different. Here the well data were not differentiated by aquifer or relative depth

Five COCs are included in this Report. Nitrate and arsenic are currently the chemical of highest concern specific to BWD drinking water quality. Fluoride, sulfate, and TDS are other three COCs. The data were collected over varying time periods and not all sampling events included a complete set of the eight general minerals. A review of the COCs for all of the active BWD wells is provided in **Section 4**.

Limited depth-specific hydraulic and contaminant data are available to assess the nature and extent of COCs in groundwater. As a result, the analyses among wells is limited to spatial comparisons. The lack of depth-specific data is a data gap that affects the assessment of all water quality parameters. The primary impact of this data gap is that the depth-dependent data will provide a good indication of how water quality will change over time as water levels decline. If specific zones are contributing poor water quality, then the data can be used to selectively complete future water wells to reduce the impact of the inflow of poor water quality.

4.0 CHEMICALS OF CONCERN (COCs) AT BWD WATER SUPPLY WELLS

The five chemicals of concern (COCs) include arsenic, total dissolved solids, nitrate, sulfate, and fluoride (As, TDS, NO_3, SO_4, and F). There are nine BWD water supply wells reviewed here. The COC and Piper diagram data for these wells is depicted in the following Figures that follow this subsection:

Figure 18 ID4-4 (Well #4, as depicted in Figure 4)
Figure 19 ID4-11 (Well #5, as depicted in Figure 4)
Figure 20 ID4-18 (Well #2, as depicted in Figure 4)
Figure 21 ID1-10 (Well #14, as depicted in Figure 4)
Figure 22 ID1-12 (Well #9, as depicted in Figure 4)
Figure 23 ID1-16 (Well #12, as depicted in Figure 4)
Figure 24 ID5-5 (Well #8, as depicted in Figure 4)
Figure 25 Wilcox (Well #13, as depicted in Figure 4)
Figure 26 ID1-8 (Well #15, as depicted in Figure 4)

Of these, three wells are being considered for replacement- ID4-4, ID4-18, and ID1-10. **Table 4** summarizes the review of **Figures 18 through 26.**

Water quality trends, if identified, are based on visual description of the various data. The GSP describes the use of Mann-Kendall statistical trend analyses, a non-parametric way to detect a monotonic trend (up or down), to assess individual water quality parameters. The work here is focused on identifying correlations among parameters.

NOTE: Well ID4-4 was redrilled in 1979. Water chemistry changed.

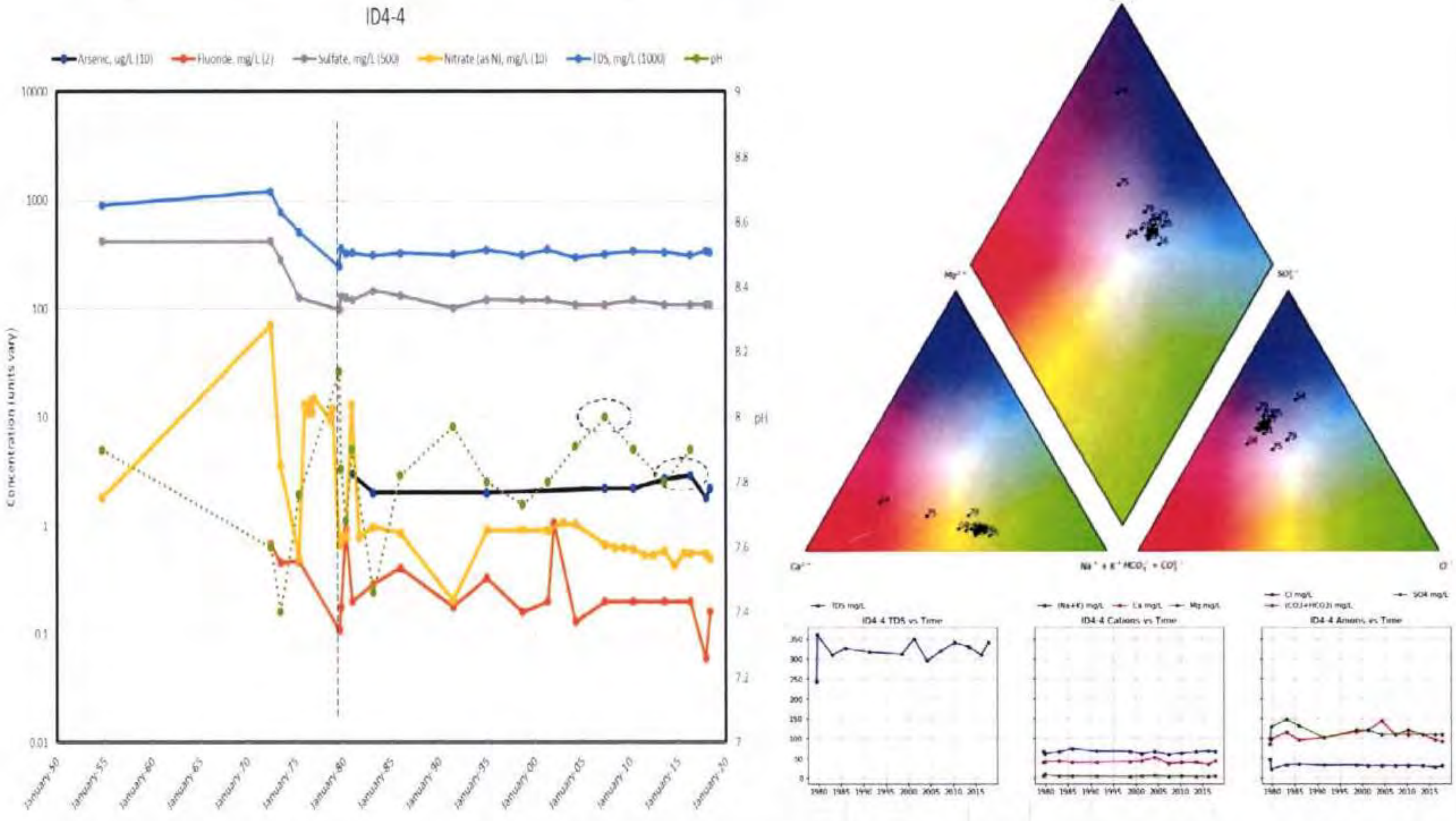


FIGURE 18. BWD Well ID4-4

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

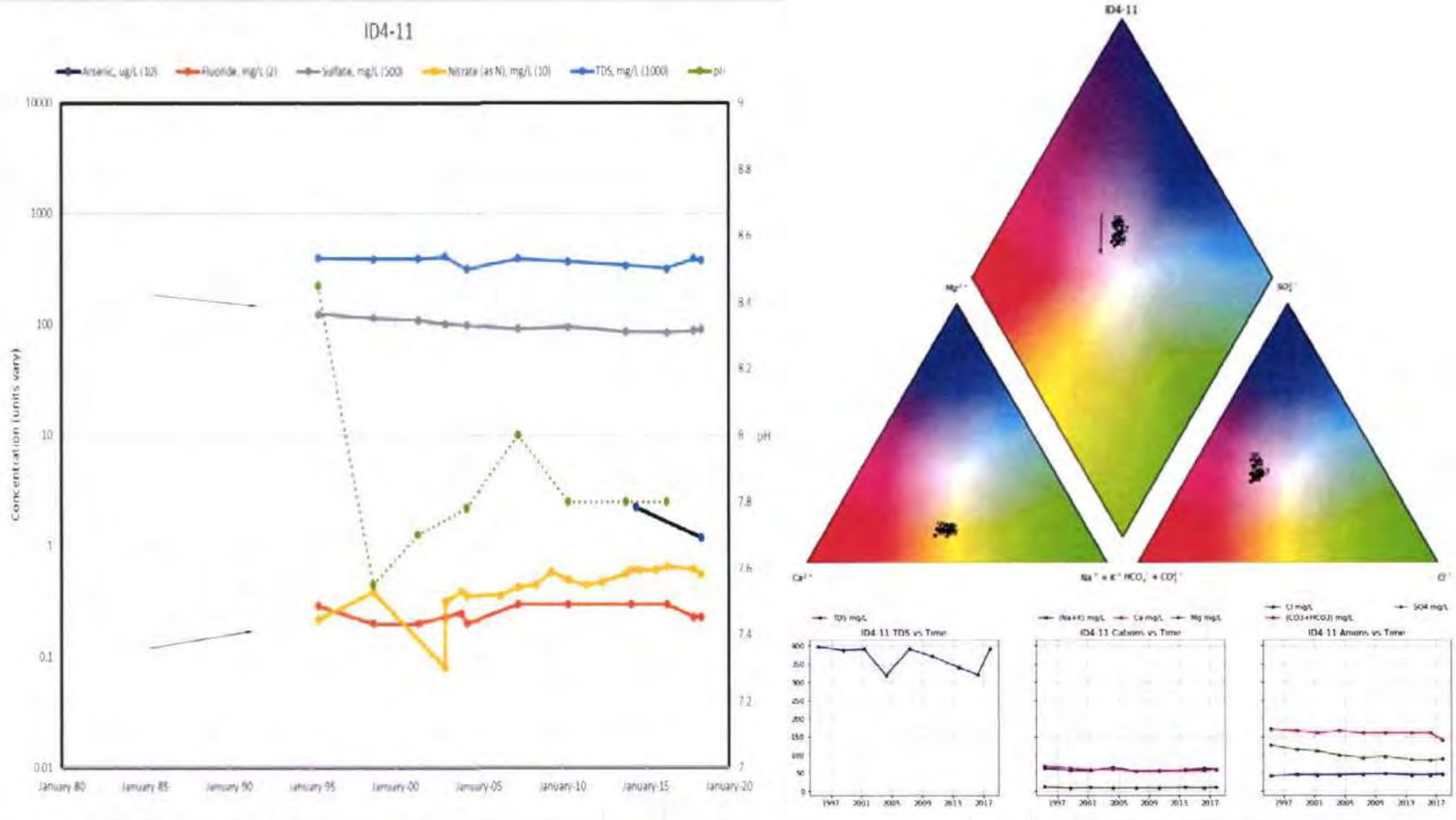
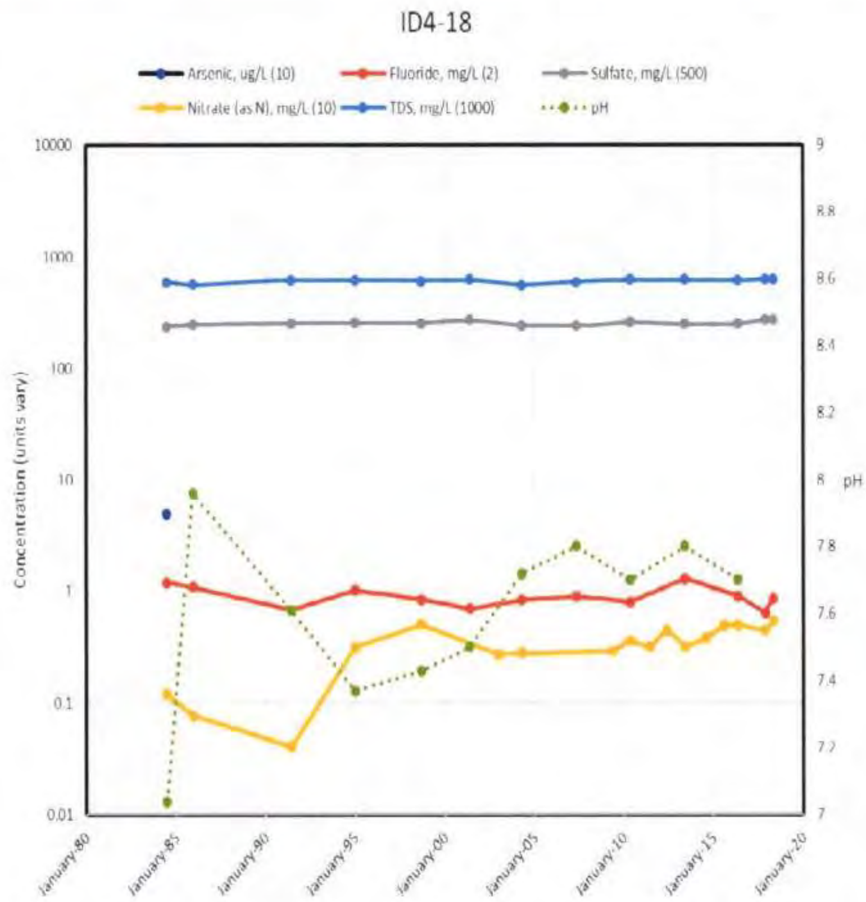


FIGURE 19. BWD Well ID4-11

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)



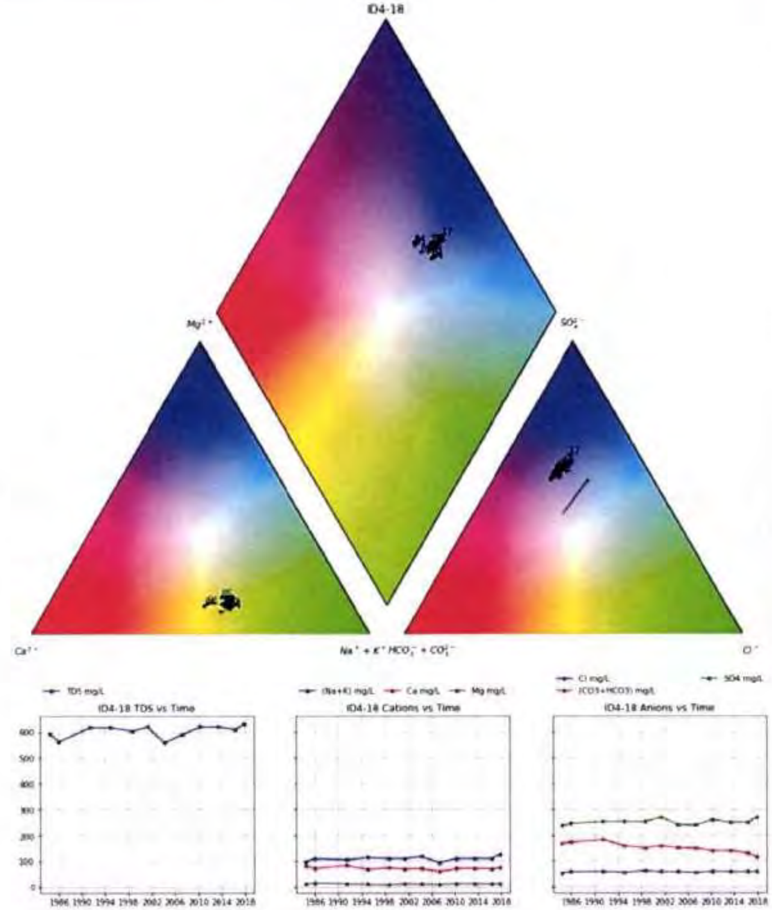


FIGURE 20. BWD Well ID4-18

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

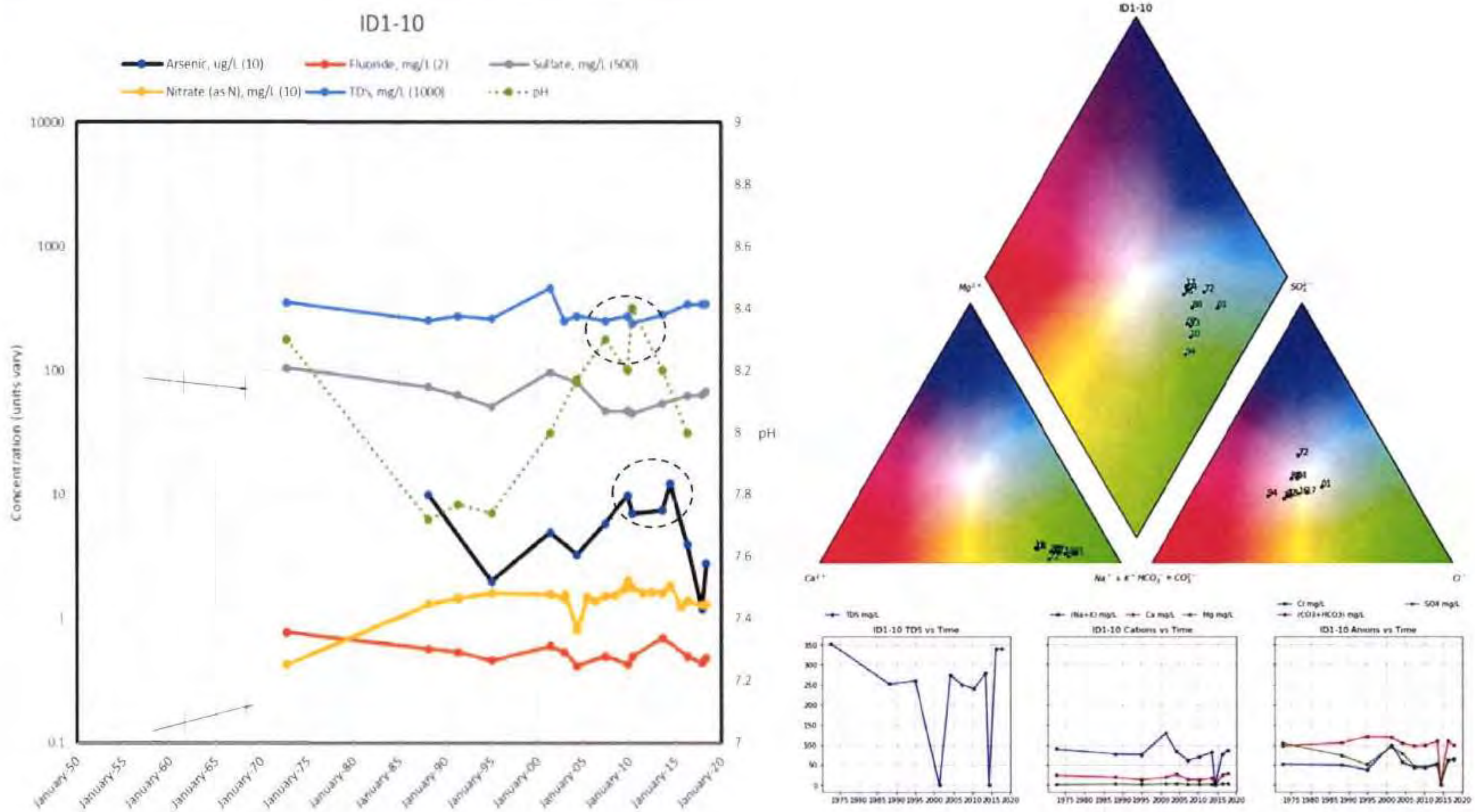
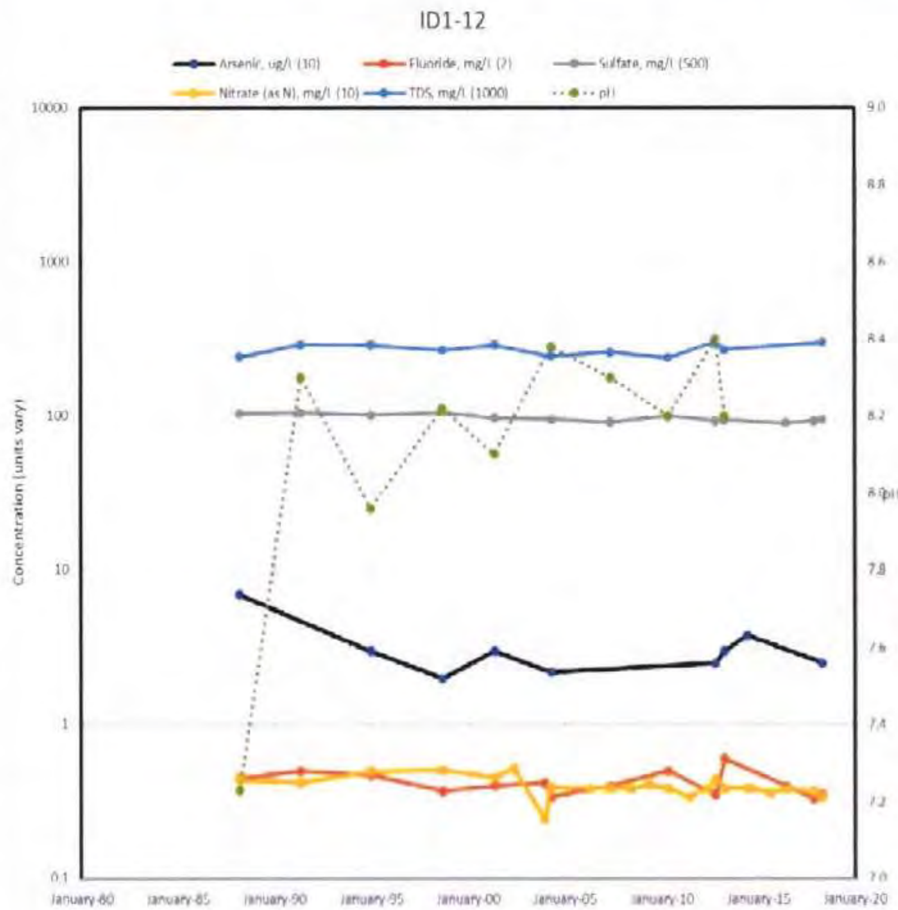


FIGURE 21. BWD Well ID1-10

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)



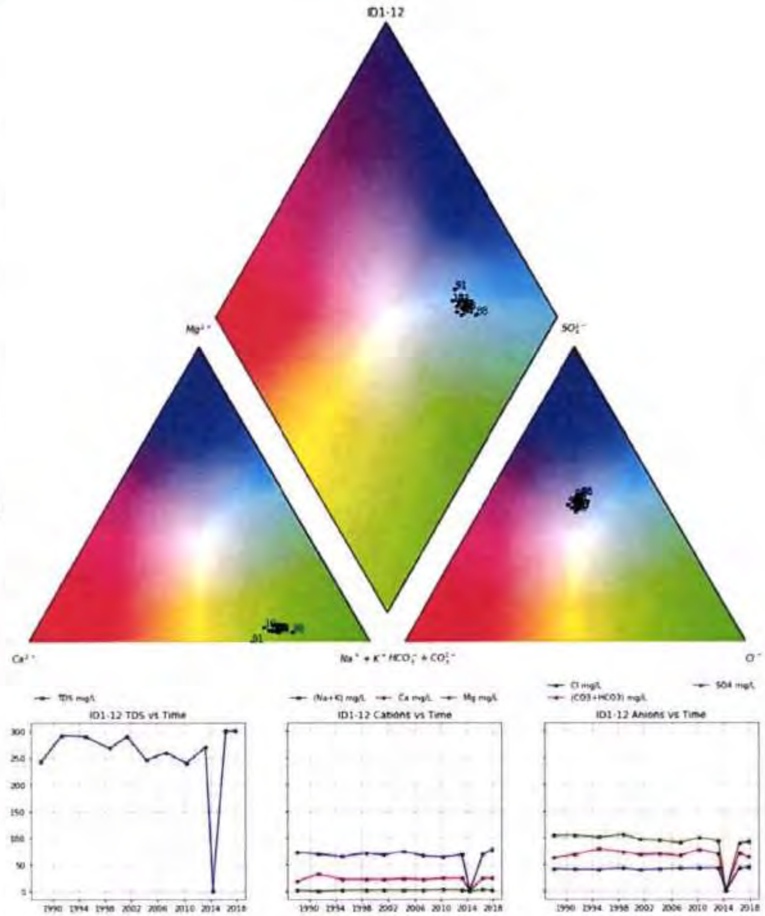


FIGURE 22. BWD Well ID1-12

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

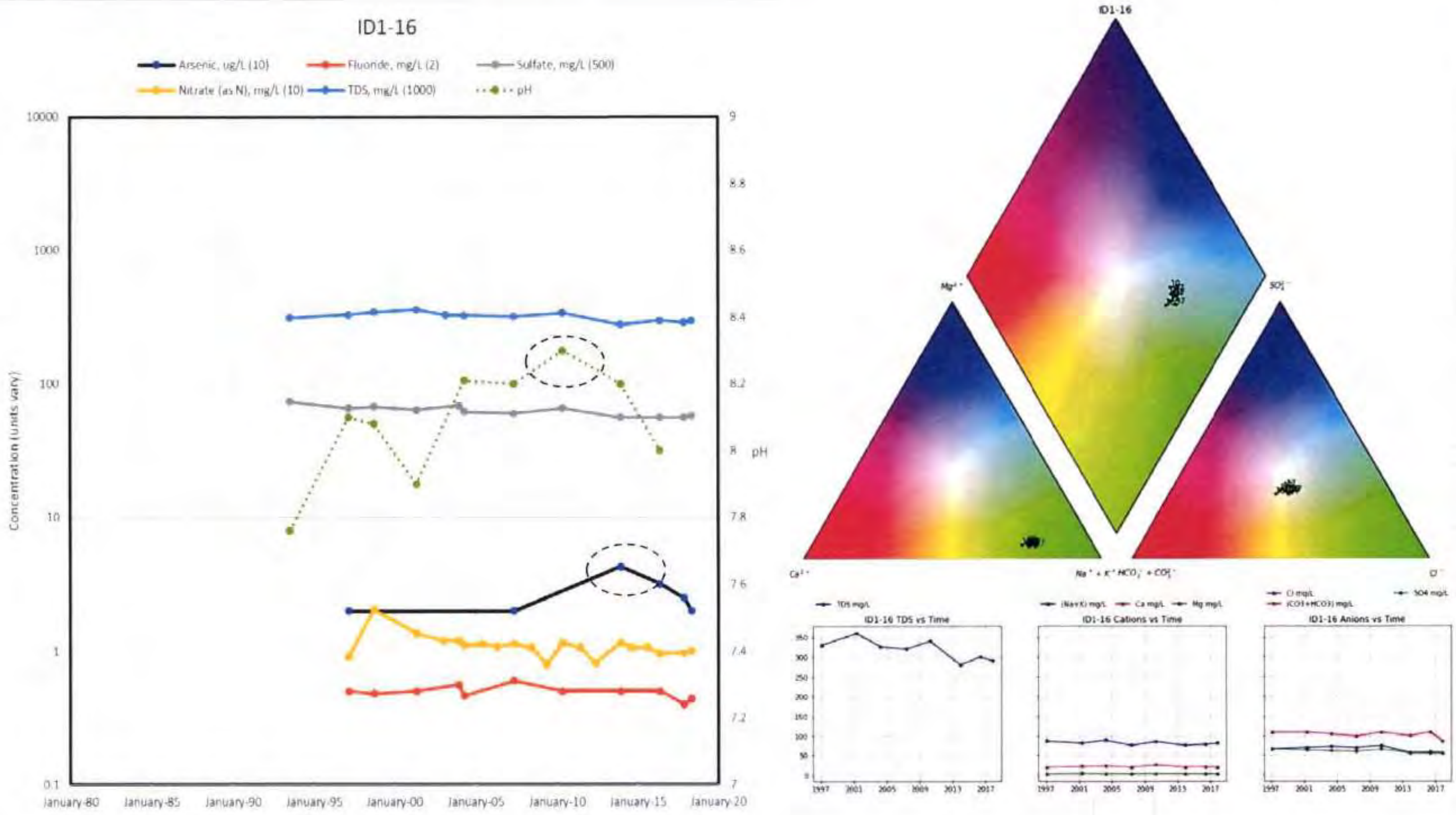


FIGURE 23. BWD Well ID1-16

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

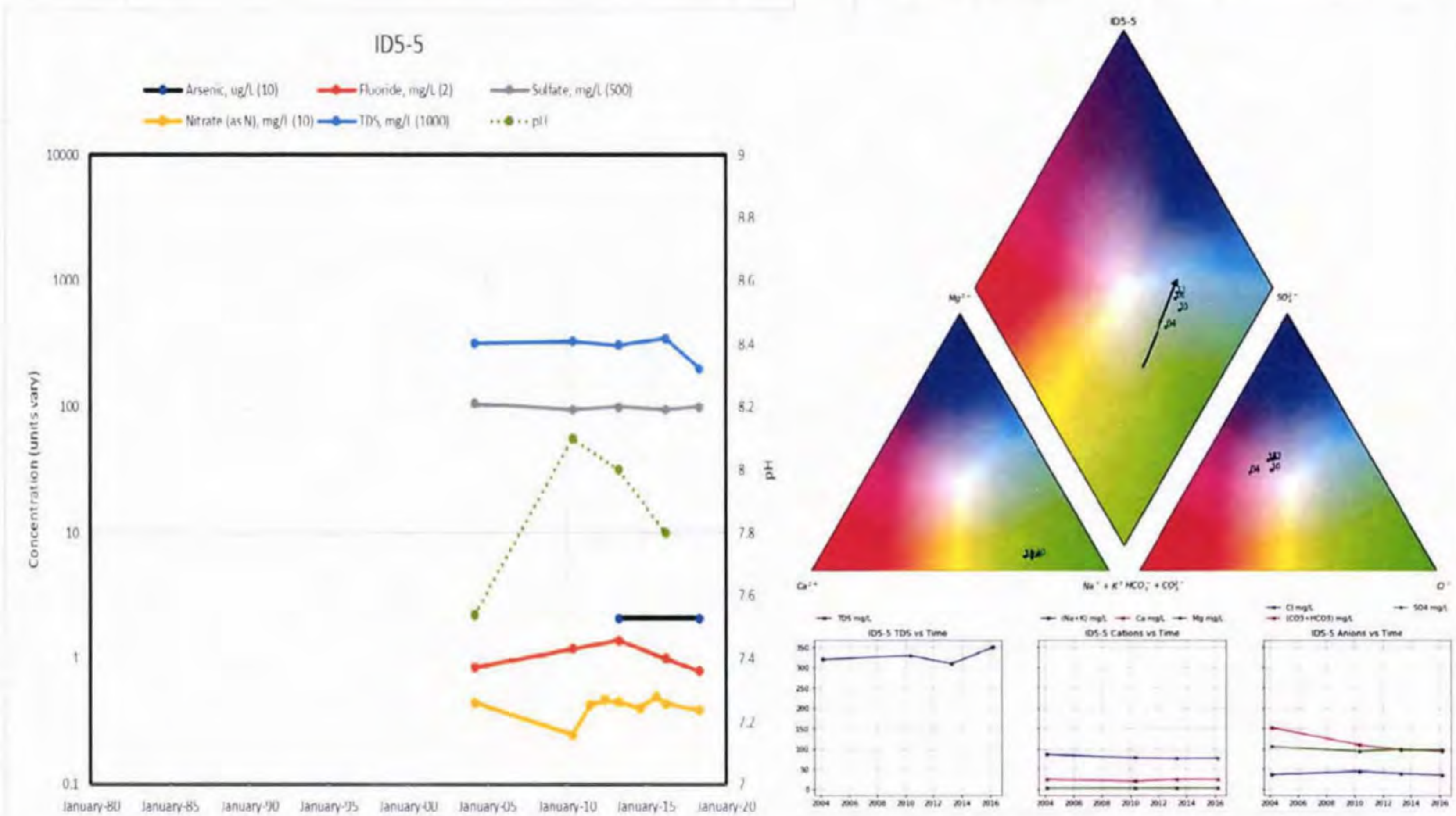


FIGURE 24. BWD Well ID5-5

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

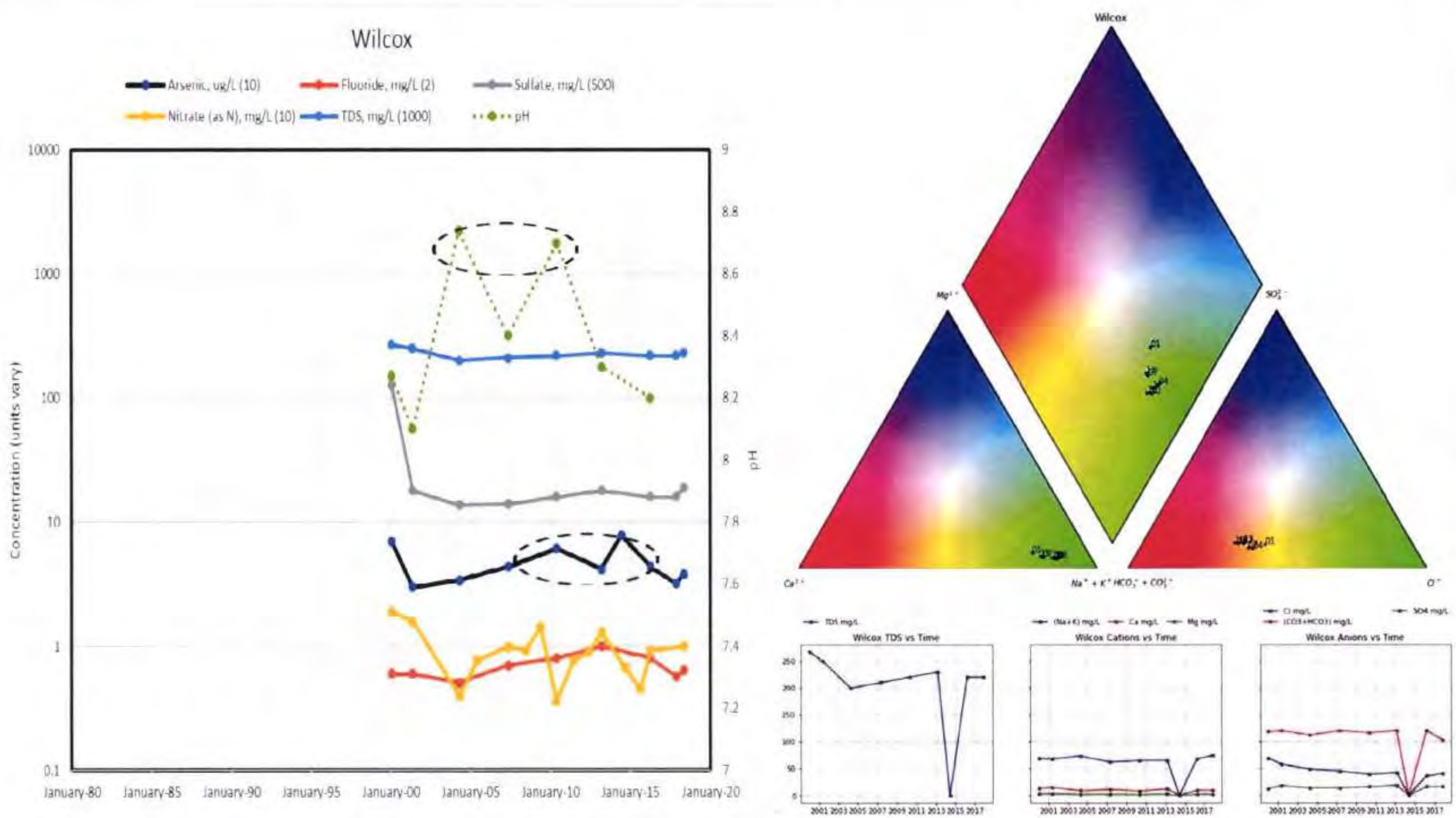


FIGURE 25. BWD Wilcox Well

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

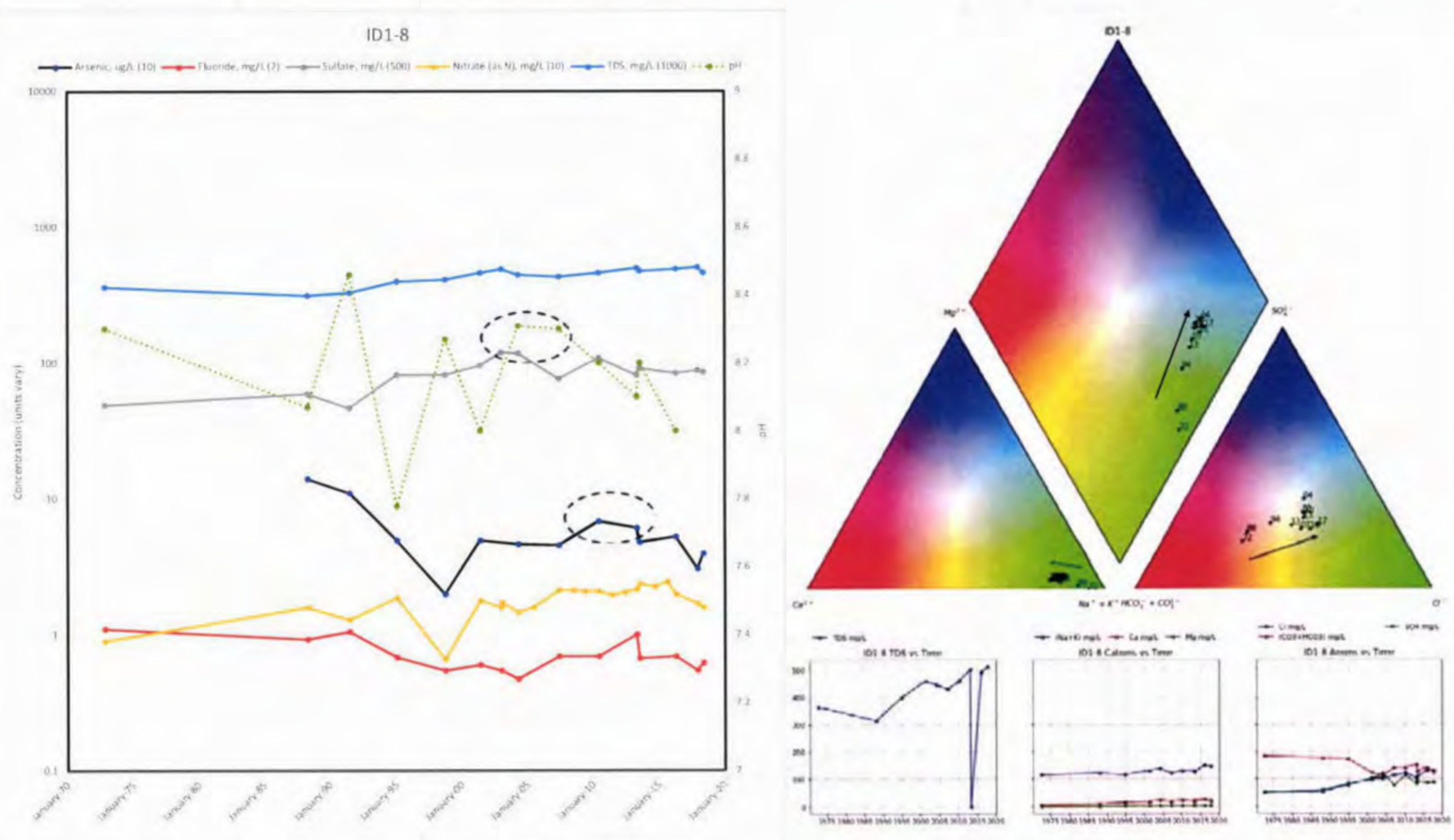


FIGURE 26. BWD Well ID1-8

Notes: pH and COC concentrations versus time shown left panel.
Piper trilinear diagram depicts change over time- the labels indicate the last two digits of the year when sampled (e.g. 72 = 1972)

TABLE 4

WELL	TDS/ Gen Min (MCL: 500 recc/1000 max, mg/L)	Sulfate (MCL: 250 recc/500 max,mg/L)	Arsenic (MCL: 10 ug/L)	pH	Nitrate (MCL: 10 mg/L as N)	Fluoride (MCL: 2 mg/L)
ID4-4 (#4)**	Stable (330) TDS: 320 to 340 GenMins*: Vble, cation trend may develop	Stable (110) SO4: 110 to 120	In Range (2.2) As: 1 8 to 2.9	Stable Range pH*: 7.8 to 8	Decreasing (0.5) NO3: 1.0 to 0 43	In Range (0.16) 0.6 to 0.2
ID4-11 (#5)	Stable (380) TDS: 320 to 390 GenMins*: Vble, anion trend may develop	Stable SO4: 91 to 95 Was decreasing prior to 2005	Insuff. Data (2.1) As: 1.2 to 2.2 Two recent detects	Stable Range pH*: 7.8 to 8	Increasing (0.56) NO3: 0 36 to 0 66	In Range (0 23) 0.23 to 0.3
ID4-18 (#2)**	Possibly Increasing (630) TDS: 590 to 630 GenMins: inc SO4, dec HCO3	Increasing (270) SO4: 240 to 270 Slowly changing	Non-Detect	Stable Range pH*: 7.7 to 7.8	Increasing (0 54) NO3: 0.29 to 0.54	In Range (0 87) 0.54 to 1.3
ID1-10 (#14)**	Possibly Increasing (340) TDS: 250 to 340 GenMins: inc SO4, dec HCO3 (major changes since 1972)	Increasing (67) SO4: 45 to 67 Slowly changing	In Wide Range (2.8) As: 1.2 to 12.2 Maximum 6/2014	In Wide Range pH*: 8.0 to 8.4 Maximum 5/2010 (~2 yr *ahead of As*)	In Range (1.3) NO3: 1.27 to 2.02	In Range (0.48) 0.43 to 0.7
ID1-12 (#9)	Stable (300) TDS: 260 to 300 GenMins: Stable	Stable (95) SO4: 91 to 95	In Range (2.5) As: 2.5 to 3.79	In Range pH*: 8.2 to 8.4	In Range (0.34) NO3: 0.34 to 0.44	In Range (0 34) 0.38 to 0 6
ID1-16 (#12)	Possibly Decreasing (340) TDS: 280 to 340 GenMins: SO4 slowly decreasing	Decreasing (58) SO4: 56 to 66 Slowly changing	In Range (2.0) As: 2.0 to 4.3 Maximum 12/2013	In Range pH*: 8.0 to 8.3 Maximum 5/2010 (~3 yr *ahead of As*)	In Range (1.3) NO3: 1.27 to 2 02	In Range (0.48) 0 43 to 0.7
ID5-5 (#8)	Stable (350) TDS: 202 to 350 GenMins*: Vble, anion trend may develop (inc SO4)	Stable (100) SO4: 95 to 106	Insuff. Data (2.1) As: 2.1 (twice) Two recent detects	In Wide Range pH*: 7.54 to 8.1	In Range (0 39) NO3: 0.25 to 0.50	In Range (0.8) 0 85 to 1.4
Wilcox (#13)	Stable (230) TDS. 210 to 230 GenMins: SO4 slowly increasing	Increasing (19) SO4: 14 to 19 Slowly changing	In Range (3 8) As: 3.2 to 7.8 Maximum 6/2014	In Range pH*: 8 2 to 8.7 Maximum 5/2010 (~4 yr *ahead of As*)	In Range (1.0) NO3: 0.36 to 1.42	In Range (0.64) 0.57 to 0 87
ID1-8 (#15)	Possibly Increasing (460) TDS: 430 to 510 GenMins: long-term inc SO4 & Cl & Ca, dec HCO3 (major changes since 1972)	Stable (86) SO4: 82 to 110	In Range (4 0) As: 3.1 to 6 8 Maximum 5/2010	In Range pH*: 8.0 to 8.4 Maximum during 2004 to 2007 (*~3 to 6 yr ahead of As*)	In Range (1.6) NO3: 1.6 to 2.46 (long-term inc)	In Range (0.62) 0 55 to 1.0

Notes:
* Most recent general minerals and pH analyses done in 2016
** Wells expected to be replaced or re-drilled in short-term

Explanation:
Trends noted as Stable, Increasing, Decreasing, Possibly Increasing/Decreasing, or In a Range
Number after descriptor – e g. Stable (330), is the most recent sampling result from Spring 2018
Next line is the range of values observed since 2005
GenMins refers to the set of general minerals data- eight major anions and cations
xx, a value that is highlighted occurs at a concentration greater than 50% of the MCL
xx, a value that is highlighted and bold occurs at a concentration greater than the MCL

4.1 North Management Area (3 Wells: ID4-4, ID4-11, and ID4-18)

The North Management Area wells are generally located to the west and upgradient of the irrigated agricultural areas visible in **Figures 4 and 7**. COC-specific observations are included in **Table 4.**

ID4-4

ID4-4 was re-drilled in 1979 due to high nitrate concentrations related to the upper aquifer. Nitrate remains detectable but at low concentrations. Water quality is good and reasonably stable. The District is currently planning to re-drill this well at the same site as a result of poor well conditions that resulted in sanding and the installation if a well liner that limits the depth to which the pump can be installed in the well.

Additional information regarding the well replacement can be found in a 8/30/2018 Dudek presentation entitled "Water Vulnerability & New Extraction Well Site Feasibility Analysis" posted at the County SGMA website:
https://www.sandiegocounty.gov/content/dam/sdc/pds/SGMA/Prop-1-SDAC-Grant-Task-5-New-Extraction-Well-Site-Feasibility-Analysis.pdf

ID4-11

Water quality in ID4-11 is good and reasonably stable.

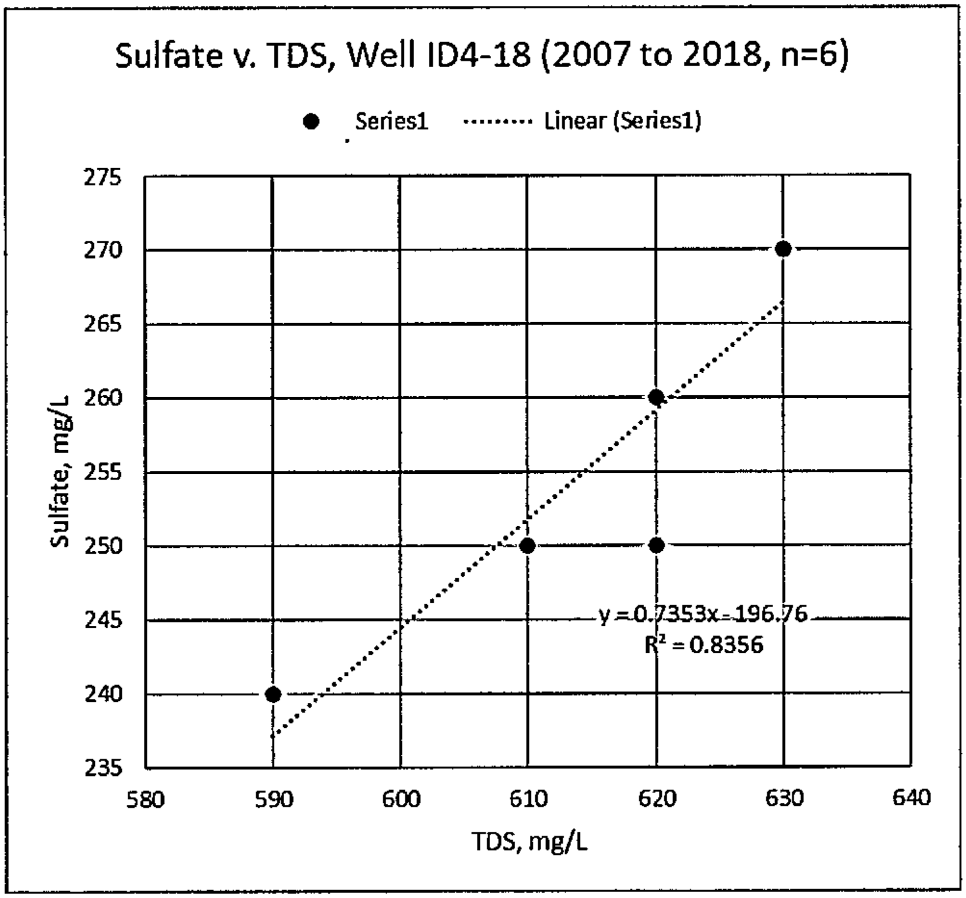
ID4-18

TDS is between the recommended and upper secondary MCL (currently at 630 mg/L). Sulfate is slowly increasing and is above the recommended secondary MCL of 250 mg/L. Arsenic has not been detected in this well (last reported as ND < 1.2 µg/L).

Figure 27 shows how TDS and sulfate are correlated and is presented as an example of how TDS measurements based on electrical conductivity testing may be able to be used to assess sulfate.

FIGURE 27

Date	TDS	Sulfate
5/8/2007	590	240
5/11/2010	620	260
6/10/2013	620	250
5/16/2016	610	250
11/17/2017	630	270
4/30/2018	630	270



4.2 Central Management Area (5: ID1-10, ID1-12, ID1-16, ID5-5, and Wilcox)

The Central Management Area is associated with both the "central" and "transitional" water quality type as indicated in **Figure 6** and COC-specific observations included in Table 4.

ID1-10

Water quality in ID1-10 is currently good and reasonably stable.

Elevated arsenic concentrations (a maximum of 12.2 μg/L that exceeded the MCL of 10 μg/L) were observed in 2014 that were preceded by elevated pHs of 8.2 to 8.4 (see **Figure 21**). Arsenic concentrations and elevated pH conditions have since declined.

ID1-12

Water quality in ID1-12 is currently good and reasonably stable.

ID1-16

Water quality in ID1-12 is currently good and reasonably stable.

Elevated arsenic concentrations (a maximum of 4.3 μg/L) were observed in 2014 that were preceded by and elevated pH of 8.3 (see **Figure 23**). Arsenic concentrations and elevated pH conditions have since declined.

ID5-5

Water quality in ID5-5 is currently good and reasonably stable.

Wilcox

Water quality in the Wilcox well is currently good and reasonably stable.

Elevated arsenic concentrations (a maximum of 7.8 μg/L) were observed in 2010 and 2014 that were preceded by elevated pH of greater than 8.6 (see **Figure 25**). Arsenic concentrations and elevated pH conditions have since declined.

4.3 South Management Area (1: ID1-8)

As previously discussed, the water chemistry observed in the South Management Area is distinctly different than that observed to the north. COC-specific observations are included in Table 4.

ID1-8

Water chemistry at ID1-8 has significantly changed over time, but now appears to be stabilizing. Water quality in ID1-8 is currently good.

Arsenic is of concern due to MCL exceedances consistently observed in nearby Ram's Hill wells.

Elevated arsenic concentrations (a maximum of 6.8 µg/L) were observed in 2010 that were preceded by an elevated pH of 8.3 (see **Figure 26**). Arsenic concentrations and elevated pH conditions have since declined.

5.0 SUMMARY

The multi-parameter assessment of water quality and COC trends provides additional insight compared to single parameter assessments.

Natural Water Chemistry (anions and cations)

- Natural water chemistry as determined by the eight dominant anions and cation systematically varies across the Subbasin (these include calcium [Ca], magnesium [Mg], sodium [Na], potassium [K], chloride [Cl], sulfate [SO_4], bicarbonate [HCO_3], and carbonate [CO_3]).

  The observed variations generally correlate with the previously established management areas that are further discussed in the GSP. Overall trends generally correlate with the well location relative to the pre-development groundwater flow paths and distance from where recharge waters enter the Subbasin,

- Water samples from BWD water supply wells show that the dominant cations and anions are sodium and calcium; and bicarbonate, sulfate, and chloride, respectively.

- The water type transitions from a calcium sulfate to a sodium chloride in the Northern Management Area wells.

- Sodium bicarbonate type water generally occurs in the South Management Area as tested. The groundwater analysis further supports that the South Management Area has distinctly different water quality than observed in the north and central groundwater management areas.

- The primary causes for the difference in water quality within the Subbasin include variations in the water being recharged (e.g. Coyote Creek versus San Felipe Creek), proximity of irrigated lands (e.g. nitrate impacts due to fertilizer application), aquifer lithology (local deposits of evaporites and potential arsenic-bearing clays), aquifer depth (related to increase in TDS), and location within the Subbasin with respect to the Borrego Sink where enhanced evaporation of ephemeral surface water occurs.

- Due to the location of the BWD wells this analysis does not fully represent the water quality distribution in the Subbasin. Refer to **Figures 4 and 7** for the well locations. As result the spatial trends identified among the wells are limited to examining variations along the western side of the Subbasin.

- Water quality as a function of depth has not been assessed in the BWD water supply wells, for example by the use of depth-specific water sampling. Well profiling data obtained by the DWR (**Figure 10**, for example) indicate that TDS linearly increases with depth. Given the high correlation with sulfate, the increase in TDS implies that sulfate will also increase with depth.

- Multiple aquifers are represented in the water chemistry data because of the construction of the 23 wells used in this report. As a result, water quality could not be differentiated in terms of the three-layer aquifer system (upper/middle/lower) used by the USGS and others (for example in the USGS Model Report).

- Temporal trends are more readily identified when multiple general mineral analyses are considered for each of the wells. Here Piper trilinear diagrams were used to assess the eight dominant anions and cations.

- 17 of the 23 wells had sufficient anion and cation data for temporal analysis and in some cases, well over 40 years data are available. Of these approximately 70 percent have experienced changes in water chemistry over time. The changes are generally attributed to long-term overdraft.

Chemicals of Concern (COCs)

- Five COCs were examined: arsenic, nitrate, TDS, sulfate, and fluoride. The overall analyses are improved when all five parameters are considered together and geochemical factors such as pH are included. The five COCs are depicted together with pH for each of the nine active BWD water supply wells in **Section 4**.

- Single parameter trend assessments, for example using Mann-Kendall trend analyses included in previous studies, are not repeated here.

- The COC analysis is based on a comparison of concentrations with current MCLs. Down-revision of the criteria, especially for arsenic, could have a large impact on BWD operations should water treatment be required. The State of California MCL for arsenic was last revised (from 50 to 10 ug/L) on 1/28/2008[25]. As of February 2017, there is no indication that the State Water Resources Control Board is planning to revise the arsenic MCL[26].

- Overall the water quality is currently good and water can be delivered without the need for advanced treatment. However, short-term water quality trends have been of concern, especially for arsenic. The following summarizes the analysis per COC.

[25] See: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Arsenic.html

[26] Per a state review from 2017: "We are not aware of changes in treatment that would permit materially greater protection of public health, nor of new scientific evidence of a materially different public health risk than was previously determined. Thus, we do not plan on further review of the arsenic MCL." See: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/reviewofmaximumcontaminantlevels-2017.pdf

Arsenic and Fluoride

Arsenic concentrations were increasing in multiple BWD water supply wells until 2014 and have since decreased. The potential for MCLS to be exceeded is of high concern to BWD due to the potential cost of water treatment and/or well replacement. The MCL was temporarily exceeded in one well, ID1-10. Review of the data shows that there is a relationship between pH and arsenic where elevated arsenic concentrations occur under alkaline conditions with pH levels of approximately 8 and greater. Especially noteworthy is that peak arsenic concentrations can be observed to occur after the peak pH was observed in multiple wells (ID1-10, ID1-16, Wilcox, and ID1-8). The lag time is approximately 2 to 4 years. While additional data and observations are required to further assess the connection between arsenic and pH, this relationship could prove important toward the monitoring and management of BWD's water supply.

Fluoride is discussed with arsenic because it has been observed to correlate with arsenic. While fluoride occurs at detectable concentrations in all of the active BWD wells, it has not been of concern as concentrations have typically been well less than 1.0 mg/L, less than half the MCL. Given the correlation it may prove useful towards future trend analyses for arsenic.

TDS and Sulfate

TDS represents the sum of all anions and cations that occur in the water. Here a number of these anions and cations have been observed to correlate with TDS. **Figures 15 through 17** show the correlation with TDS for sulfate, sodium, calcium, and chloride. A specific example is shown for well ID4-18 in **Figure 27** where TDS and sulfate are well correlated.

The USGS Model Report (p. 2) identified TDS and sulfate as "the only constituents that show increasing concentrations with simultaneous declines in groundwater levels".

Electrical conductivity measurements are commonly used to assess TDS. In this case they can be used as a field-based monitoring tool for TDS, and in turn support tracking of sulfate. The TDS profiles presented by DWR (**Figure 10**) are examples of electrical conductivity measurements used to evaluate TDS.

Nitrate

Historically there have been significant nitrate-related water quality problems encountered in BWD wells that led to well reconstruction, abandonment, and replacement. These wells were typically producing water from the uppermost portion of the aquifer system. As noted in **Table 4**, nitrate occurs in all of the active BWD wells at varying concentrations well below the MCL. Nitrate predominantly occurs as a result of fertilizers contained in irrigation return flow, and from septic systems. Historically, because the upper portion of the aquifer system is unconfined, nitrate has primarily affected wells that were completed (open to flow) at the water table.

The USGS Model Report (p.2) noted that "TDS and nitrate concentrations were generally highest in the upper aquifer and in the northern part of the Borrego Valley where agricultural activities are primarily concentrated".

Nitrate concentrations are primarily related to land-based activities and do not correlate with inorganic water quality data. Overall determination of historical impacts and ongoing susceptibility of the aquifer to nitrate contamination will require review of prior, current, and future land use placed in a spatial context. Work done by DWR (for example as illustrated in **Figure 11**) is an example of how land use information can be used. Among the land use parameters that would go into a nitrate source analysis would the location and types of septic and sewer systems, current and historical agricultural activities, and current and historical irrigated turf/golf courses.

5.1 Other Potential COCs

This report focused on the dominant anions and cations, and the five primary COCs. Other potential COCs include naturally-occurring uranium and radionuclides. Anthropogenic COCs include herbicides, pesticides, and similar chemicals used for agriculture and turf management. Microbial contamination, typically associated with animal wastes and sewage/septic, is also of potential concern.

Groundwater quality provided by BWD water supply wells is currently good and meets California drinking water maximum contaminant levels (MCLs). To date the current wells are producing water without the need for treatment. The BWD public water supply monitoring program is conducted in compliance with the State of California's requirements as administered by the State Water Resources Control Board Division of Drinking Water (DDW) and includes a wide range of analytes.

BWD provides all sampling data to the DDW, and is listed as public water supply CA3710036. A summary of BWD's sampling program for other COCs can be reviewed in the annual consumer confidence report, available online at http://nebula.wsimg.com/c30a61991a5160ddf5e577fe9f7b3c01?AccessKeyId=D2148395D6E5BC38D600&disposition=0&alloworigin=1. The BWD is also sampling all of its water supply well semi-annually as part of the GSA monitoring network rather than the minimum 3-year timeframe currently required by DDW.

5.2 Recommendations

- The COC analysis supports expansion of groundwater monitoring and testing program to include field-based water quality measurements of water being produced by BWD. Monthly wellhead measurements are recommended for electrical conductivity (EC), pH, and oxidation-reduction (redox) potential. These could be conducted at the same time BWD personnel collect monthly bacteria samples. EC can be used to calculate TDS, and by correlation estimate sulfate in some wells. Redox and pH are key geochemical parameters that can readily be measured at the wellhead by BWD personnel.

- Conduct vertical profiling and depth-specific sampling of water supply wells when the wells become accessible, for example during pump removal for maintenance. The primary goals of the testing are to identify potential zones where water quality may be poor and to examine the relative rate of flow of water into the well with depth. Both types of information will support assessment of well performance as overdraft continues.

  Long-term the vertical profiling will provide data to better understand the water quality trends and support BWD water management planning. For example, the data will support assessment of sulfate trends by understanding how concentrations may or may not be increasing with depth and support projections of how water quality will change as overdraft while pumping reductions occur over the 20-year GSP planning period.

- Use the groundwater model to assess pre- and post-SGMA groundwater flow conditions and potential changes in water chemistry. Current pumping conditions have changed groundwater flow patterns within the North and Central Management Area due to the establishment of two pumping centers. Future pumping reductions will likely alter groundwater flow patterns. The model can be used to support calculations of groundwater flow rates and directions using 'particle tracking', a methodology that looks at how water flows over time. The modeling software (USGS Modflow model) includes Modpath, a post-processing software that works with the model output.

- Use the groundwater model water balance to develop a 'mixing cell' calculation of salt balance to assess the potential rate of accumulation of dissolved minerals associated with water use. The Subbasin is effectively a closed system where dissolved minerals and other solutes have will continue to accumulate over time. The primary purpose of the calculations is to assess long-term TDS changes that result from irrigation and septic return flows as overdraft continues. The calculations will also support examination of areas where BWD water production may need to be established using new or existing water wells.

- Investigate the potential causes of the temporary increases in arsenic concentrations and pH observed in BWD wells as a means of predicting future arsenic concentrations. A lag time of 2 to 4 years is observed in multiple BWD wells where elevated pH preceded the increase in arsenic concentrations that could prove to be important towards BWD's water supply and risk management.

- Expand on the analysis of nitrate in groundwater relative to land use as described by the DWR (e.g. **Figure 11**). Additional discussion of the occurrence of nitrate in groundwater is included in the GSP that describes land uses within the Subbasin.

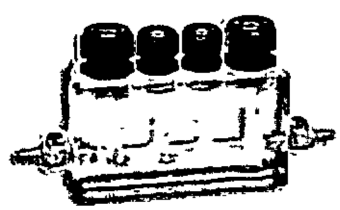
- Expand the water chemistry and water quality evaluation to areas within and downgradient of the agricultural areas in the North and Central Management Areas.

- Continue to collect the full suite of general minerals (8 anions and cations) together with pH and redox measurements. Water chemistry parameters should be collected using 'flow cells' where the chemistry of the water is tested before it is exposed to the atmosphere.[27]

- Conduct selective sampling for phosphate and review the overall electrochemical balance for all potential anions and cations to determine why the current data have excess cations relative anions (see **Section 3.2.1**).

- Further assess lithologic and geochemical conditions associated with the occurrence of arsenic. For example, work done in the San Joaquin valley (discussed in **Section 3.6.1**) linked the release of water from clay to increased arsenic concentrations in groundwater. Further review of Subbasin stratigraphy work done by Netto (2001) is warranted. Re-analysis of the geostatistical work done by the USGS to evaluate sediment lithologies may also prove useful towards understanding the nature and extent of sediments potentially associated with arsenic. Lithologic sampling and

[27] An example is shown below. Water flows directly from the well into a chamber where measurements are made. From: http://www geotechenv com/flowcell sampling systems.html. It is understood that Dudek staff are using flow cells during sampling of Rams Hill wells to measure pH, specific conductance, temperature, turbidity, dissolved oxygen, oxygen-reduction potential, and color. Their Sampling and Analysis Plan could be used for the remaining wells within the GSP monitoring program.



Geotech Flowblock
<40 mL cell volume for flow rates of
100 mL/min to 1 gpm (3 8 LPM)

geochemical testing for arsenic and related minerals is recommended during the installation of new wells.

- Investigate the potential interaction of microbially-mediated oxidation and reduction processes (e.g. denitrification and sulfate reduction) specific to arsenic mobility.

- Examine the potential application of recharge basins to facilitate arsenic removal as a result of geochemical processes in the vadose zone (see discussions in Section **3.6.1**).

- Develop an inventory of abandoned wells, including well completion information and potential condition. Abandoned wells have the potential to act as conduits for the downward flow of shallow groundwater contaminants such as surface applied fertilizers, agricultural chemicals, and turf management chemicals. Abandoned wells may need to be properly destroyed per California Well Standards (See information available from the County of San Diego https://www.sandiegocounty.gov/content/sdc/deh/lwqd/lu_water_wells.html)

- Continue to track changes in groundwater quality as a function of water level to assess trends relative to the potential for water quality degradation and the likelihood of the need for water treatment. Use the data to assess potential cost and water system reliability risks to BWD.

- Continue to track water treatment technologies and costs for arsenic as the potential for revision of the arsenic MCL is, in part, dependent on cost-benefit analyses for water treatment (see COC discussion in Section 5).

6.0 REFERENCES

All references are cited within the text using footnotes.

APPENDIX A

DWR, 2014

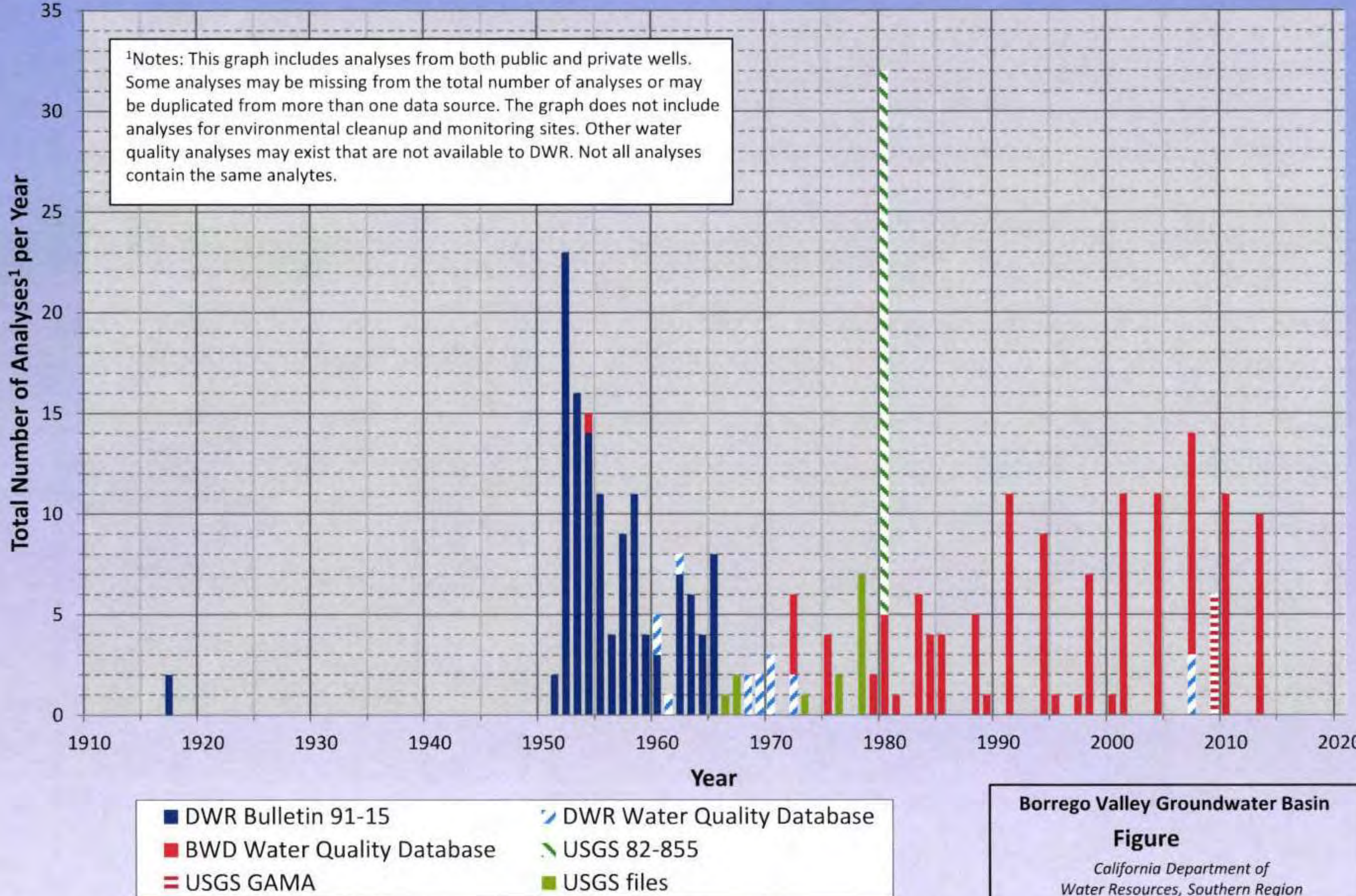
Groundwater Quality Information
for
Borrego Valley

Groundwater Quality Information
for
Borrego Valley

DEPARTMENT OF WATER RESOURCES • STATE OF CALIFORNIA •

Southern Region May 2014

Water Quality Analyses by Year and Source



Borrego Valley Groundwater Basin

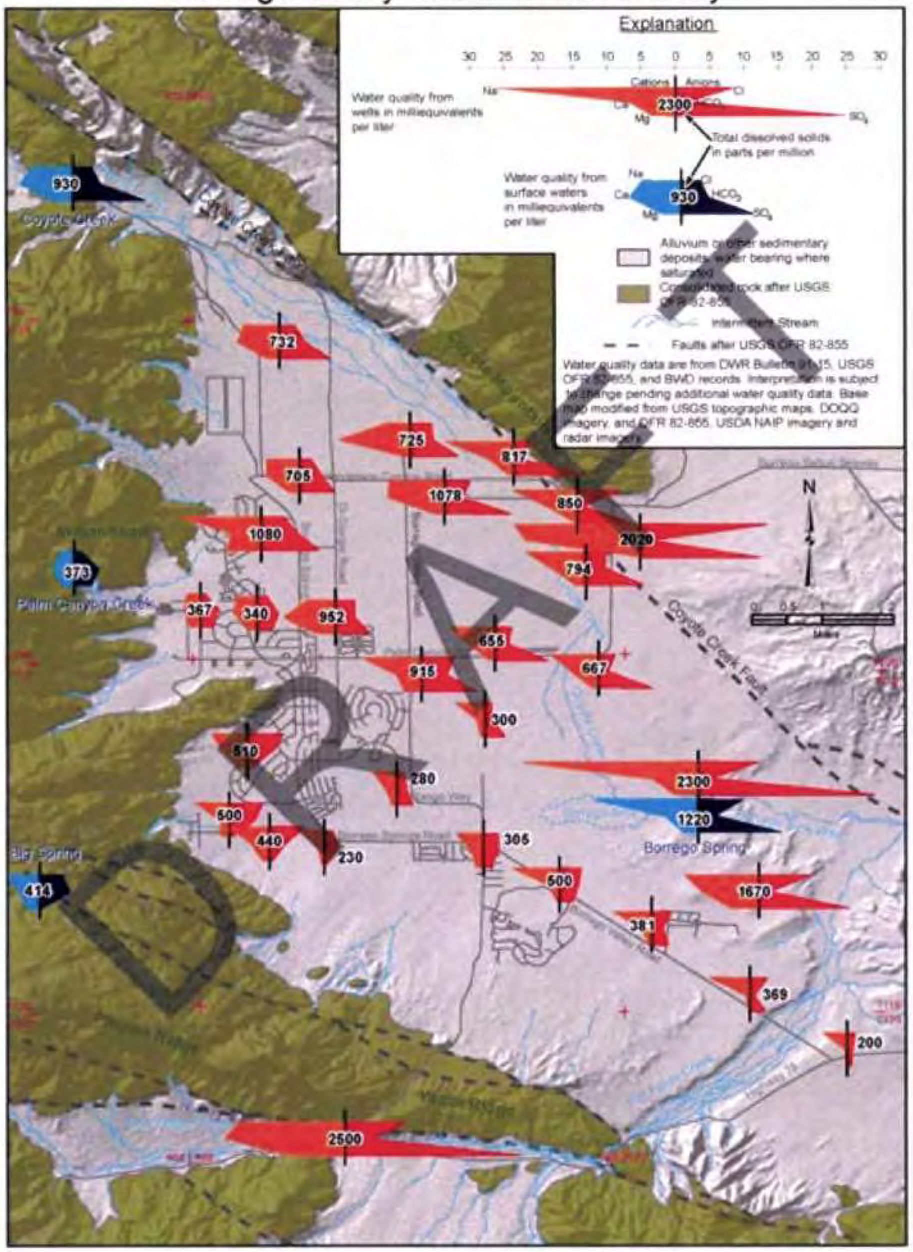
Figure

California Department of Water Resources, Southern Region

January 2020

More than 300 water quality analyses have been identified.

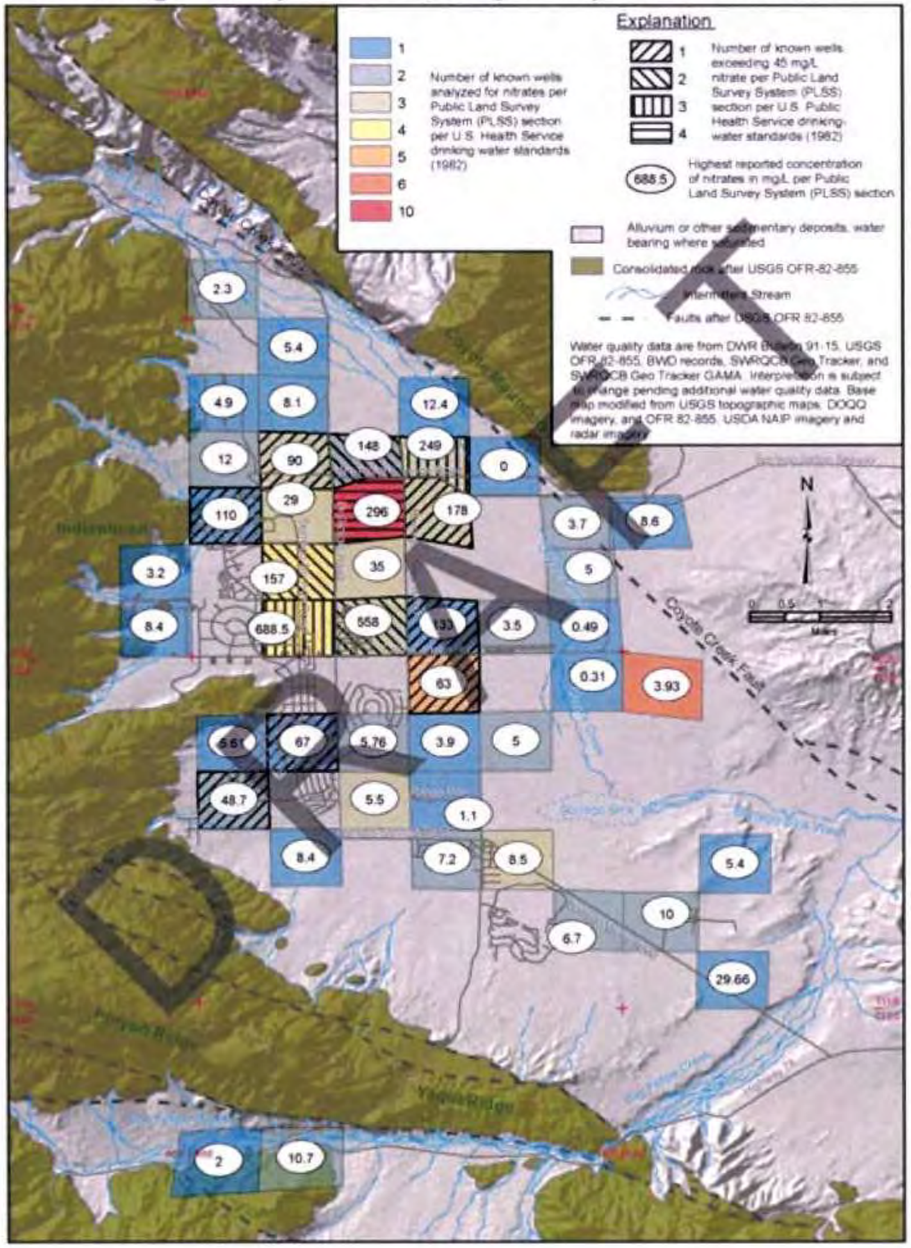
Borrego Valley Groundwater Quality



January 2020

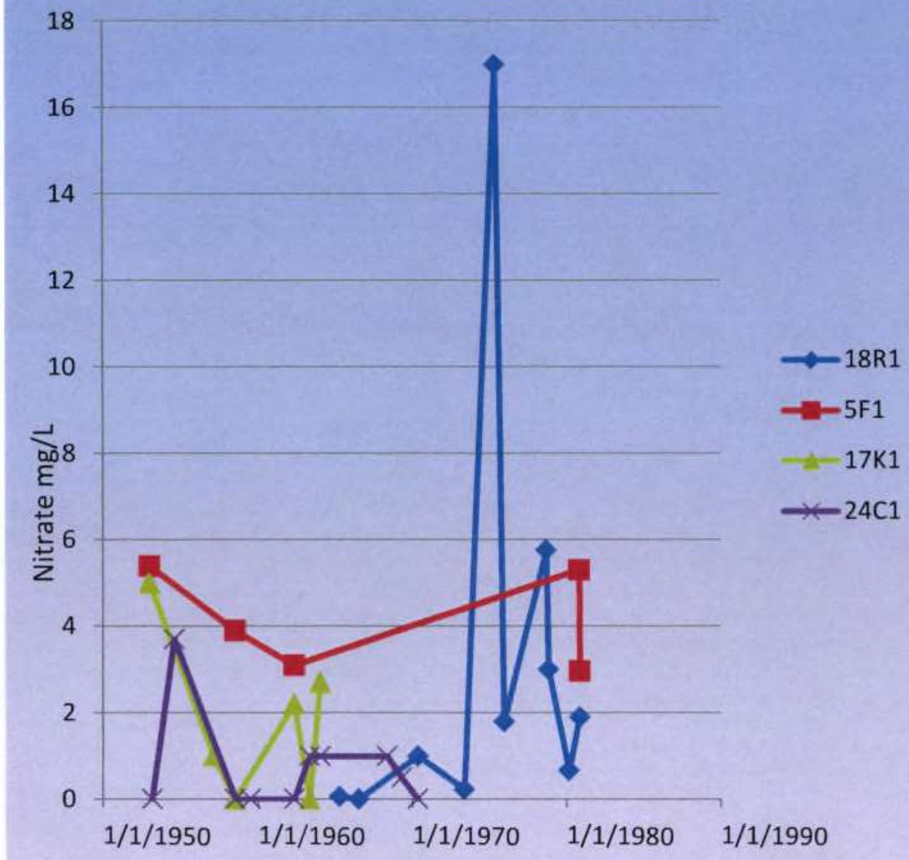
Figure showing major water quality constituents in groundwater and surface water in Borrego Valley. The high proportion of Sulfate in the surface water of Coyote Creek appears to dominate the character of groundwater in the northern and eastern parts of the basin. The more Bicarbonate waters of Borrego Palm Canyon and Big Spring influence the groundwater along the western and southern parts of the basin.

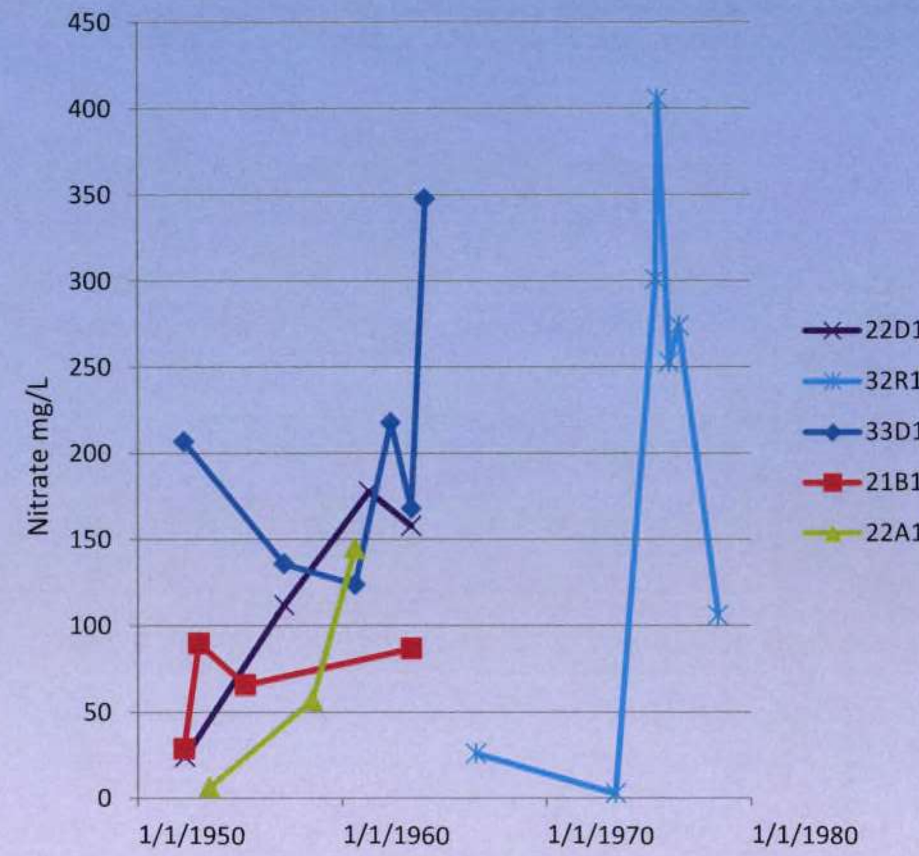
Borrego Valley Water Quality Analyses of Nitrates



January 2020

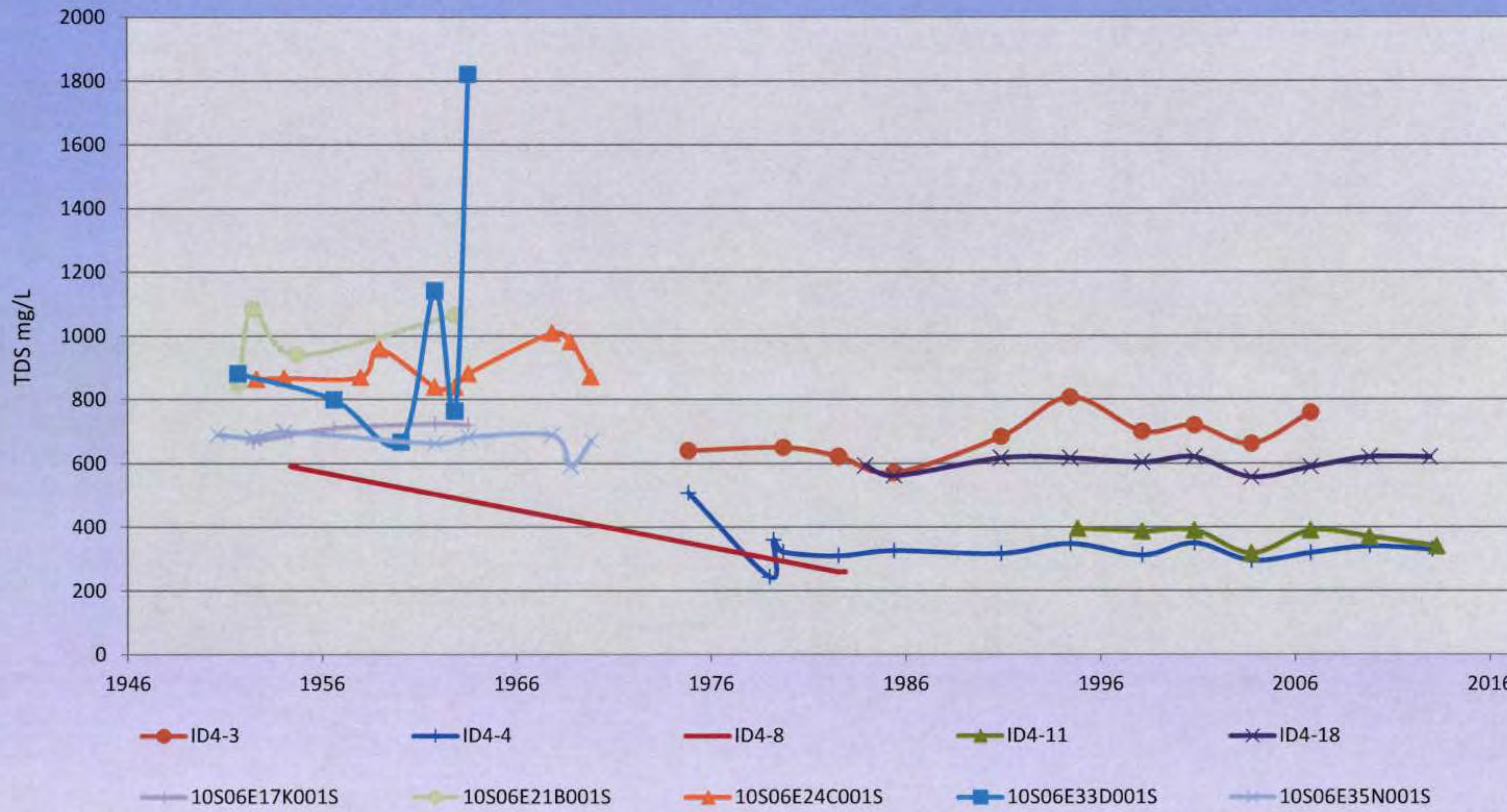
Figure showing the distribution of Nitrate analyses for the Borrego Basin. Maximum content is shown per section and sections are colored according to the number of analyses in the section. Sections where the maximum contaminant level (MCL) are exceeded are shown in hatched patterns.





Nitrate content is graphed through time for several wells in the Borrego Basin.
No obvious trend is apparent. (MCL is 45 mg/L)

North Bo[punched] Valley



Graph showing change in TDS content through time for several wells in the northern part of the basin. No clear increase in TDS is observed.

South Borrego Valley

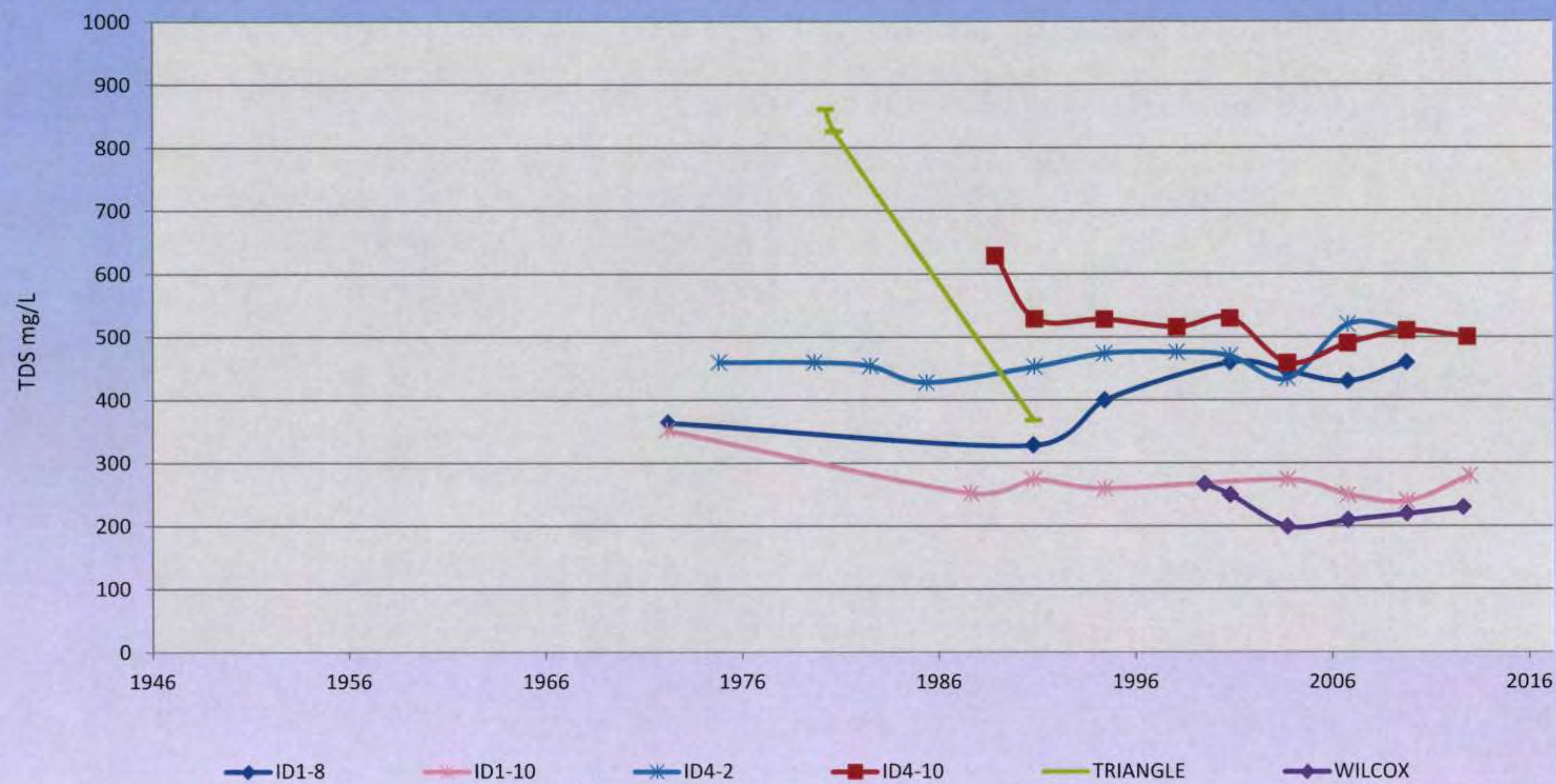
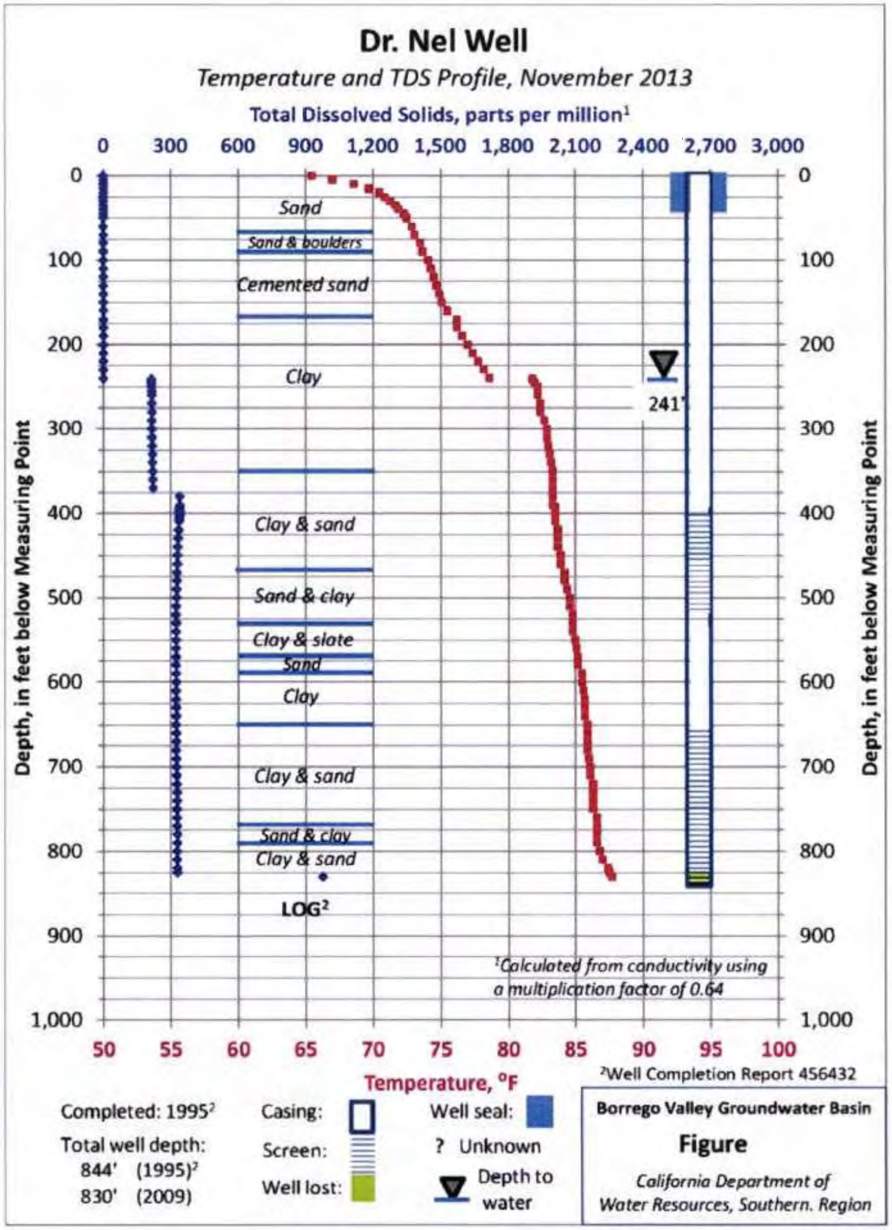
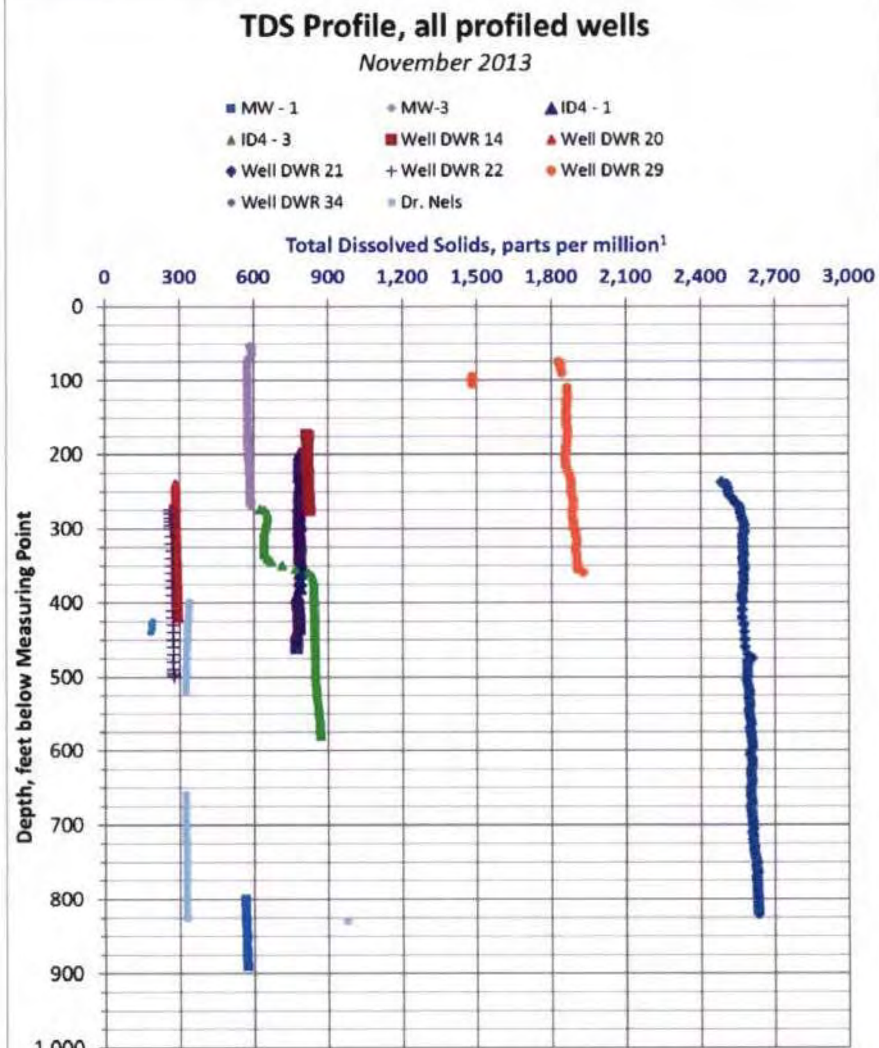


Figure showing TDS content through time for several wells in the southern portion of the basin. Most show decrease in TDS through time.

January 2020



A profile of TDS content and temperature for Dr. Nel's Well. Changes in TDS appear to occur at the well screen. TDS does not change appreciably with depth through the screened interval. Temperature rises steadily with depth.



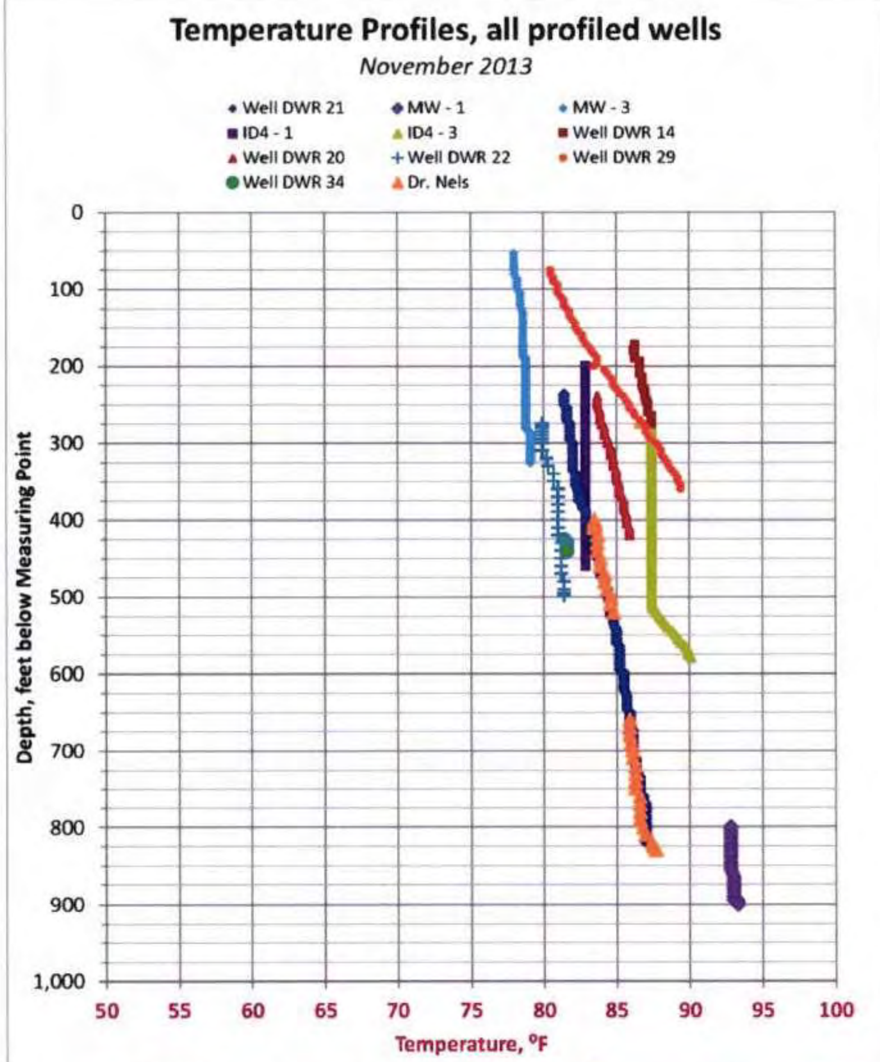
[1]*Calculated from conductivity using a multiplication factor of 0.64.*
Note: data for Well DWR 14 was obtained from water above an obstruction in the well. The screen is below the obstruction.

Borrego Valley Groundwater Basin

Figure

California Department of Water Resources, Southern. Region

Profiles of TDS with respect to depth for wells in Borrego Valley. Most show slight increase in TDS with depth



[1]Calculated from conductivity using a multiplication factor of 0.64.
Note: data for Well DWR 14 was obtained from water above an obstruction in the well. The screen is below the obstruction.

Borrego Valley Groundwater Basin
Figure
California Department of Water Resources, Southern. Region

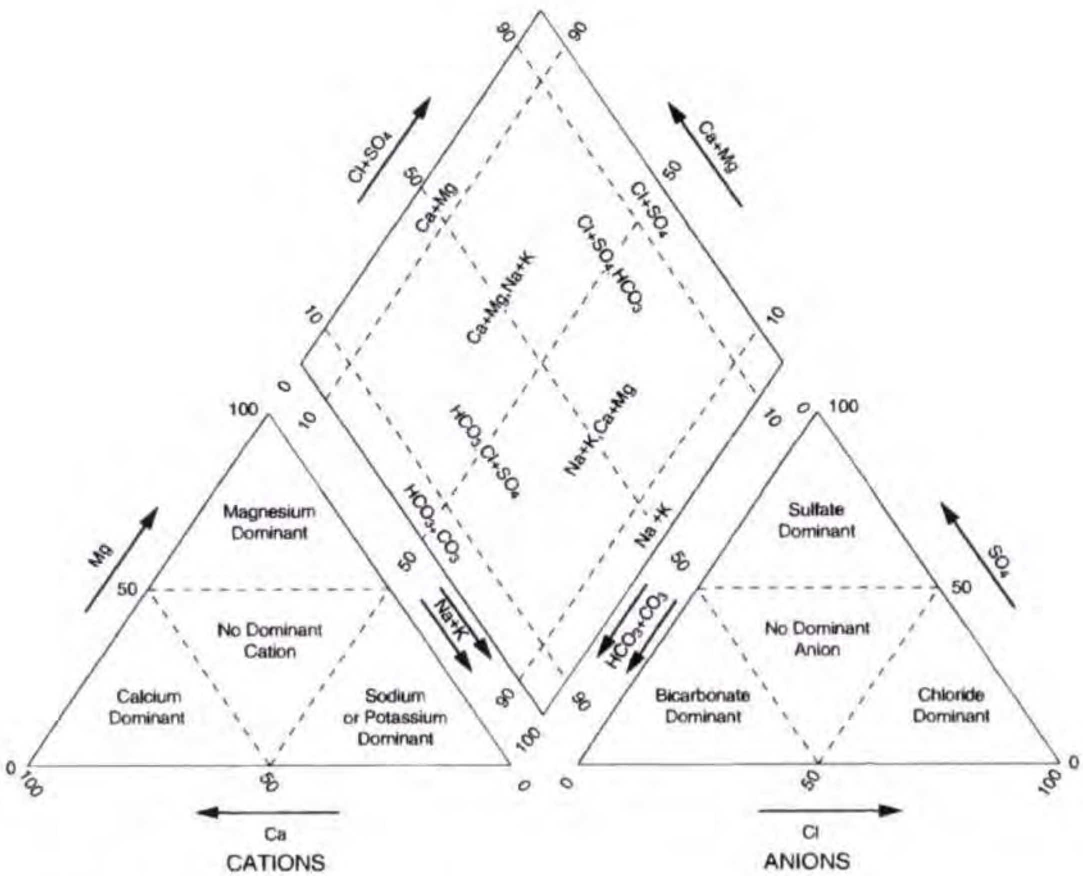
Profiles of Temperature with respect to depth. Most wells show increase in temperature with depth.

Summary

- More than 300 analyses identified
- Water character reflects recharge source
- More than 100 Nitrate analyses, widespread
- No apparent trend through time for Nitrate or TDS
- 11 Wells profiled for Temperature and TDS
- No consistent trend for TDS with depth in well.

APPENDIX B

PIPER DIAGRAMS, ALL WELLS

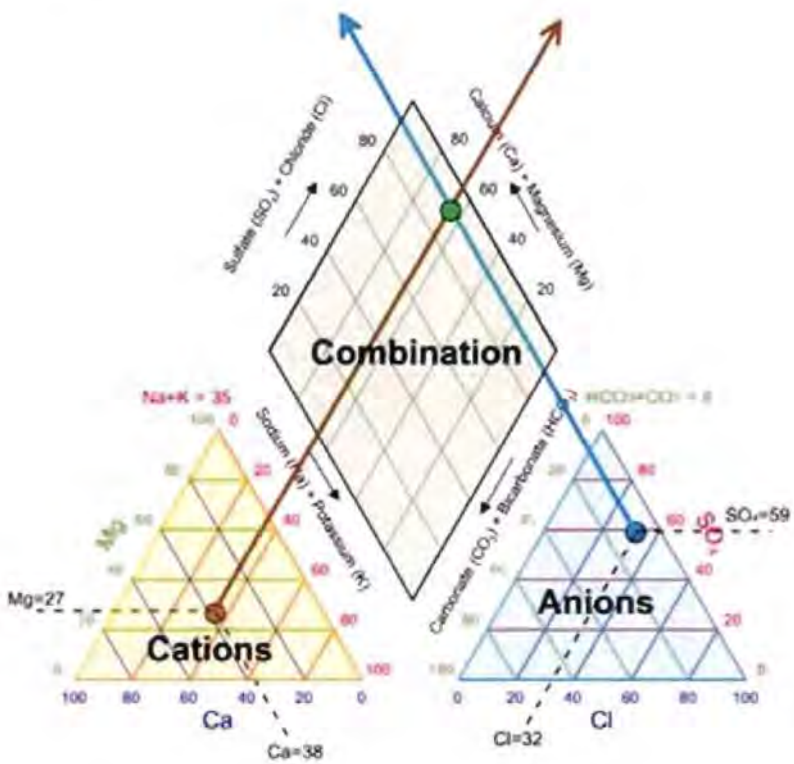


A. Classification scheme for hydrochemical facies.

APPENDIX B: PIPER DIAGRAMS

B.1 EXPLANATION OF PIPER DIAGRAMS

The eight dominant anions and cations that occur in groundwater can be used to describe of the type of water. A Piper trilinear diagram[1] combines sodium and potassium (cations), and carbonate and bicarbonate (anions) to reduce the total number of anions and cations from eight to six, with 3 values for each. This allows the anions and cations to be depicted using ternary diagrams. The values are then then projected onto a central diamond. An example of the projection follows:



From: https://support.goldensoftware.com/hc/en-us/articles/115003101648-What-is-a-piper-plot-trilinear-diagram-

The values used for the anions and cations are converted from mass/liter to milliequivalents/liter, a measure of the relative number of anions and cations in the solution. For example, if NaCl is dissolved into pure water there are an equal number of sodium cations (Na^+) and chloride anions (Cl^-). An analysis by weight will show that there is more chloride because chloride has a larger molecular weight (MW) - the MW of Na is 22.9 grams/mole versus Cl that has a MW of 35.45 grams/mole. 'Equivalents' are derived by dividing the reported mass by the MW so that the relative number of ions (in moles) is calculated.

[1] Piper, A.M. 1944. A graphic procedure in the geochemical interpretation of water-analyses. Transactions-American Geophysical Union 25, no. 6: 914–923

APPENDIX B: PIPER DIAGRAMS

The overall intent of the diagram is to support grouping and classification of water types, also termed hydrochemical facies. An example follows from https://www.hatarilabs.com/ih-en/what-is-a-piper-diagram-and-how-to-create-one

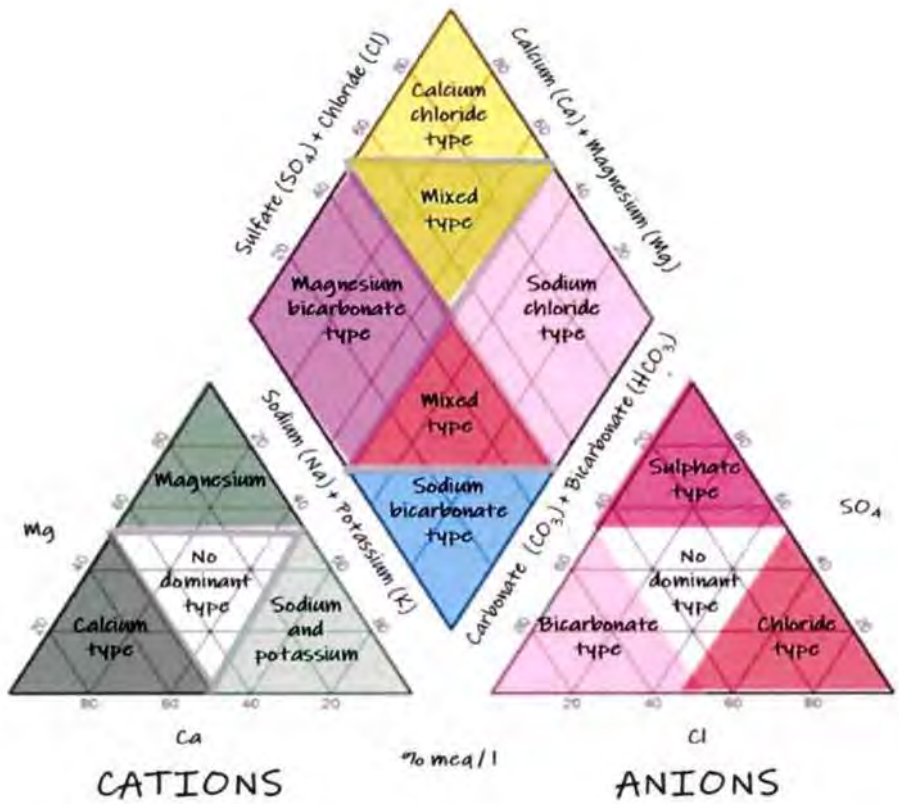


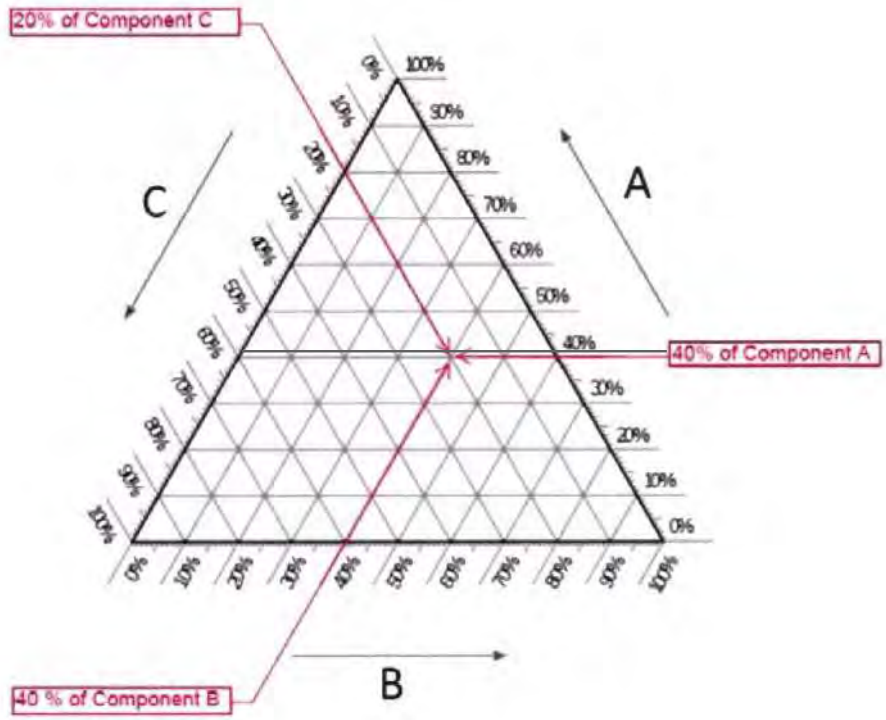
FIGURE 1A. HYDROCHEMICAL FACIES IN THE CATION AND ANION TRIANGLES AND IN THE DIAMOND.

The lower triangles are ternary diagrams that represent the relative proportion of anions or cations. The various types of water, or facies, are shown in the middle diamond.

Piper diagrams depicted in this report use a colored field scheme implemented in the Python programming language as published by Peeters, 2014[2]. Rather than drawing an underlying grid, the colored fields are used to help the visual interpretation of the data. The computations and graphics were developed using open source program code published by Peeters.

[2] Peeters, L., 2014. A Background Color Scheme for Piper Plots to Spatially Visualize Hydrochemical Patterns. Vol. 52, No. 1–Groundwater–January-February 2014

The following is an example of the ternary grid and how data are plotted:



All values equal 100% on the triangular grid. The highest percentage of each of the components occurs in the extreme corners of the triangle.

Values increase as indicated by the arrows.

Source:
https://upload.wikimedia.org/wikipedia/commons/thumb/a/ac/Blank_ternary_plot.svg/486px-Blank_ternary_plot.svg.png

APPENDIX B.2 PIPER DIAGRAMS USED IN THE REPORT

The following diagram are presented in the following order:

1: ID4-7 (not included due to insufficient data)
2: ID4-18
3: ID4-3
4: ID4-4
5: ID4-11
6: Cocopah
7: ID4-5
7A: ID4-1
8: ID5-5
9: ID1-12
10: ID4-2
11: ID4-10
12: ID1-16
13: Wilcox
14: ID1-10
15: ID1-8
16: RH-3
17: RH-4
18: RH-5
19: RH-6
20: ID1-1
21: ID1-2
22: Jack Crosby
23: WWTP (insufficient data)
24: MW-3 (insufficient data)

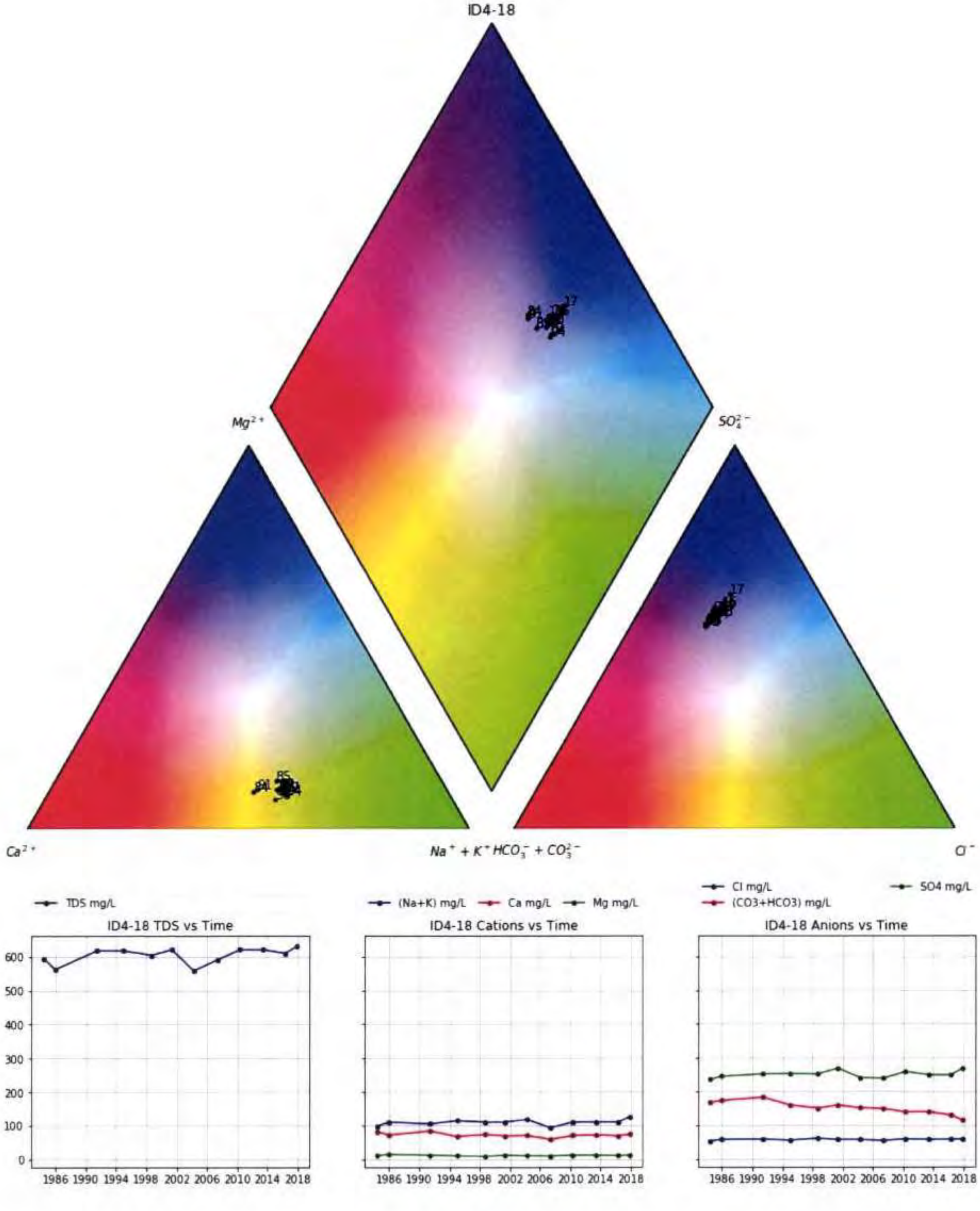
Recent Data: All (Piper only)
Recent Data: North and Central (Piper only)
Recent Data: South (Piper only)

A copy of the map follows (**Figure 4**, from main body of report)

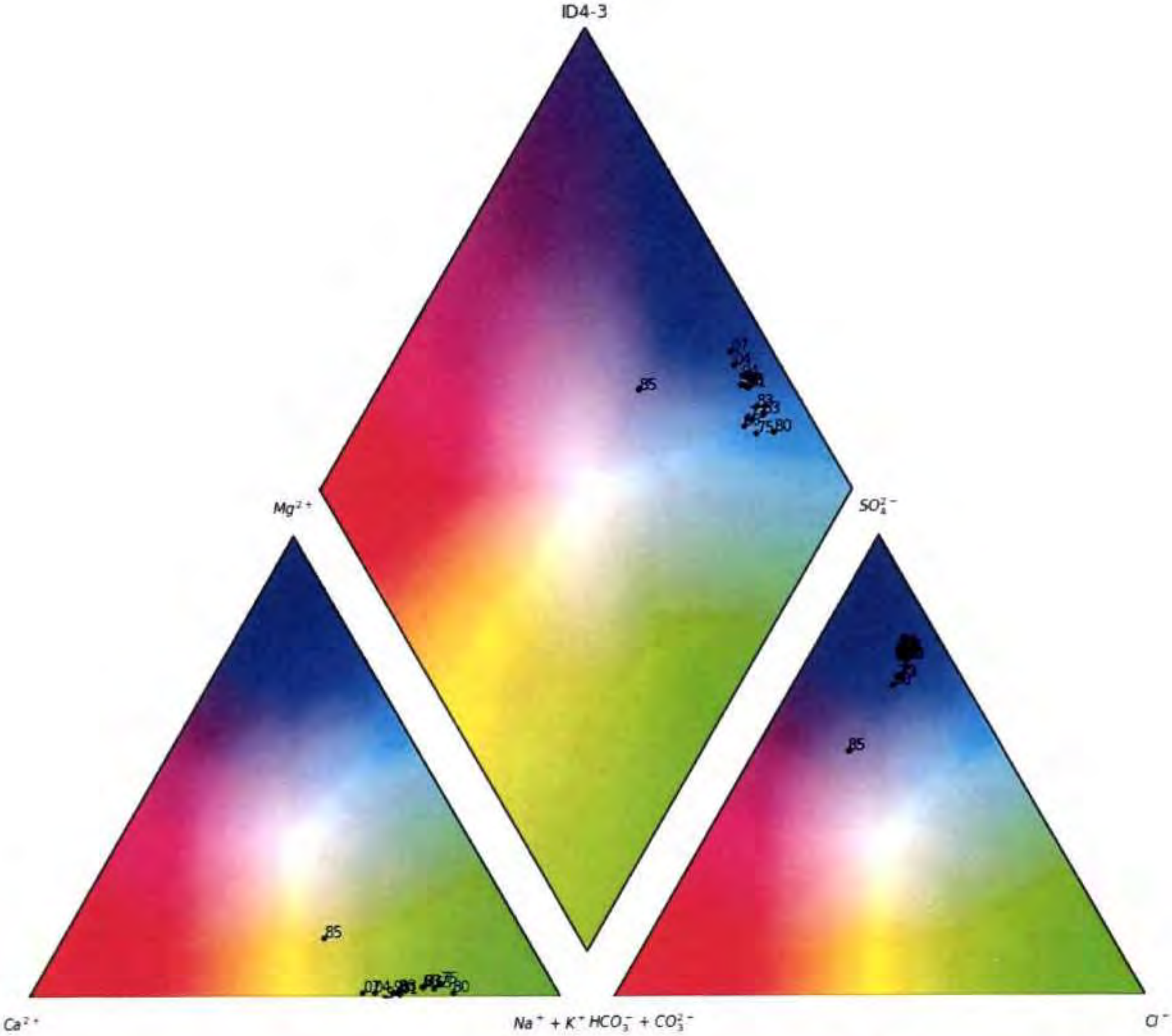

ID4-7
ID4-18
ID4-3
MW-1
DI GIORGIO ROAD
BORREGO SALTON SEAWAY
PEGLEG ROAD
ID4-4
ID4-11
COCOPAH
ID4-1
ID4-5
PALM CANYON DRIVE
MW-4
ID5-5
ID4-2
MW-5A/B
ID1-12
ID4-10
ID1-16
ID1-10
WILCOX
DEEP WELL TRAIL
WWTP
ID1-8
MW-3
JACK CROSBY WELL
RH-3
RH-4
ID1-1
RH-5
ID1-2
RH-6
YAQUI PASS ROAD
BORREGO VALLEY
N
ENVIRONMENTAL NAVIGATION SERVICES, INC.
EXPLANATION BLOCK
ID4-4 Active BWD Groundwater Well
RH-4 Active Private Groundwater Well
ID4 Inactive BWD Groundwater Well
MW-1 Groundwater Monitoring Well
0 3,500 7,000
APPROXIMATE SCALE (FEET)
WELL LOCATION MAP
Borrego Valley Water District
Borrego Springs, California
JWJ
BWD
JWJ
CM
10/17/2018
4

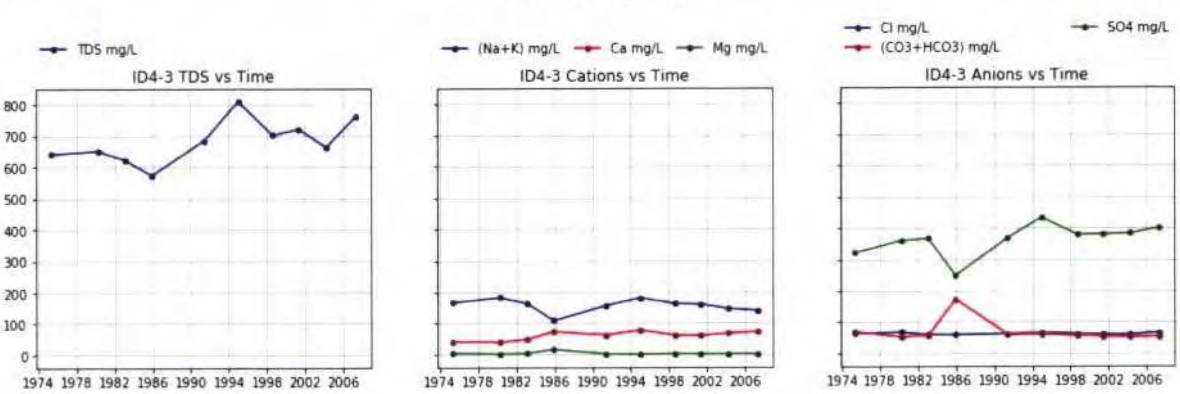
APPENDIX B: PIPER DIAGRAMS

2: ID4-18

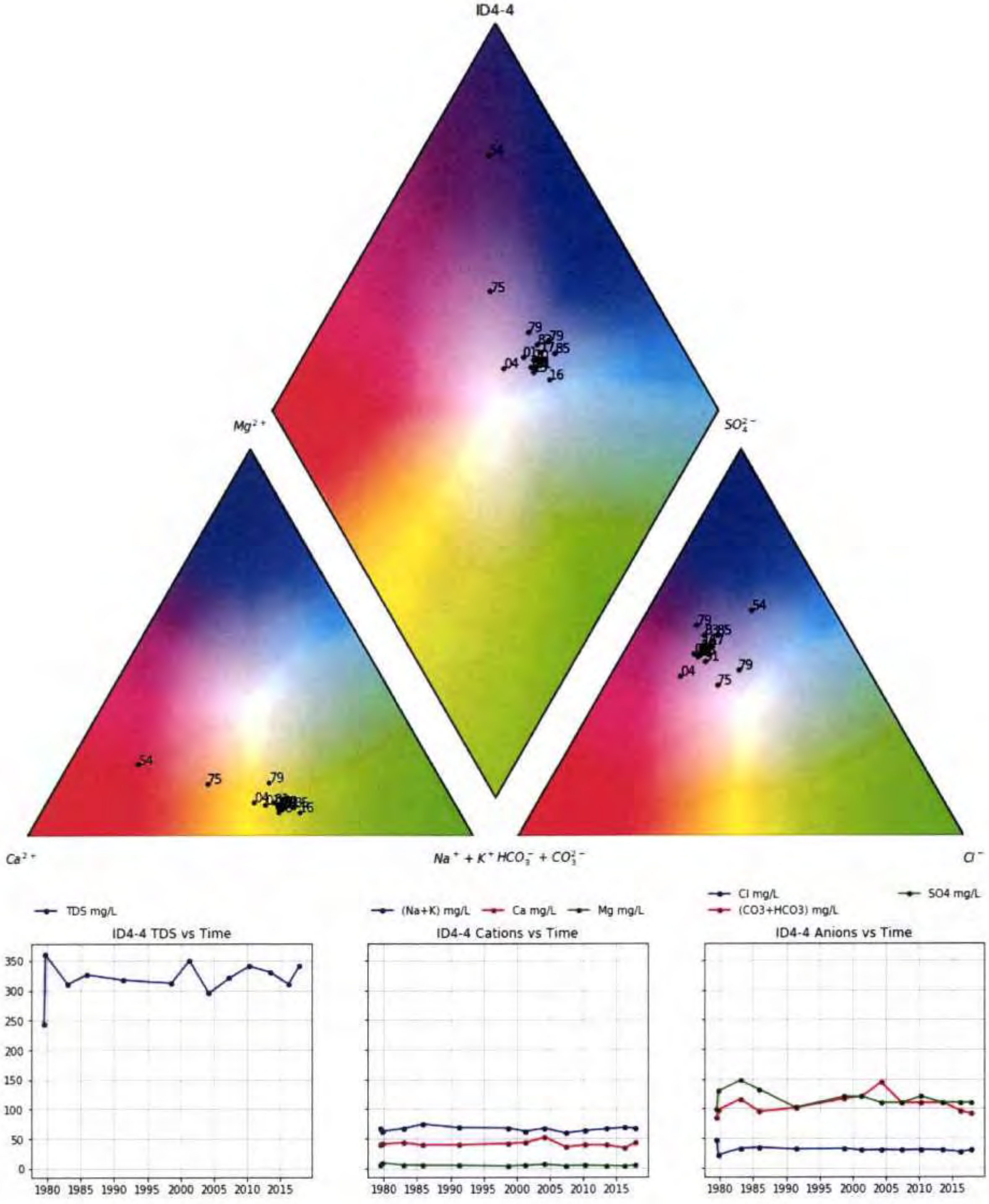


3: ID4-3

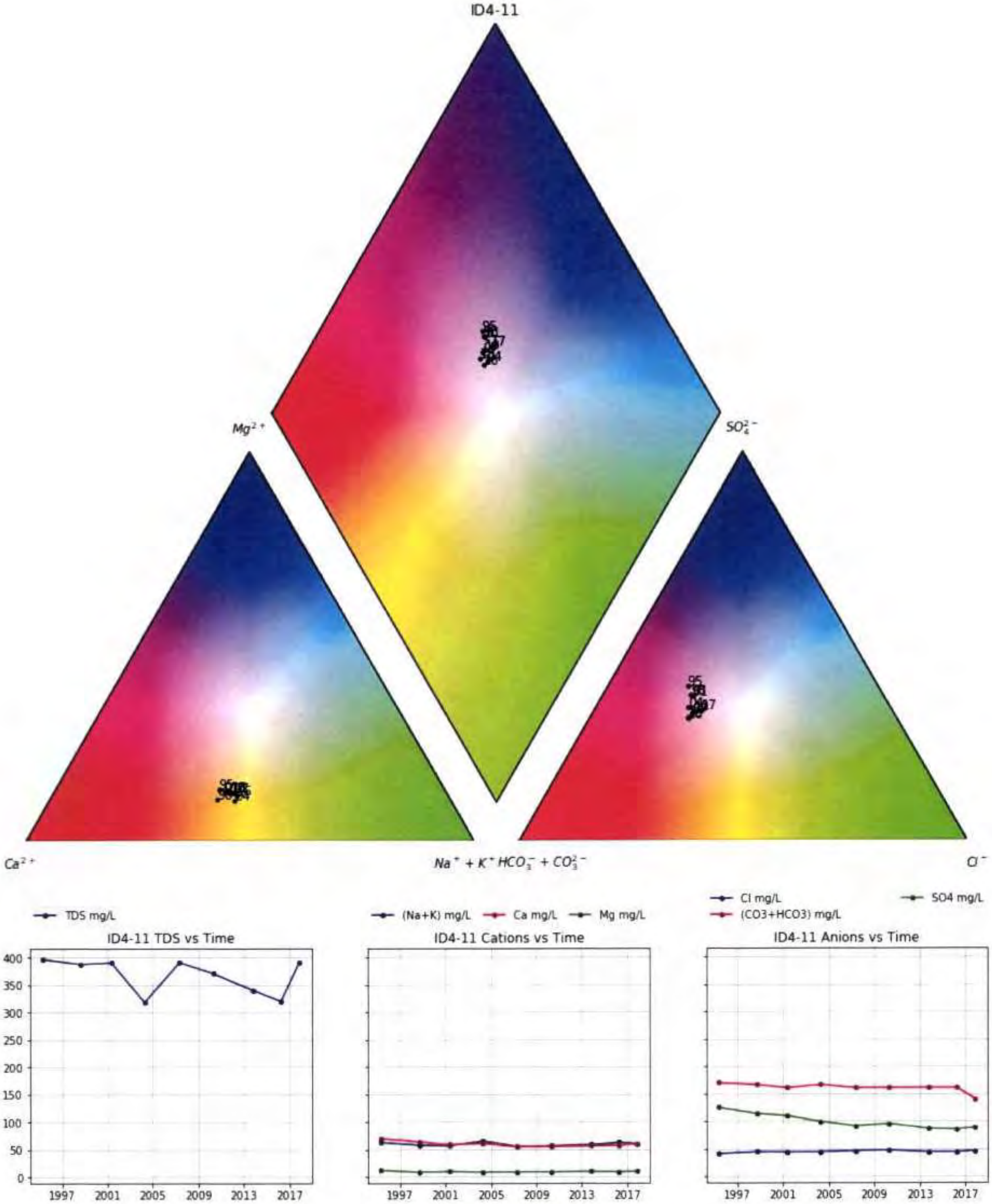

ID4-3
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-


TDS mg/L
ID4-3 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID4-3 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID4-3 Anions vs Time
1974 1978 1982 1986 1990 1994 1998 2002 2006

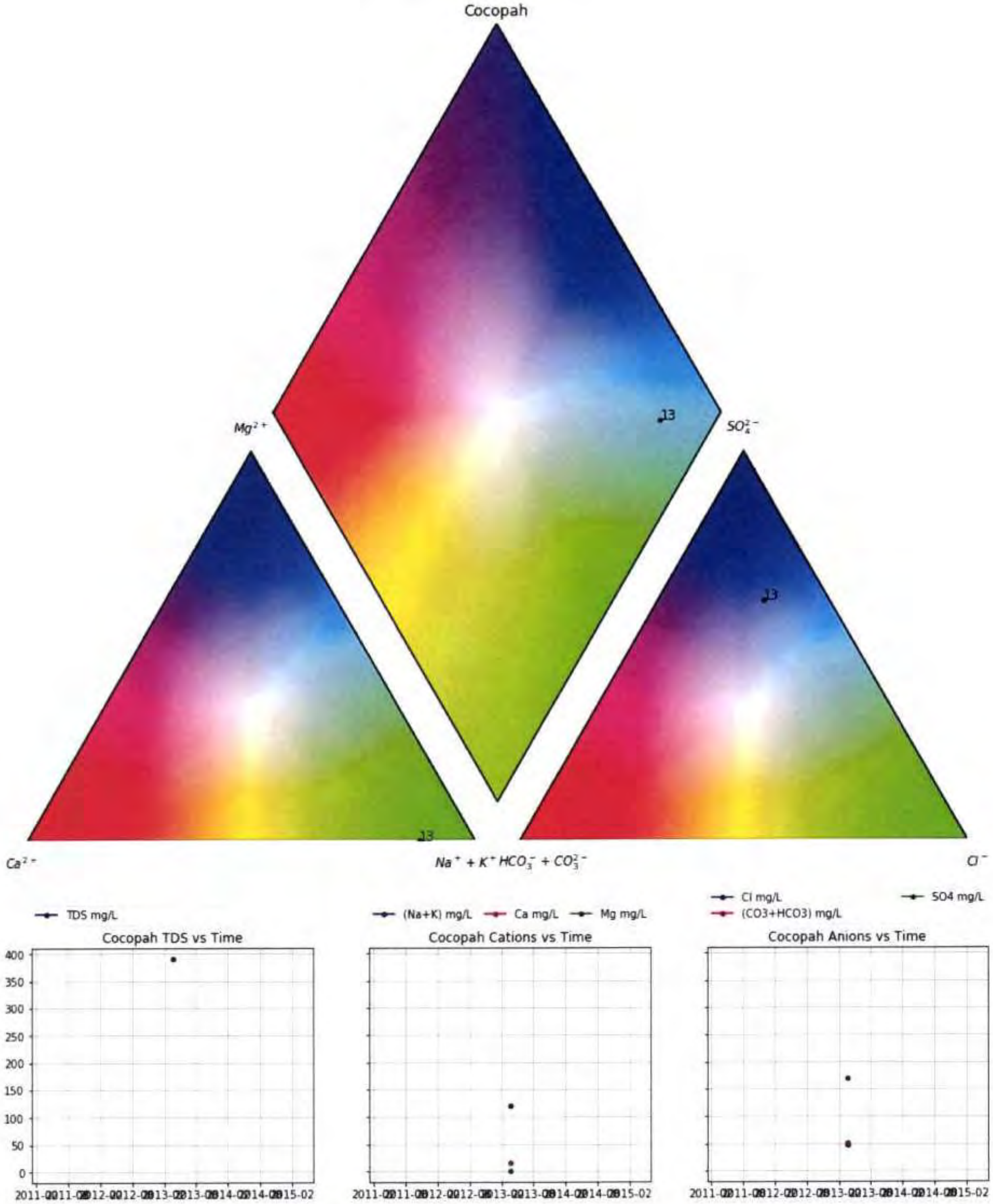
4: ID4-4


ID4-4
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
ID4-4 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID4-4 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID4-4 Anions vs Time

5: ID4-11

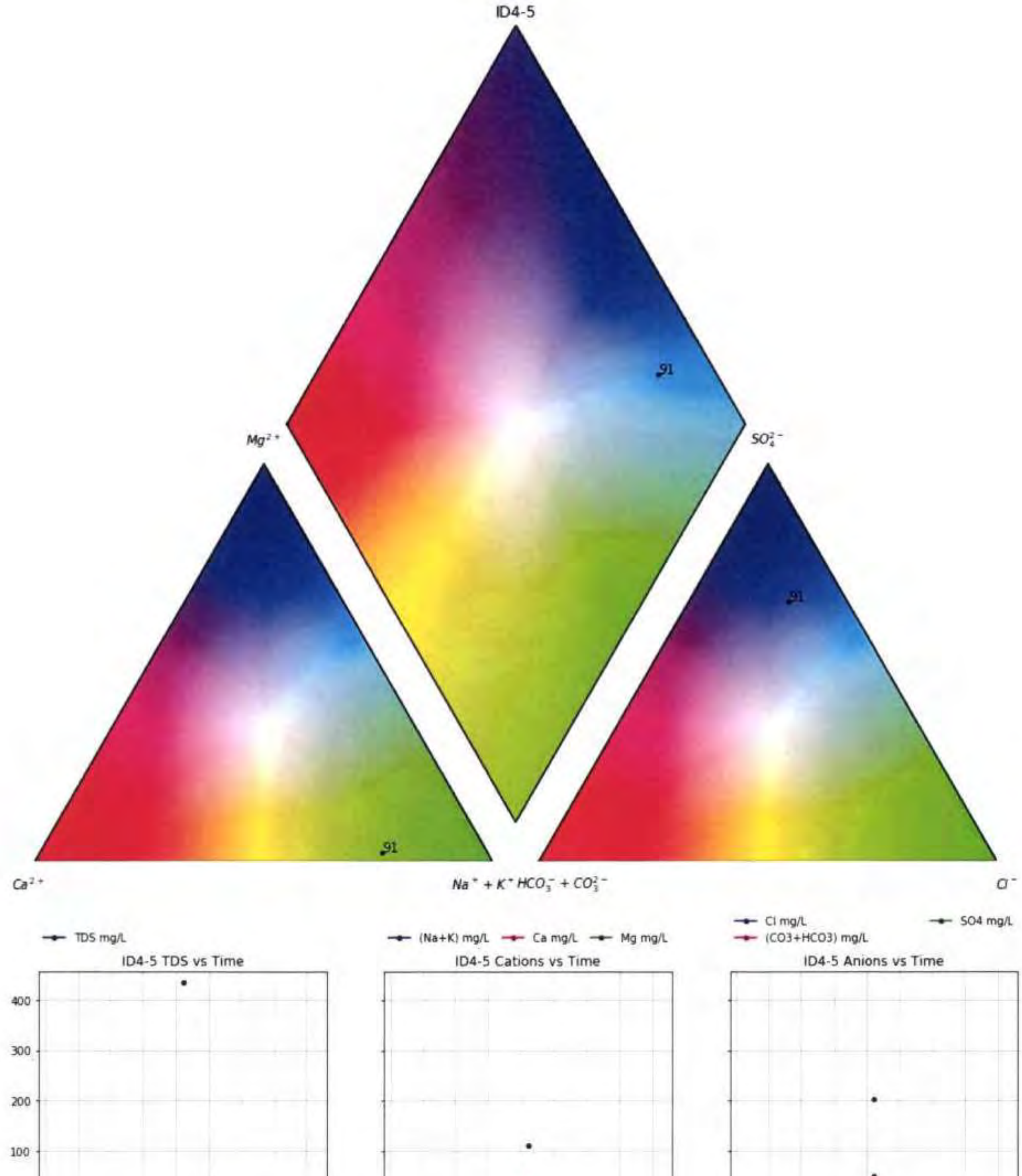

ID4-11
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
ID4-11 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID4-11 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID4-11 Anions vs Time
0
50
100
150
200
250
300
350
400
1997
2001
2005
2009
2013
2017

6: Cocopah

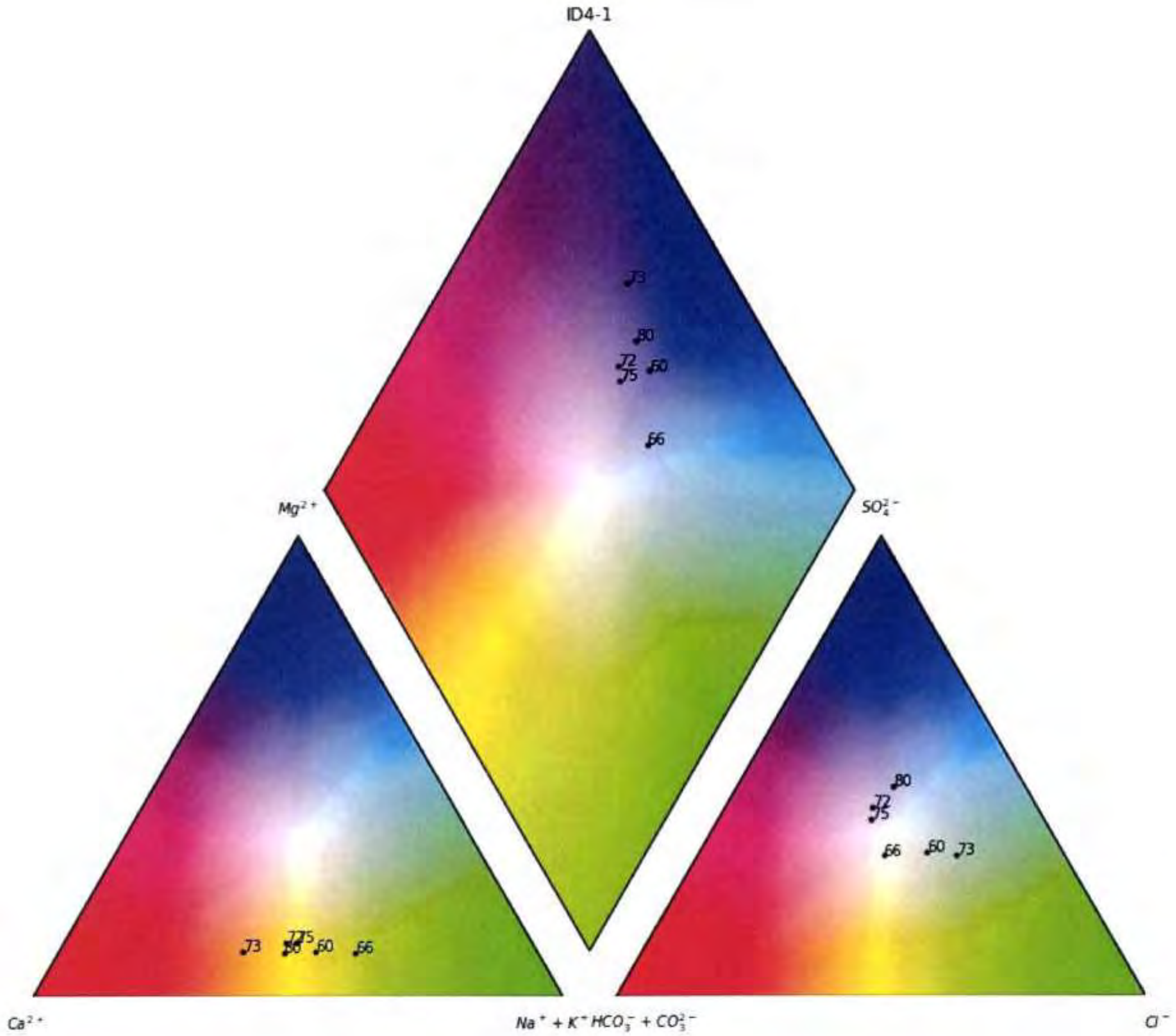

Cocopah
Mg^{2+}
SO_4^{2-}
13
13
13
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
Cocopah TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
Cocopah Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
Cocopah Anions vs Time
400
350
300
250
200
150
100
50
0

APPENDIX B: PIPER DIAGRAMS

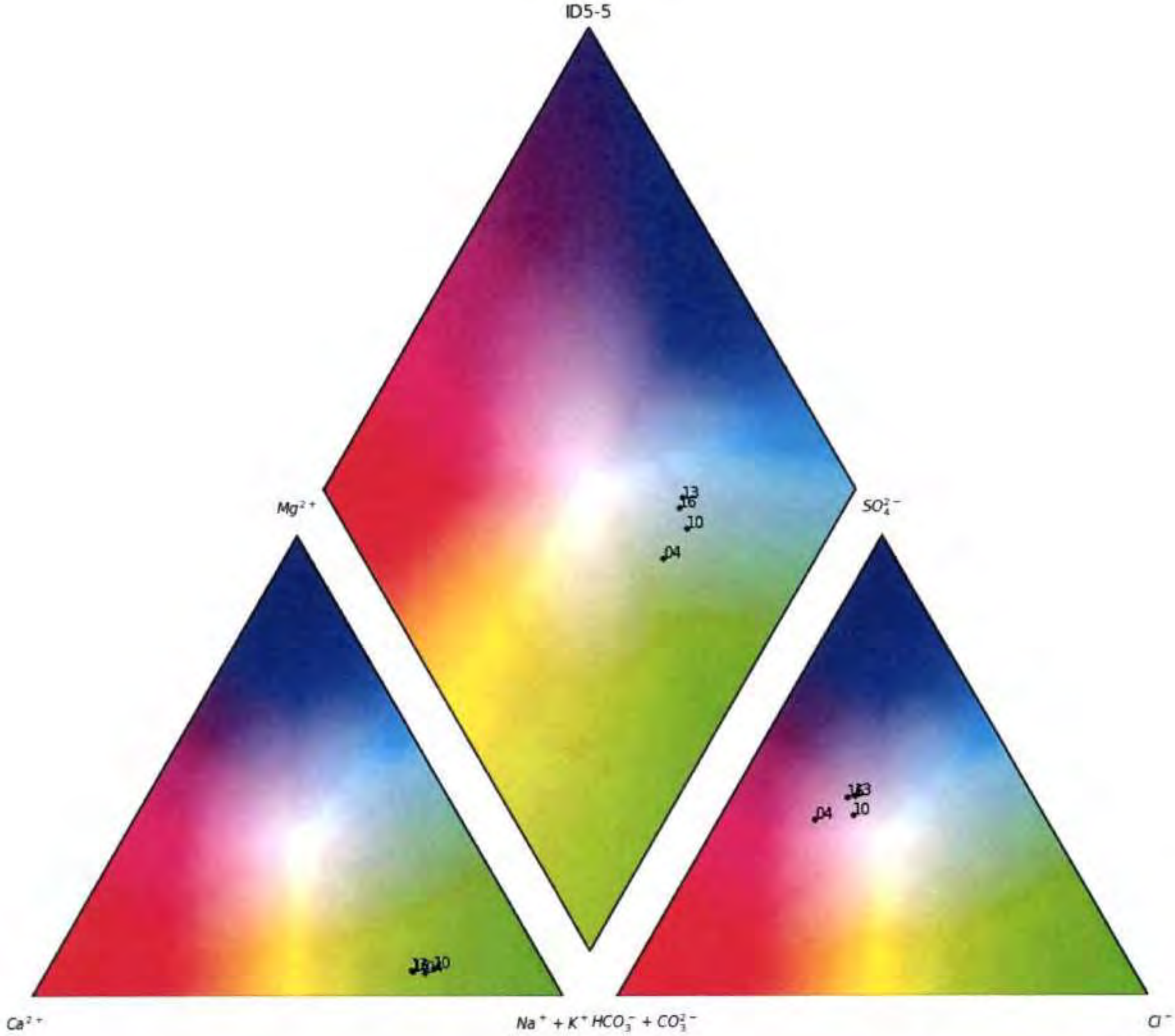
7: ID4-5

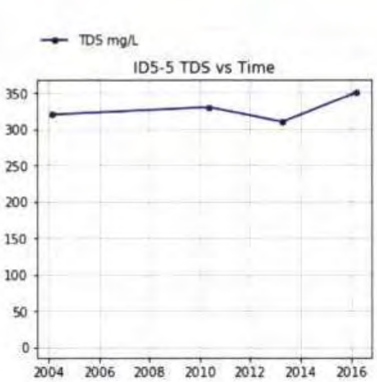


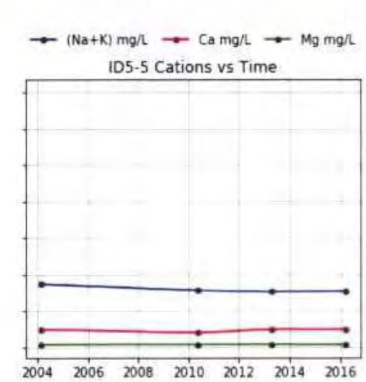
7A: ID4-1

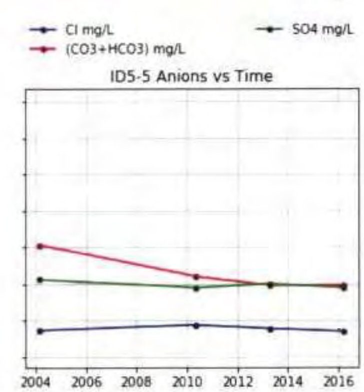

ID4-1
73
80
72
75
60
66
Mg²⁺
SO₄²⁻
73
775
56
60
66
80
72
75
66
60
73
Ca²⁺
Na⁺ + K⁺ HCO₃⁻ + CO₃²⁻
Cl⁻

8: ID5-5

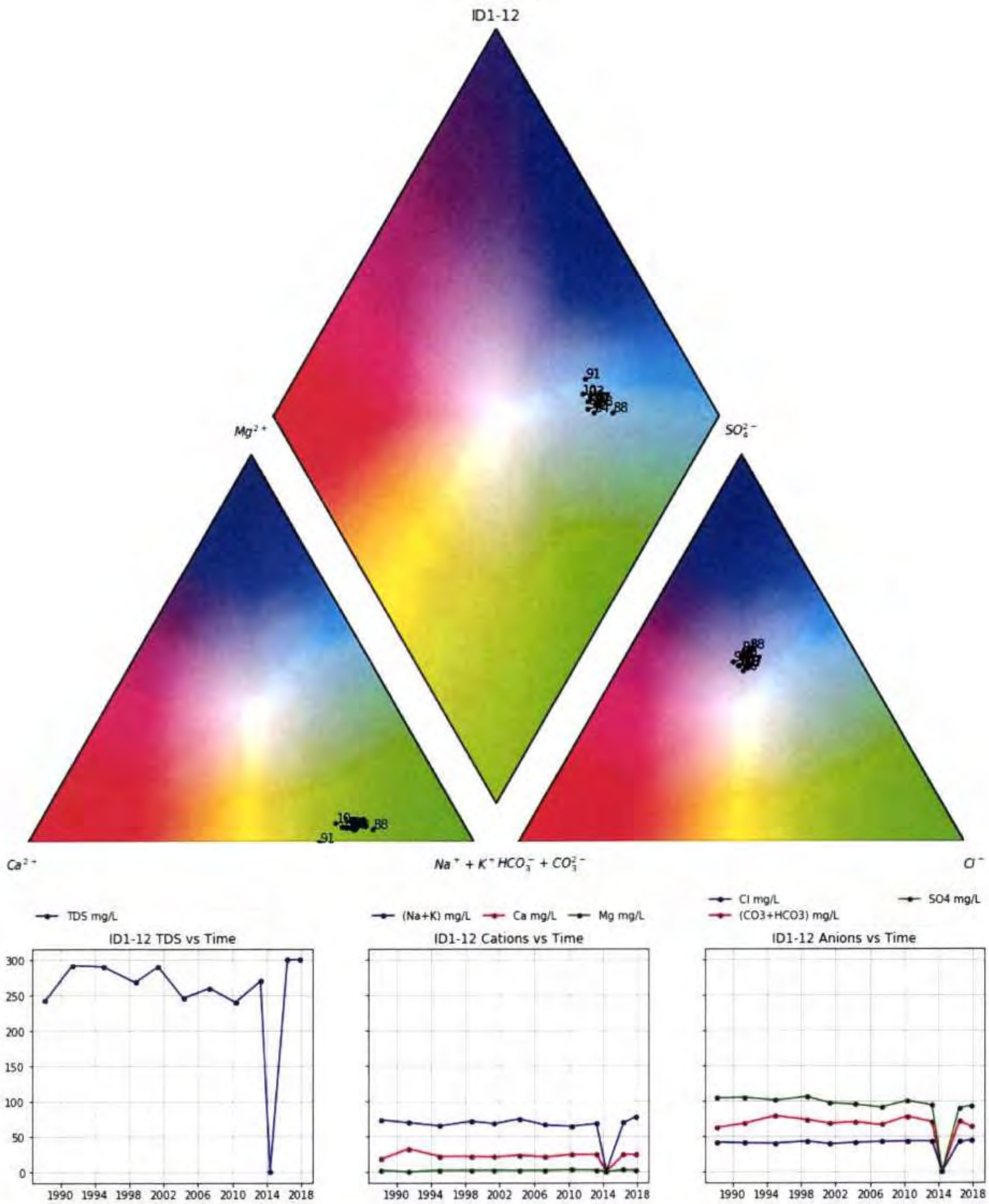

ID5-5
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-


TDS mg/L
ID5-5 TDS vs Time

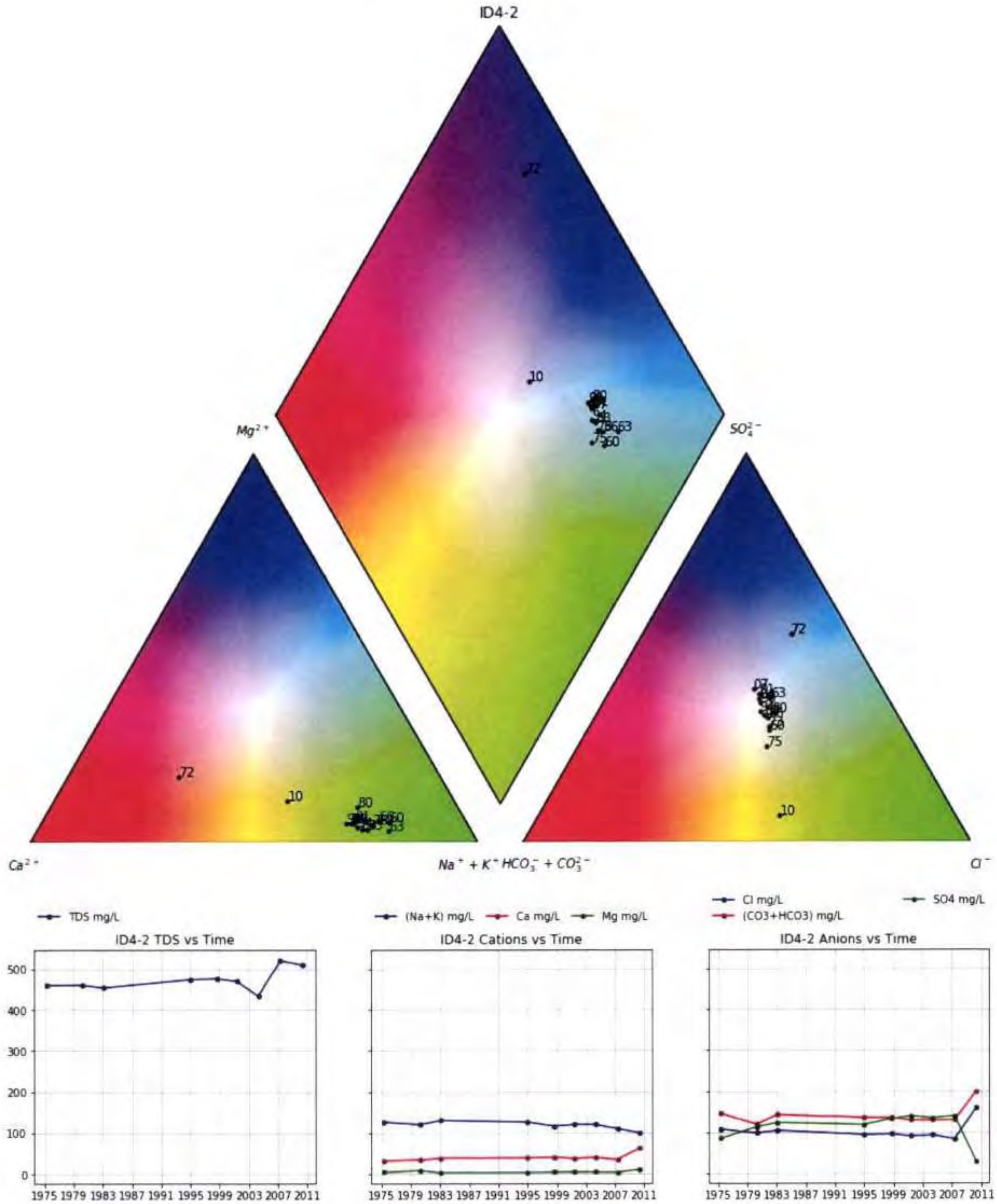

(Na+K) mg/L
Ca mg/L
Mg mg/L
ID5-5 Cations vs Time


Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID5-5 Anions vs Time

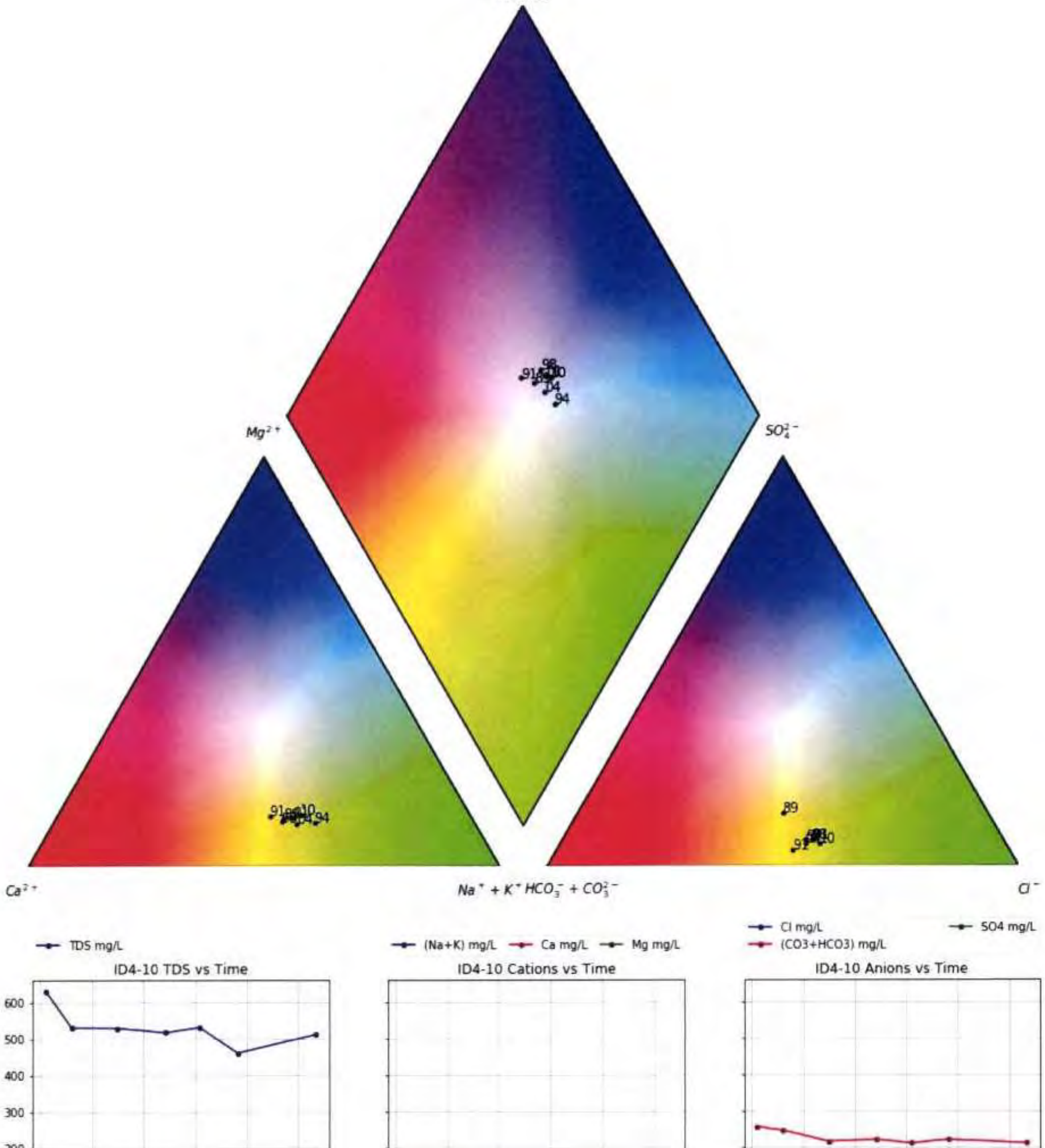
9: ID1-12

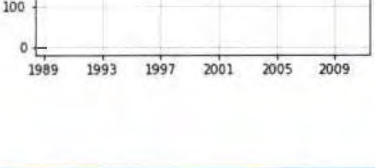

ID1-12
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
91
88
TDS mg/L
ID1-12 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID1-12 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID1-12 Anions vs Time
1990 1994 1998 2002 2006 2010 2014 2018

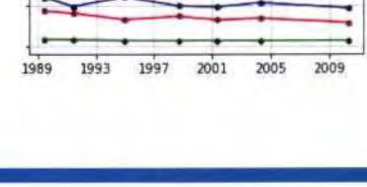
10: ID4-2

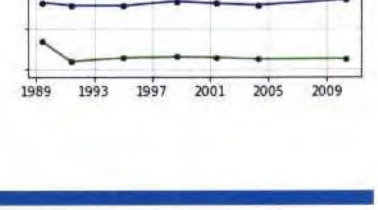

ID4-2
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
ID4-2 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID4-2 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID4-2 Anions vs Time
1975 1979 1983 1987 1991 1995 1999 2003 2007 2011

11: ID4-10

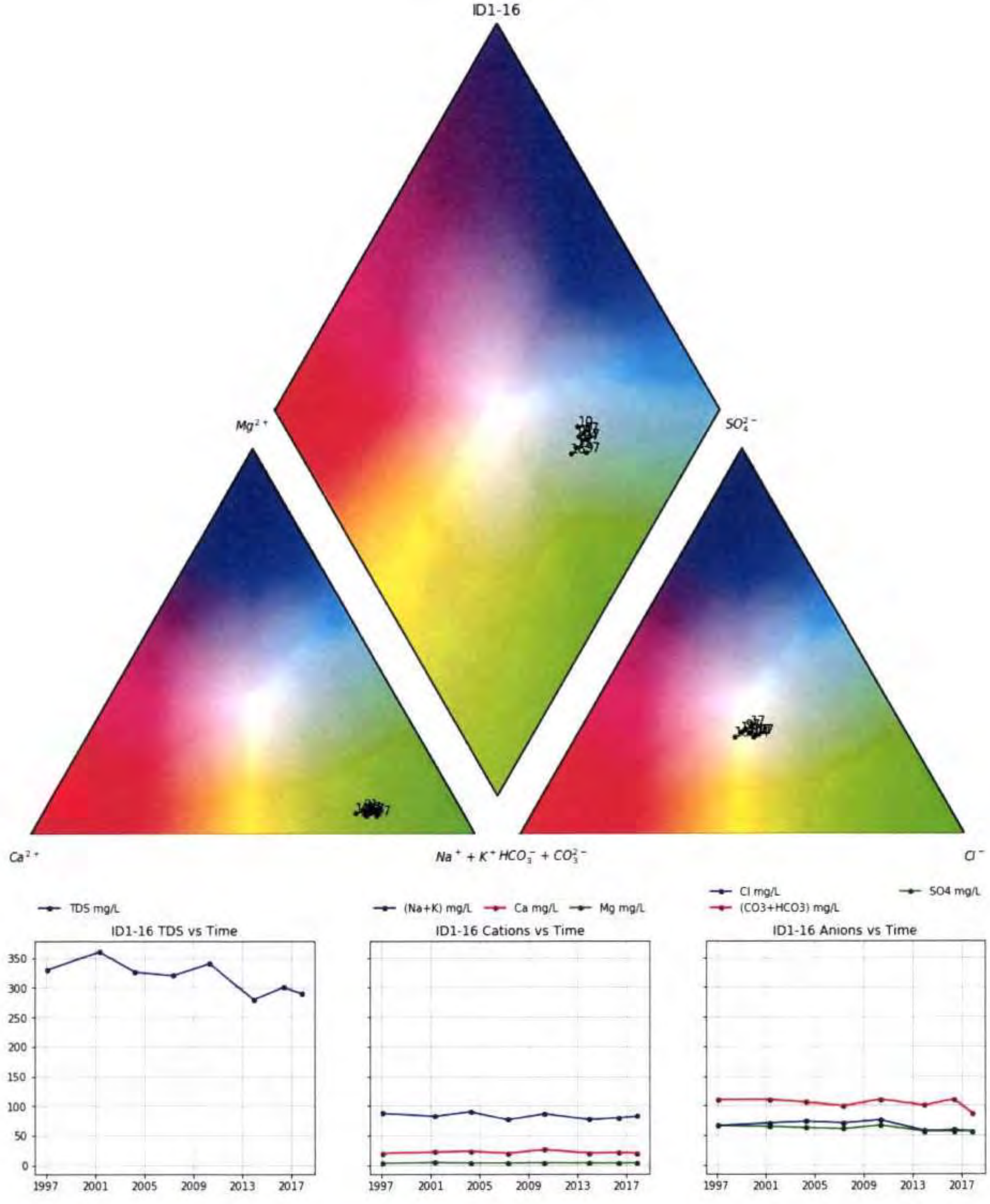

ID4-10
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-

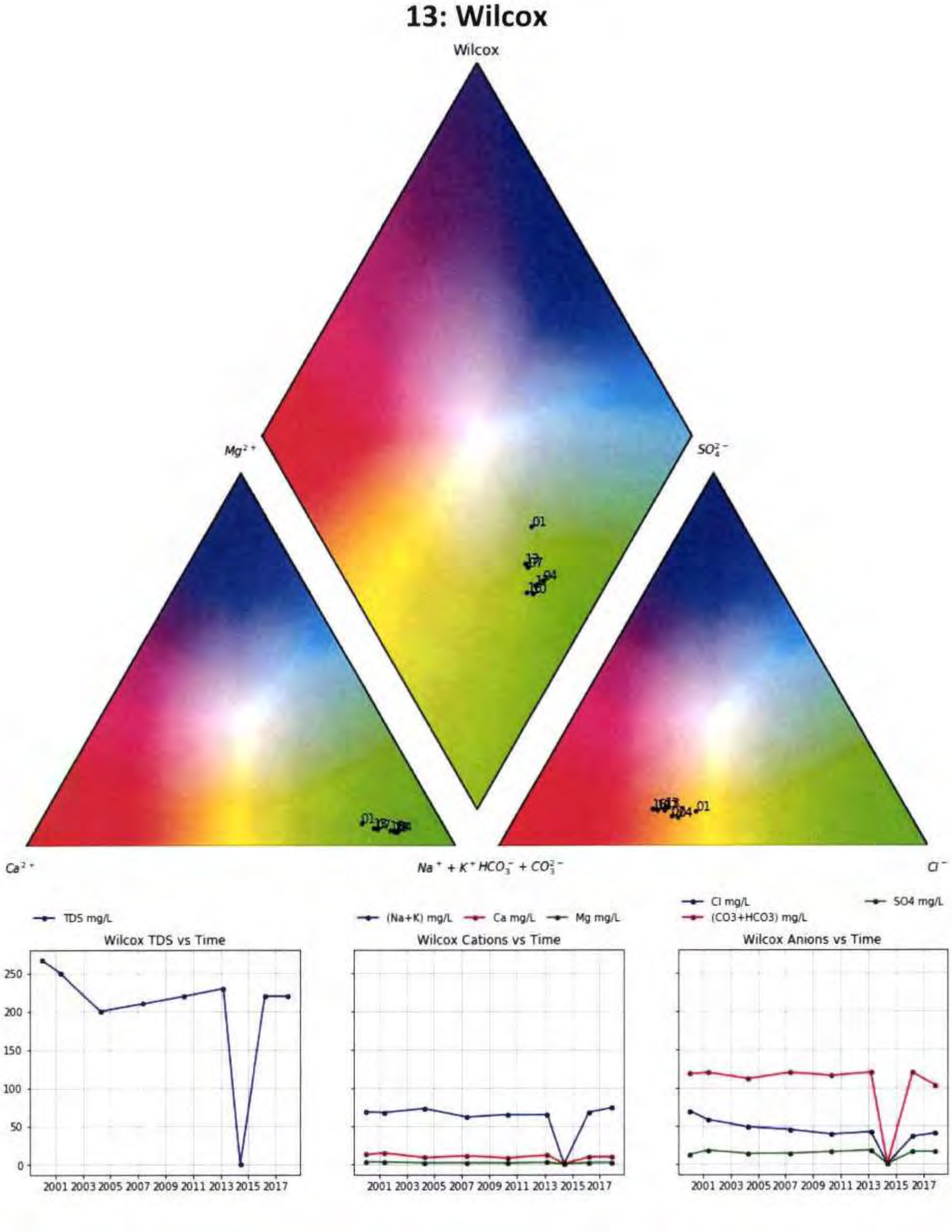

TDS mg/L
ID4-10 TDS vs Time
600
500
400
300
200
100
0
1989
1993
1997
2001
2005
2009


(Na+K) mg/L
Ca mg/L
Mg mg/L
ID4-10 Cations vs Time
1989
1993
1997
2001
2005
2009

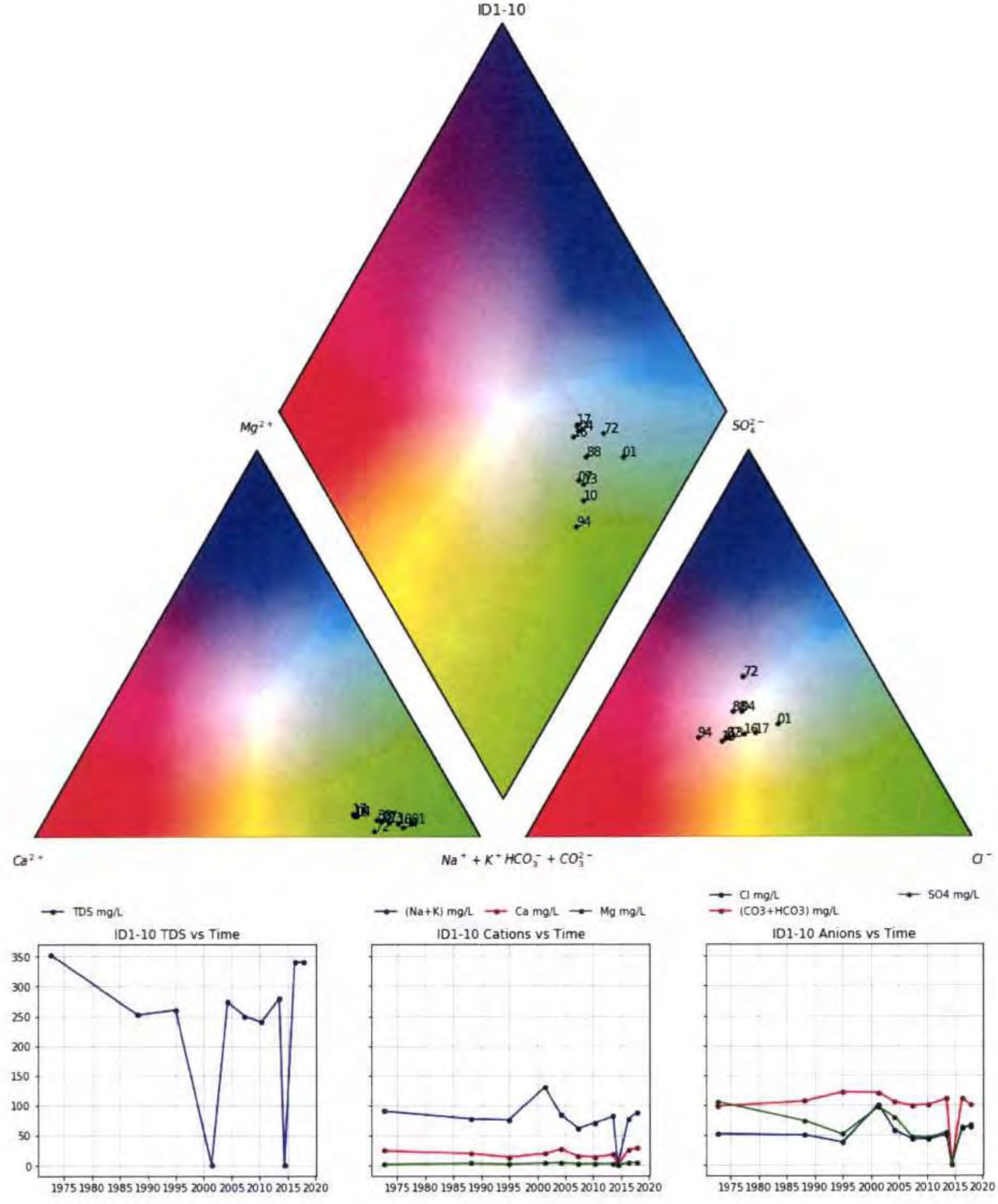

Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID4-10 Anions vs Time
1989
1993
1997
2001
2005
2009

12: ID1-16

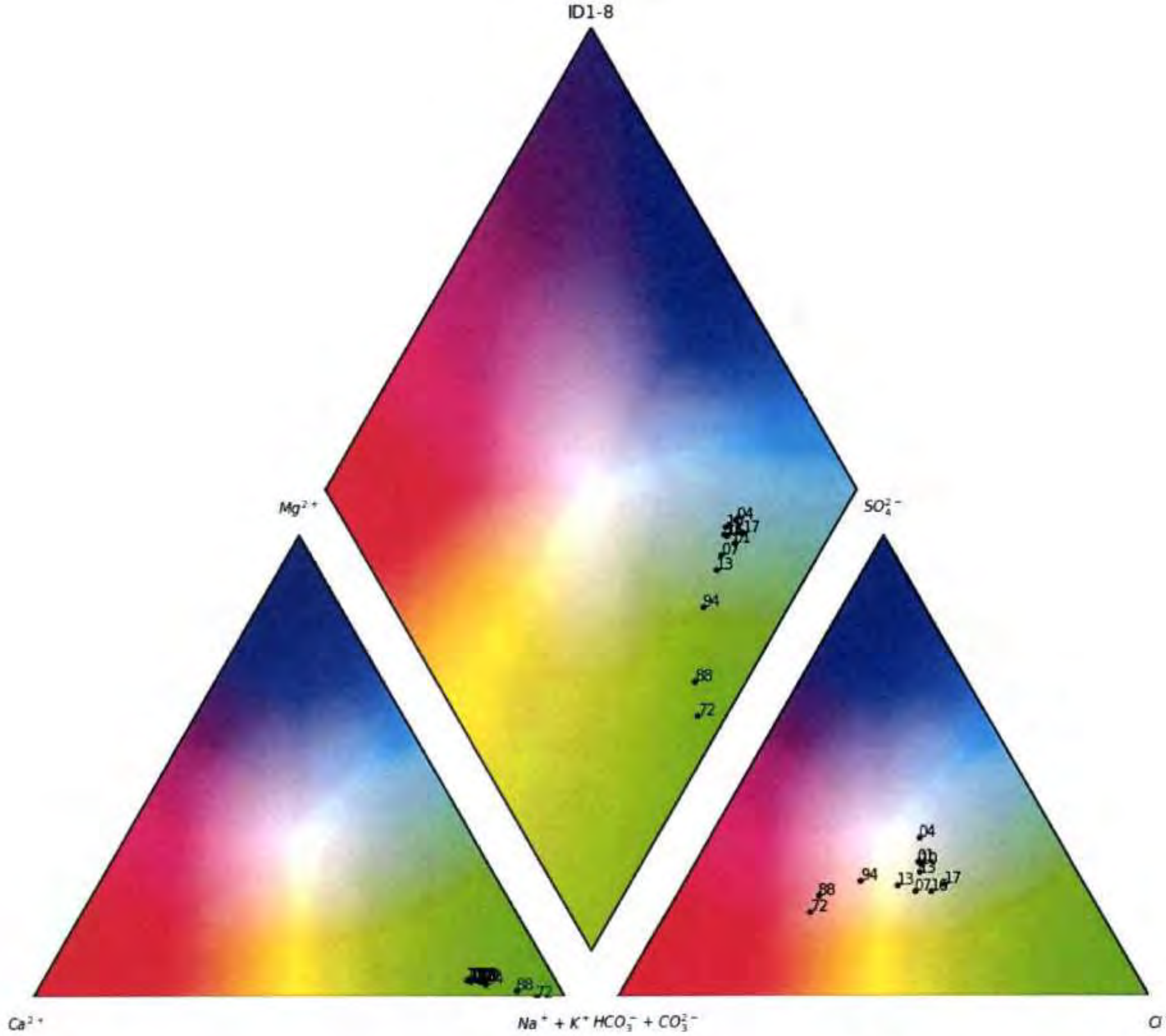

ID1-16
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
ID1-16 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID1-16 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID1-16 Anions vs Time
1997
2001
2005
2009
2013
2017
0
50
100
150
200
250
300
350

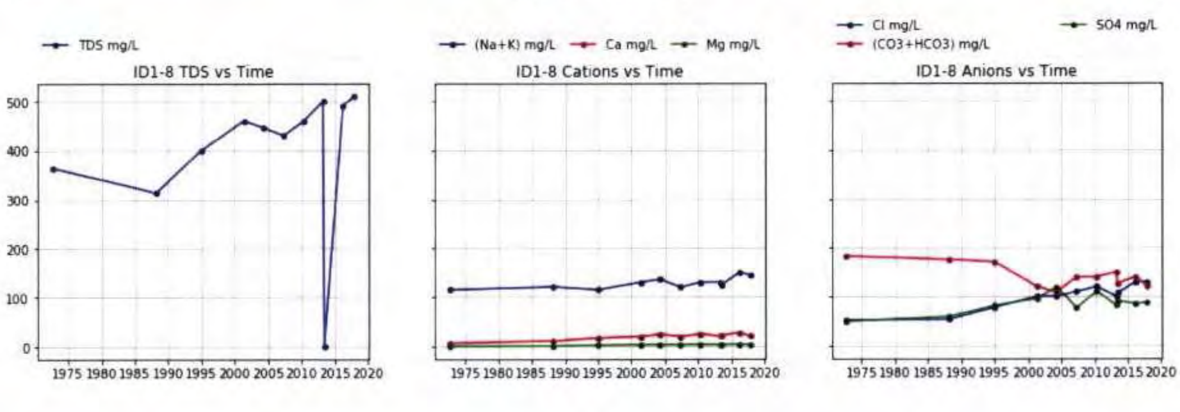

13: Wilcox
Wilcox
Mg2+
SO4 2-
Ca2+
Na+ + K+ HCO3- + CO3 2-
Cl-
TDS mg/L
Wilcox TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
Wilcox Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
Wilcox Anions vs Time
2001 2003 2005 2007 2009 2011 2013 2015 2017

14: ID1-10


ID1-10
Mg²⁺
SO₄²⁻
Ca²⁺
Na⁺ + K⁺ HCO₃⁻ + CO₃²⁻
Cl⁻
TDS mg/L
ID1-10 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID1-10 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID1-10 Anions vs Time
1975 1980 1985 1990 1995 2000 2005 2010 2015 2020

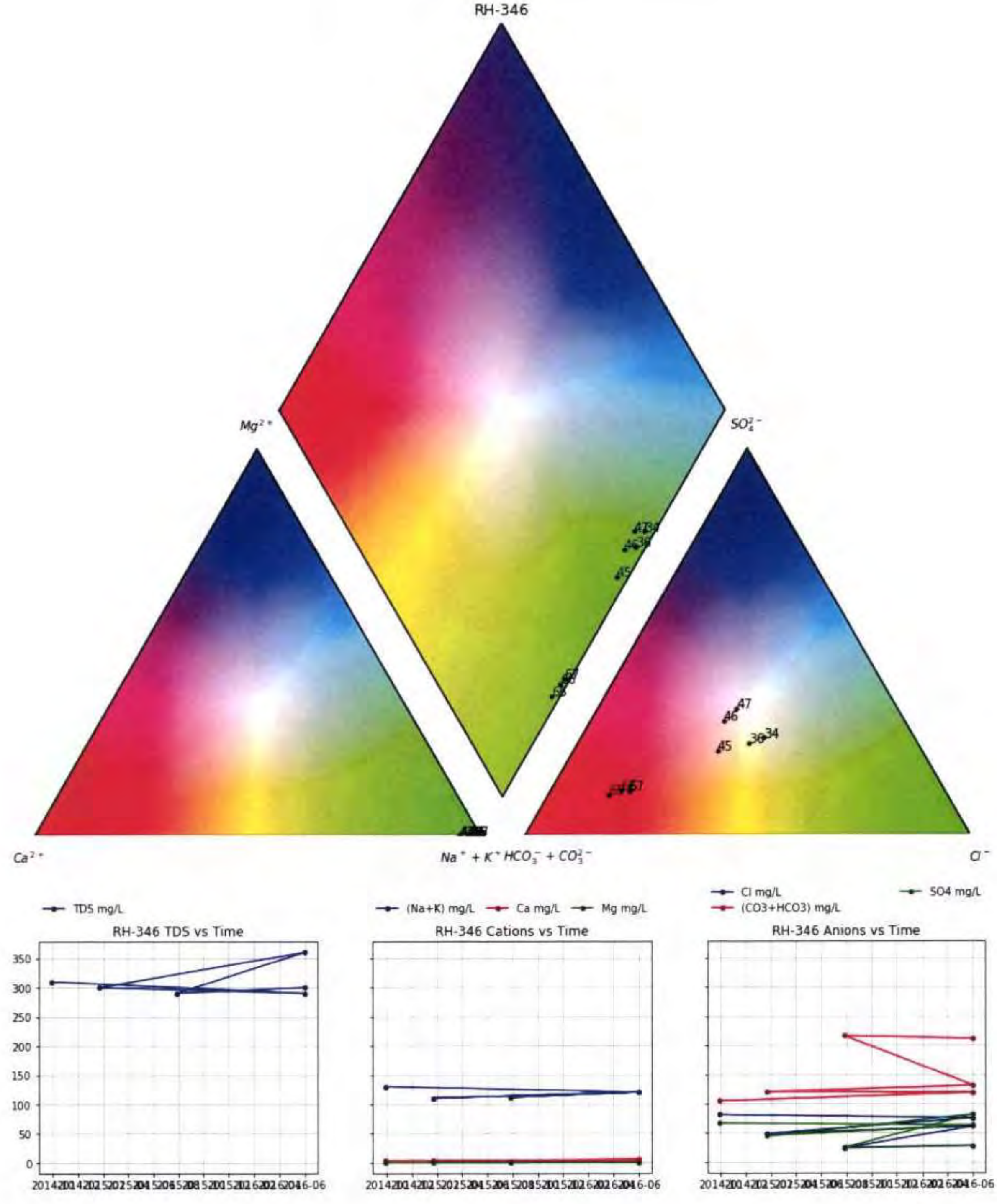
15: ID1-8

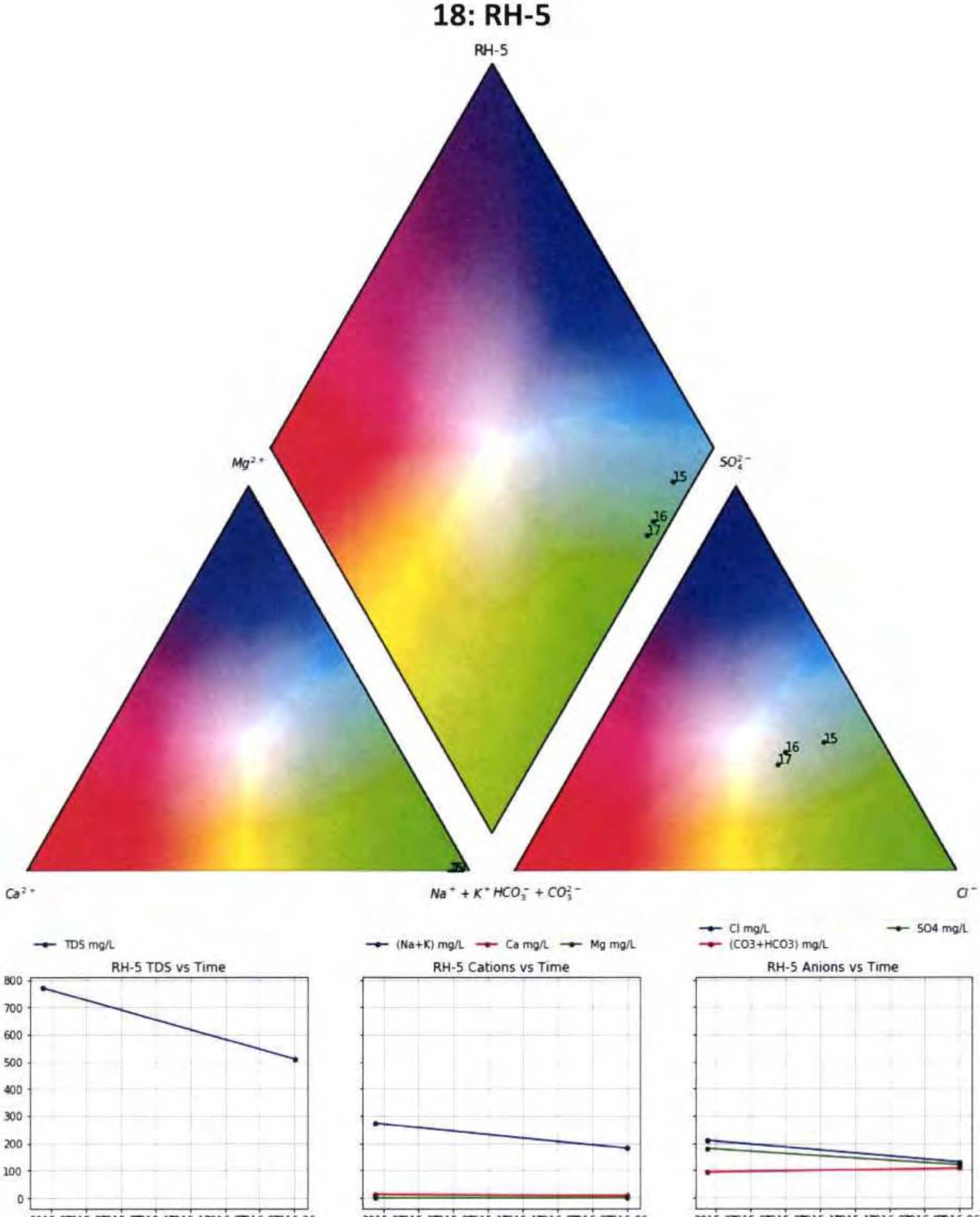

ID1-8
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
04
94
88
72
13
17


TDS mg/L
ID1-8 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID1-8 Cations vs Time
Cl mg/L
(CO3+HCO3) mg/L
SO4 mg/L
ID1-8 Anions vs Time
1975 1980 1985 1990 1995 2000 2005 2010 2015 2020

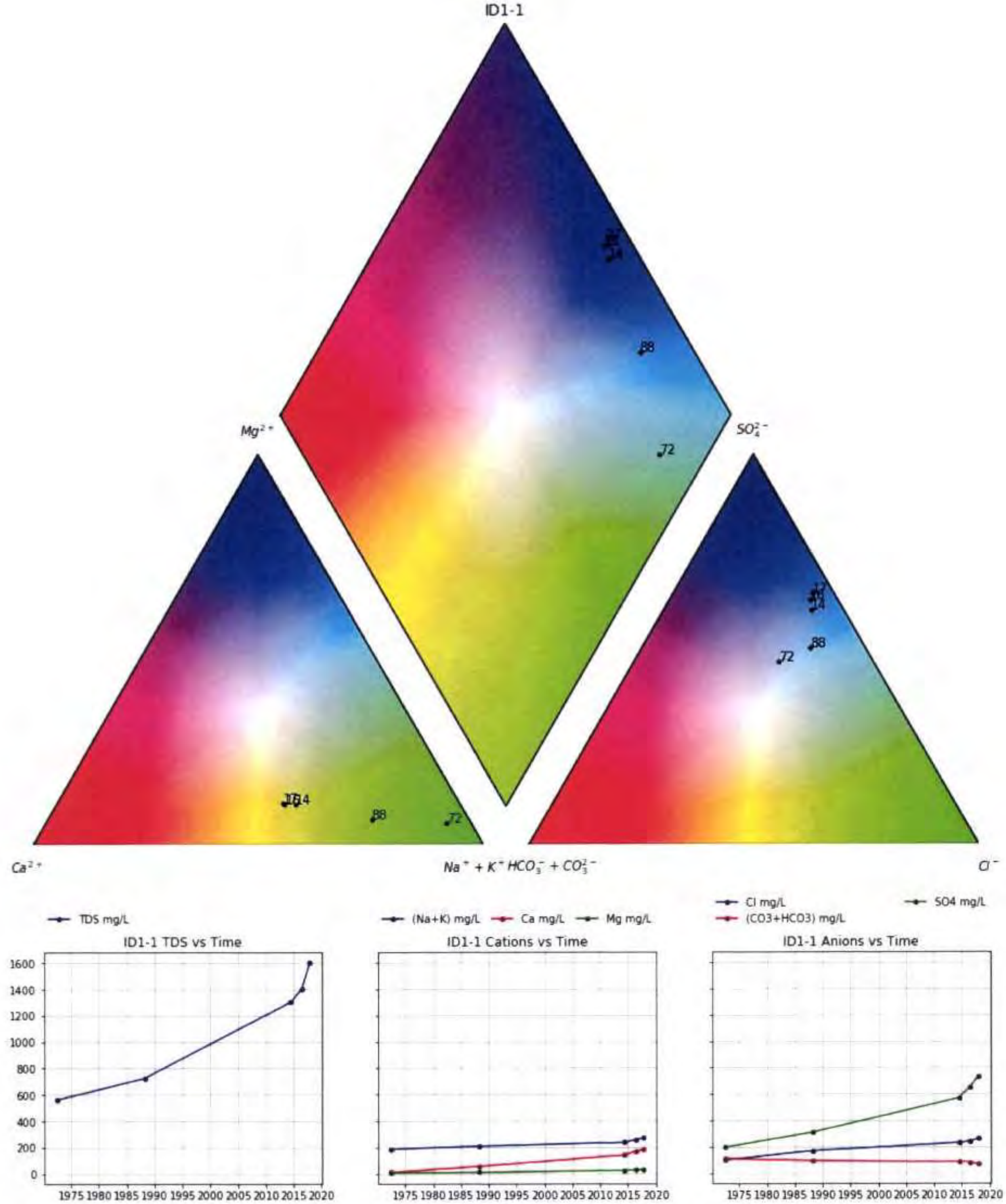
APPENDIX B: PIPER DIAGRAMS

16: RH-3; 17: RH-4; 19: RH-6

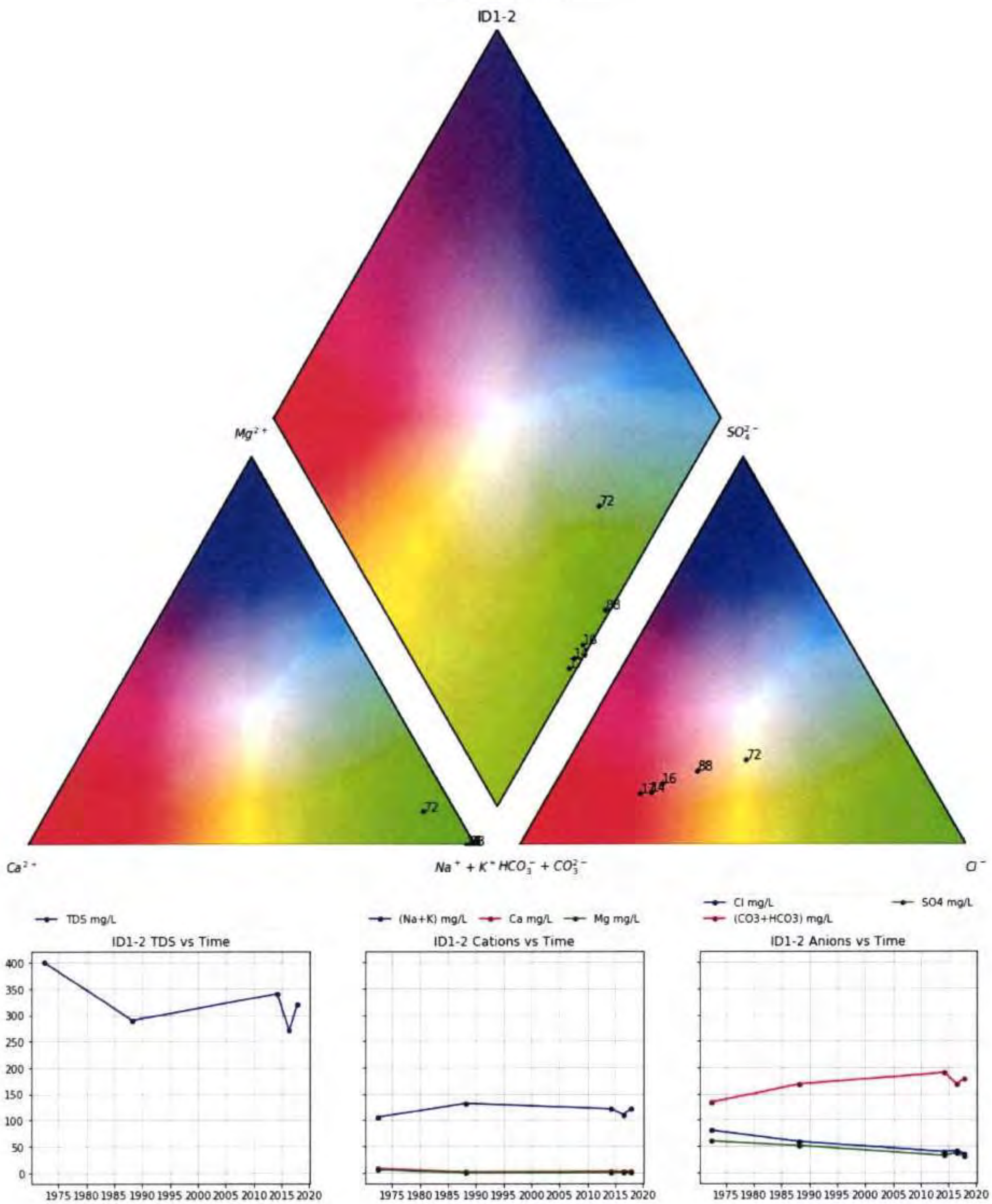



18: RH-5
RH-5
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
15
16
17
TDS mg/L
RH-5 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
RH-5 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
RH-5 Anions vs Time
800
700
600
500
400
300
200
100
0
2016-06

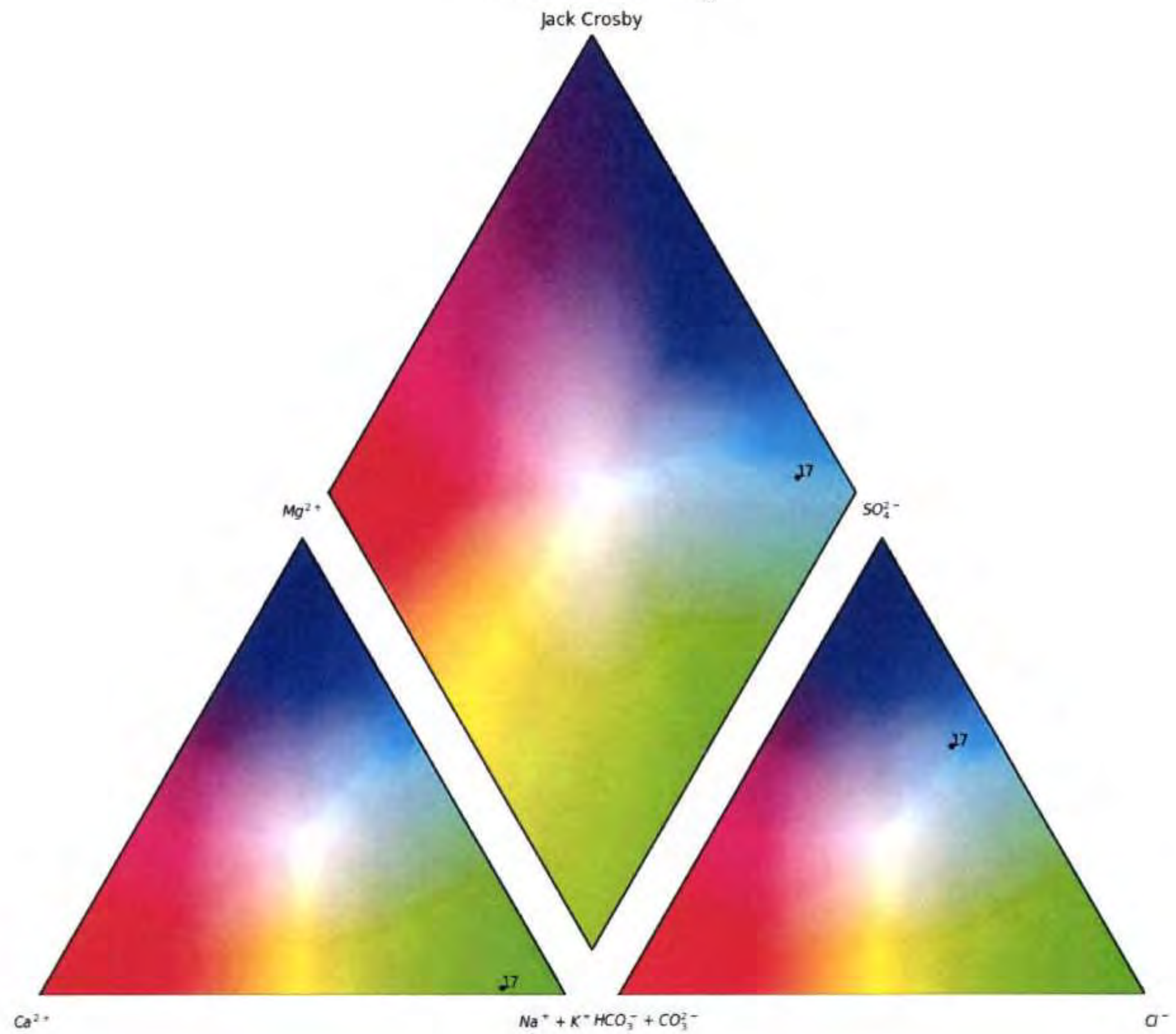
20: ID1-1


ID1-1
Mg^{2+}
SO_4^{2-}
88
72
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
ID1-1 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID1-1 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID1-1 Anions vs Time
1600
1400
1200
1000
800
600
400
200
0
1975 1980 1985 1990 1995 2000 2005 2010 2015 2020

21: ID1-2

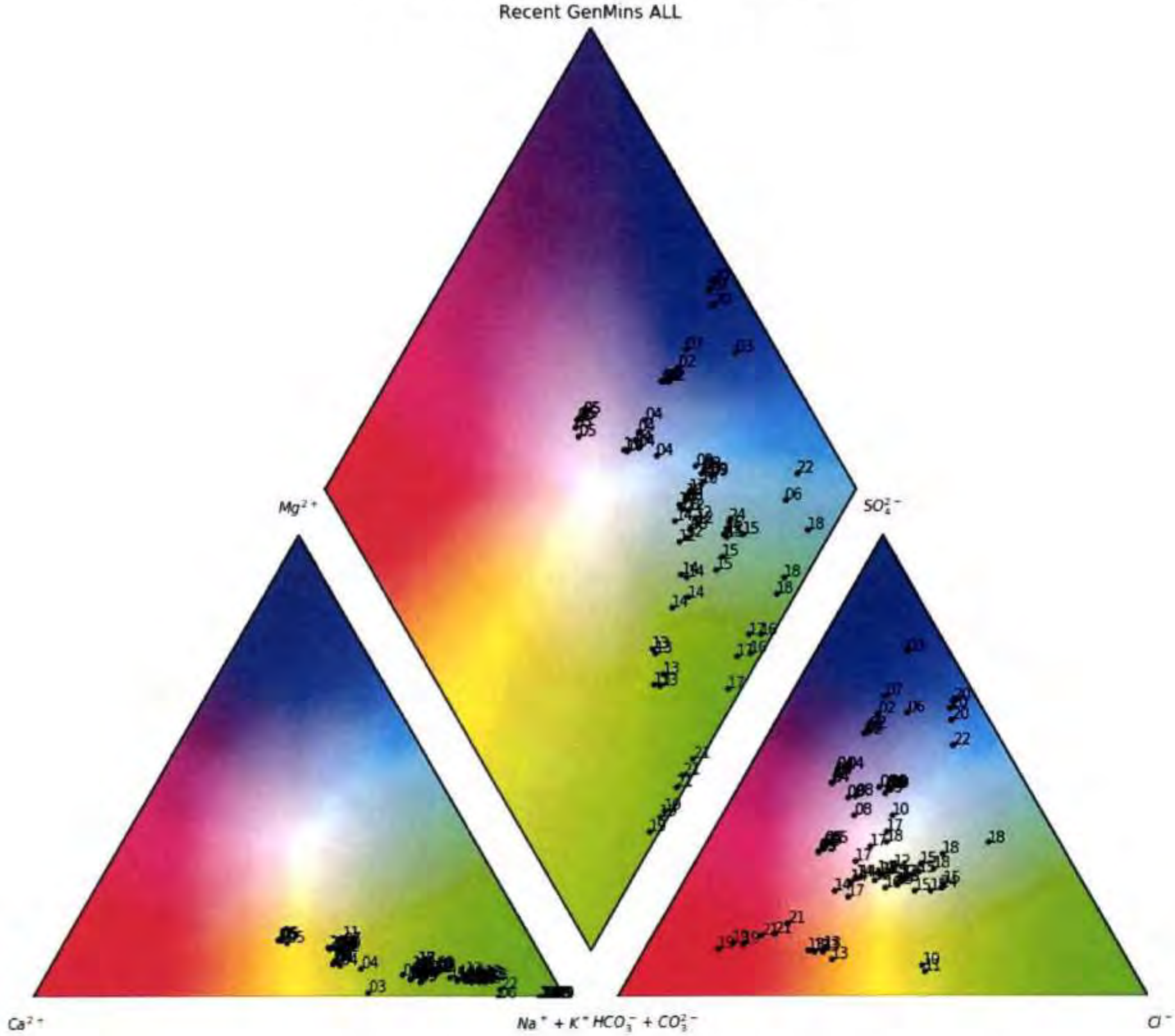

ID1-2
Mg^{2+}
SO_4^{2-}
Ca^{2+}
$Na^+ + K^+$ $HCO_3^- + CO_3^{2-}$
Cl^-
TDS mg/L
ID1-2 TDS vs Time
(Na+K) mg/L
Ca mg/L
Mg mg/L
ID1-2 Cations vs Time
Cl mg/L
SO4 mg/L
(CO3+HCO3) mg/L
ID1-2 Anions vs Time

22: Jack Crosby



One data point so no plots generated.

Recent Data: All (Piper only)

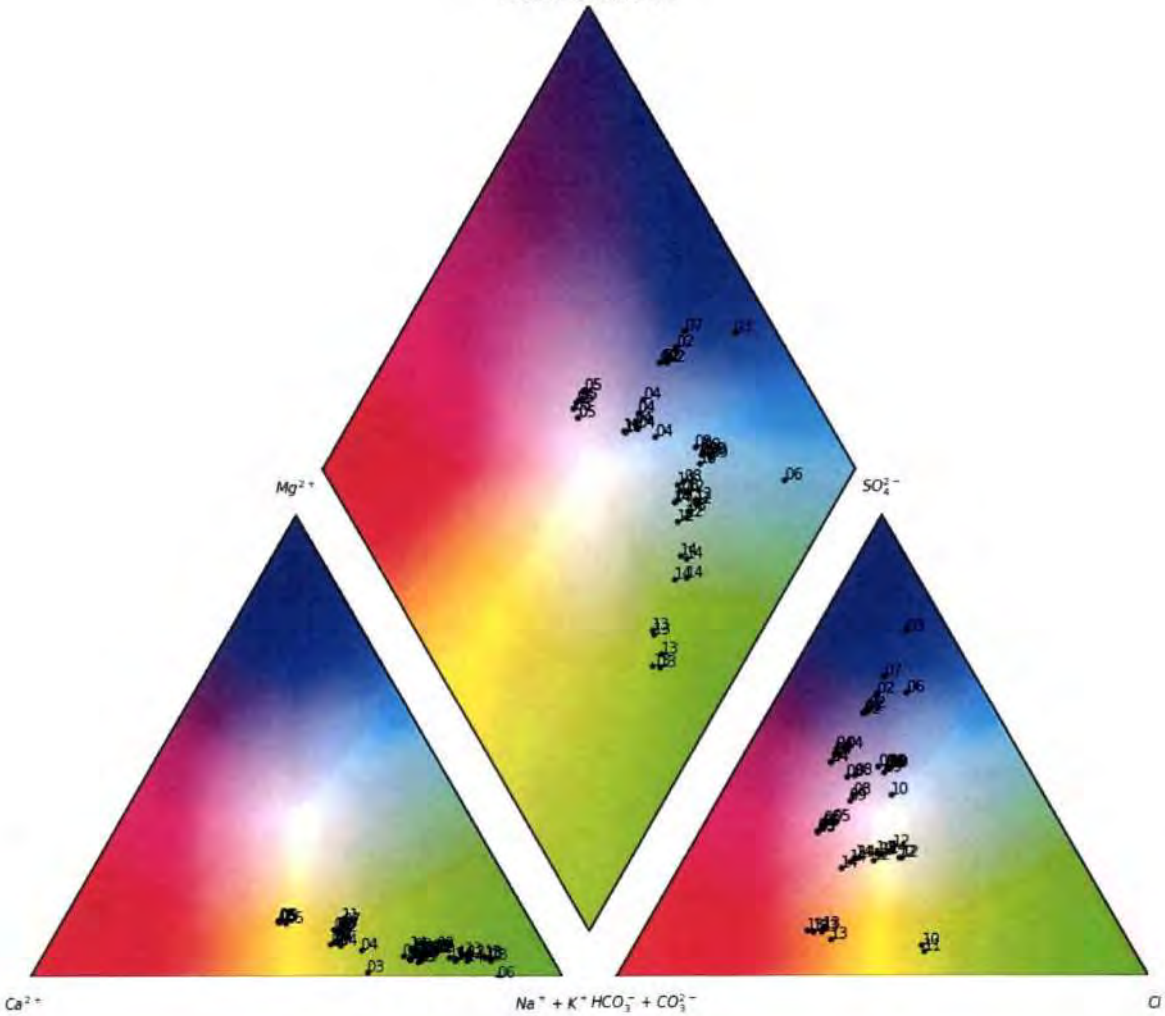


Notes:

The number on the diagrams correspond to sequential well numbers assigned to each of the wells as explained in the text. Data are for the period of 2005 to 2018.

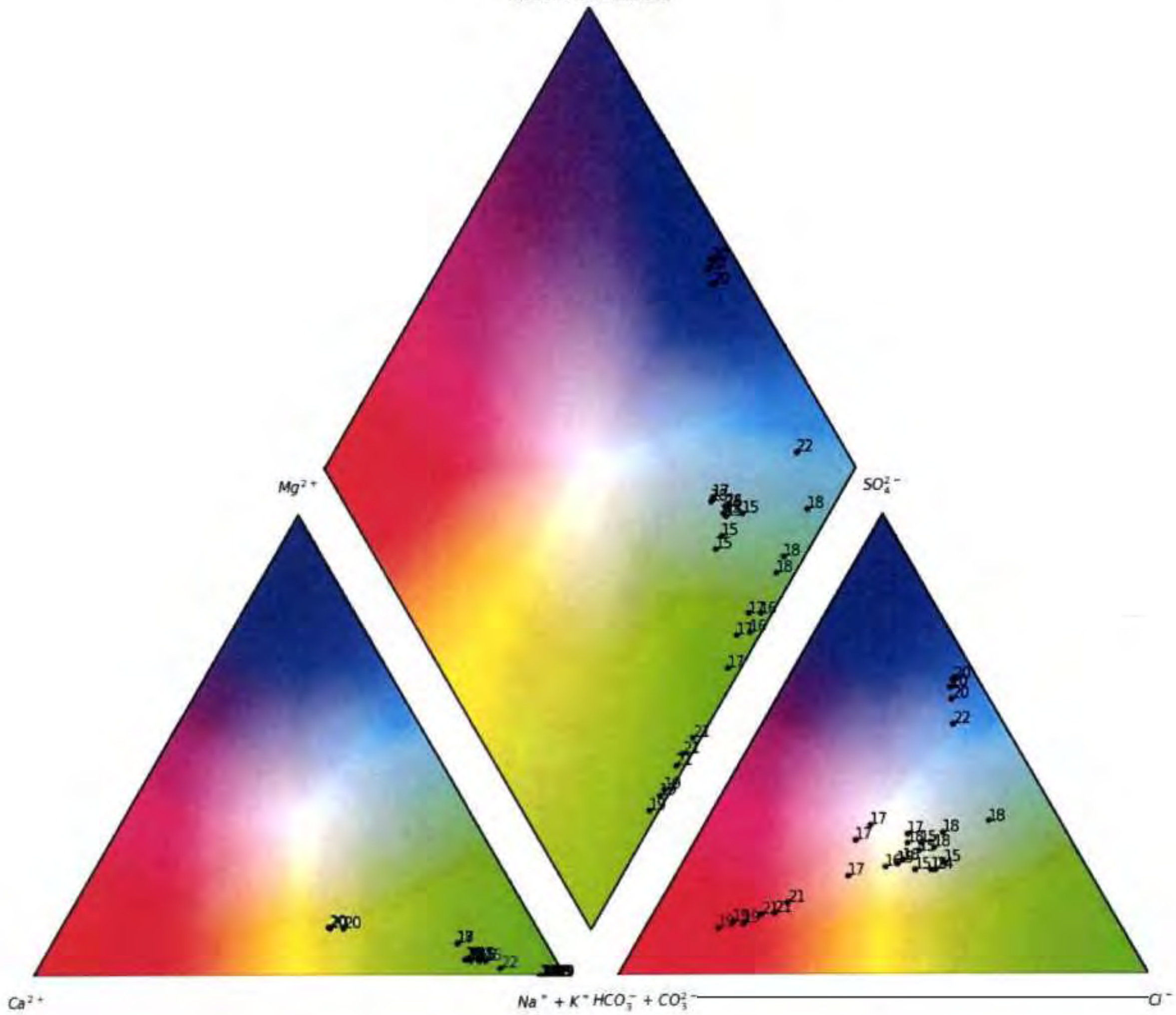
This Piper diagram is further explained in **Figure 6**.

Recent Data: North and Central (Piper only)



Note: The number on the diagrams correspond to sequential well numbers assigned to each of the wells as explained in the text. Data are for the period of 2005 to 2018.

Recent Data: South (Piper only)

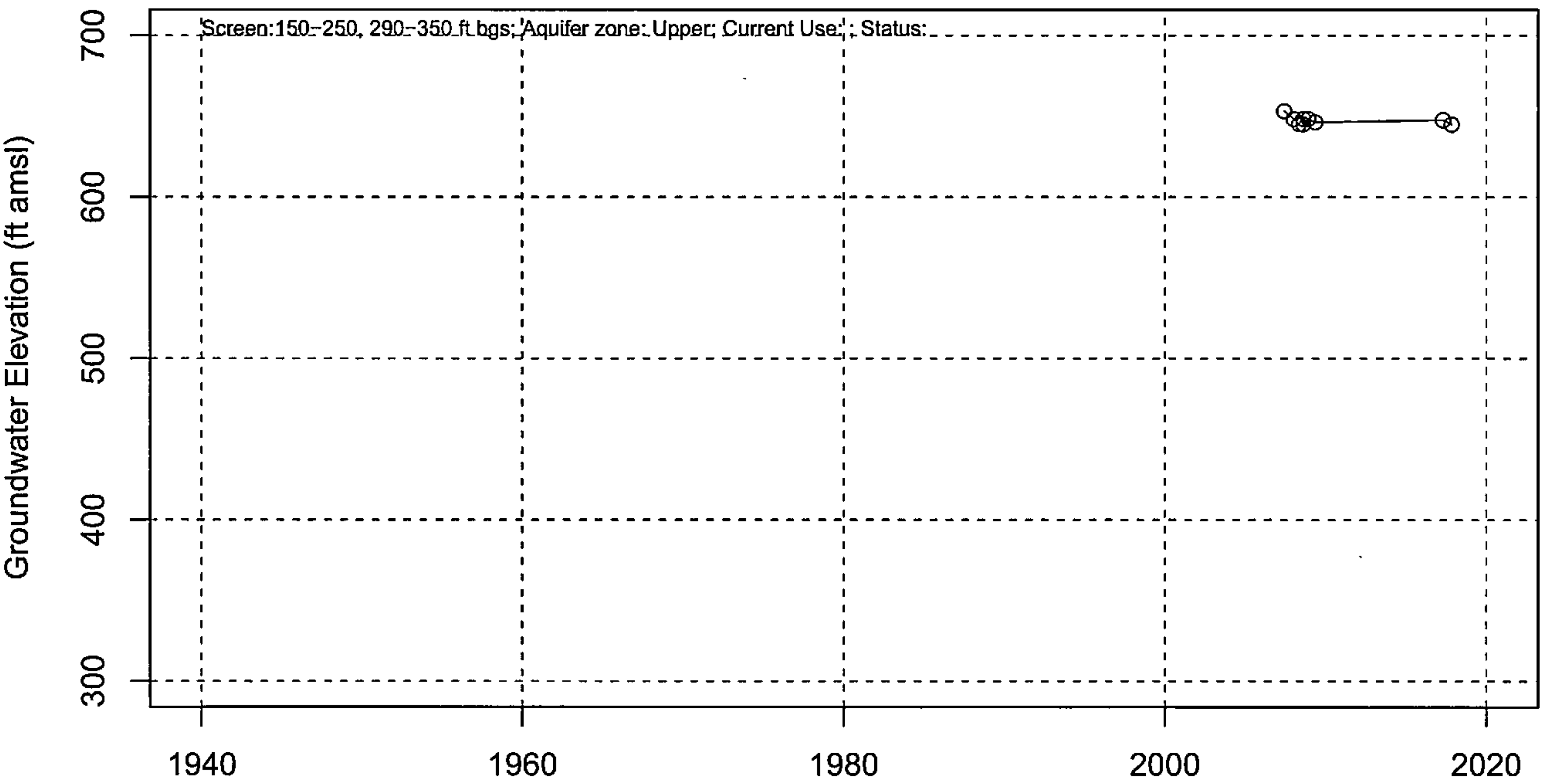


Note: The number on the diagrams correspond to sequential well numbers assigned to each of the wells as explained in the text. Data are for the period of 2005 to 2018.

APPENDIX D3

Groundwater Hydrographs

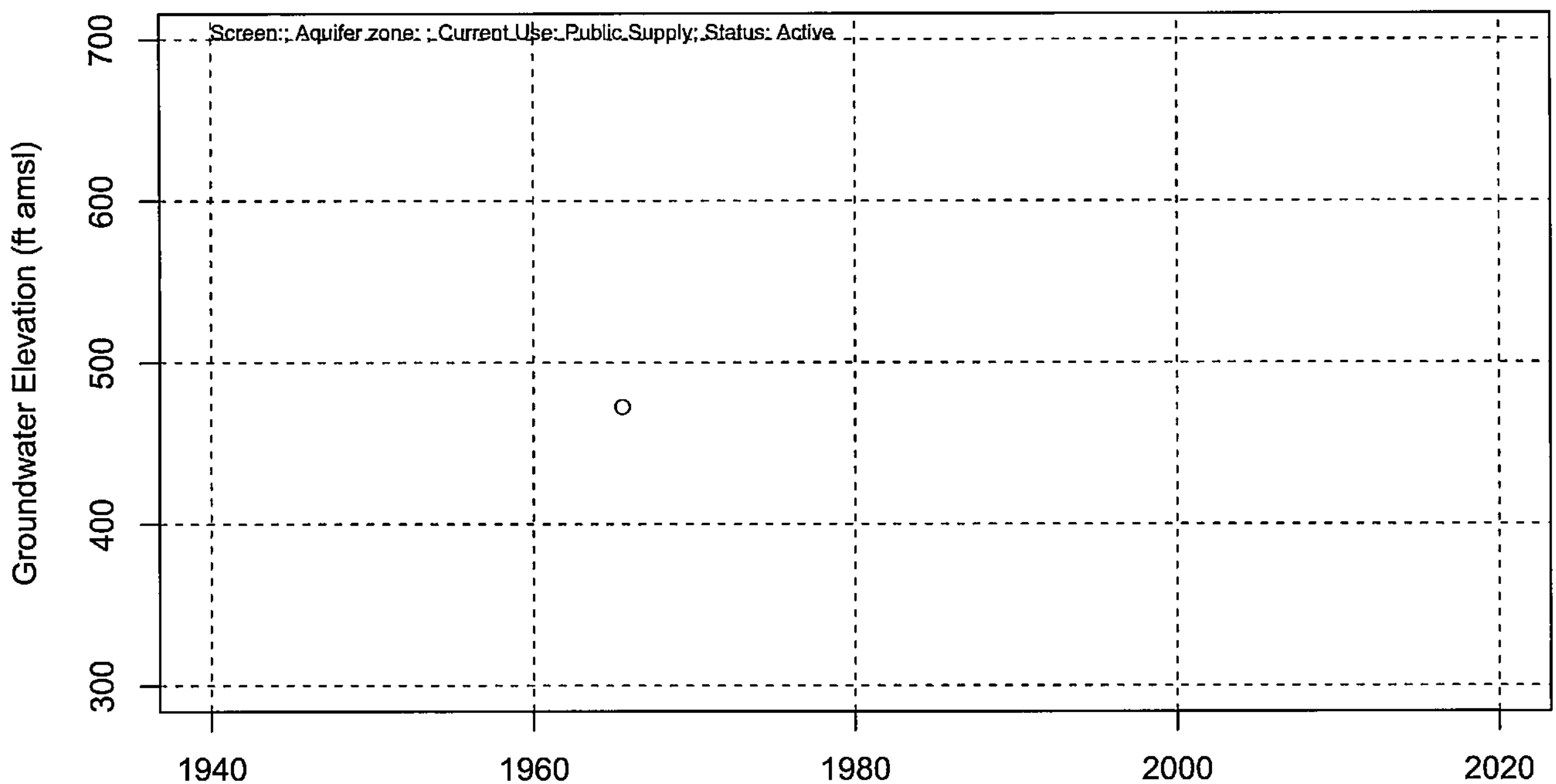
009S006E31E003S



Local ID: Horse Camp ; Number of Measuring Agenc(y/ies): 4

January 2020

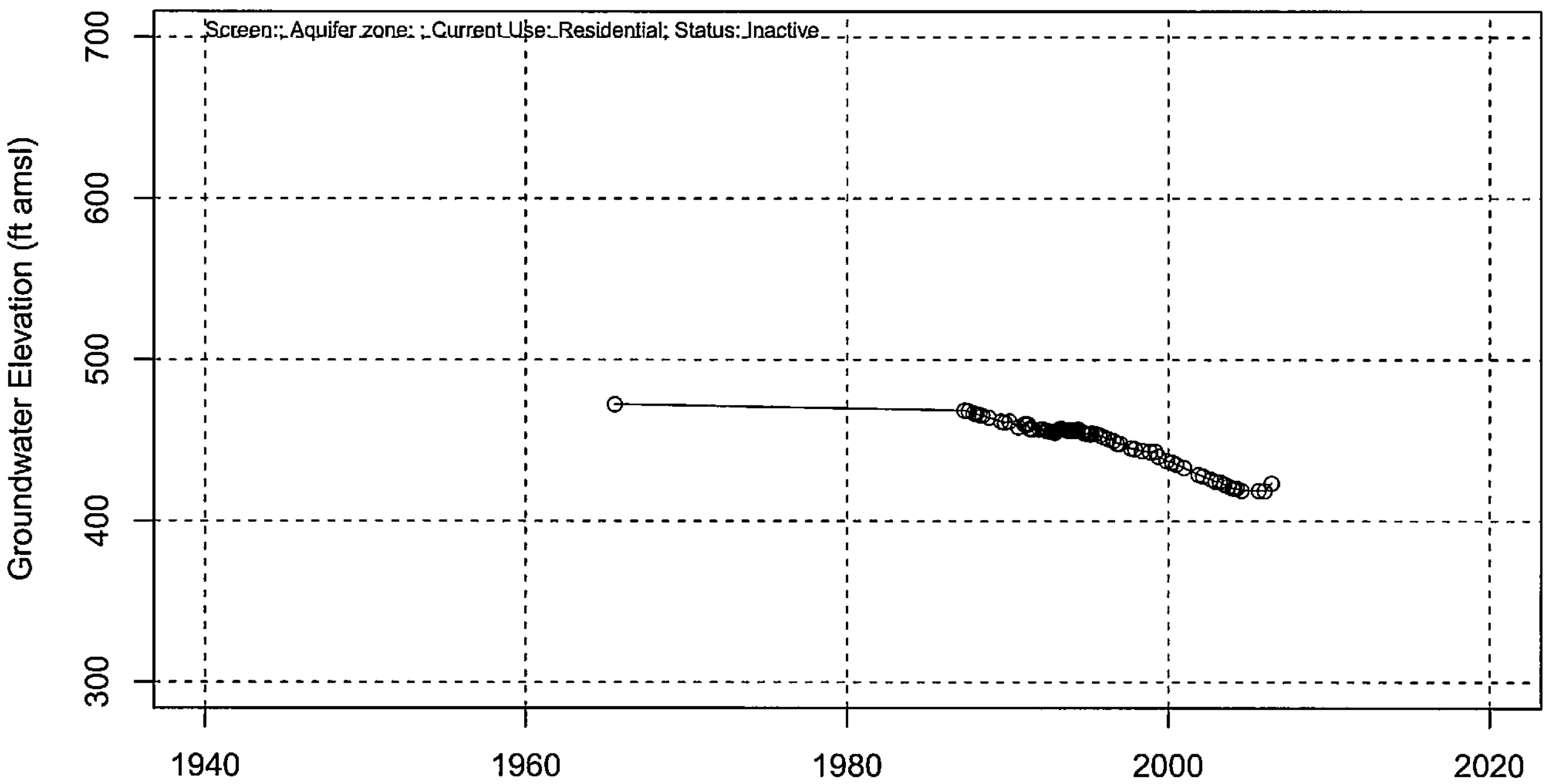
010S005E25R001S



Local ID: State Park Well 1 ; Number of Measuring Agenc(y/ies): 1

January 2020

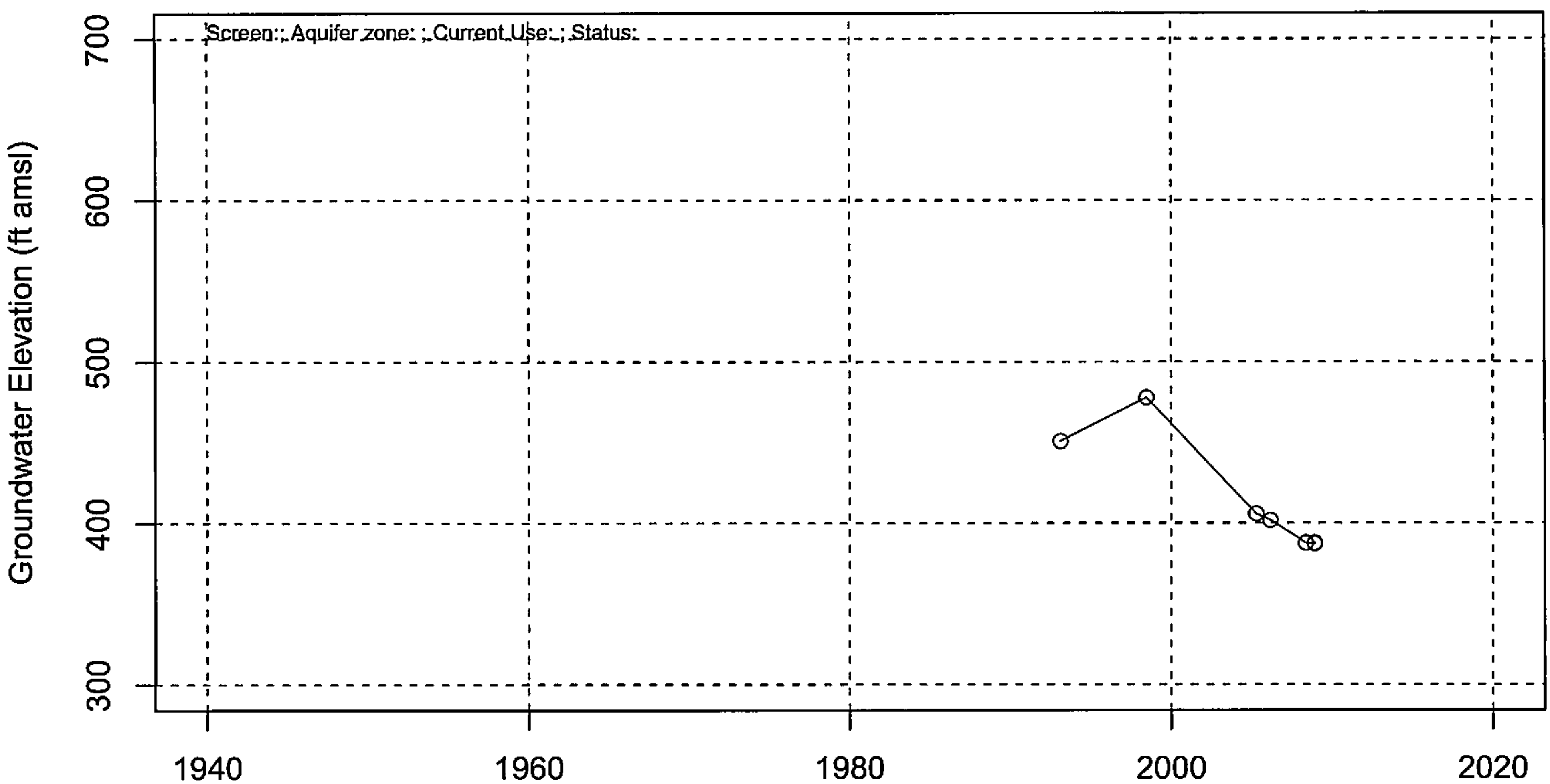
010S005E36A001S



Local ID: State Park Well 2 ; Number of Measuring Agenc(y/ies): 2

January 2020

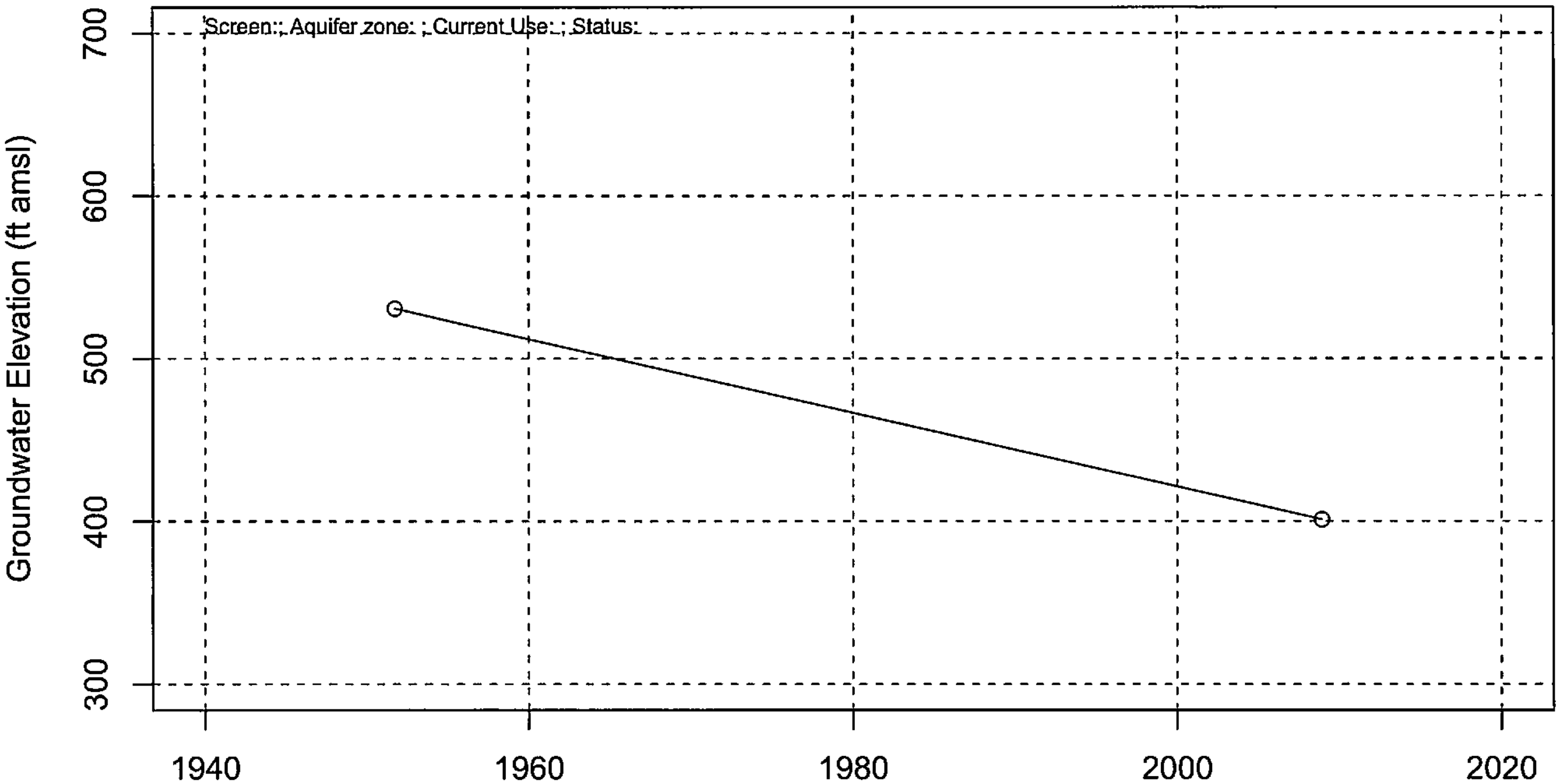
010S006E04Q001S



Local ID: Viking ; Number of Measuring Agenc(y/ies): 3

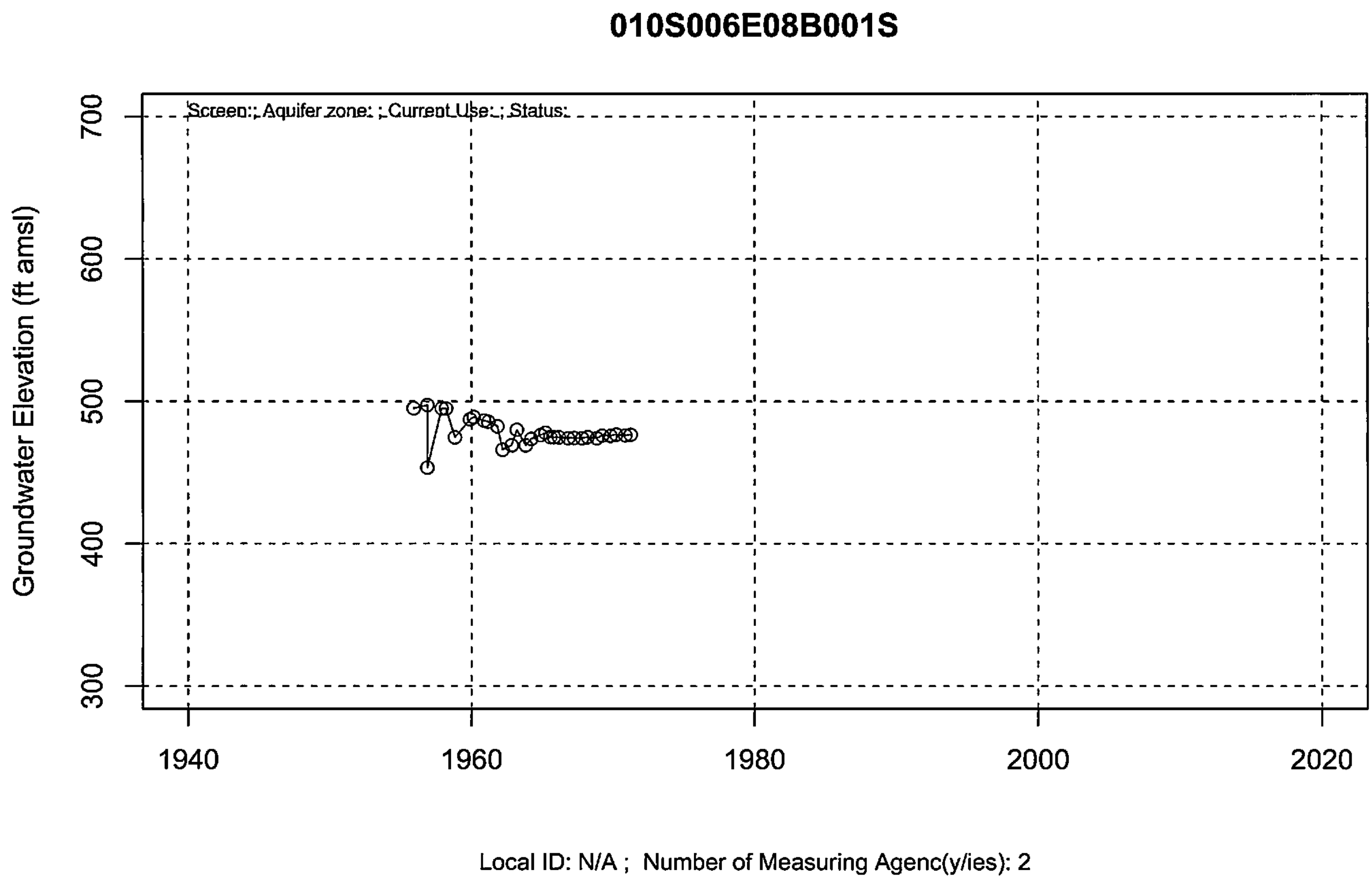
January 2020

010S006E05F001S



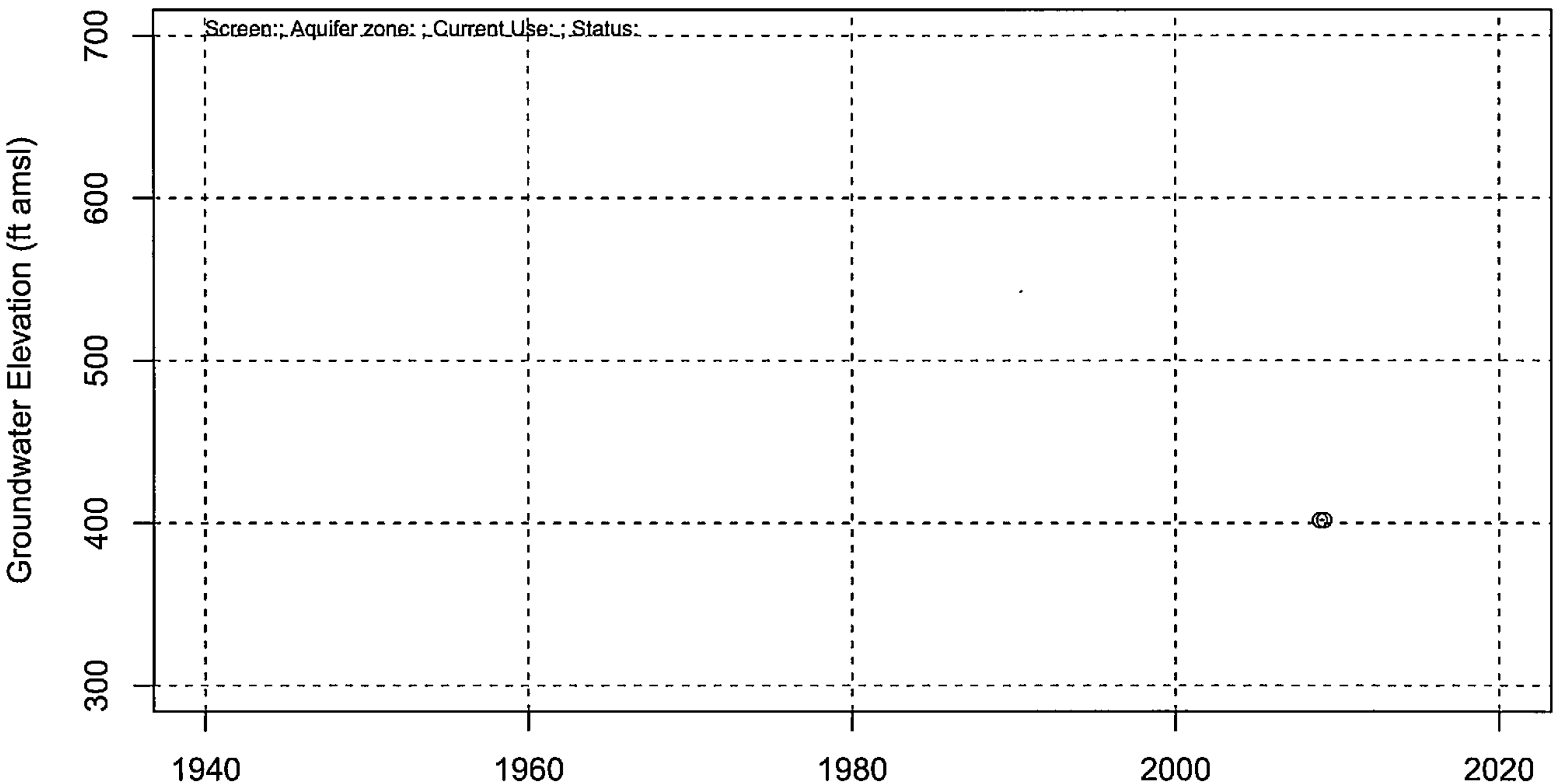
Local ID: 5F1 ; Number of Measuring Agenc(y/ies): 1

January 2020



January 2020

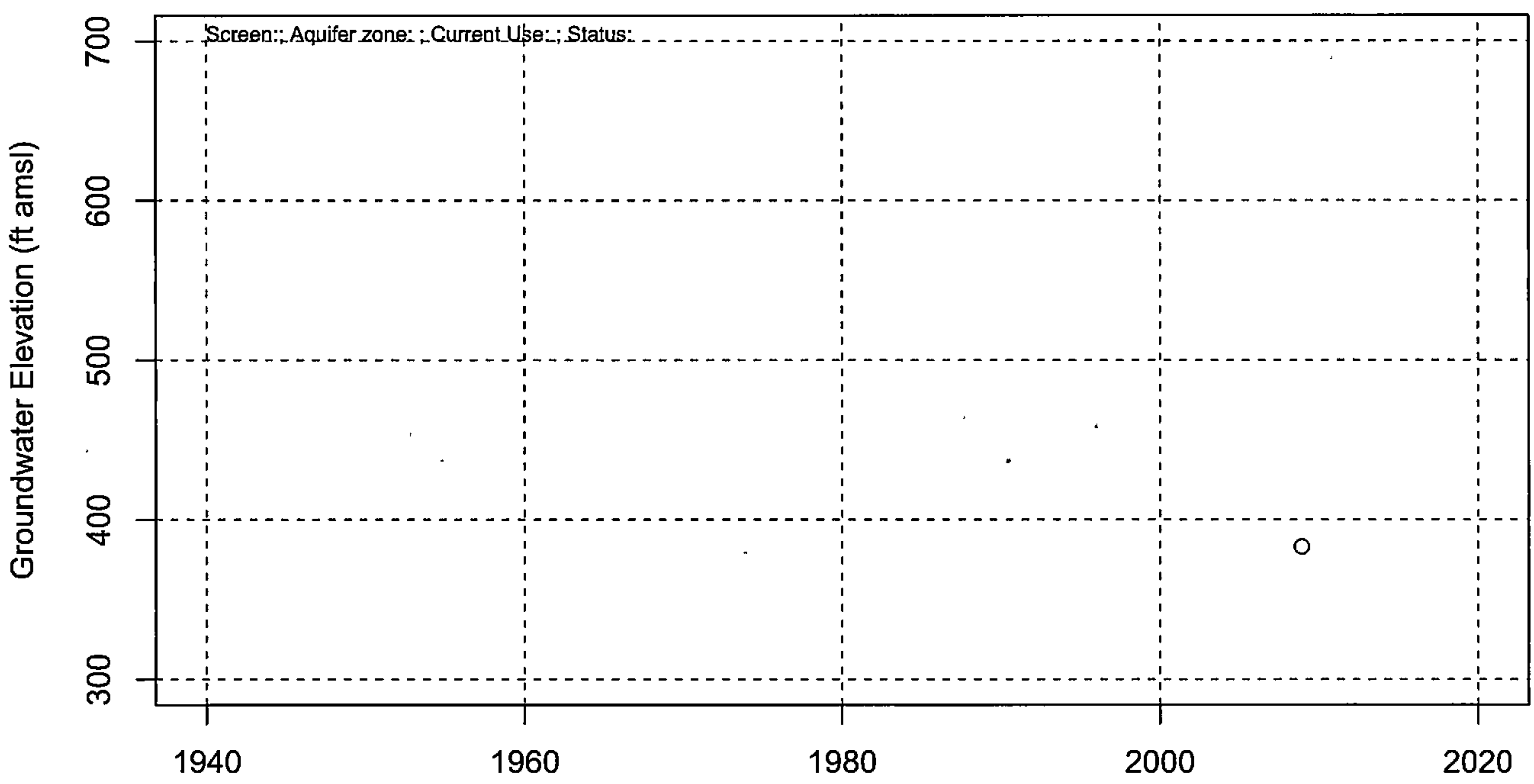
010S006E08F001S



Local ID: Charmer 2 ; Number of Measuring Agenc(y/ies): 2

January 2020

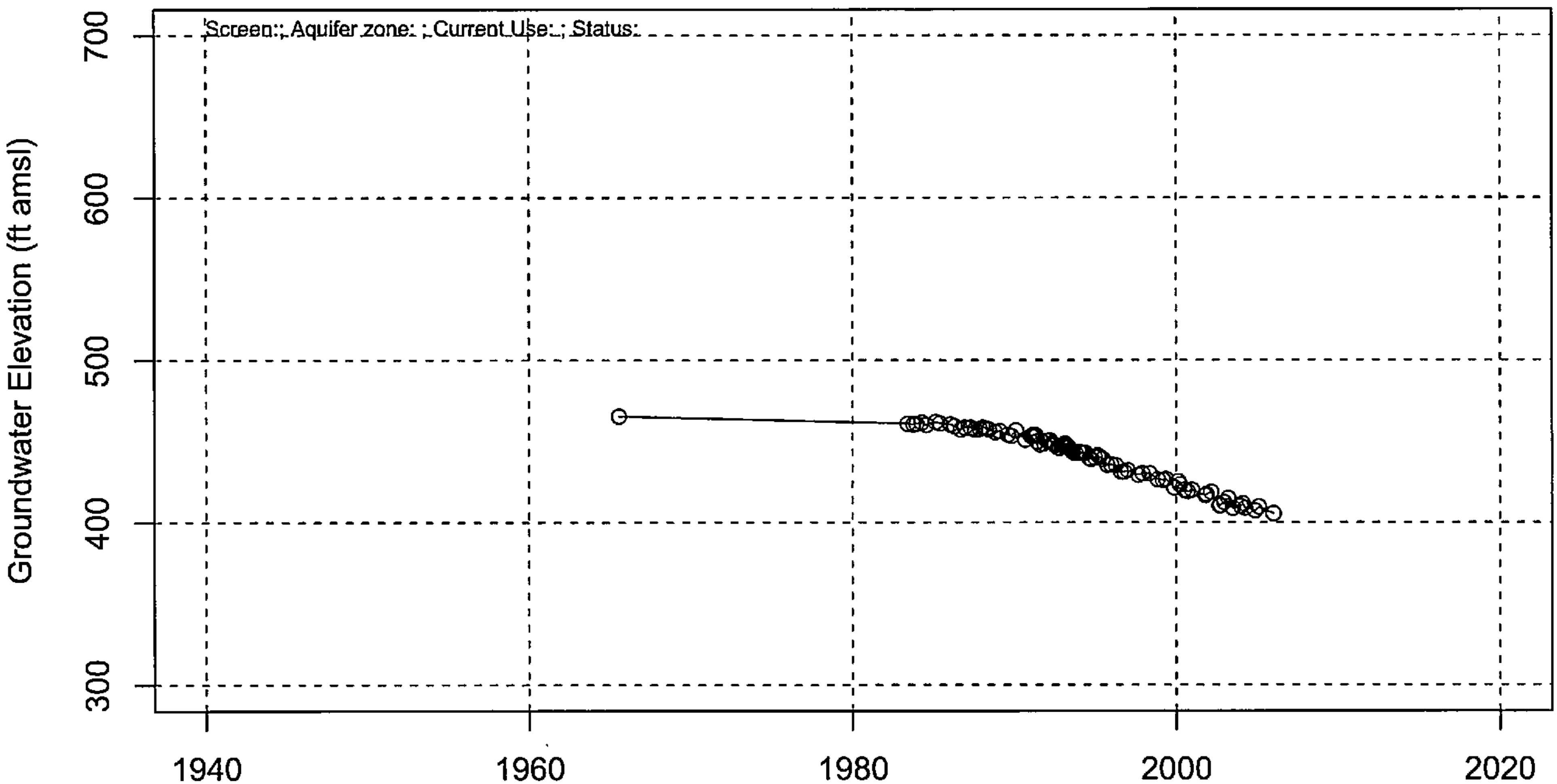
010S006E09C001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 1

January 2020

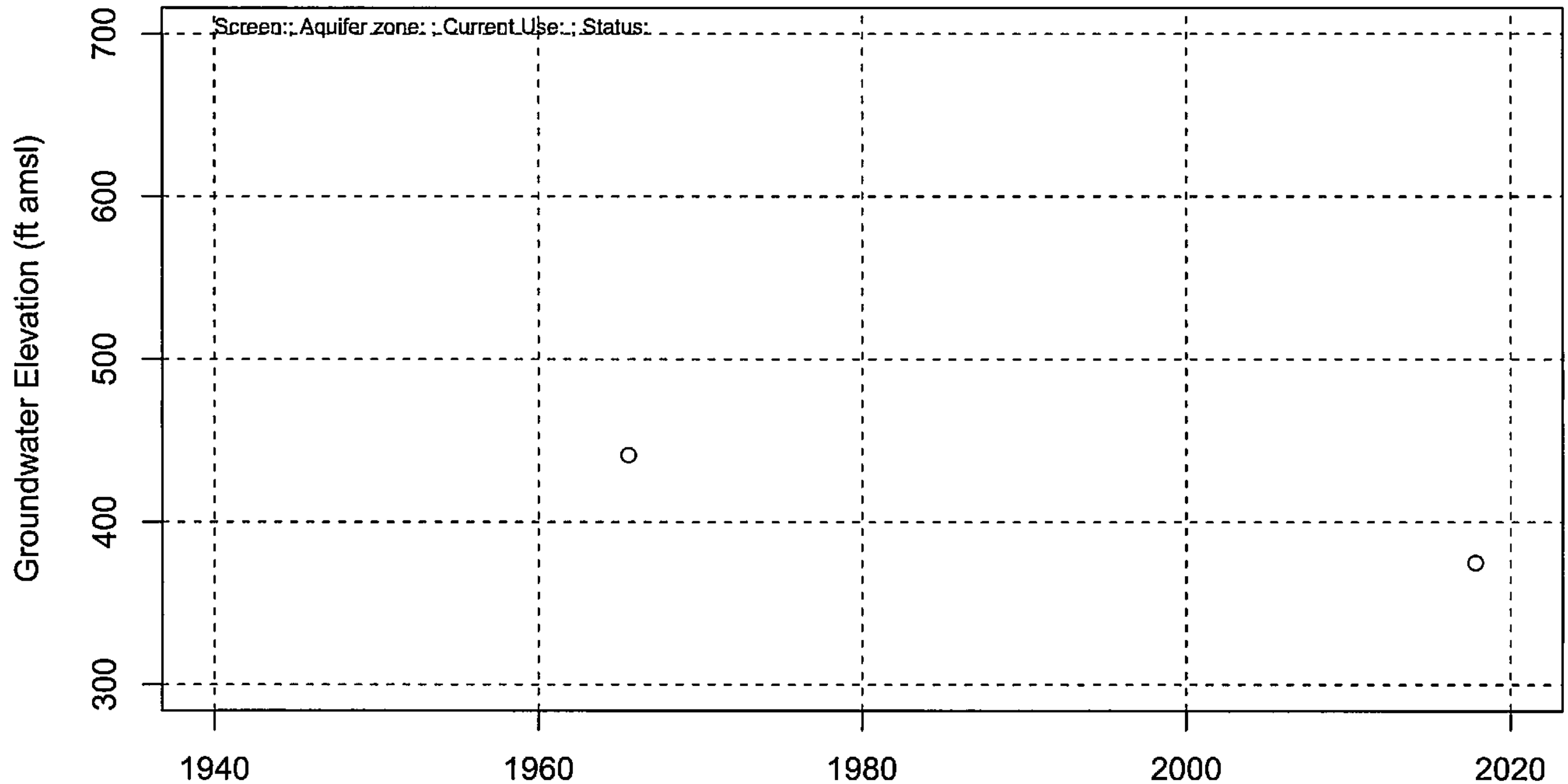
010S006E09L001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 2

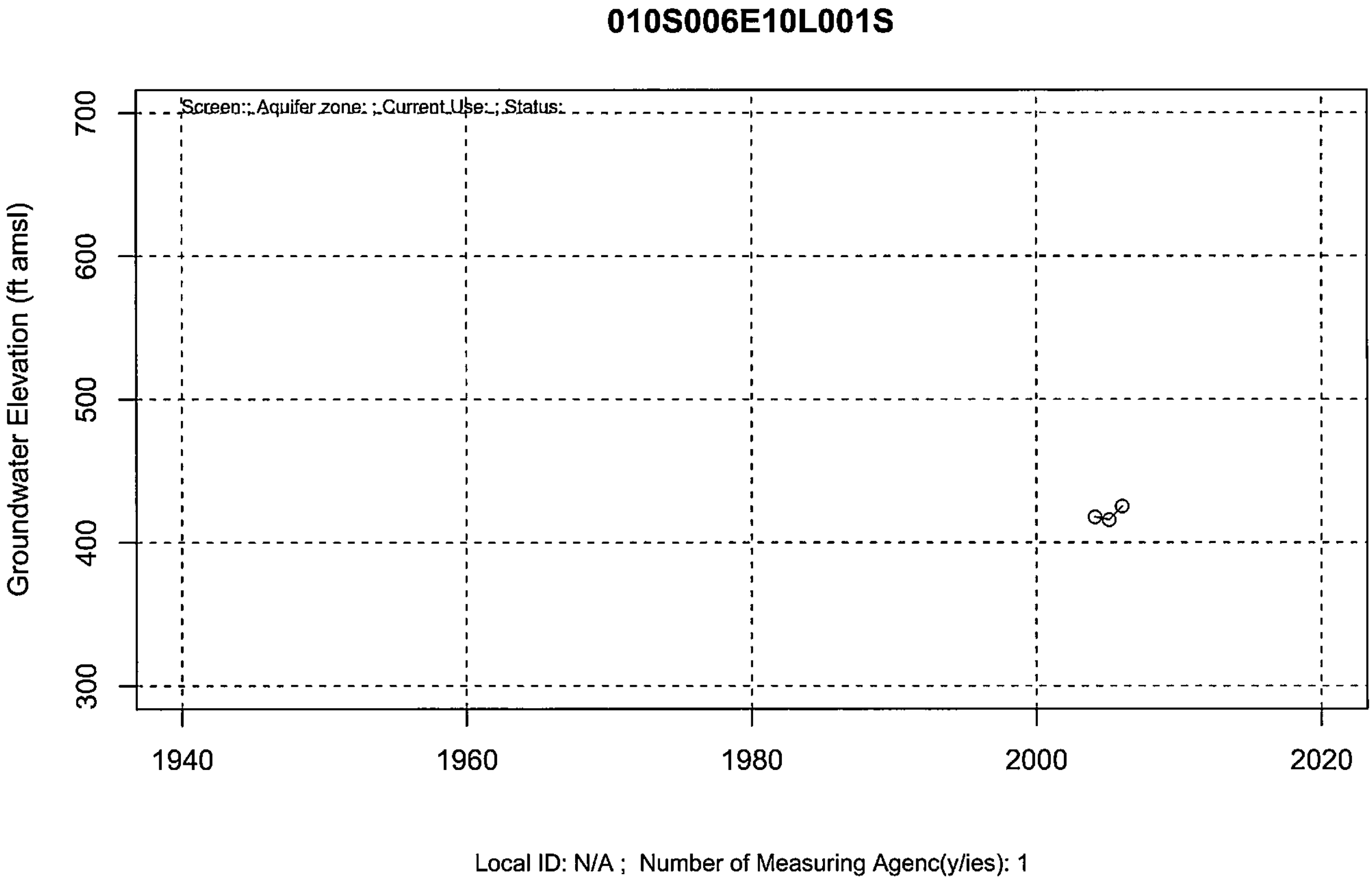
January 2020

010S006E09N001S



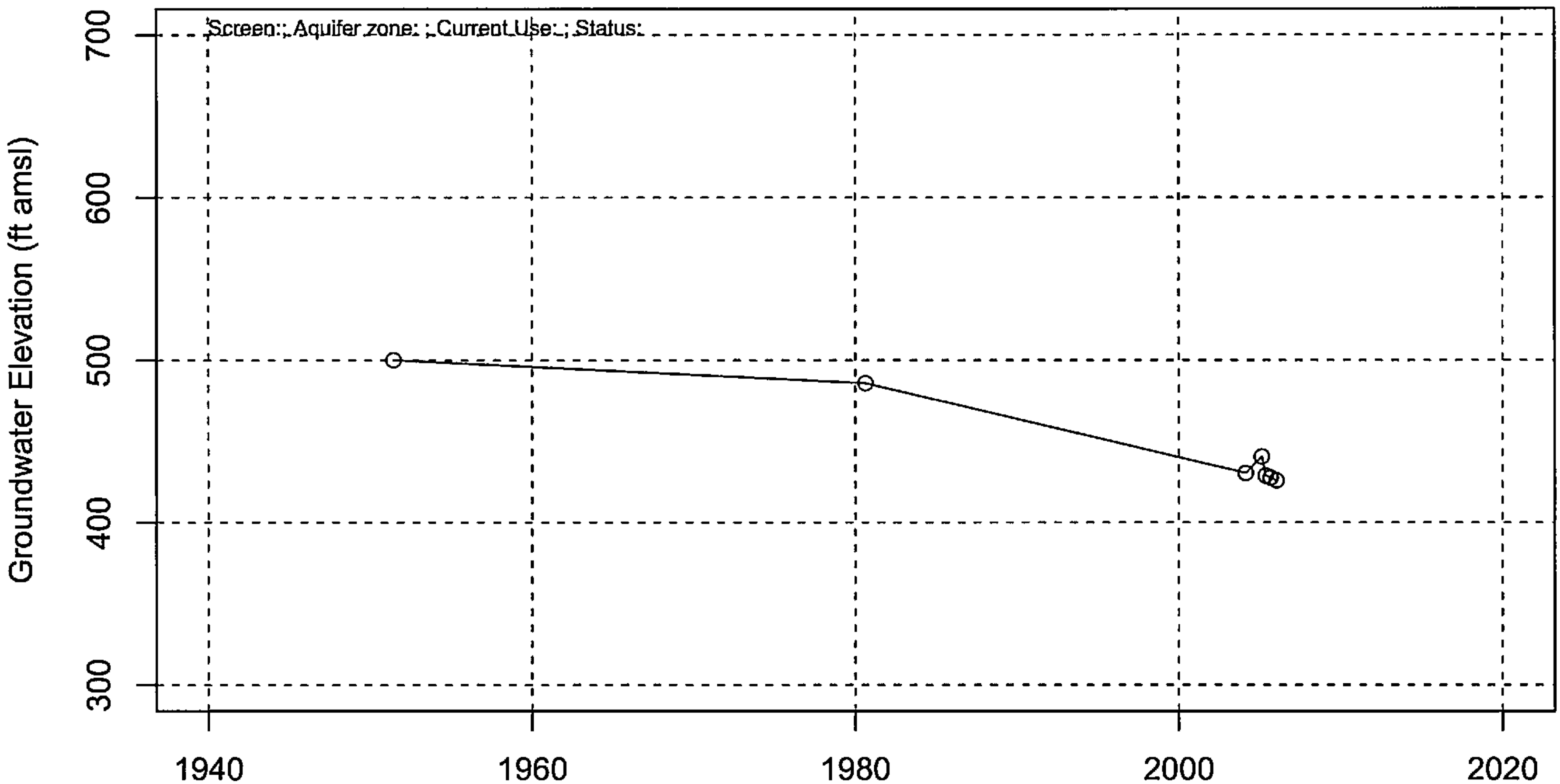
Local ID: Fortiner #1 (Allegre 1) ; Number of Measuring Agenc(y/ies): 3

January 2020



January 2020

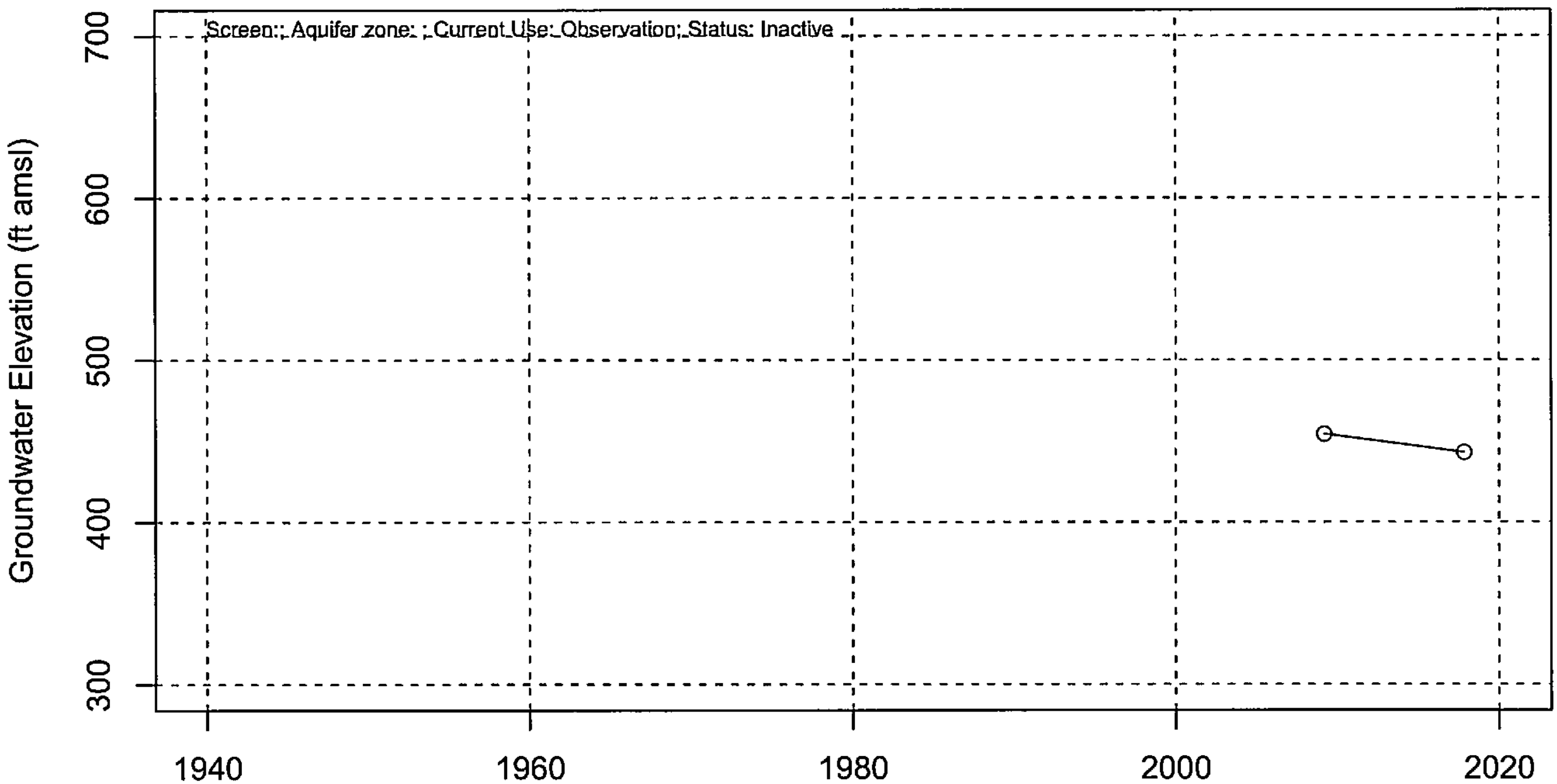
010S006E10M001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 2

January 2020

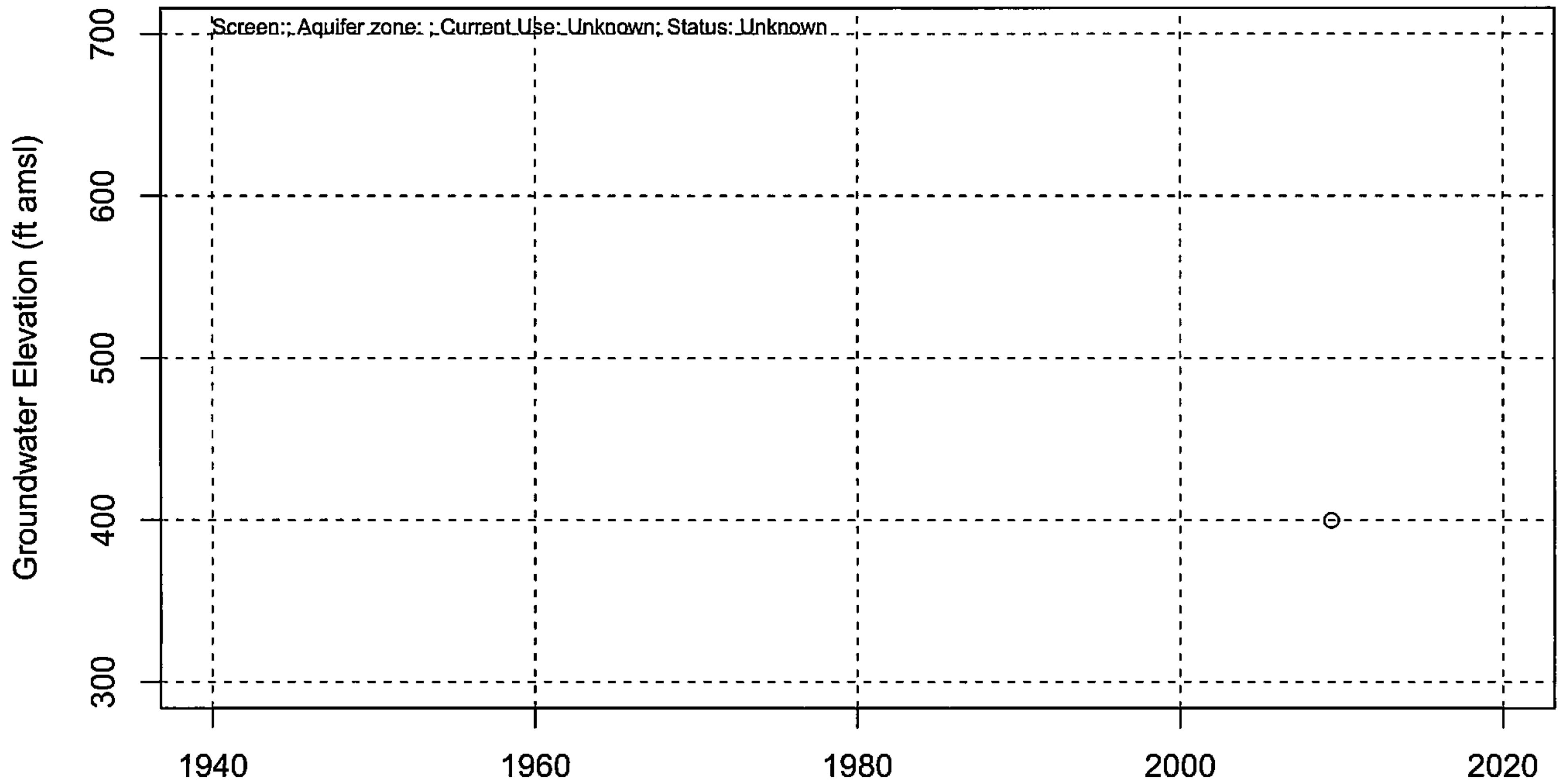
010S006E14G001S



Local ID: Hanna (Flowers) ; Number of Measuring Agenc(y/ies): 2

January 2020

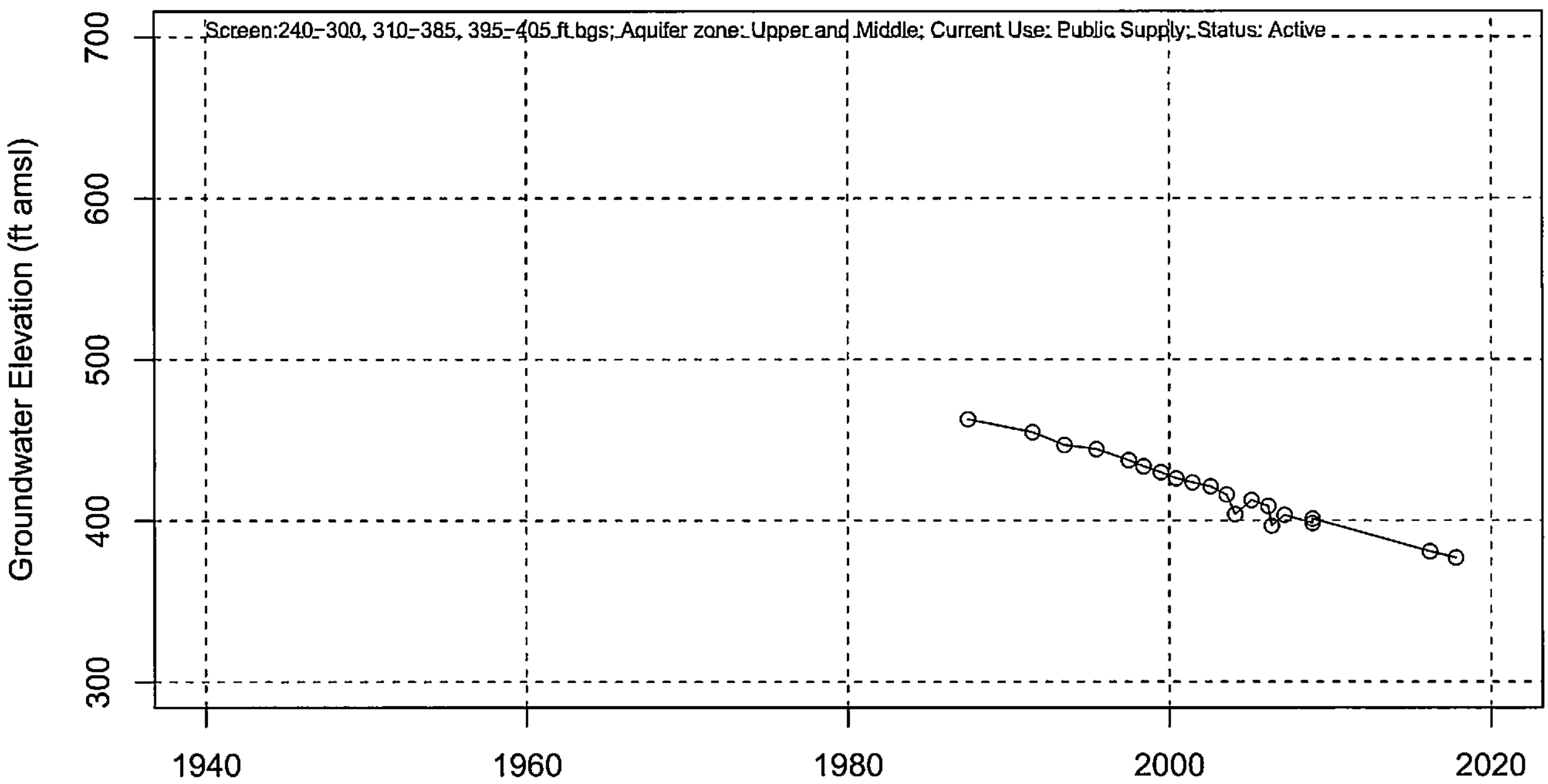
010S006E17J001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 1

January 2020

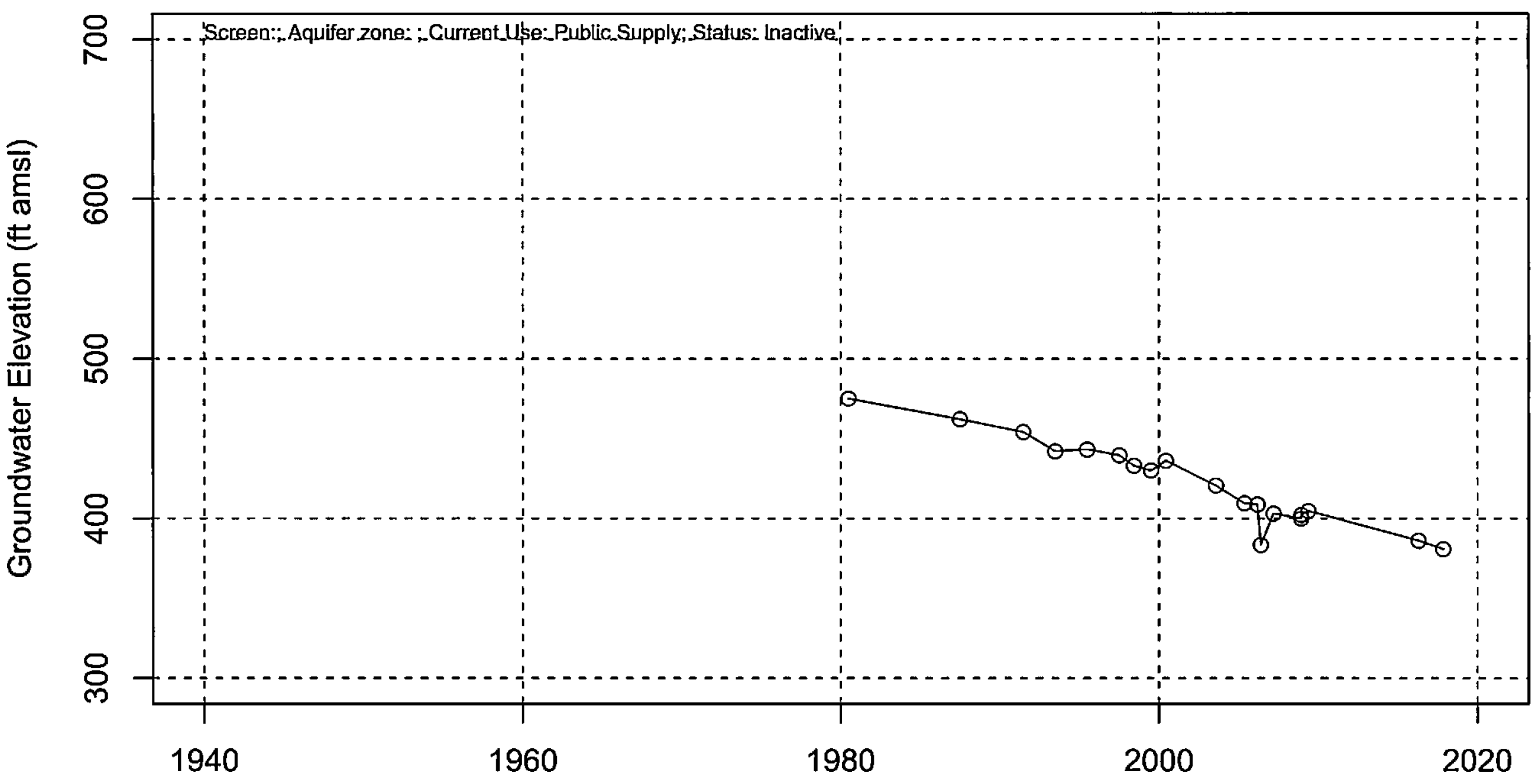
010S006E18J001S



Local ID: ID4−18 ; Number of Measuring Agenc(y/ies): 4

January 2020

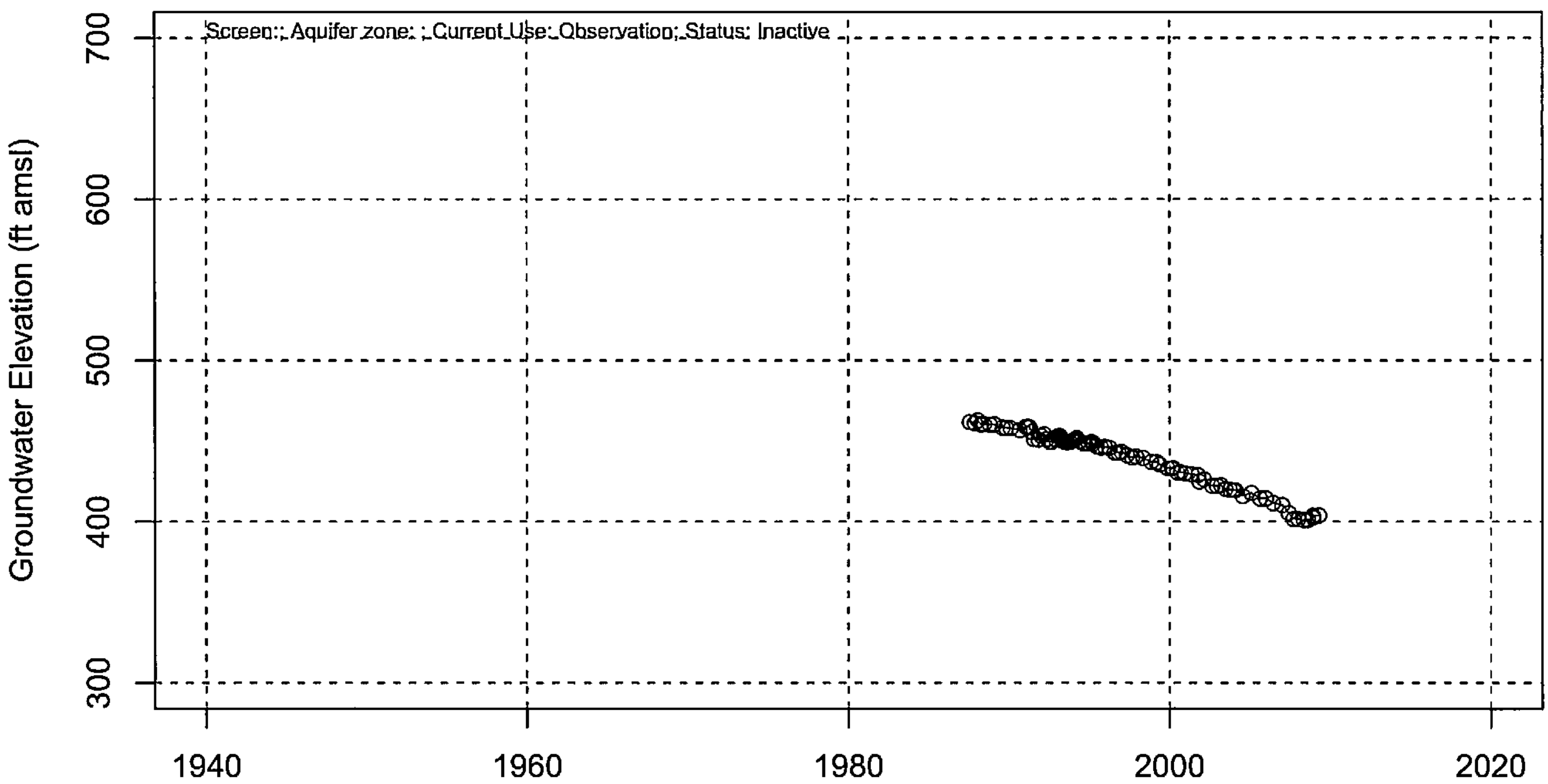
010S006E18R001S



Local ID: ID4−3 ; Number of Measuring Agenc(y/ies): 5

January 2020

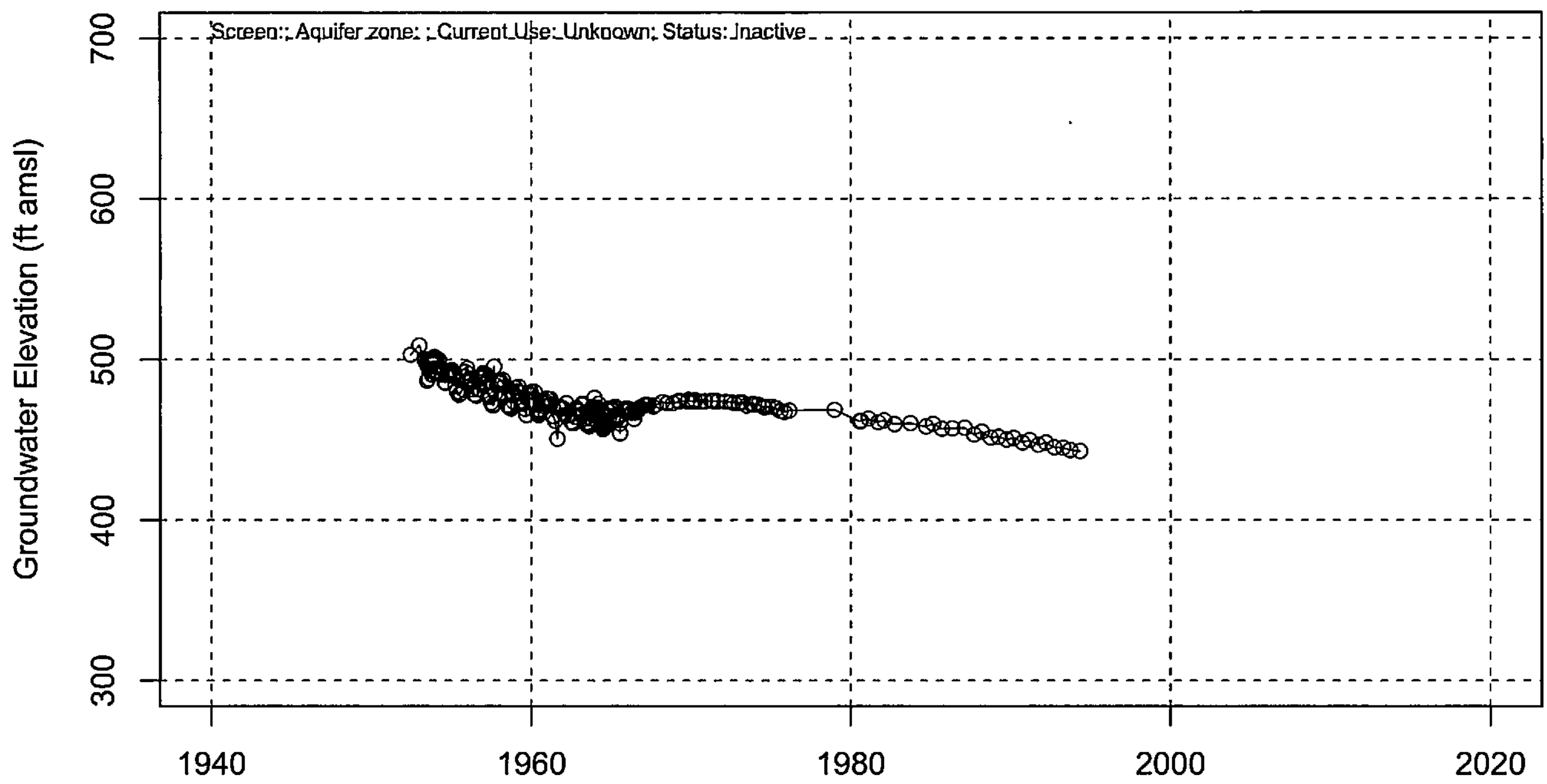
010S006E20L001S



Local ID: Empty Irrigation ; Number of Measuring Agenc(y/ies): 3

January 2020

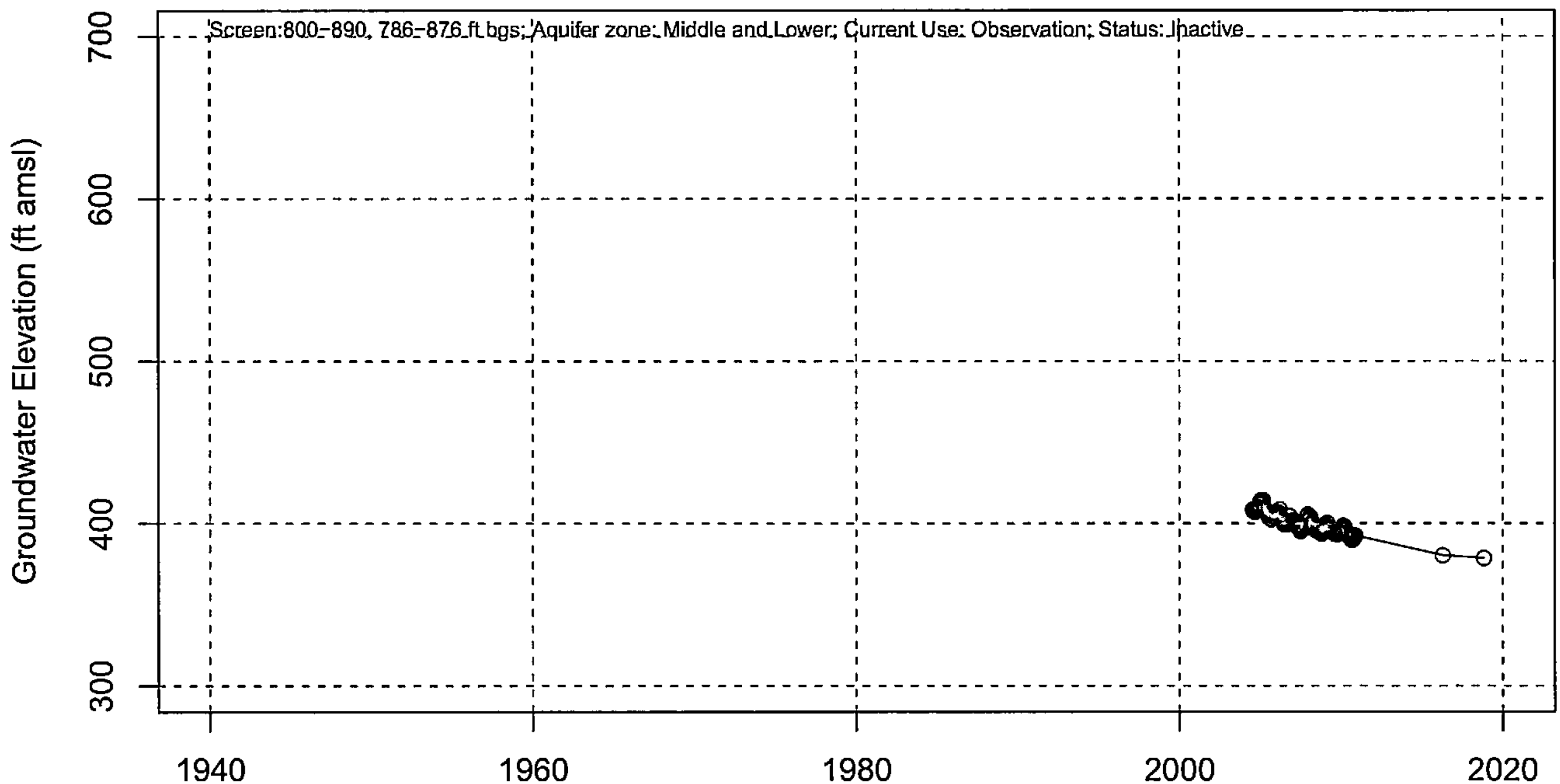
010S006E21A001S



Local ID: 21A1 ; Number of Measuring Agenc(y/ies): 2

January 2020

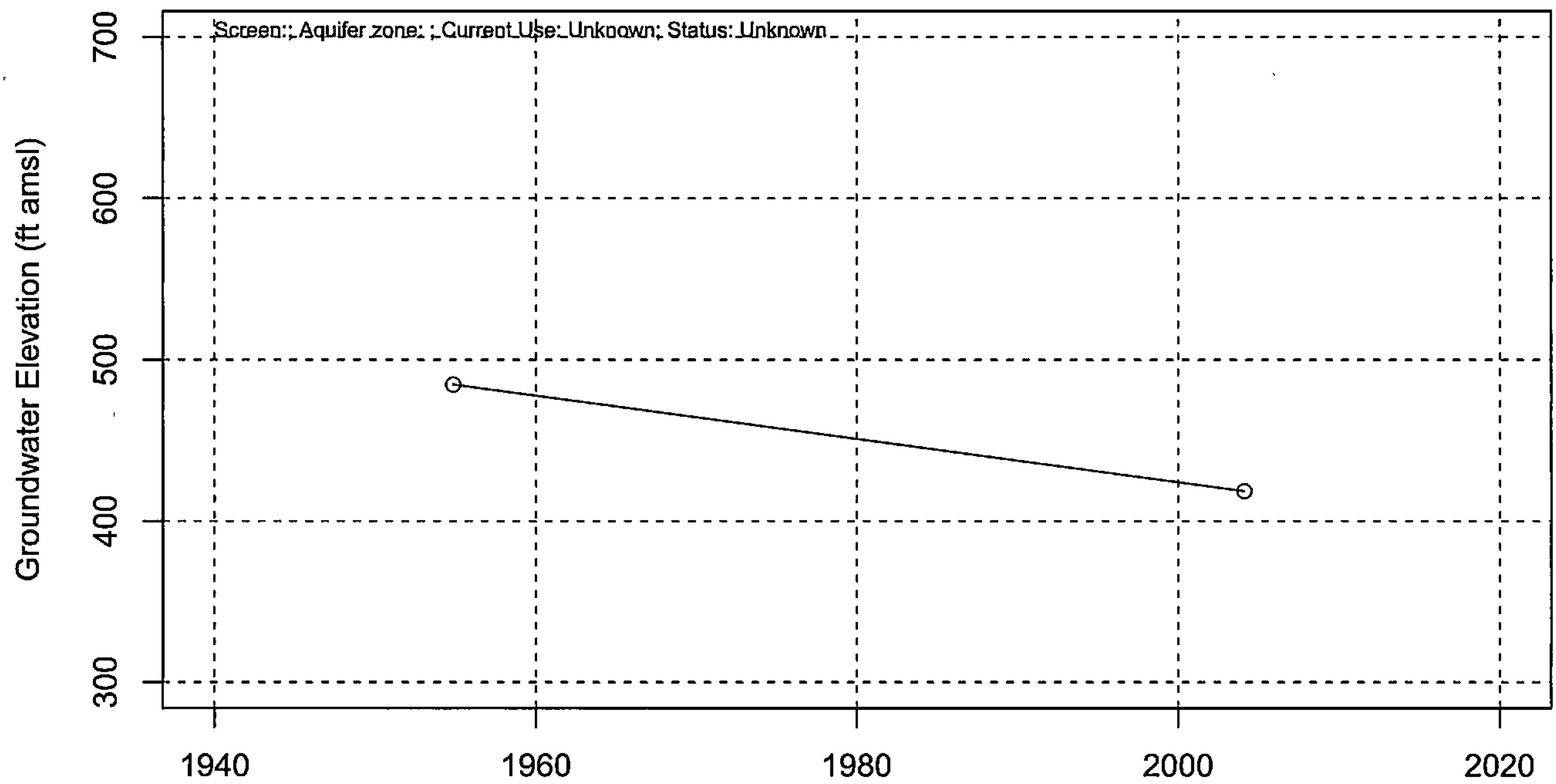
010S006E21A002S



Local ID: MW-1 ; Number of Measuring Agenc(y/ies): 5

January 2020

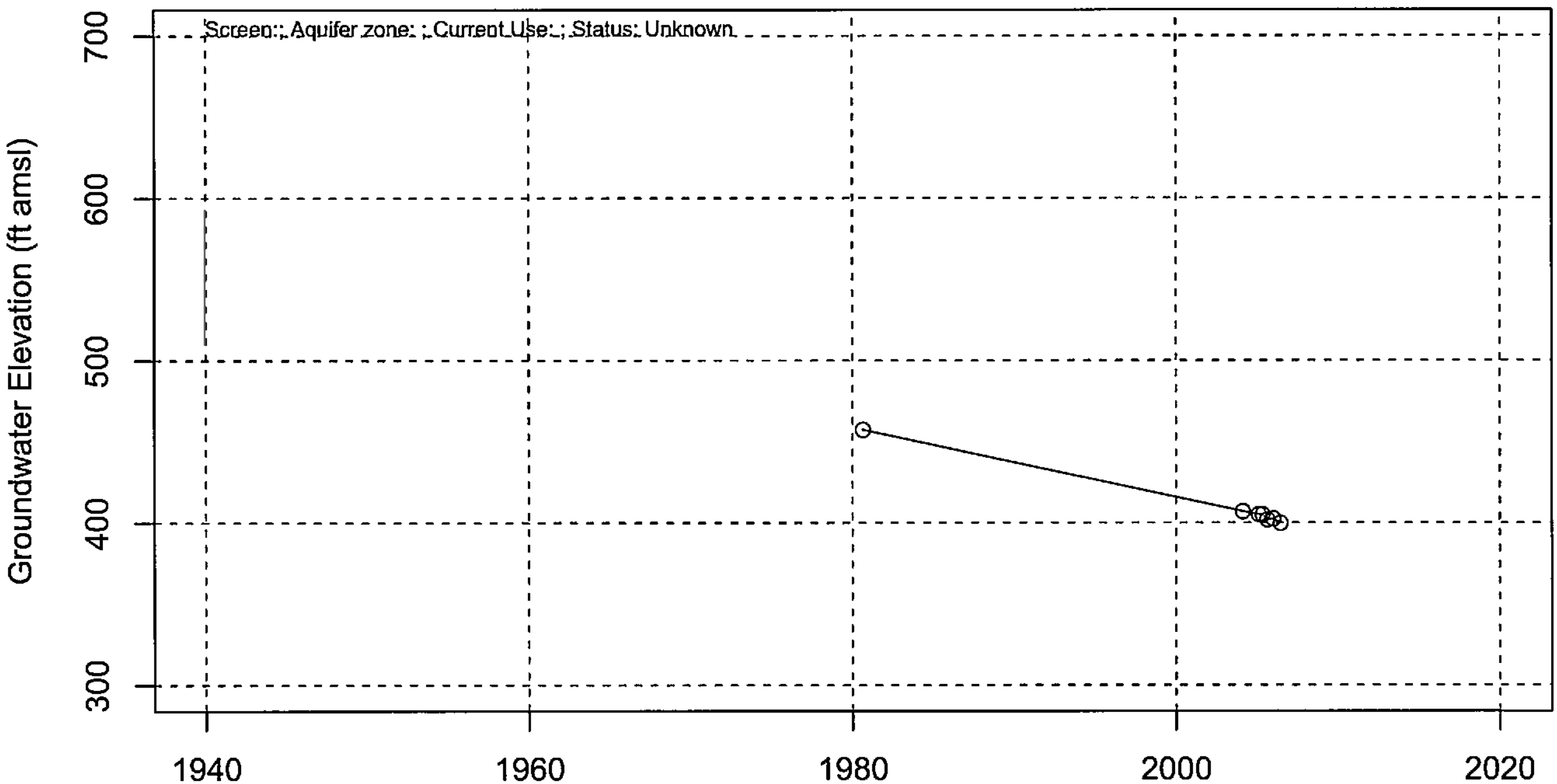
010S006E21B001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 2

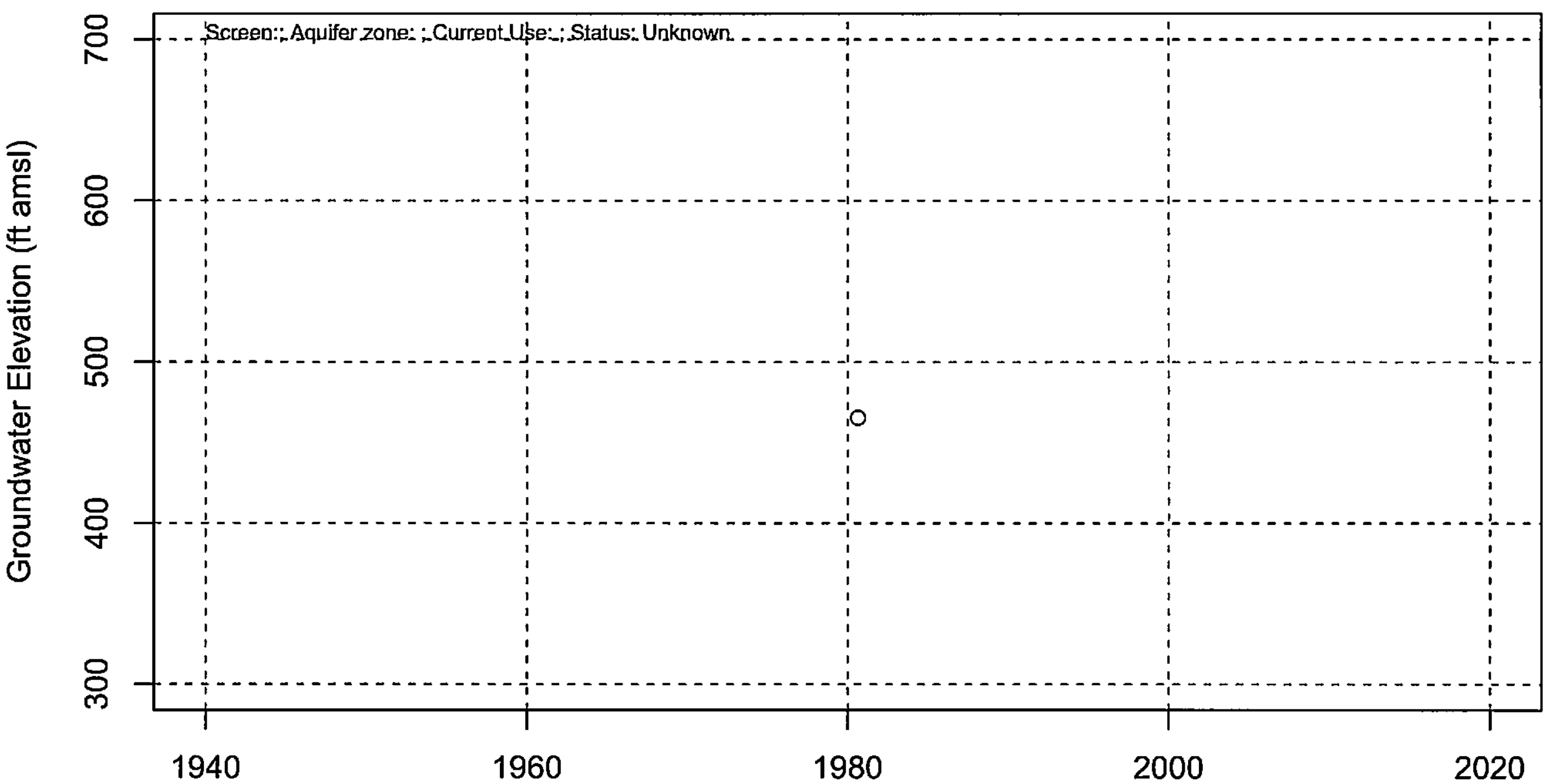
January 2020

010S006E21B002S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 2

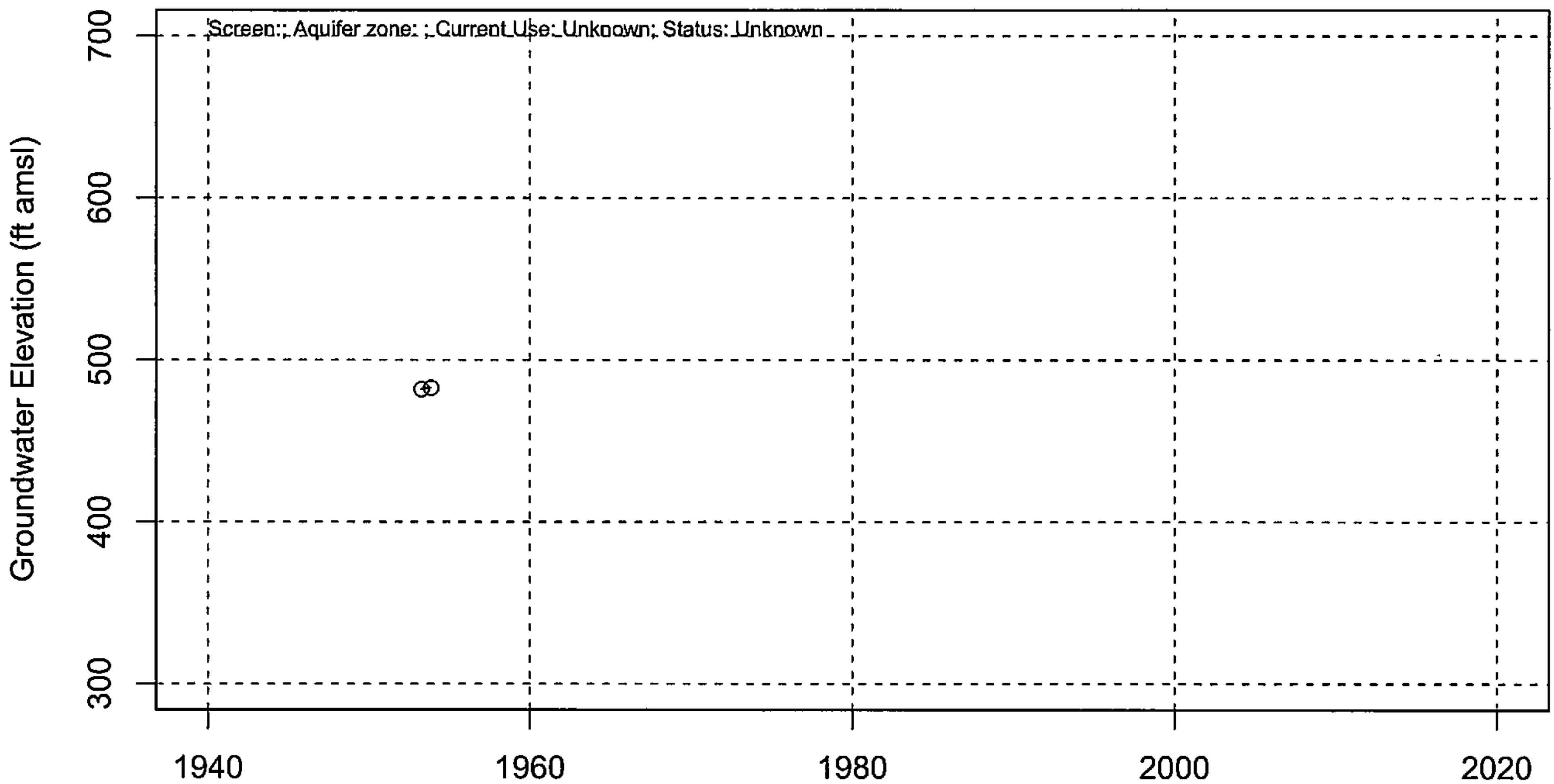
010S006E21F001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 1

January 2020

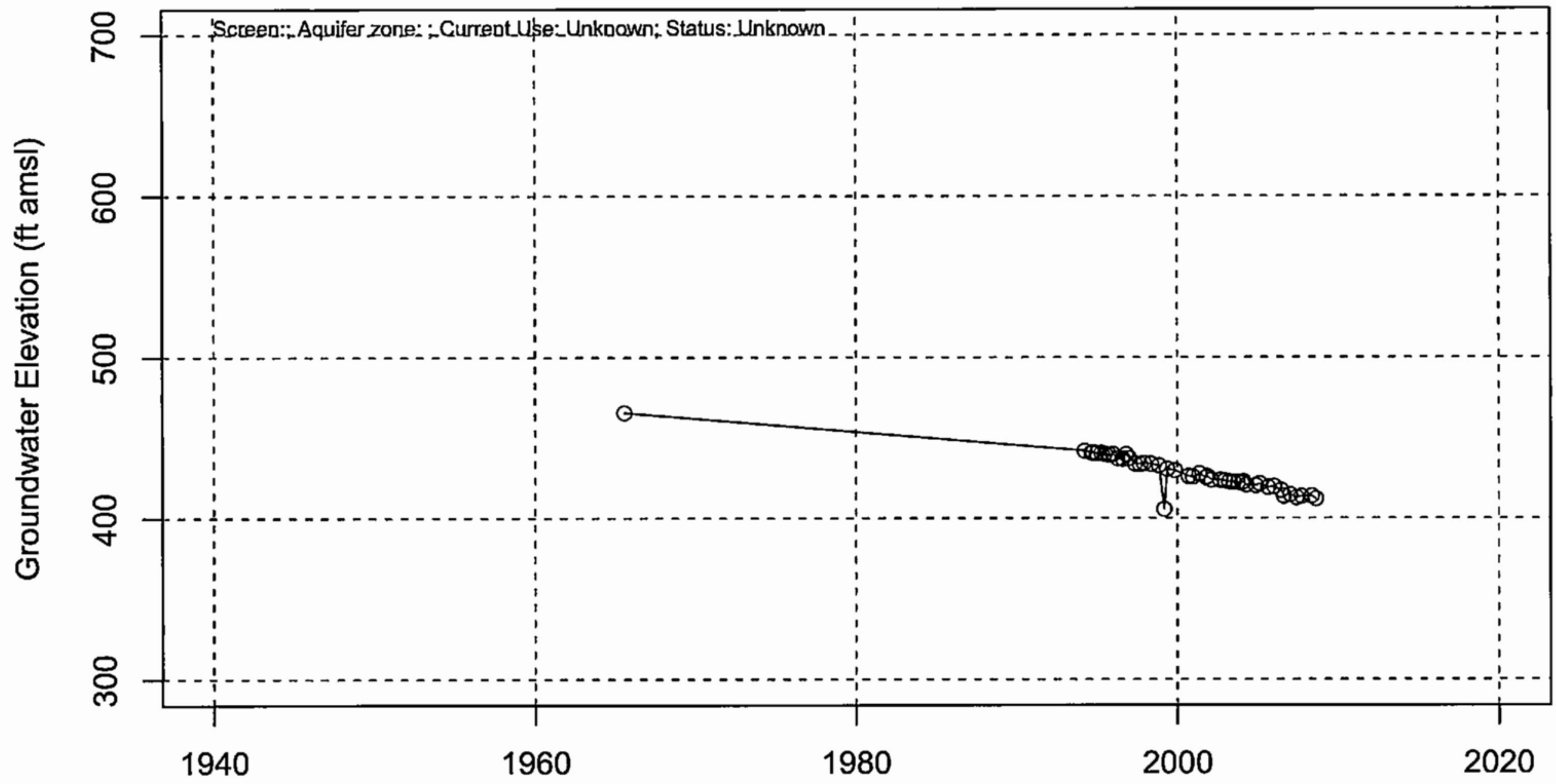
010S006E22A001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 1

January 2020

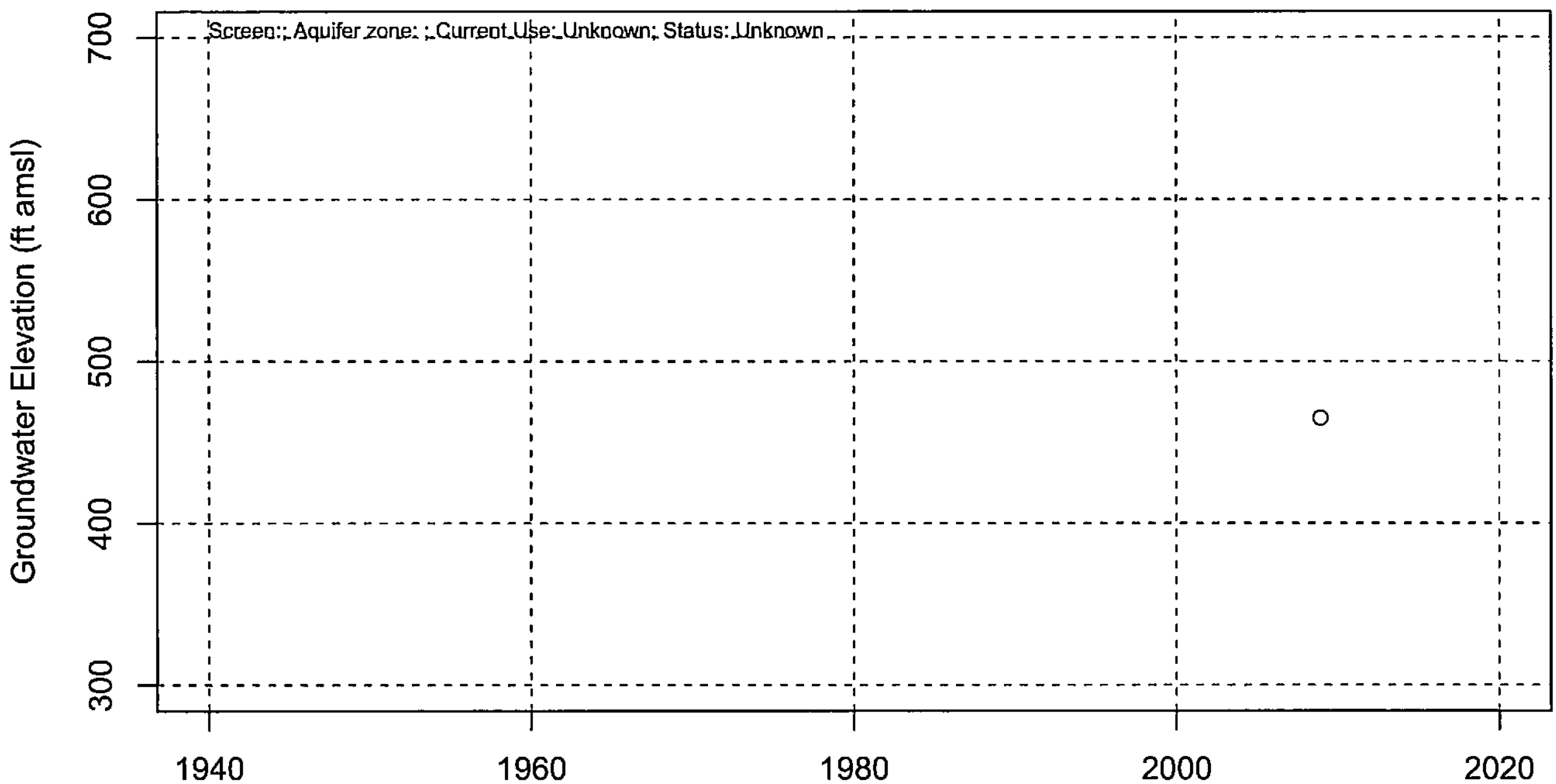
010S006E23M001S



Local ID: Potato Field ; Number of Measuring Agenc(y/ies): 3

January 2020

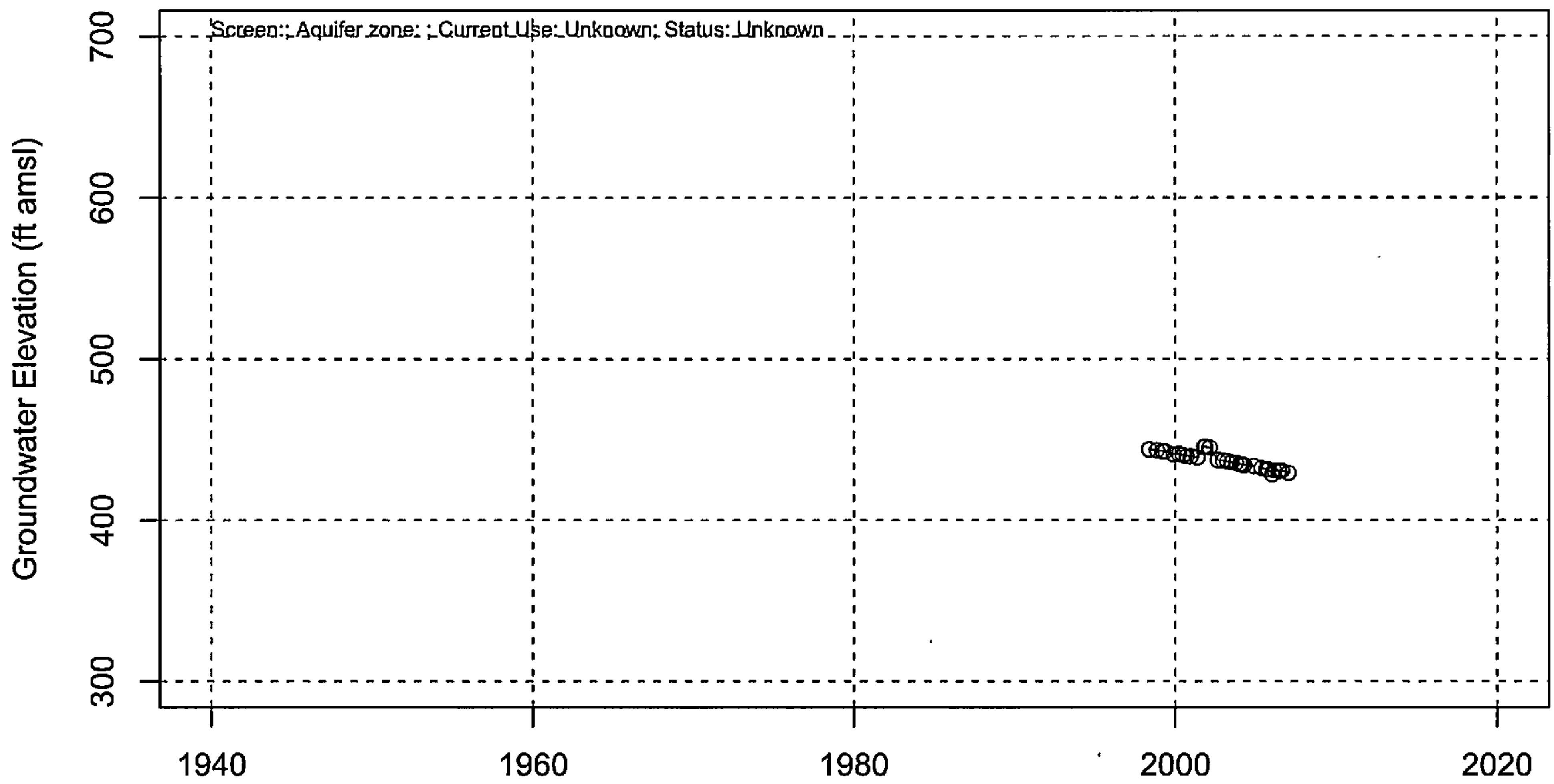
010S006E24K002S



Local ID: Bad Donkey Ranch 2 ; Number of Measuring Agenc(y/ies): 1

January 2020

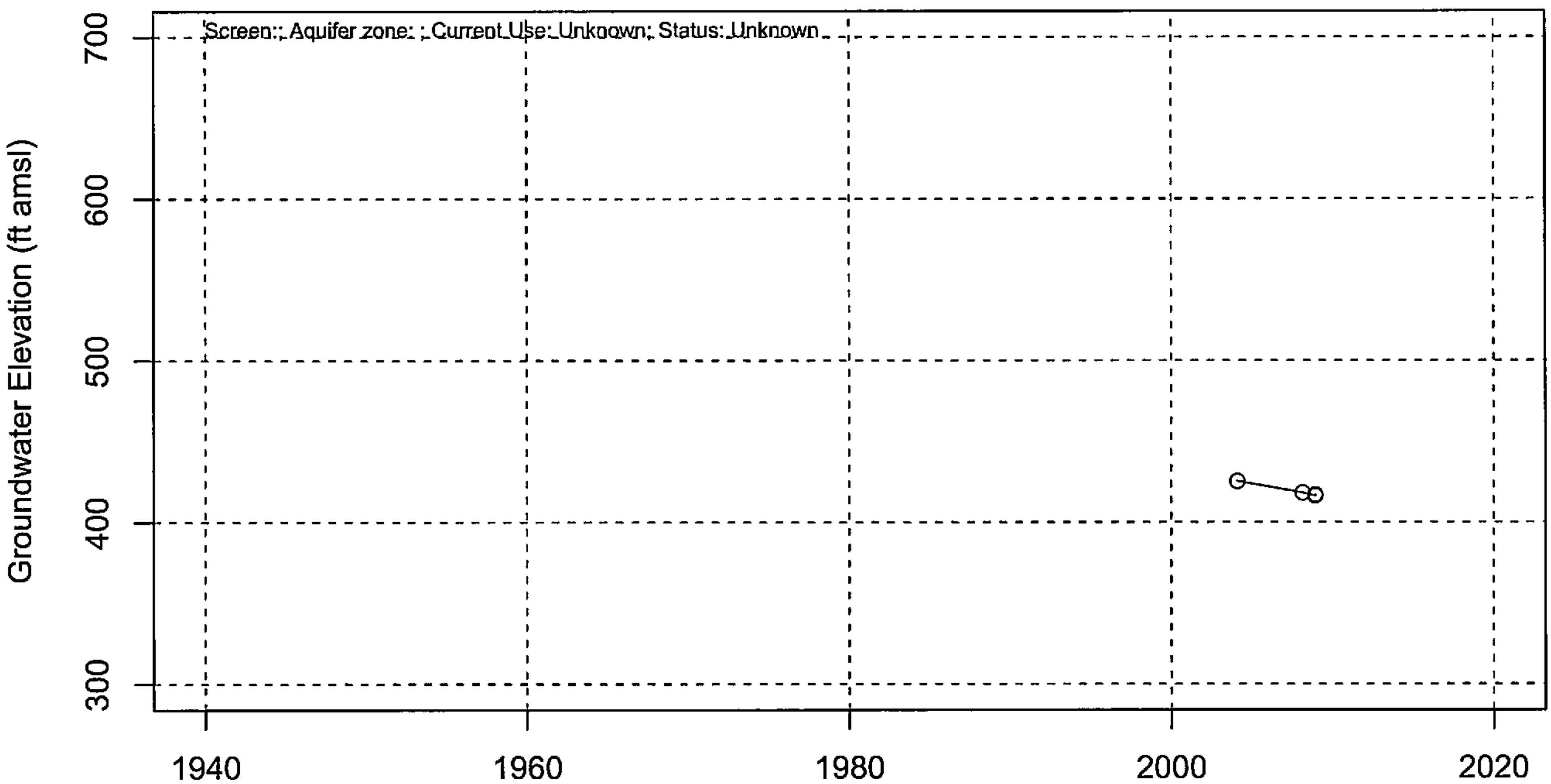
010S006E25R001S



Local ID: Gray Irrigation ; Number of Measuring Agenc(y/ies): 3

January 2020

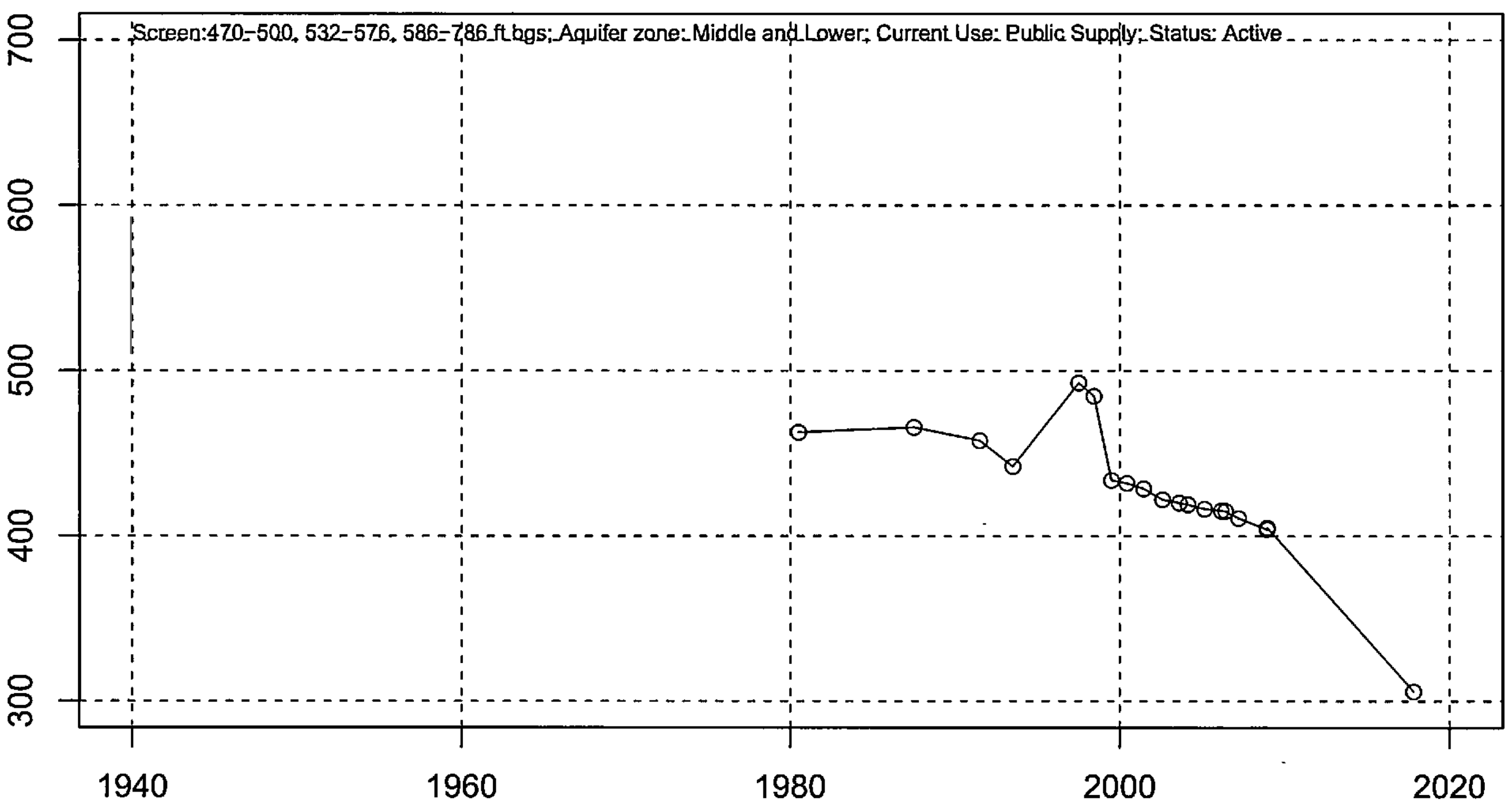
010S006E28Q001S



Local ID: Reiners ; Number of Measuring Agenc(y/ies): 2

January 2020

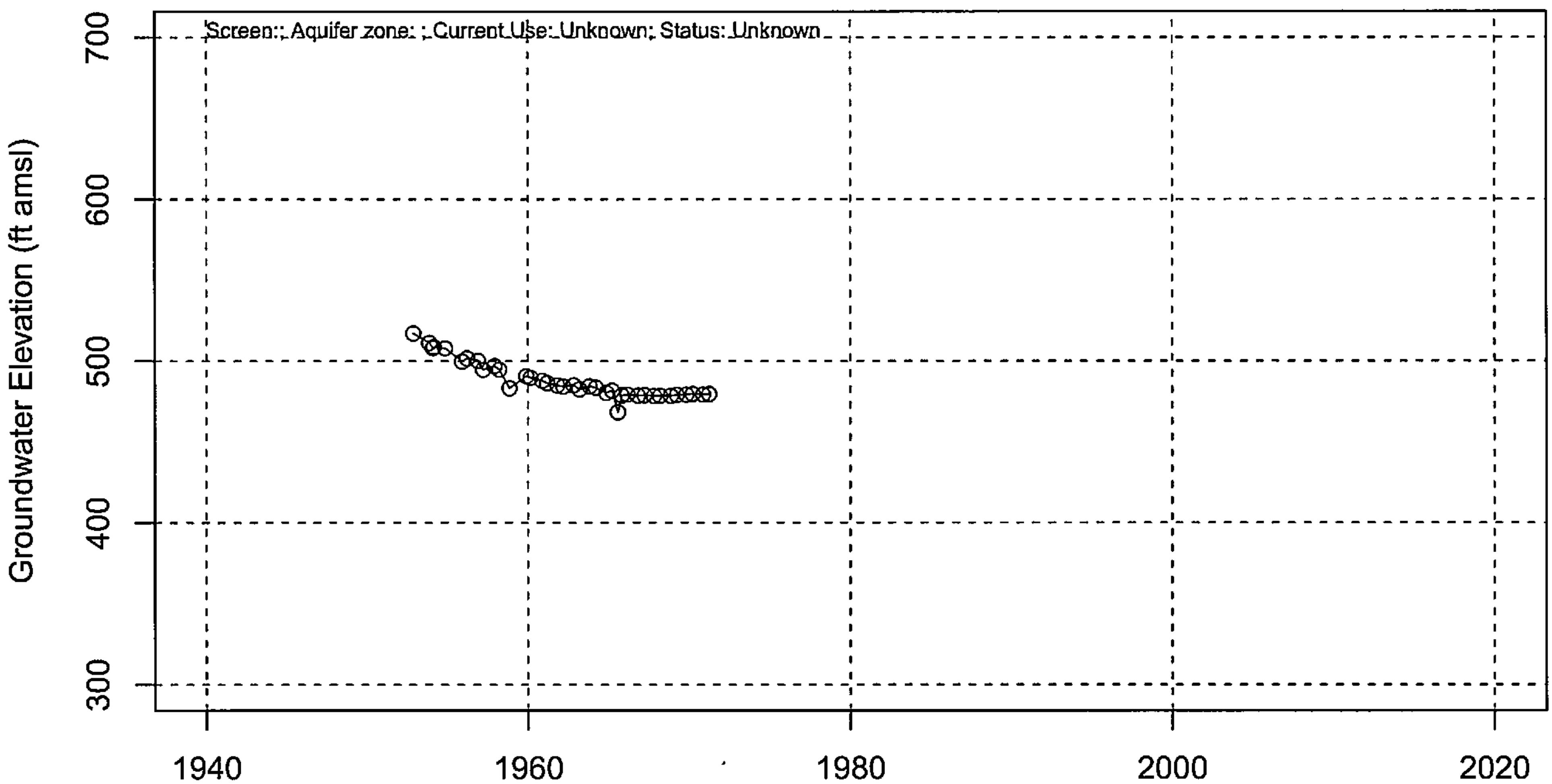
010S006E29K002S



Local ID: ID4−4 ; Number of Measuring Agenc(y/ies): 3

January 2020

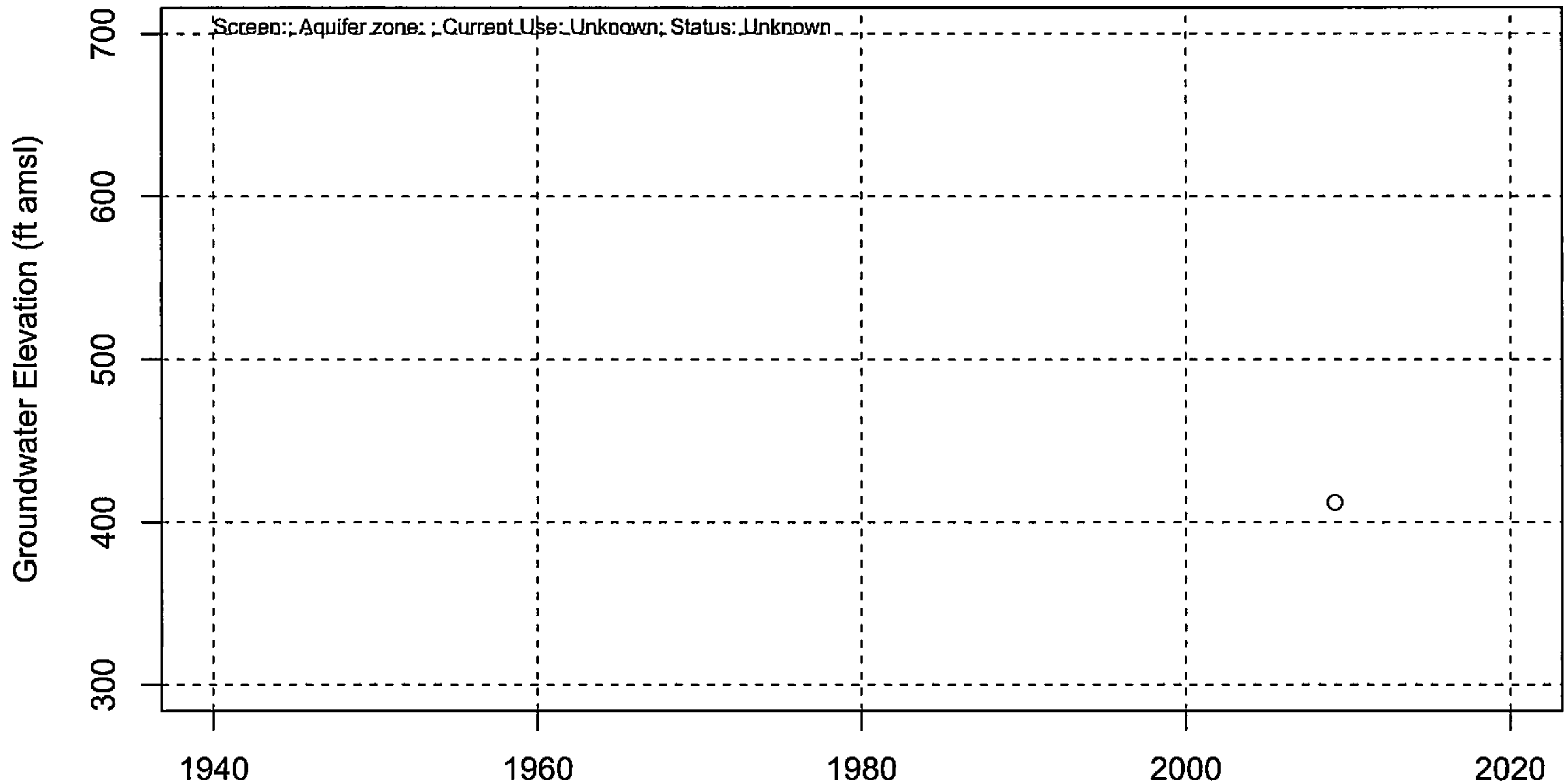
010S006E29N001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 1

January 2020

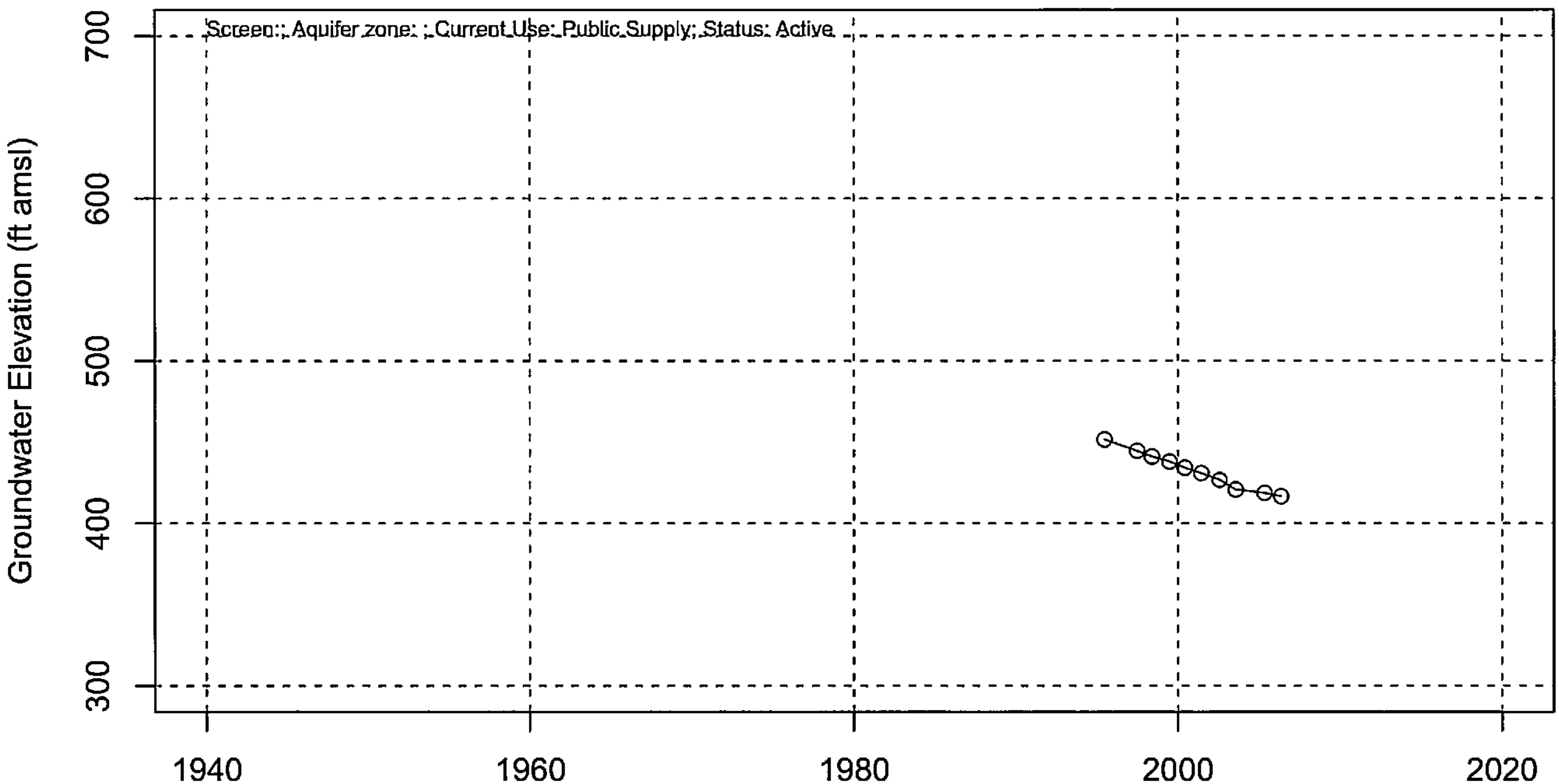
010S006E29N002S



Local ID: Pecoff 2 ; Number of Measuring Agenc(y/ies): 1

January 2020

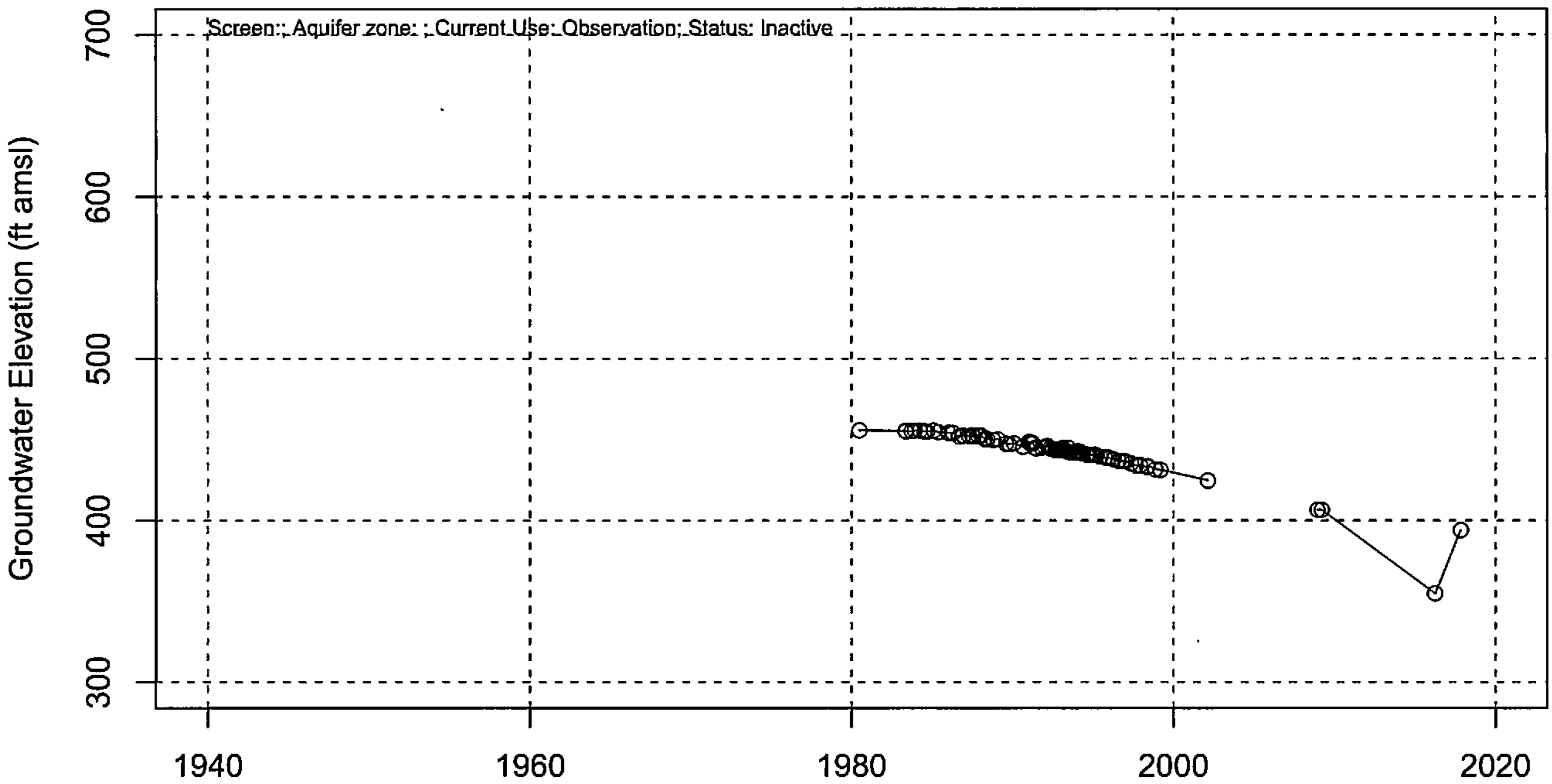
010S006E32D001S



Local ID: ID4−11 ; Number of Measuring Agenc(y/ies): 2

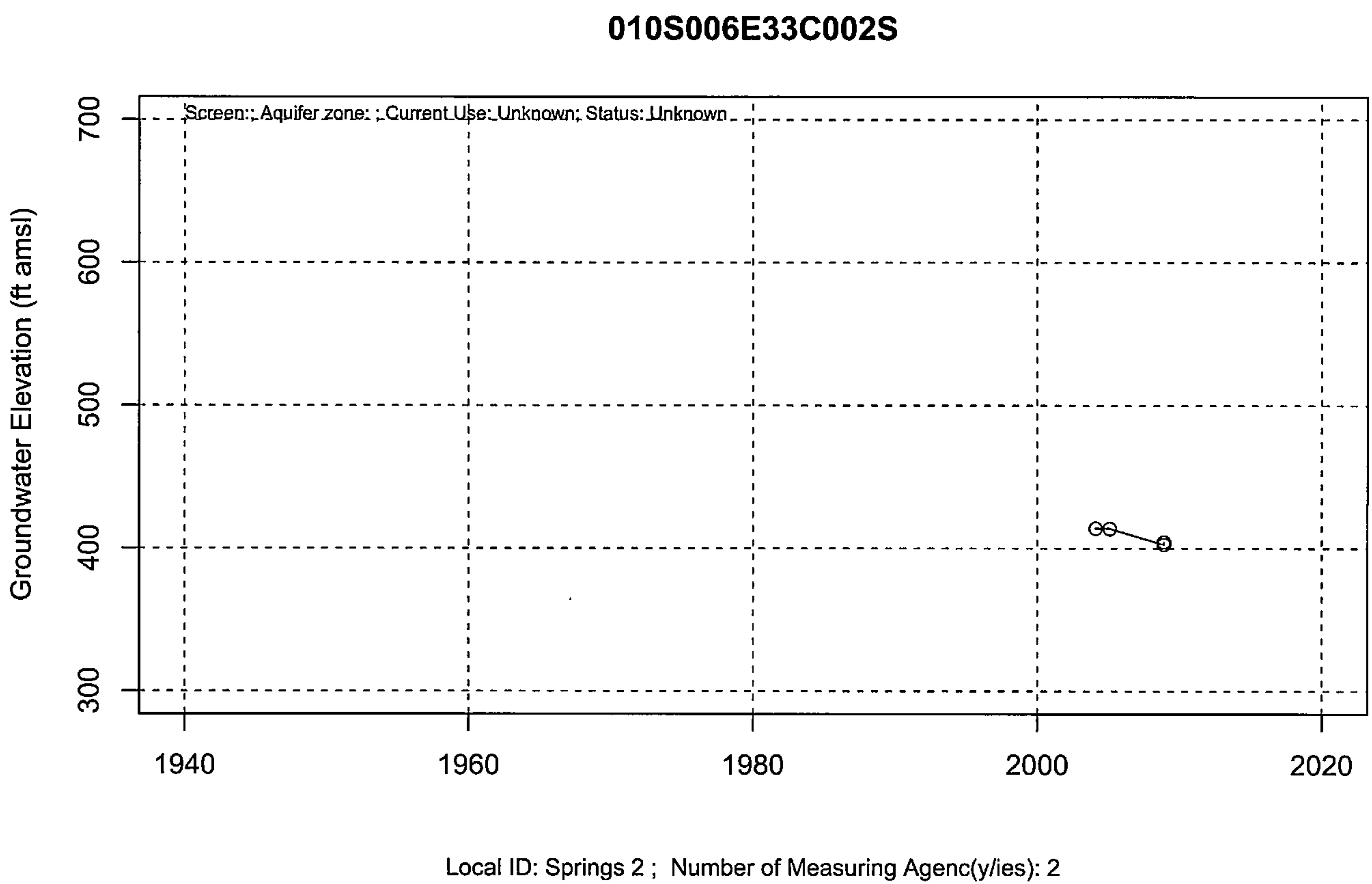
January 2020

010S006E32R001S



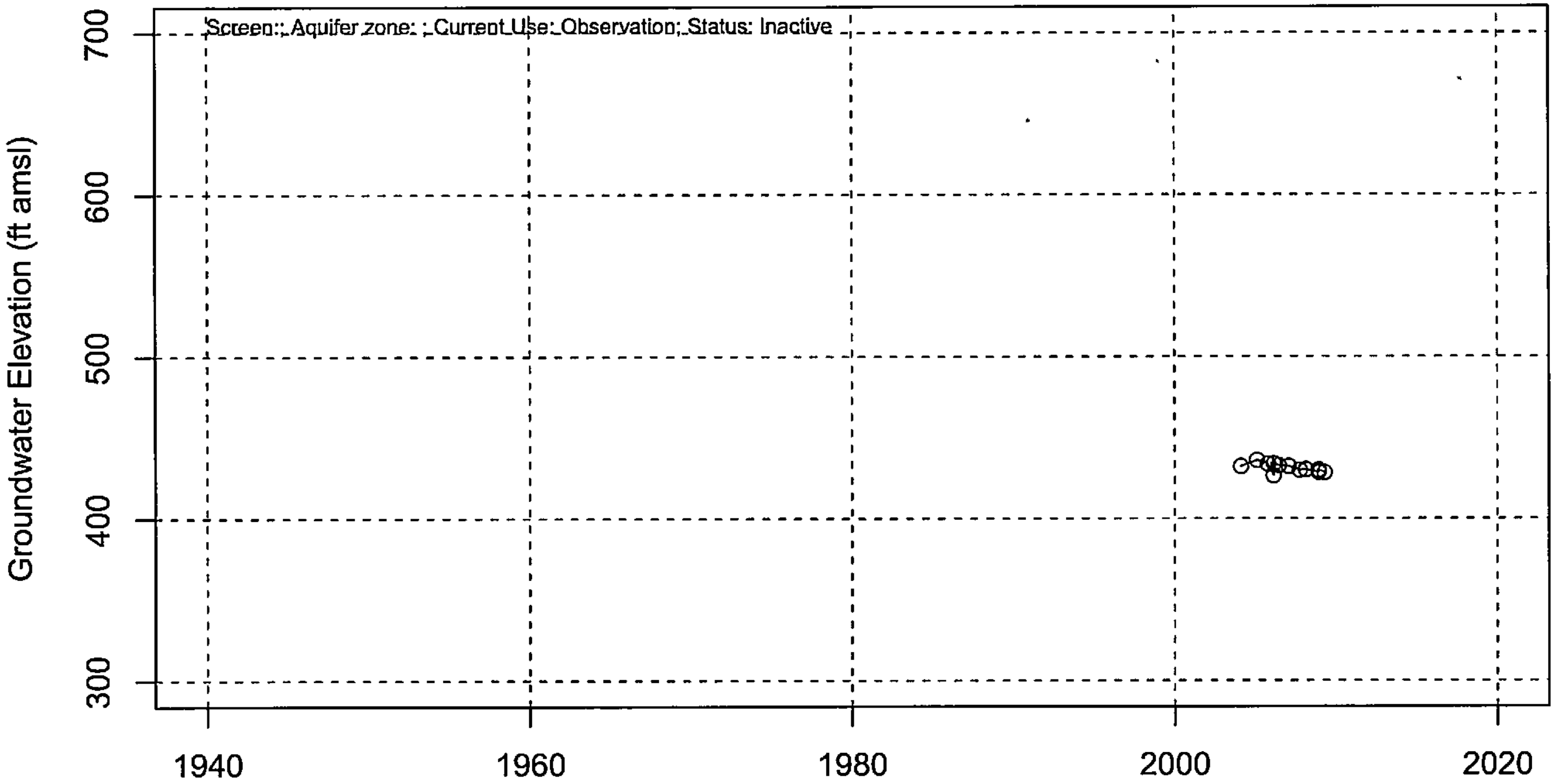
Local ID: ID4−1 ; Number of Measuring Agenc(y/ies): 5

January 2020



January 2020

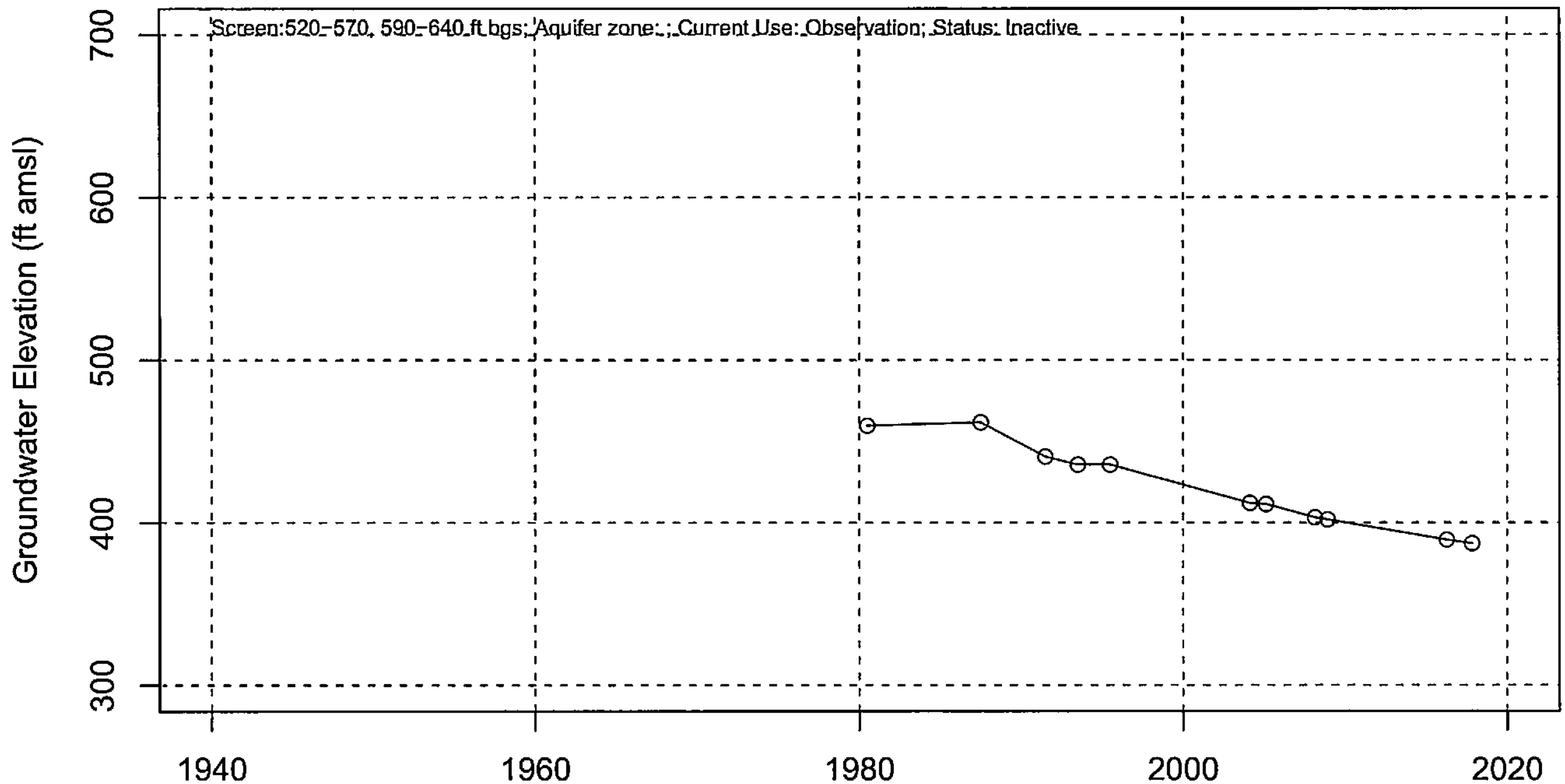
010S006E33J001S



Local ID: Palleson ; Number of Measuring Agenc(y/ies): 3

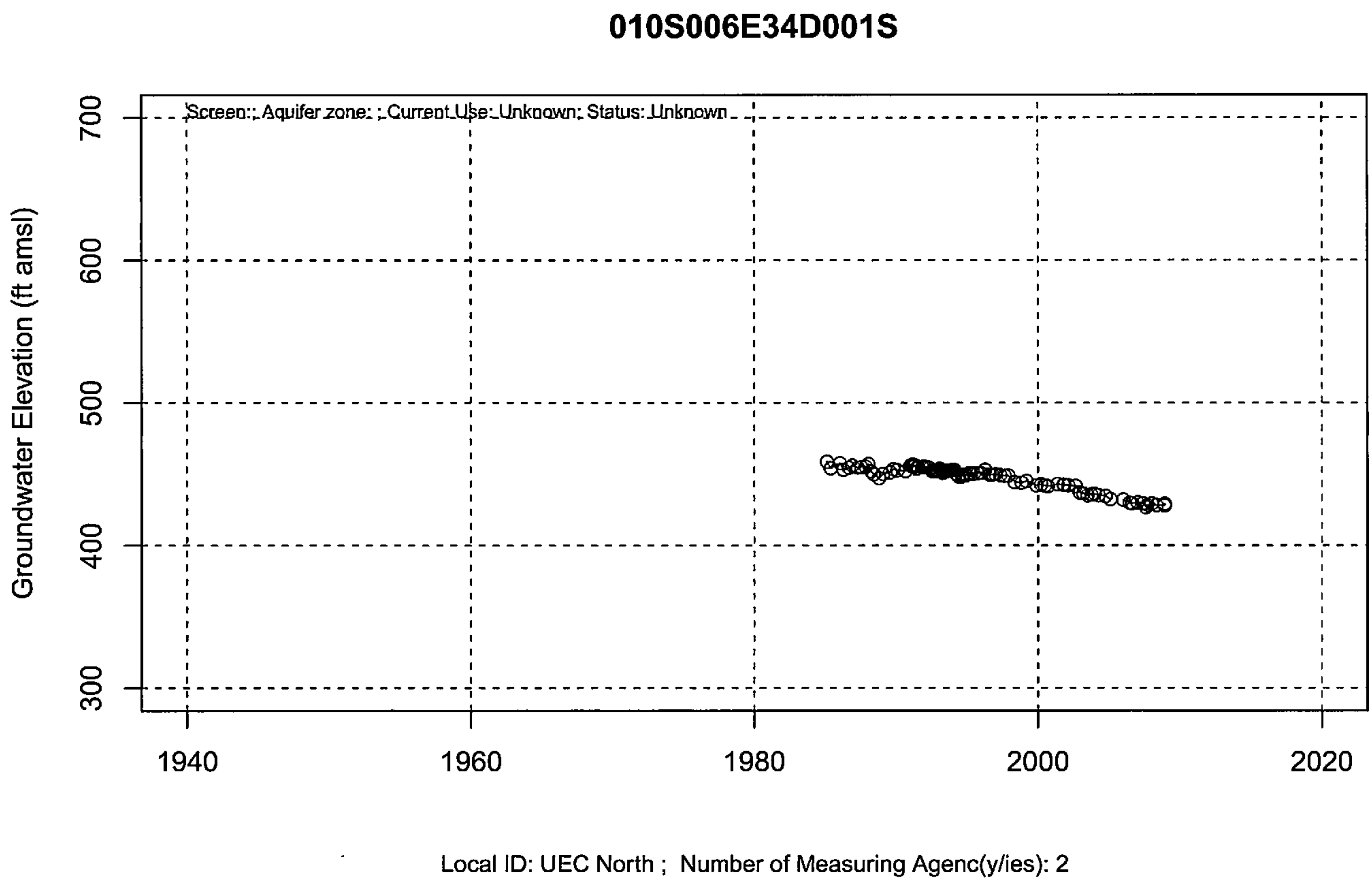
January 2020

010S006E33Q001S

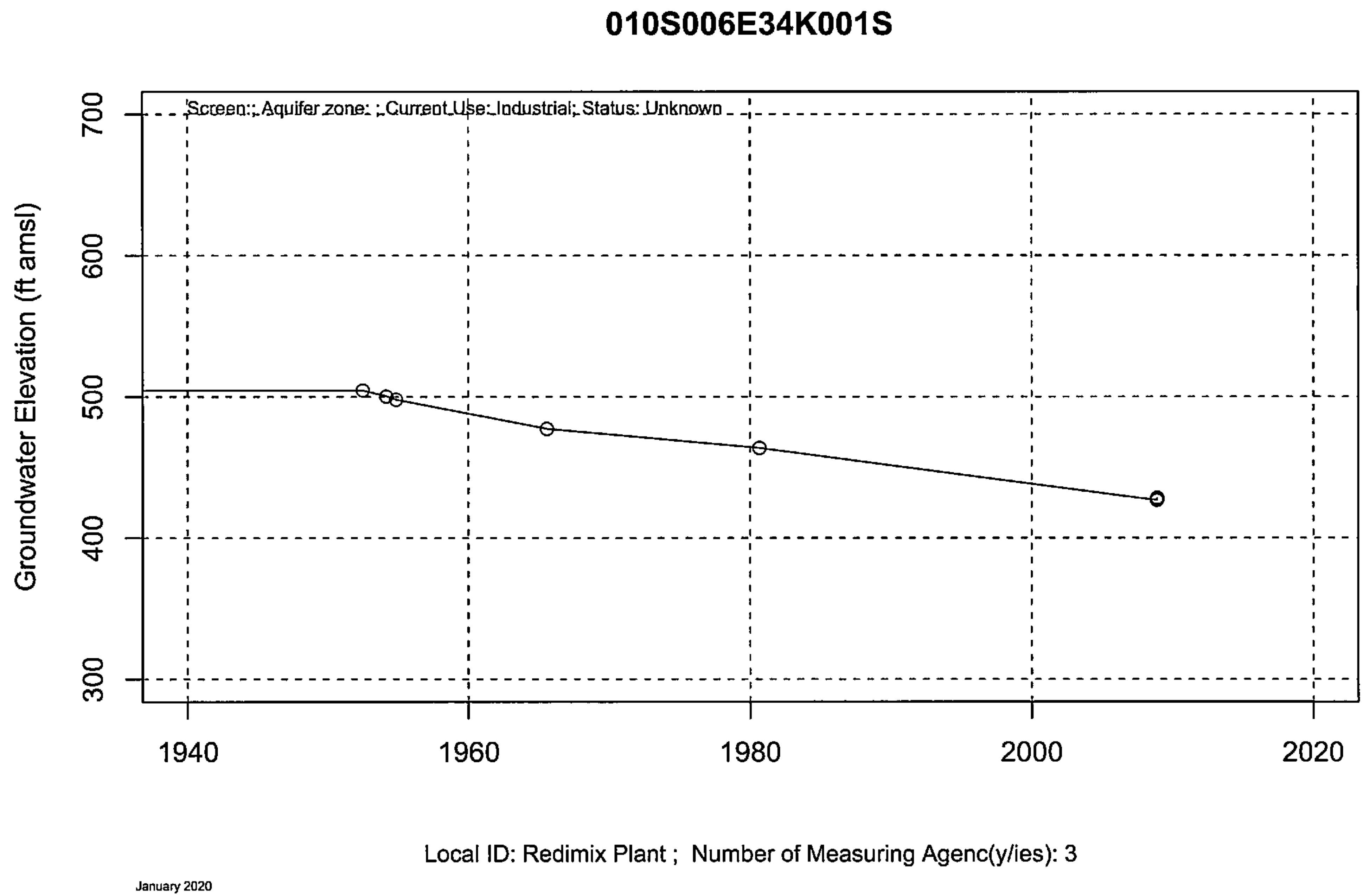


Local ID: ID4–5 ; Number of Measuring Agenc(y/ies): 4

January 2020

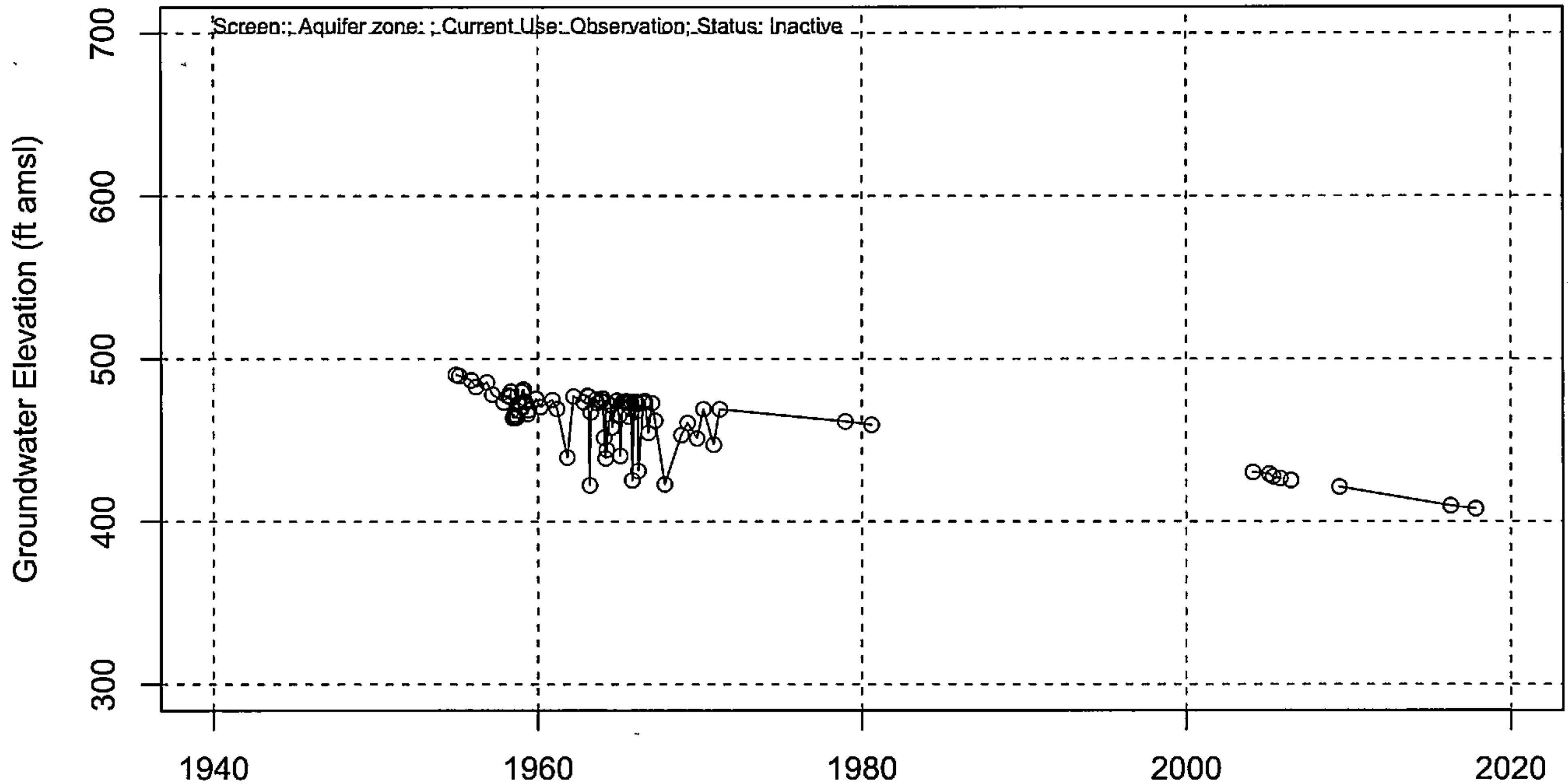


January 2020



010S006E34K001S
Screen: ; Aquifer zone: ; Current Use: Industrial; Status: Unknown
Groundwater Elevation (ft amsl)
700
600
500
400
300
1940
1960
1980
2000
2020
Local ID: Redimix Plant ; Number of Measuring Agenc(y/ies): 3
January 2020

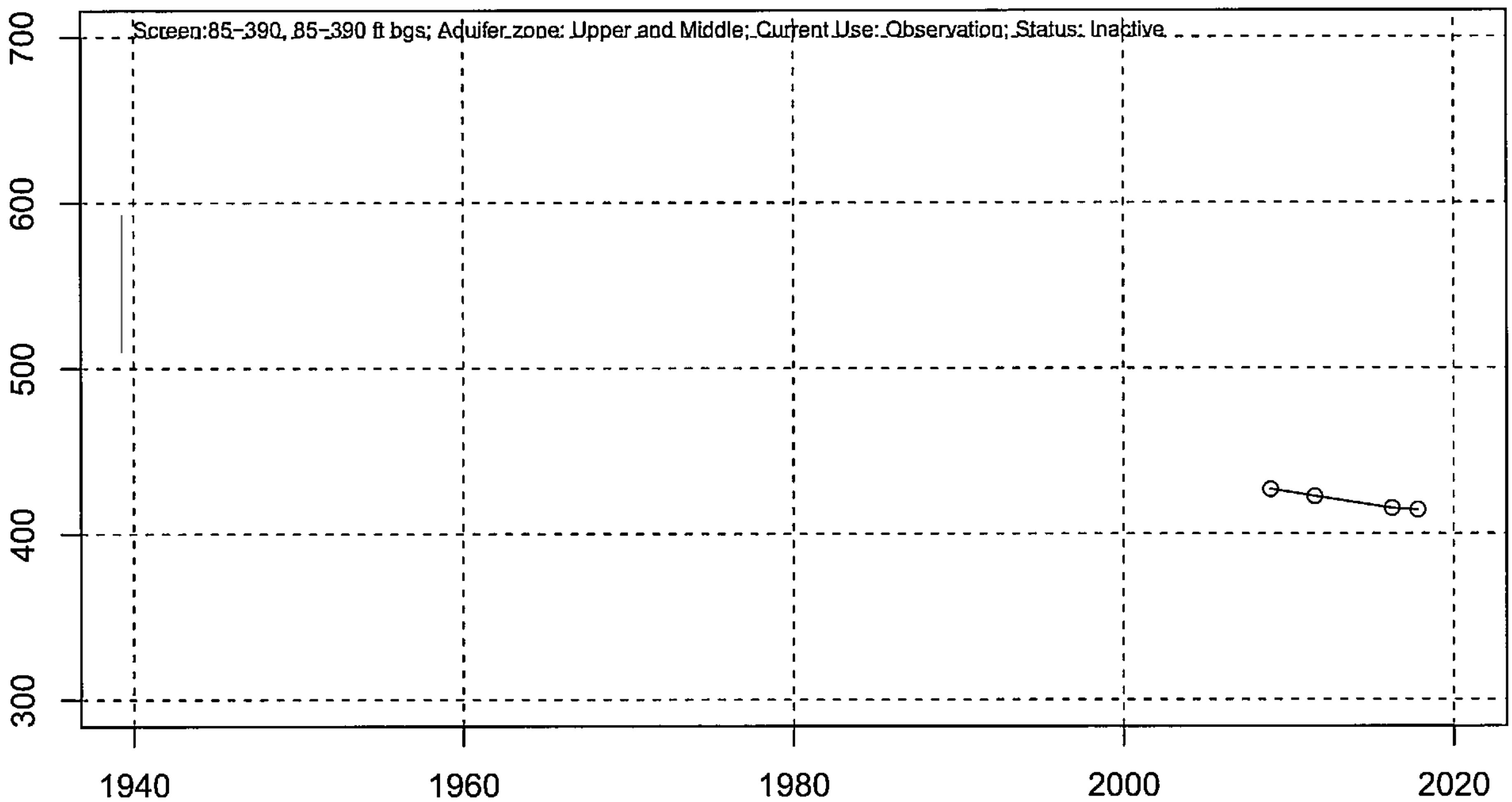
010S006E35N001S



Local ID: Airport 2 ; Number of Measuring Agenc(y/ies): 6

January 2020

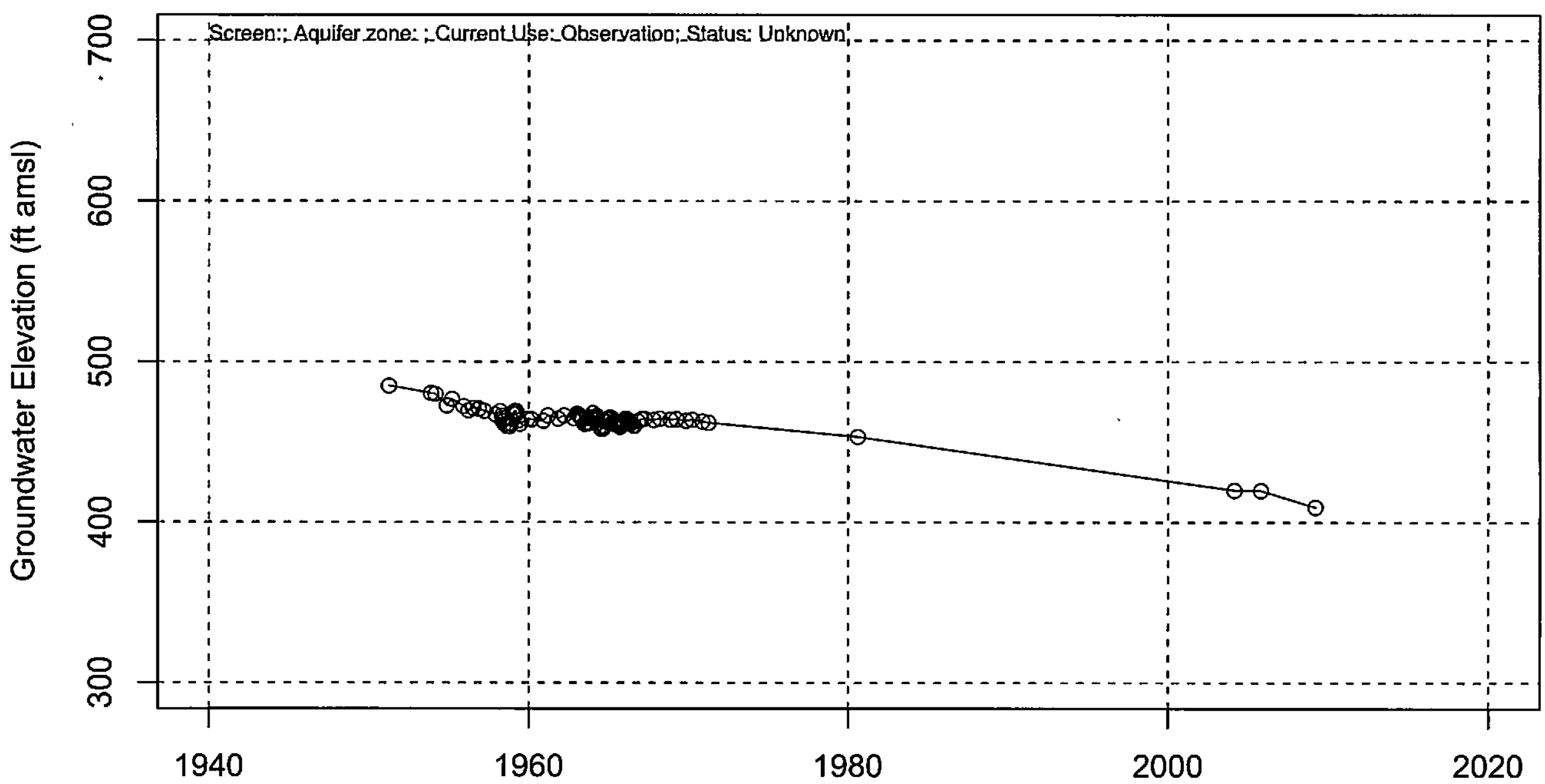
010S006E35Q001S



Local ID: MW–4 ; Number of Measuring Agenc(y/ies): 3

January 2020

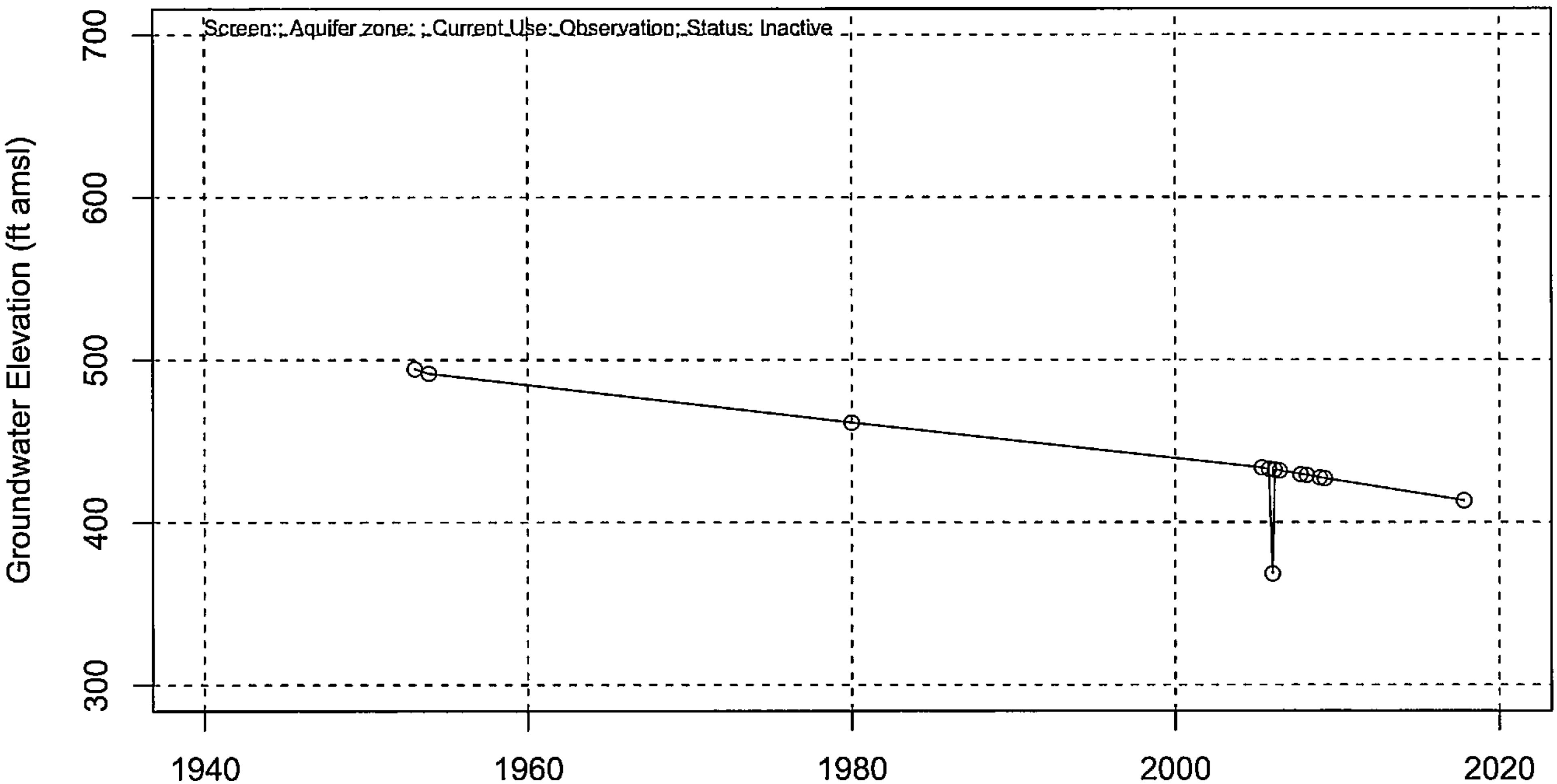
010S006E36Q001S



Local ID: Hawkins ; Number of Measuring Agenc(y/ies): 3

January 2020

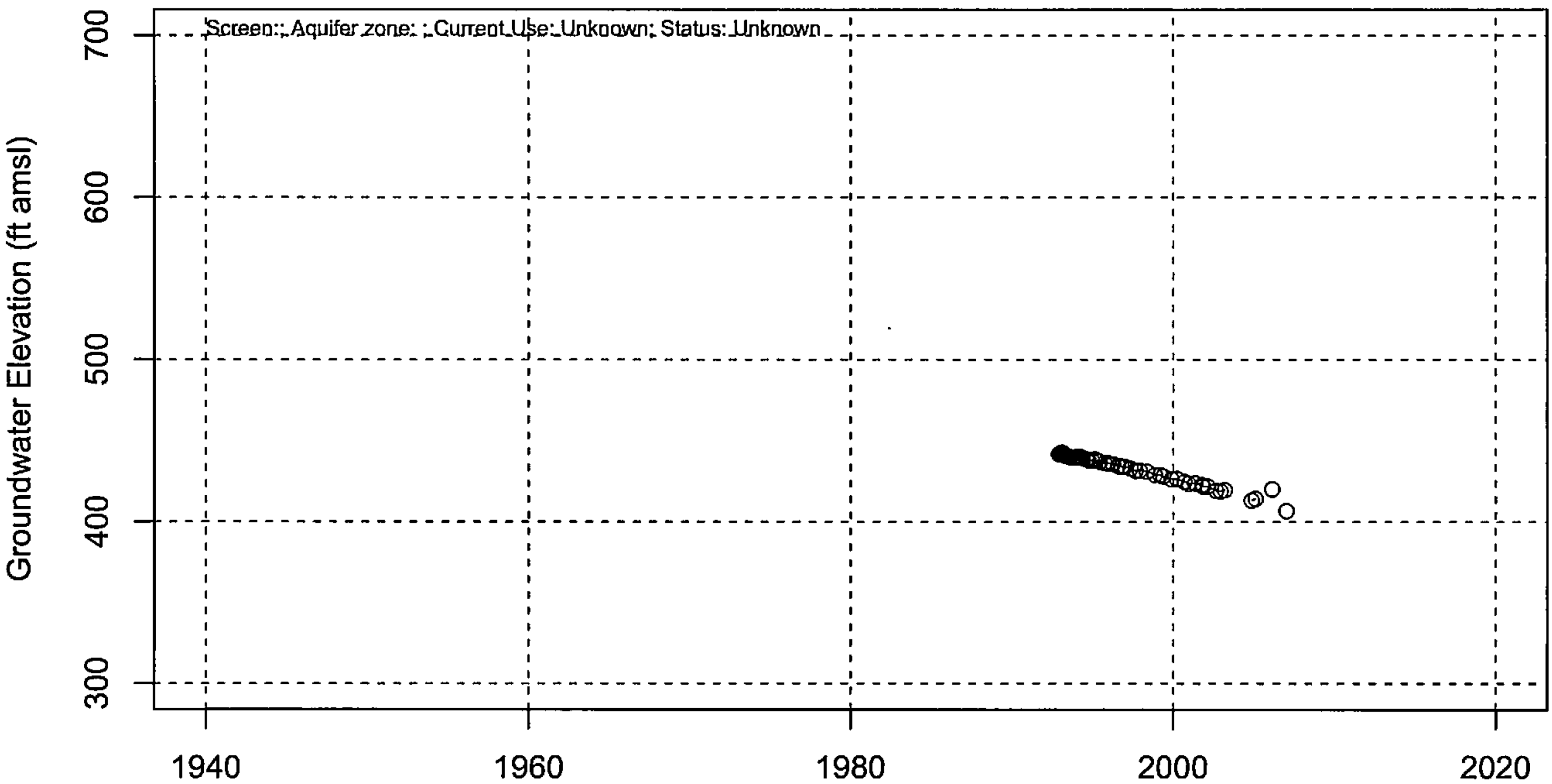
011S006E01C001S



Local ID: Gabrych #2 ; Number of Measuring Agenc(y/ies): 4

January 2020

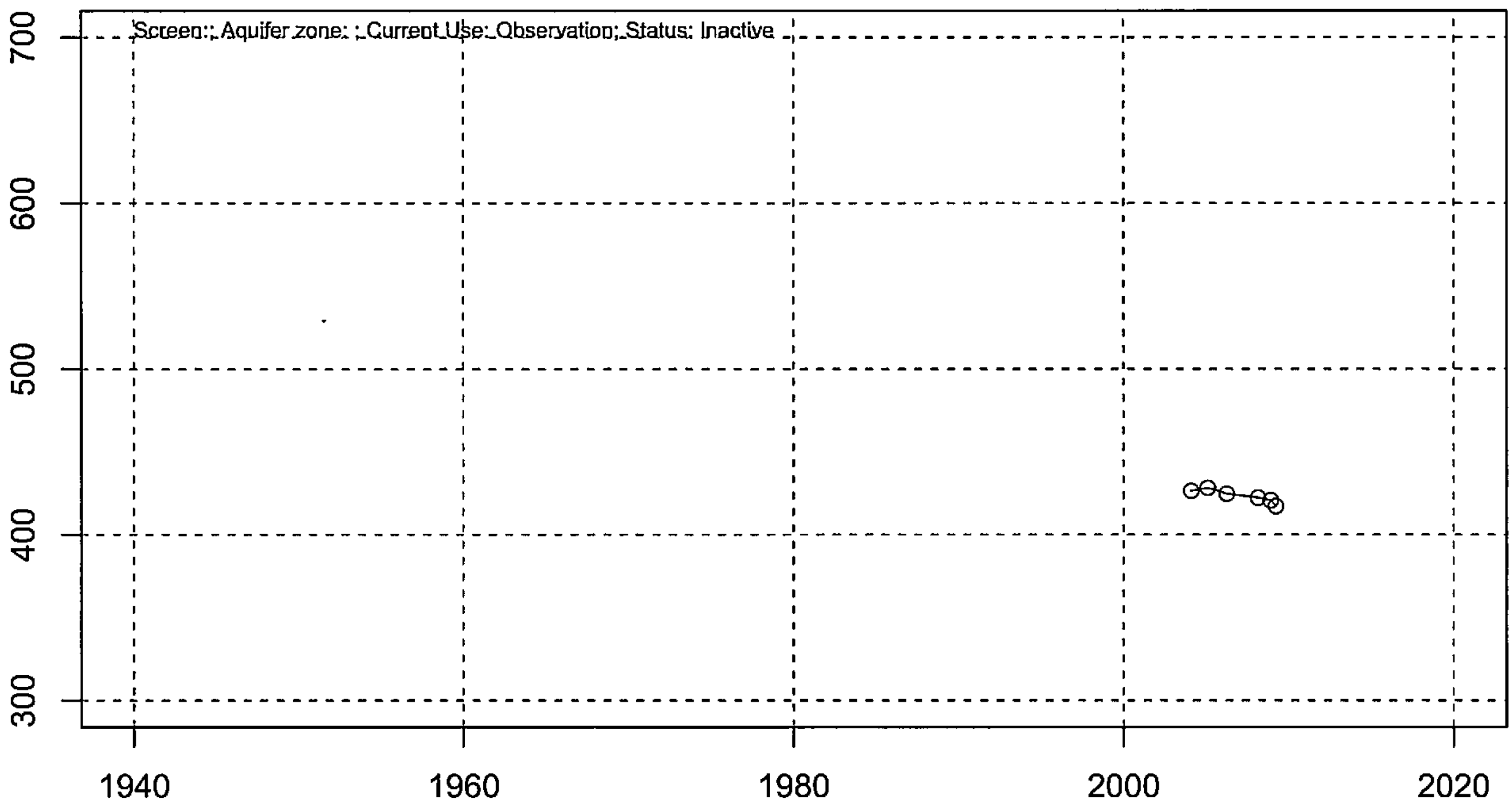
011S006E02C003S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 3

January 2020

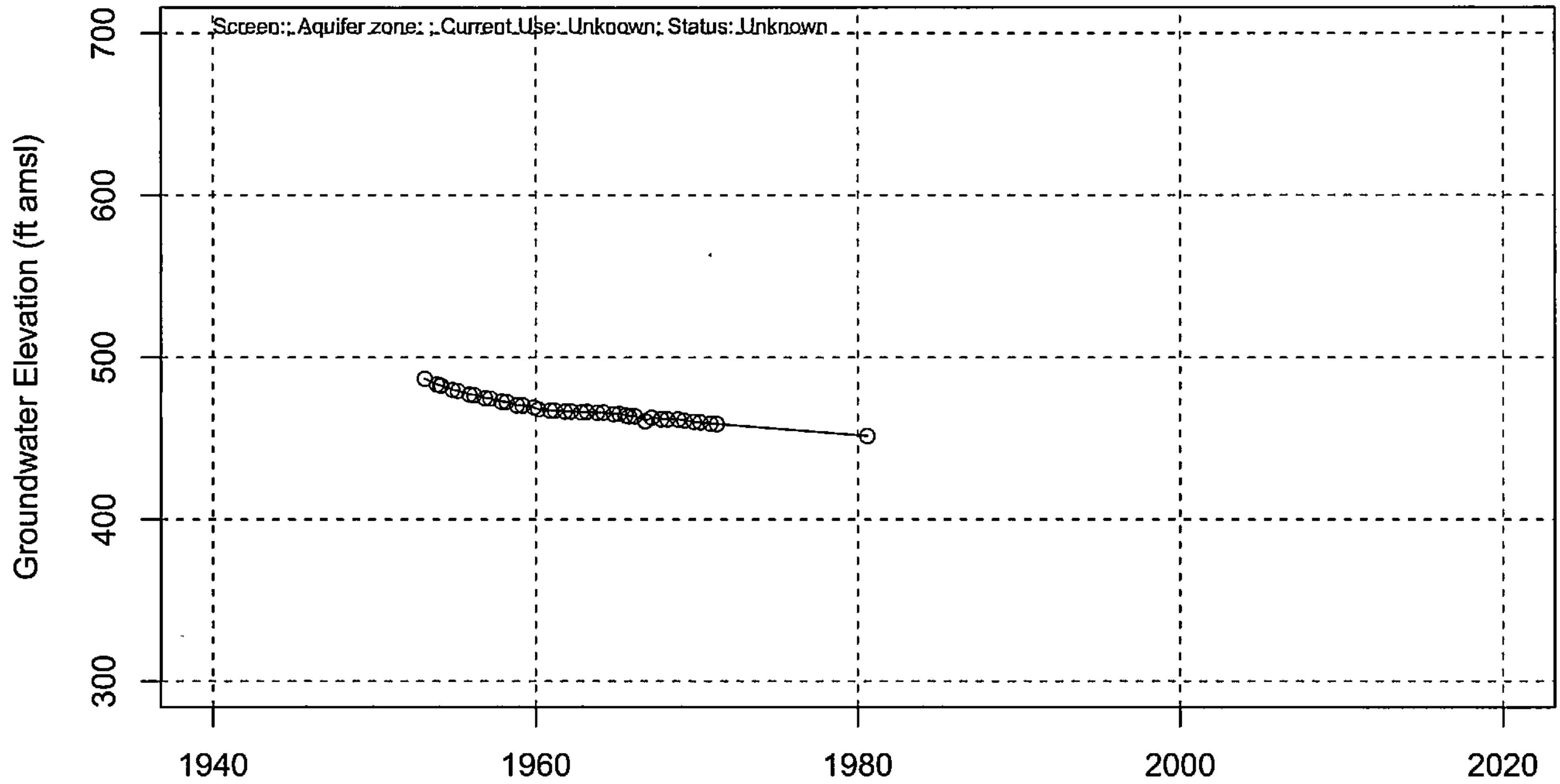
011S006E04F001S



Local ID: Cameron 2 ; Number of Measuring Agenc(y/ies): 2

January 2020

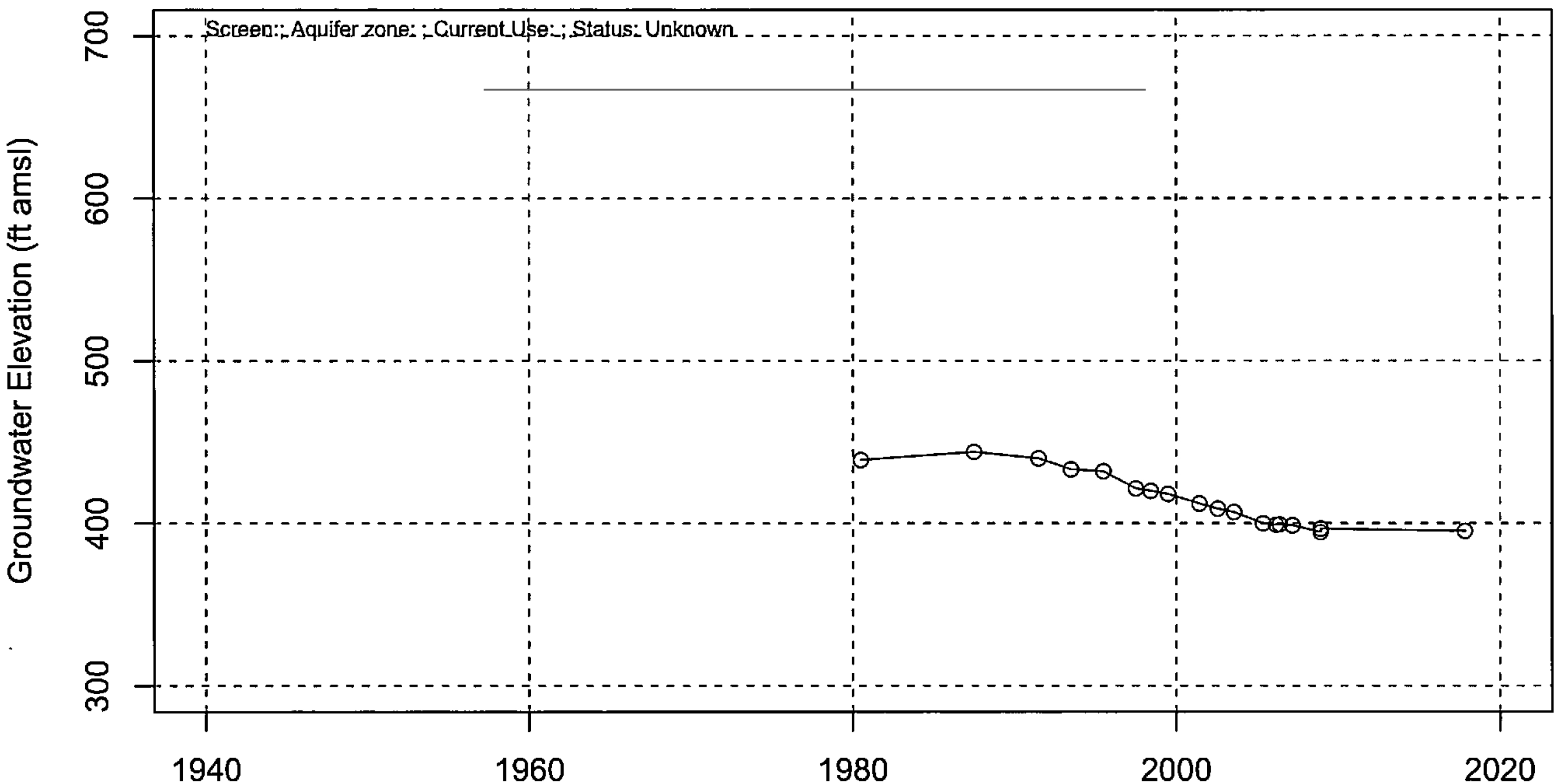
011S006E05P001S



Local ID: Bending Elbow ; Number of Measuring Agenc(y/ies): 3

January 2020

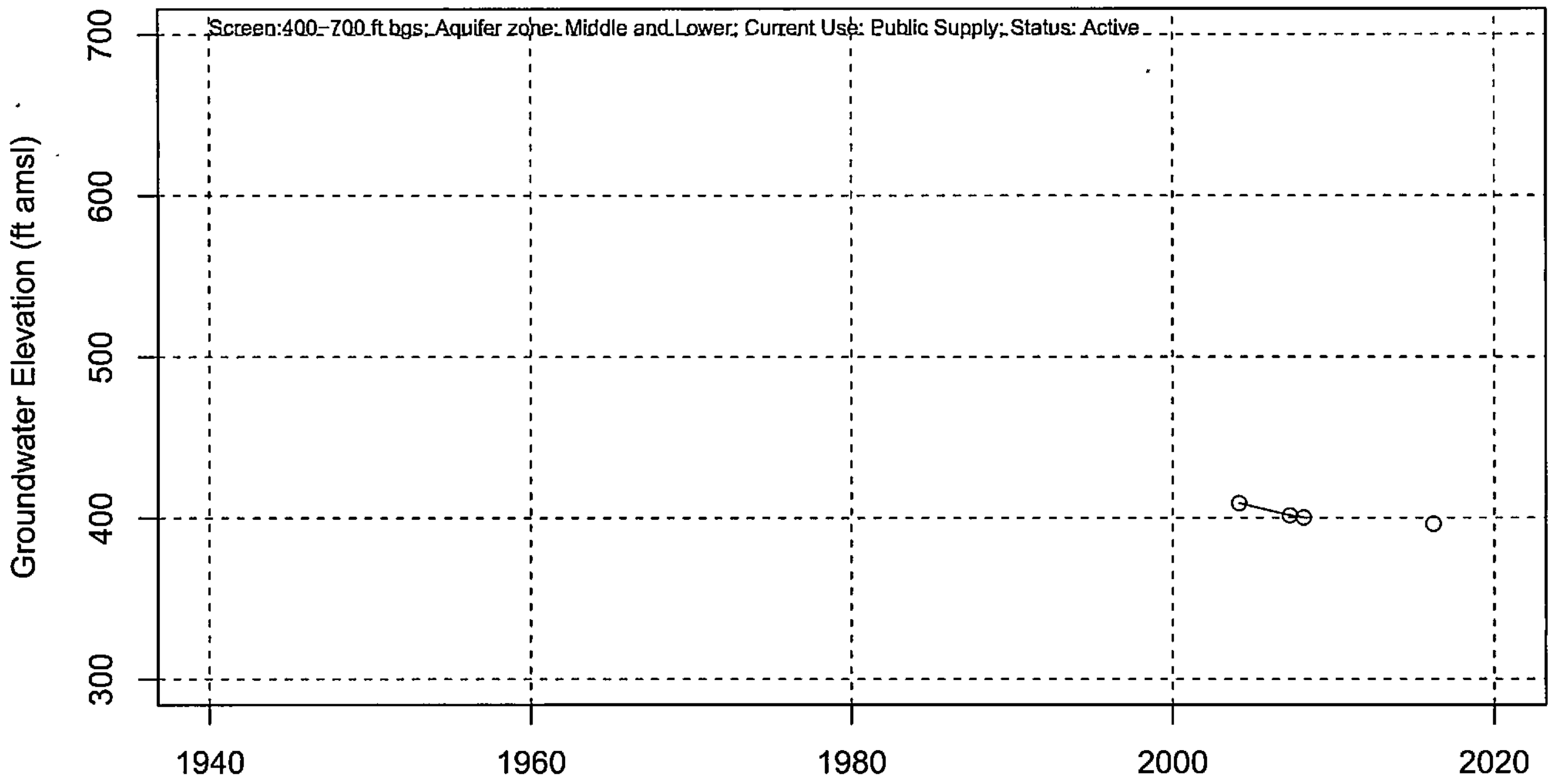
011S006E07K003S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 3

January 2020

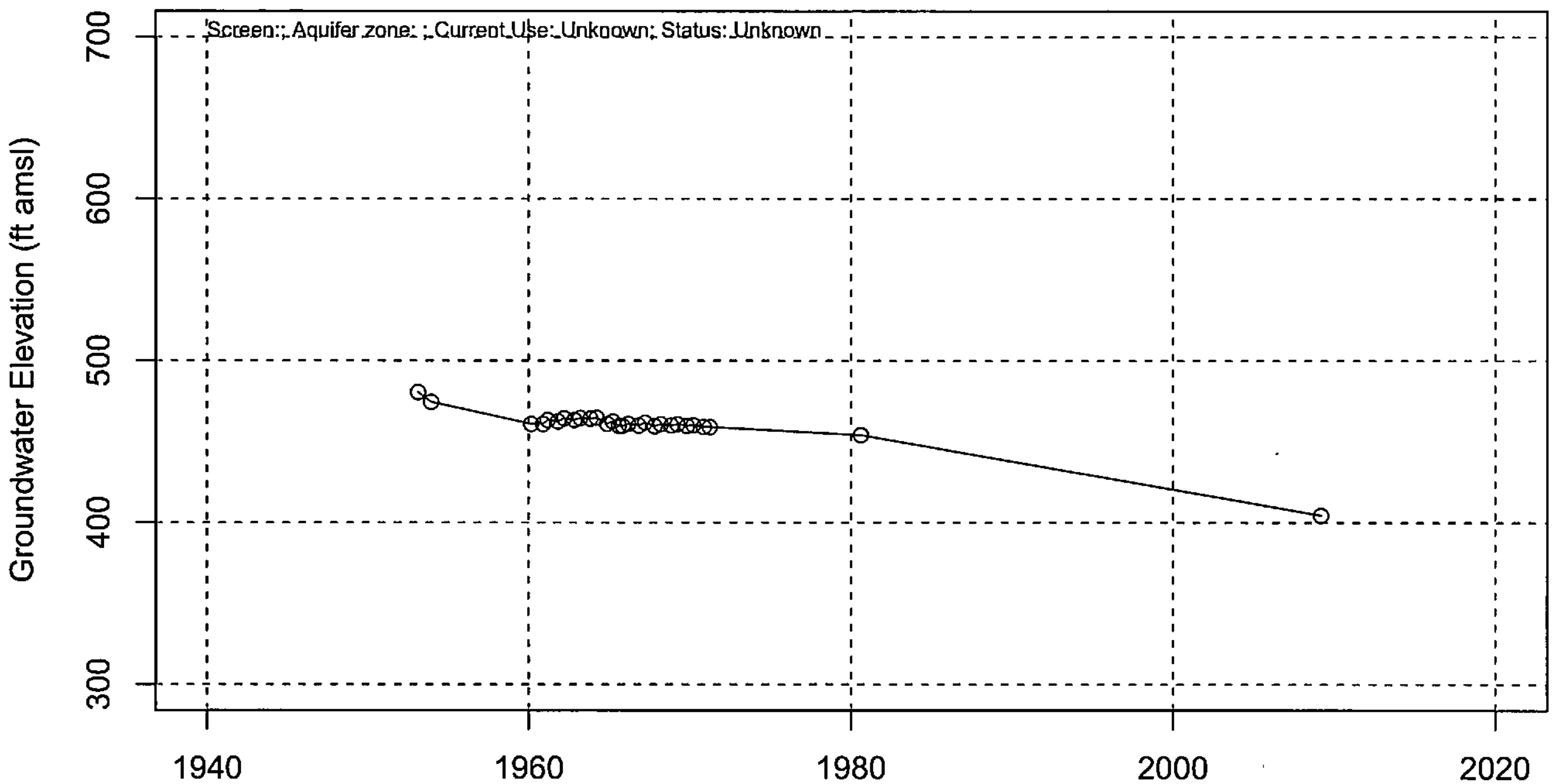
011S006E09E001S



Local ID: ID5−5 ; Number of Measuring Agenc(y/ies): 3

January 2020

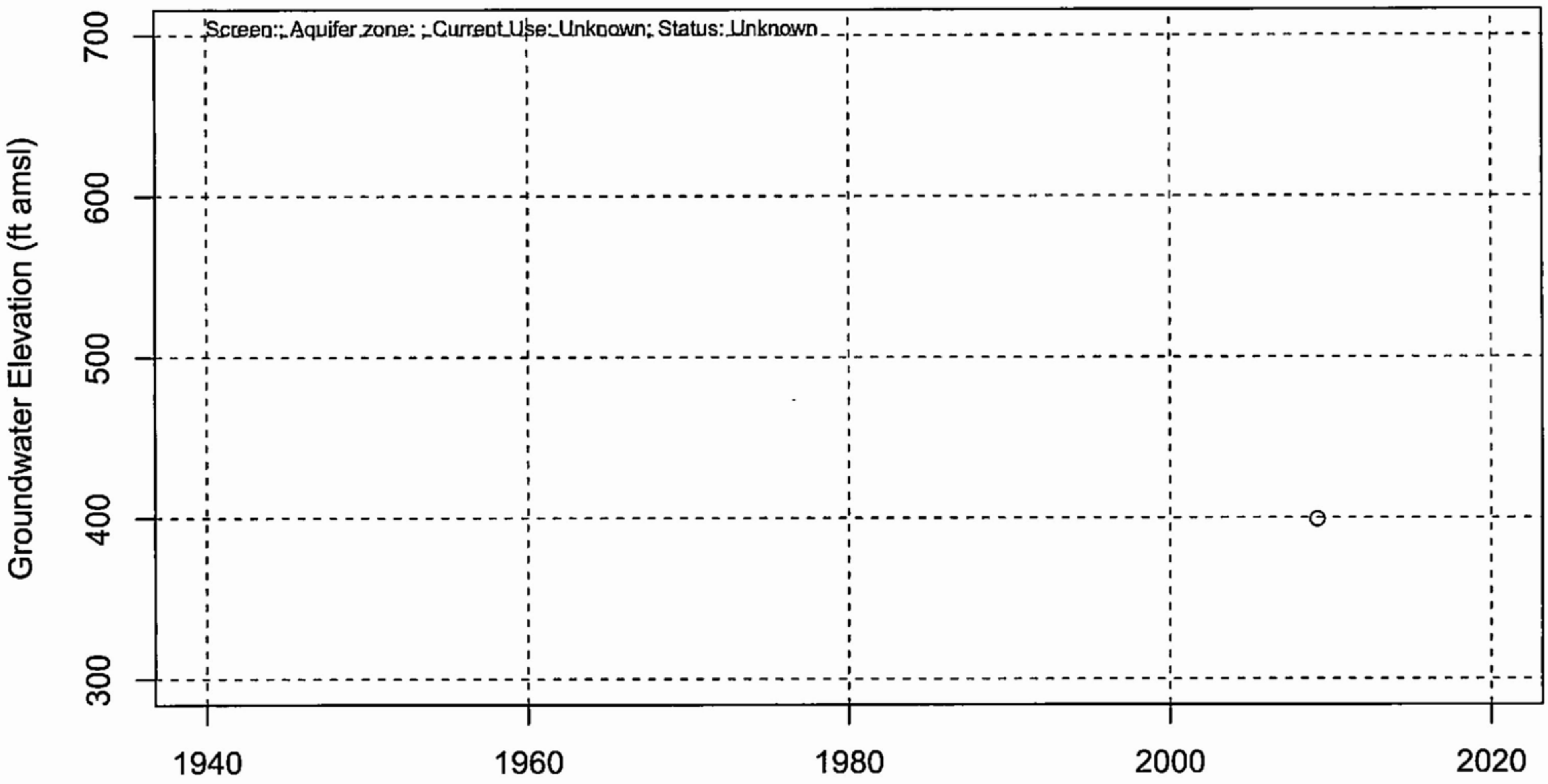
011S006E10N001S



Local ID: Abandoned Motel−1 ; Number of Measuring Agenc(y/ies): 2

January 2020

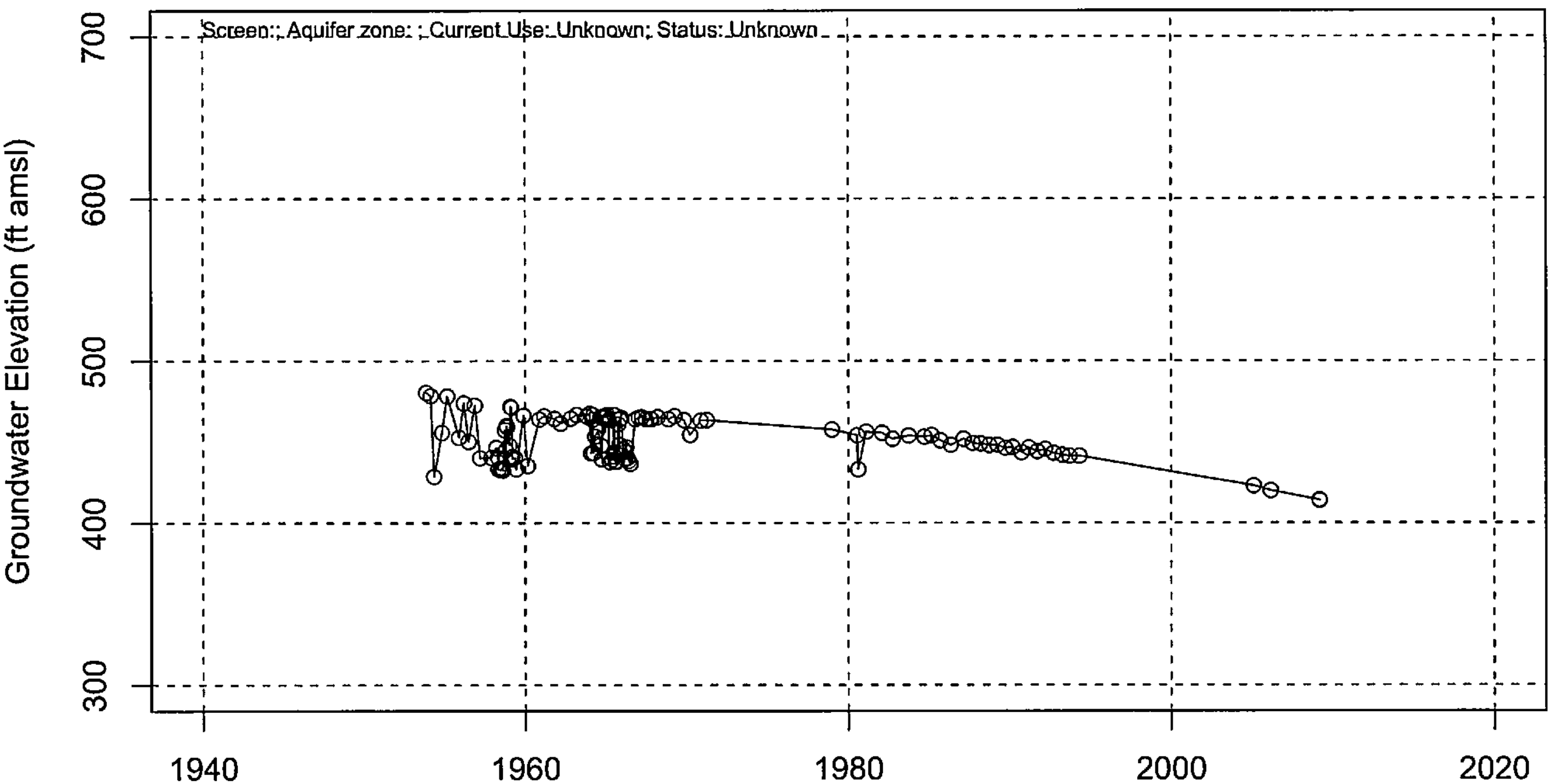
011S006E10N004S



Local ID: Abandoned motel−2 ; Number of Measuring Agenc(y/ies): 1

January 2020

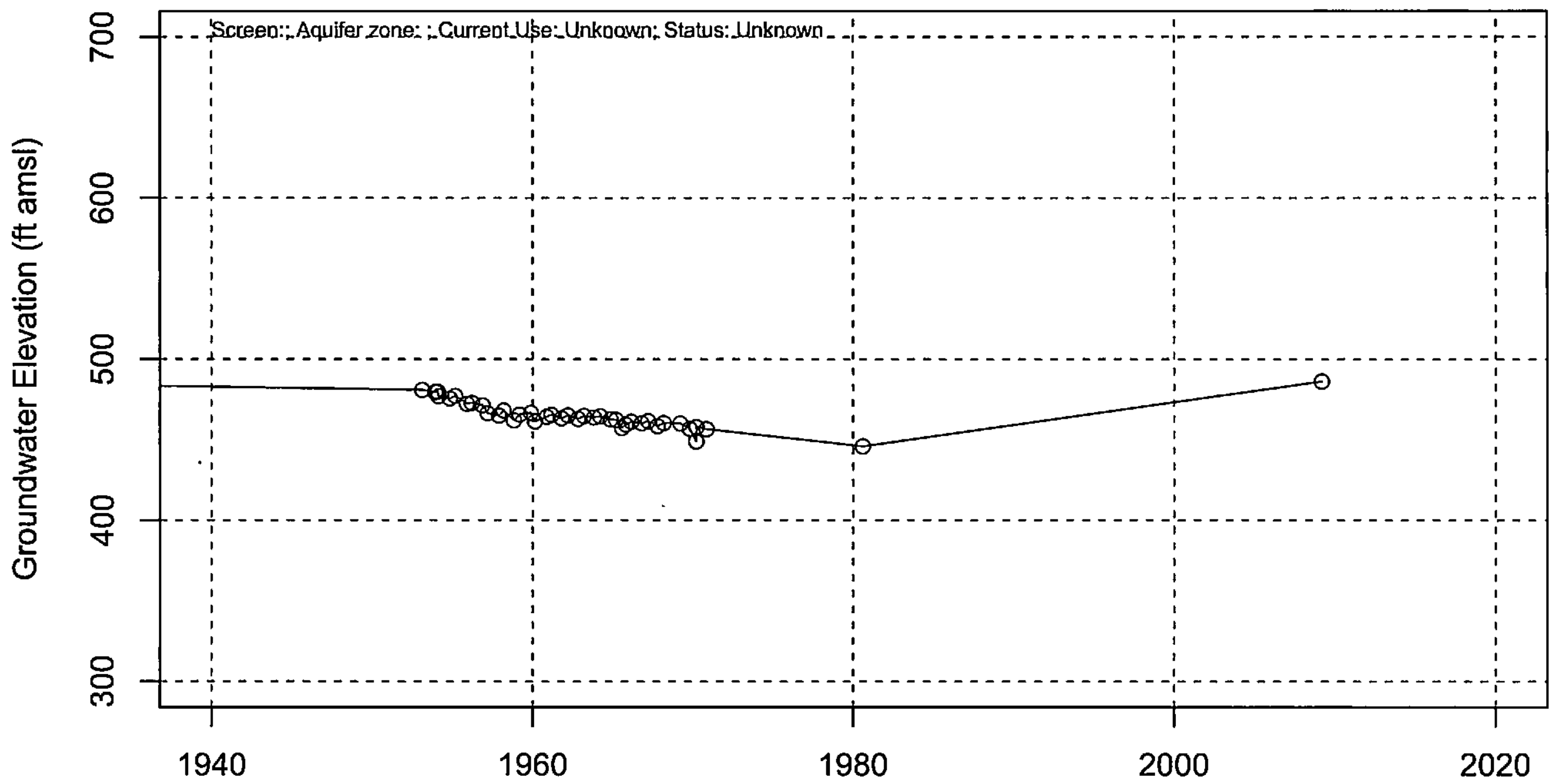
011S006E11D002S



Local ID: Berkovitch ; Number of Measuring Agenc(y/ies): 2

January 2020

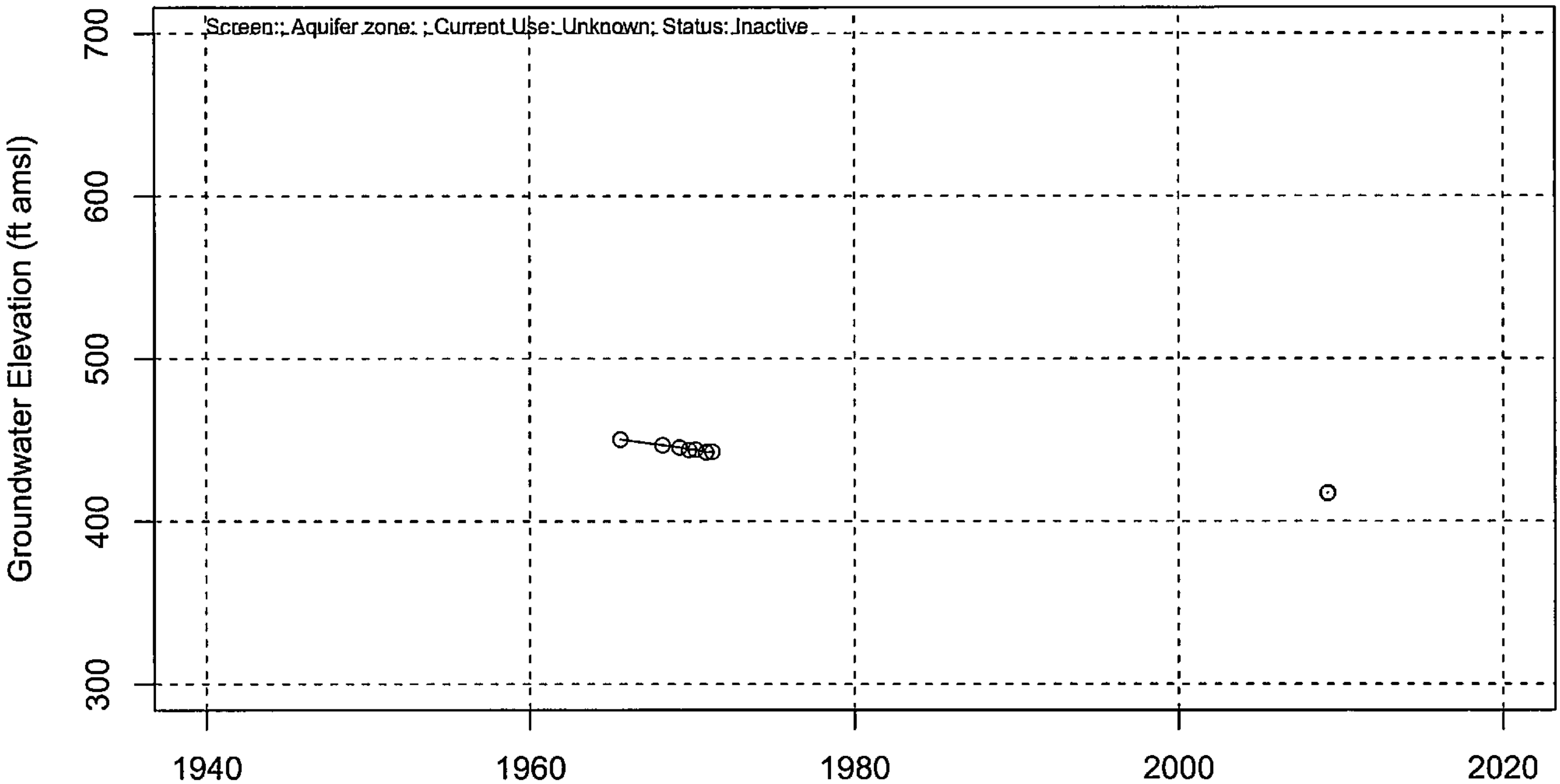
011S006E11M001S



Local ID: Burned House 1 ; Number of Measuring Agenc(y/ies): 2

January 2020

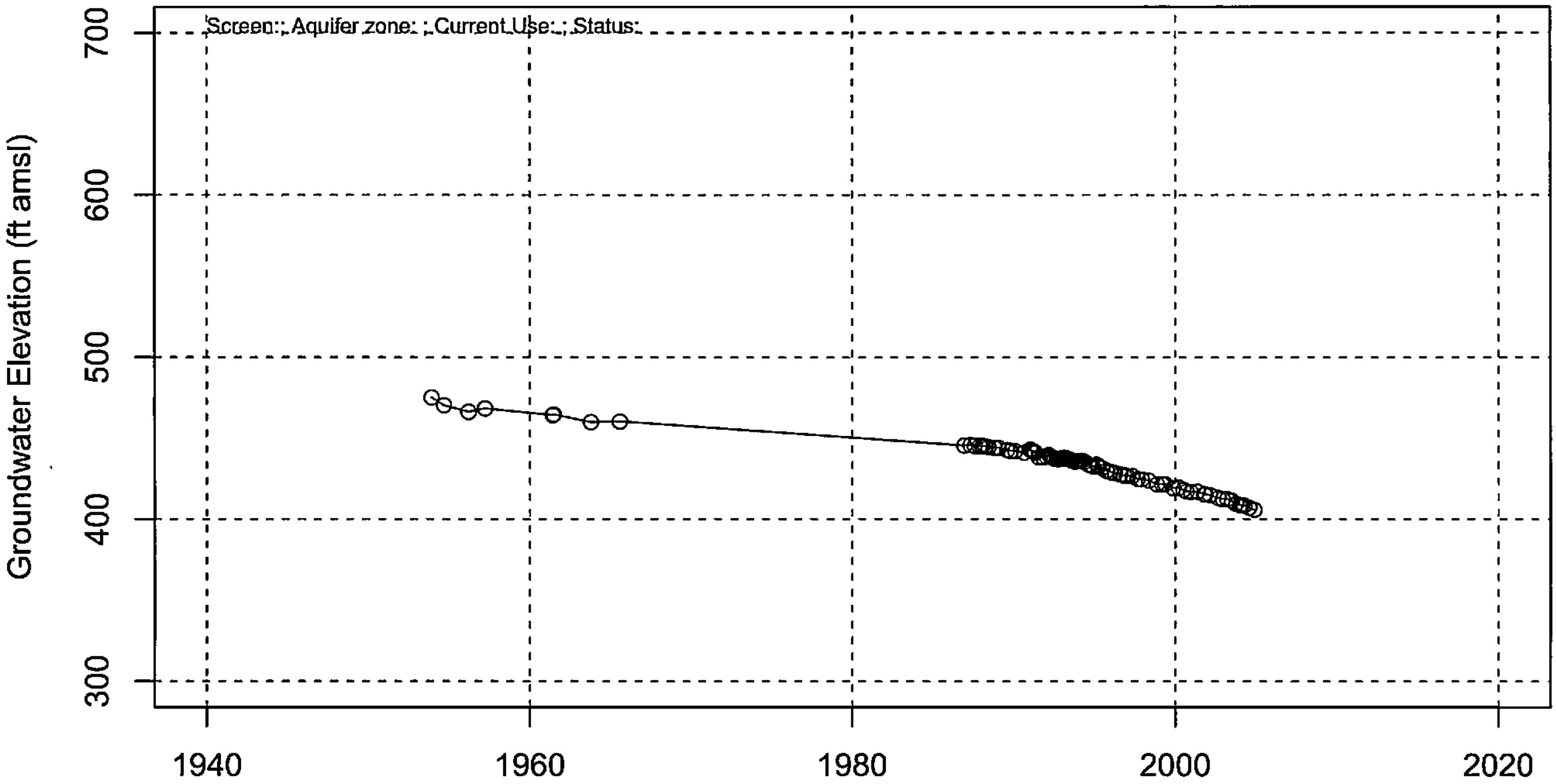
011S006E12G001S



Local ID: Sink – 12G1 ; Number of Measuring Agenc(y/ies): 4

January 2020

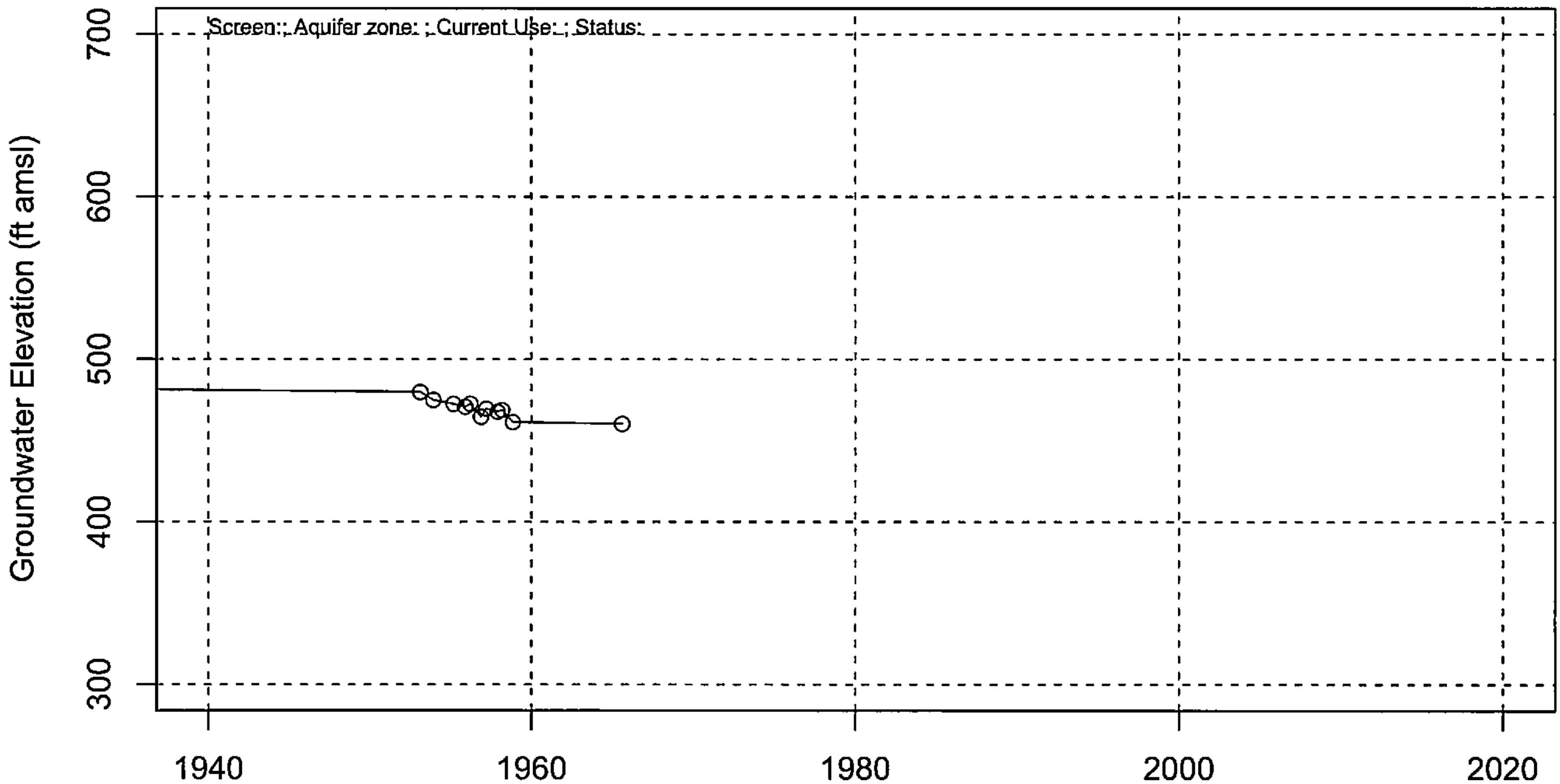
011S006E15E002S



Local ID: Levie Well ; Number of Measuring Agenc(y/ies): 2

January 2020

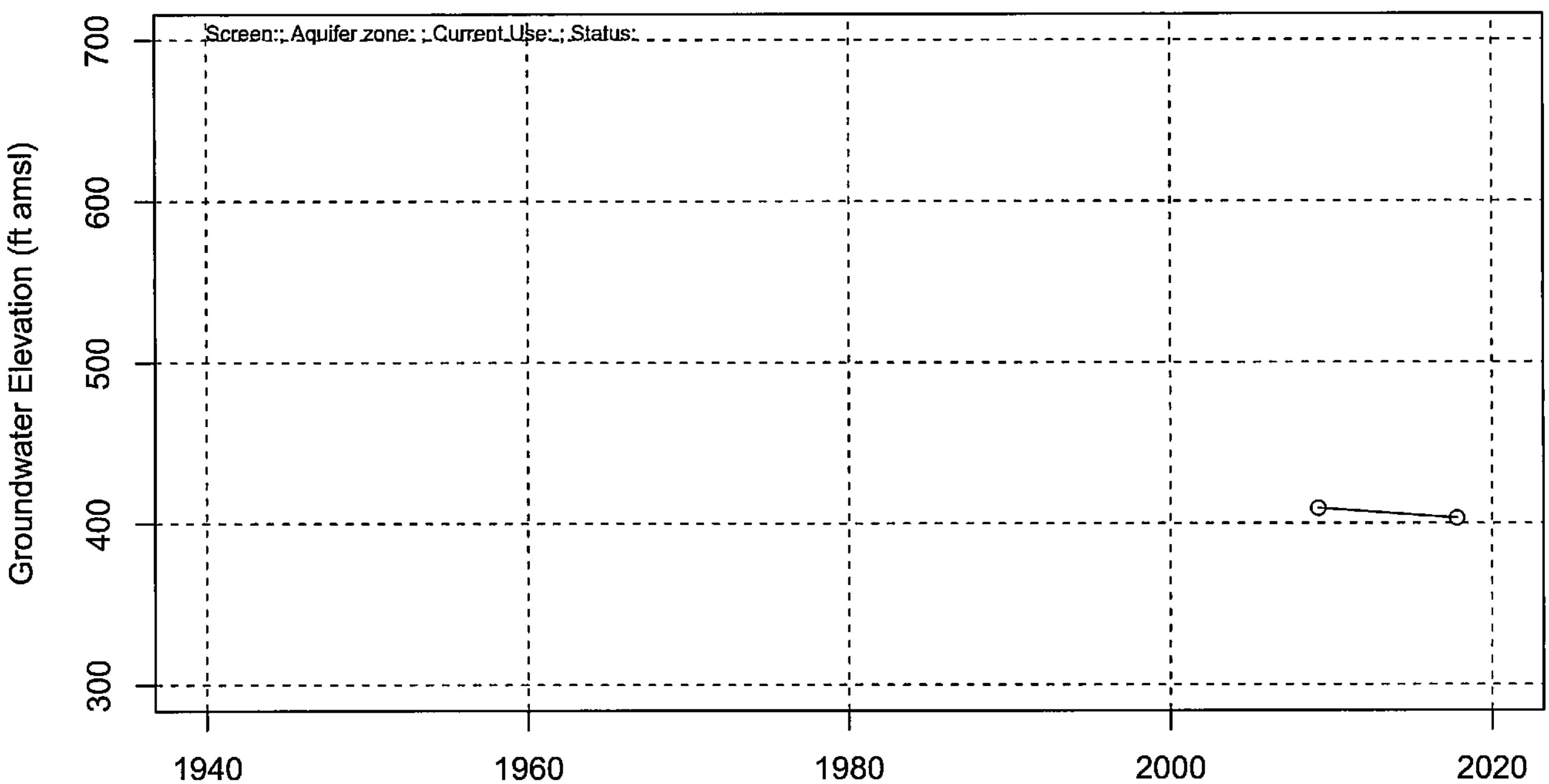
011S006E15F001S



Local ID: N/A ; Number of Measuring Agenc(y/ies): 3

January 2020

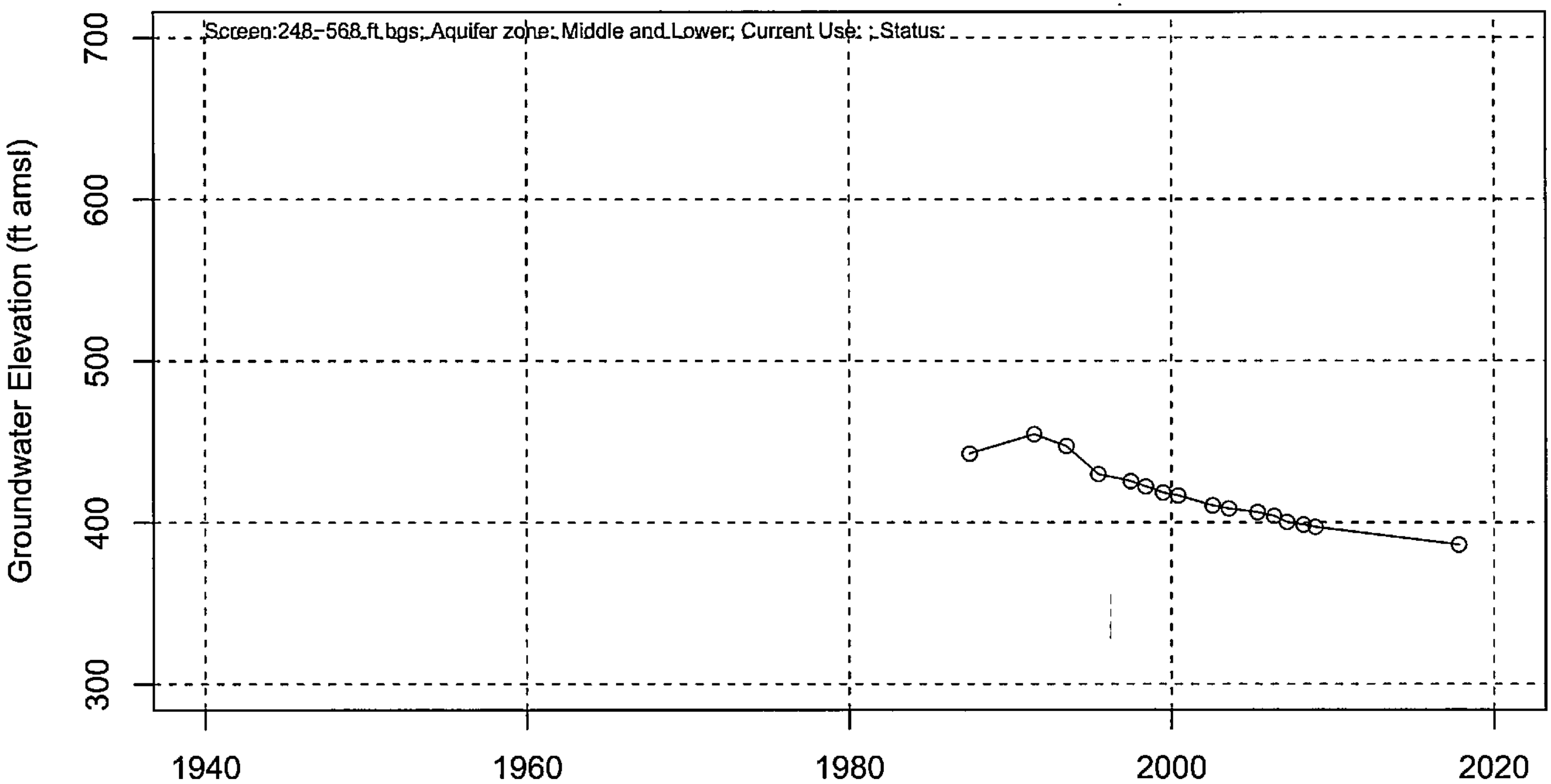
011S006E15G001S



Local ID: County Yard (SD DOT) ; Number of Measuring Agenc(y/ies): 2

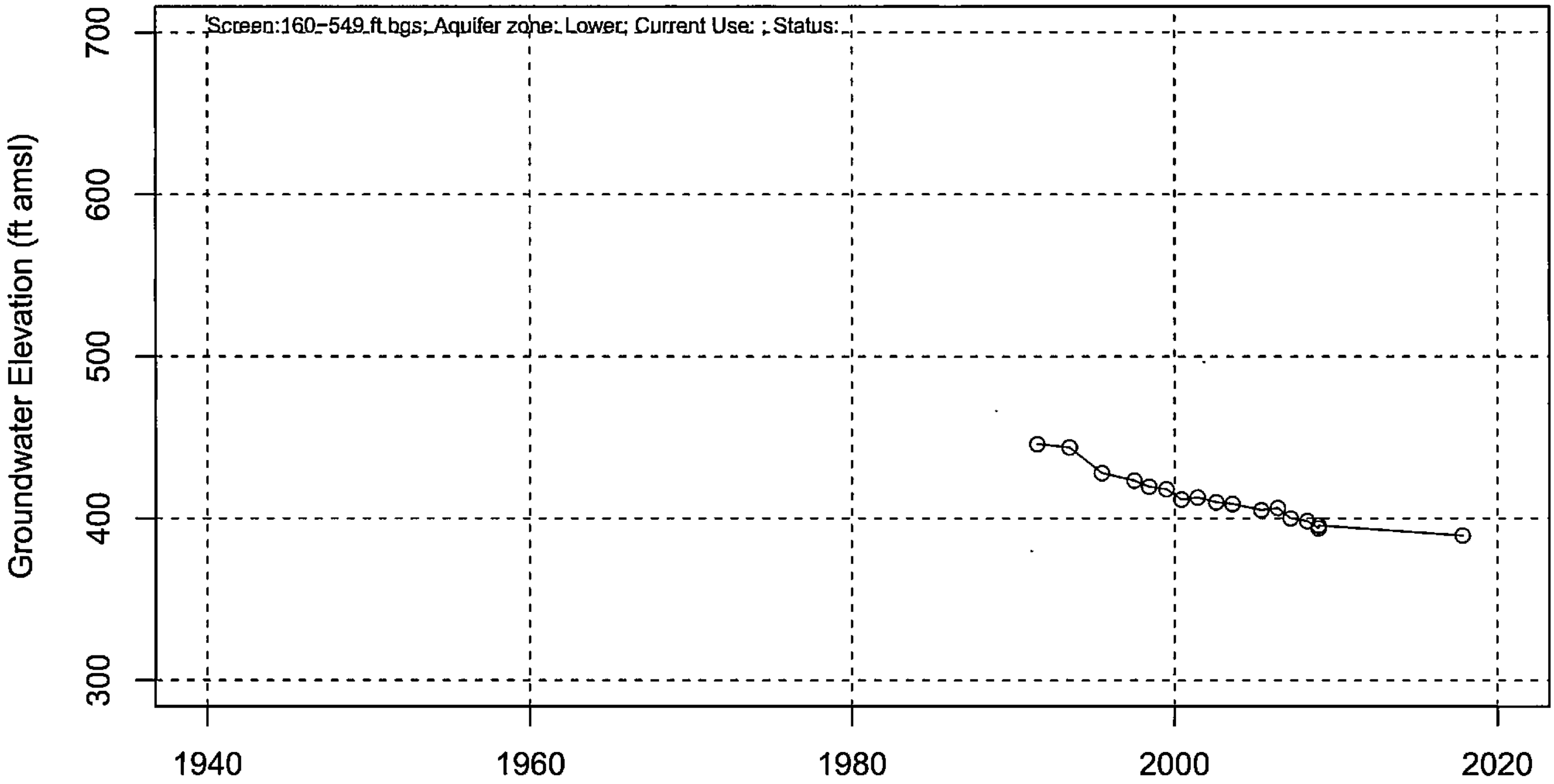
January 2020

011S006E16A002S



Local ID: ID1−12 ; Number of Measuring Agenc(y/ies): 4

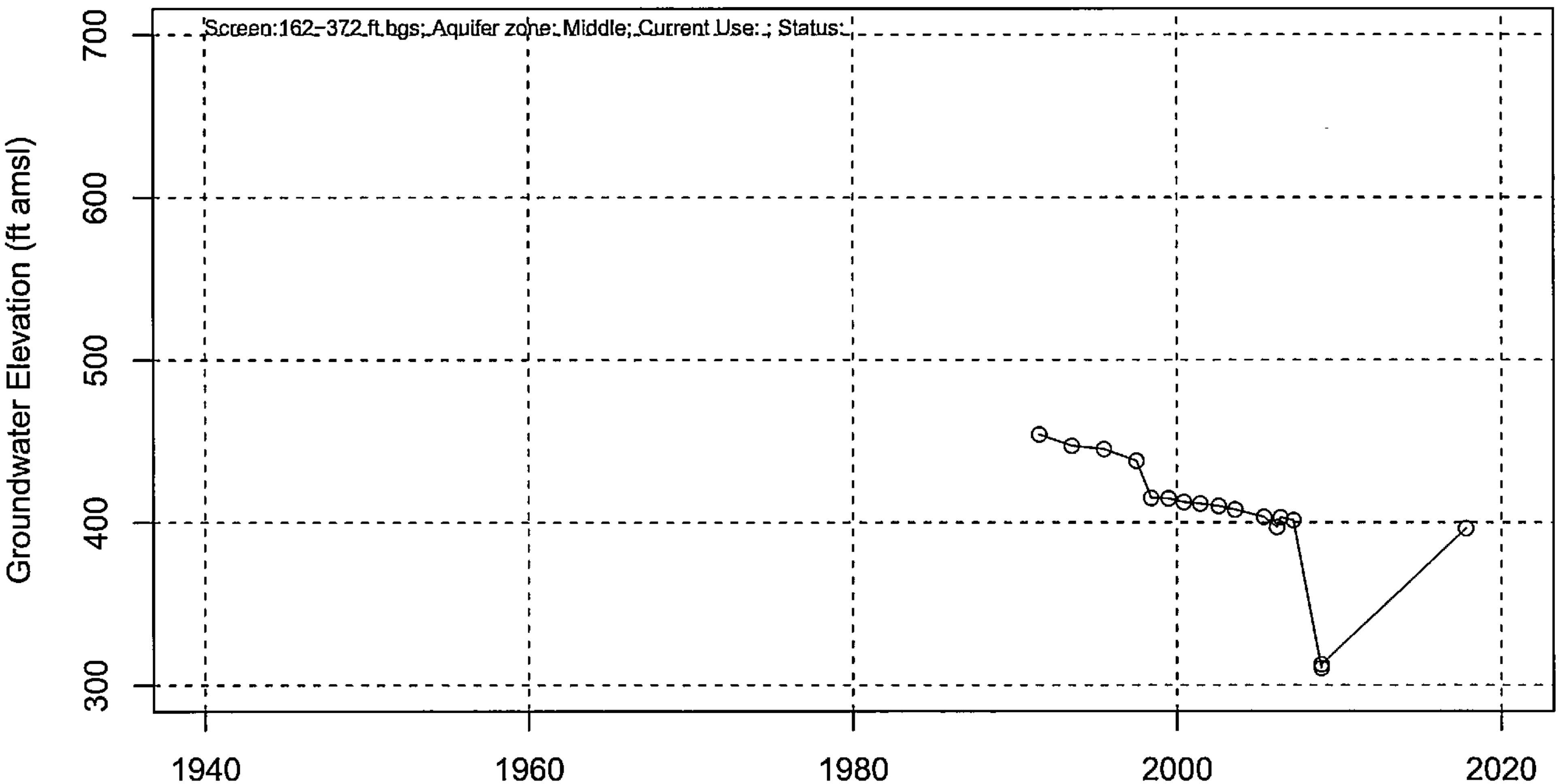
011S006E16N001S



Local ID: ID1−16 ; Number of Measuring Agenc(y/ies): 4

January 2020

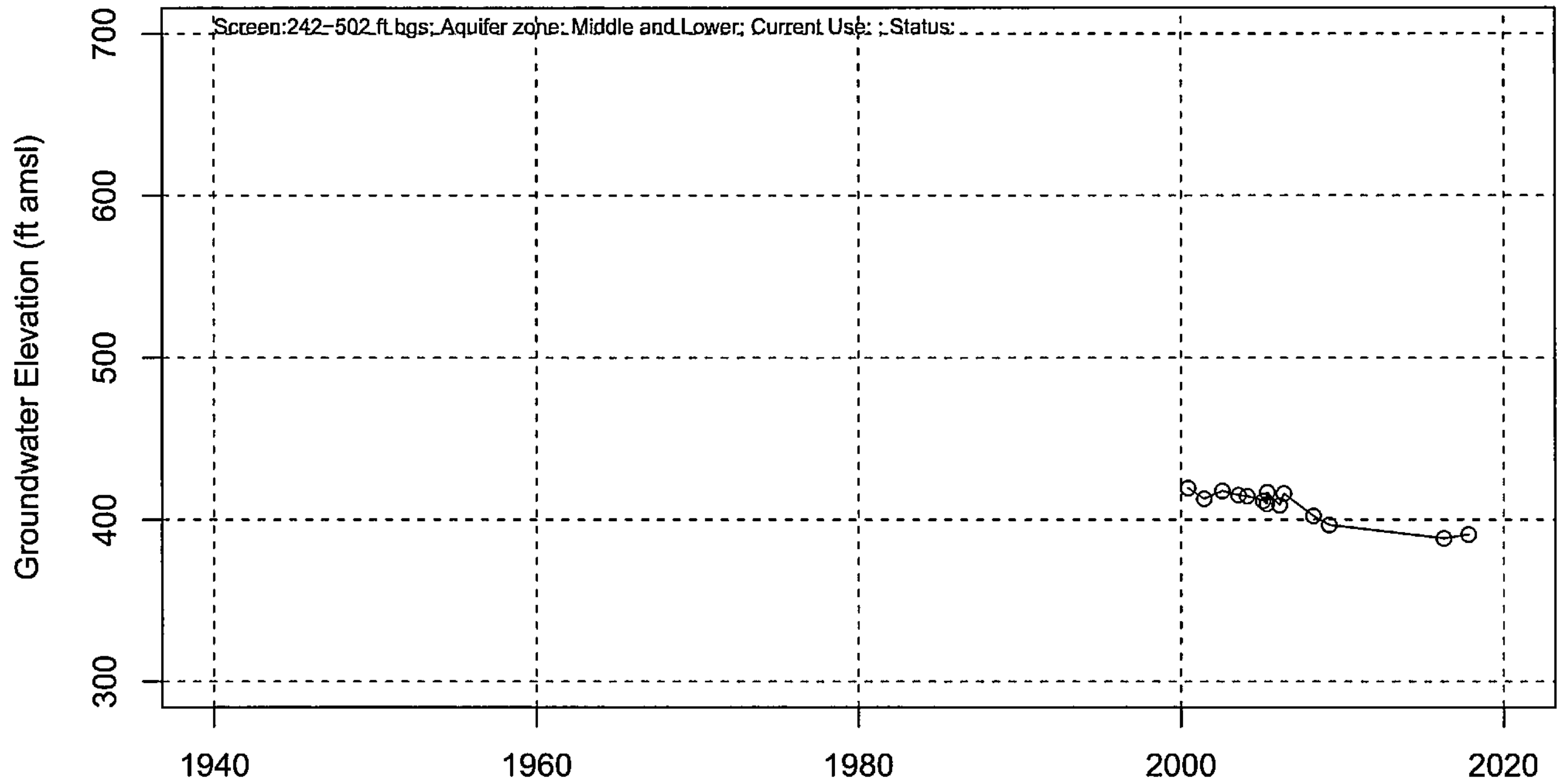
011S006E18L001S



Local ID: ID4−10 ; Number of Measuring Agenc(y/ies): 3

January 2020

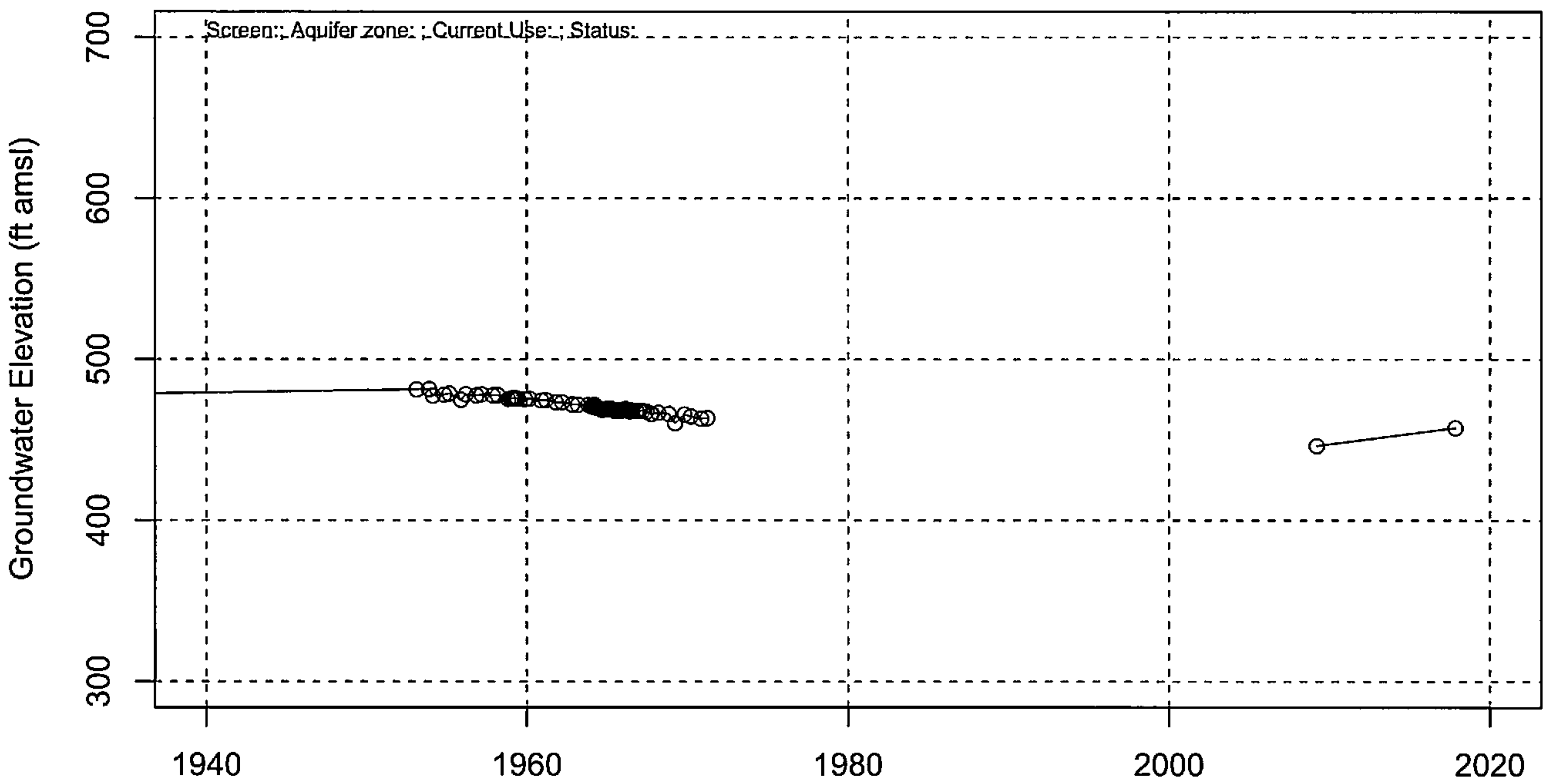
011S006E20A001S



Local ID: Wilcox ; Number of Measuring Agenc(y/ies): 4

January 2020

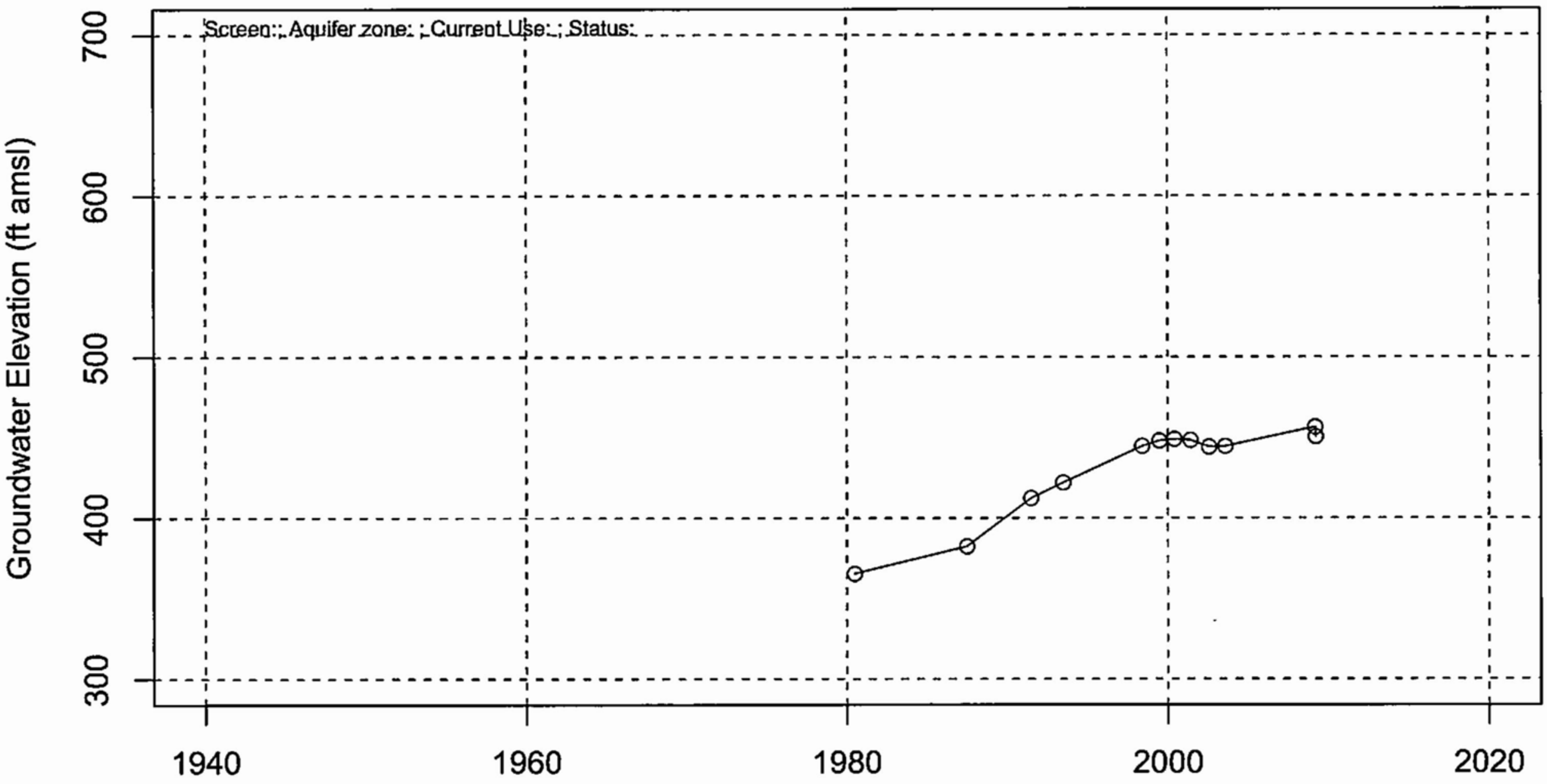
011S006E22A001S



Local ID: Bakko ; Number of Measuring Agenc(y/ies): 4

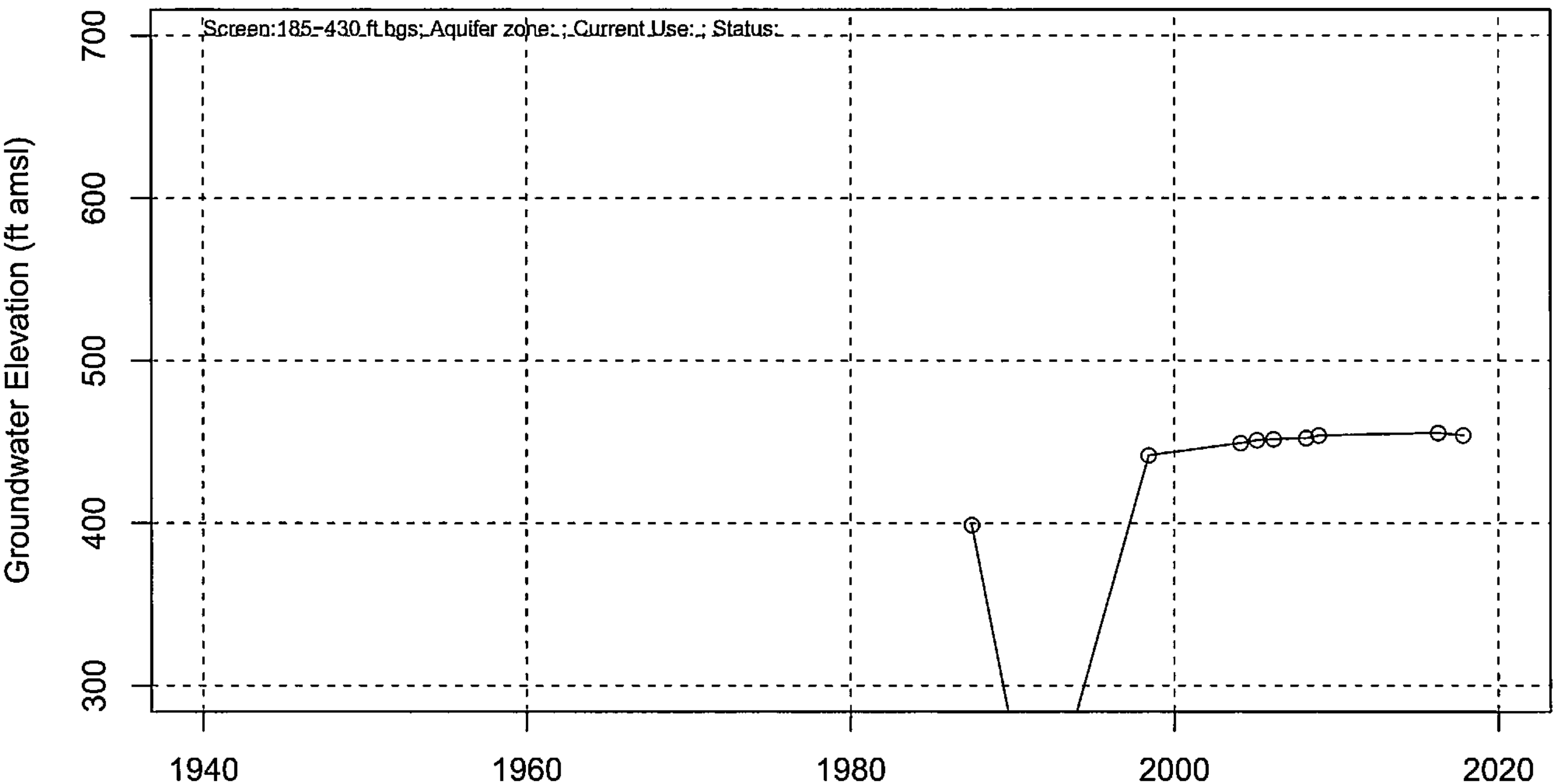
January 2020

011S006E22A002S



Local ID: Triangle ; Number of Measuring Agenc(y/ies): 2

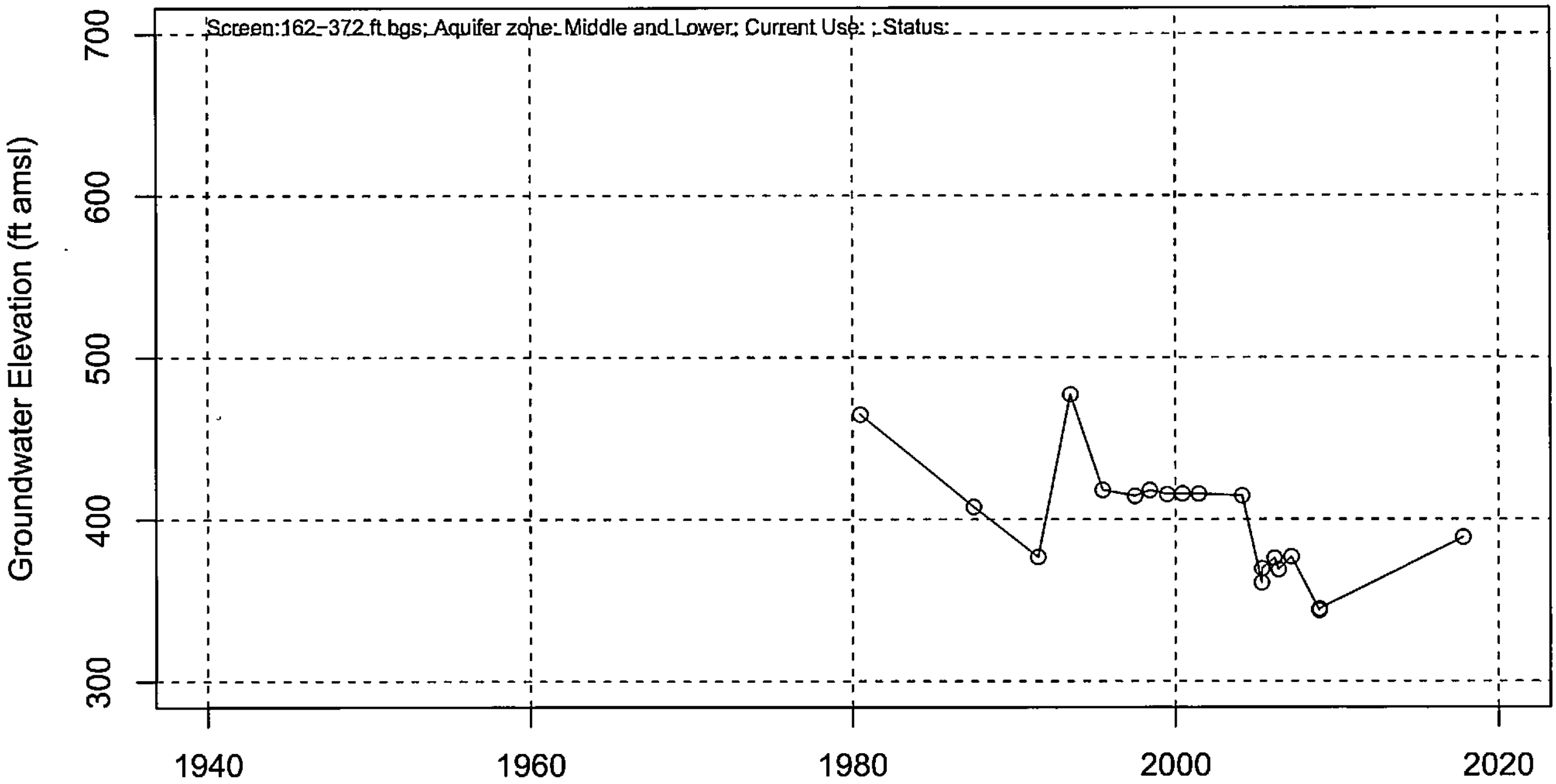
011S006E22B001S



Local ID: Paddock ; Number of Measuring Agenc(y/ies): 4

January 2020

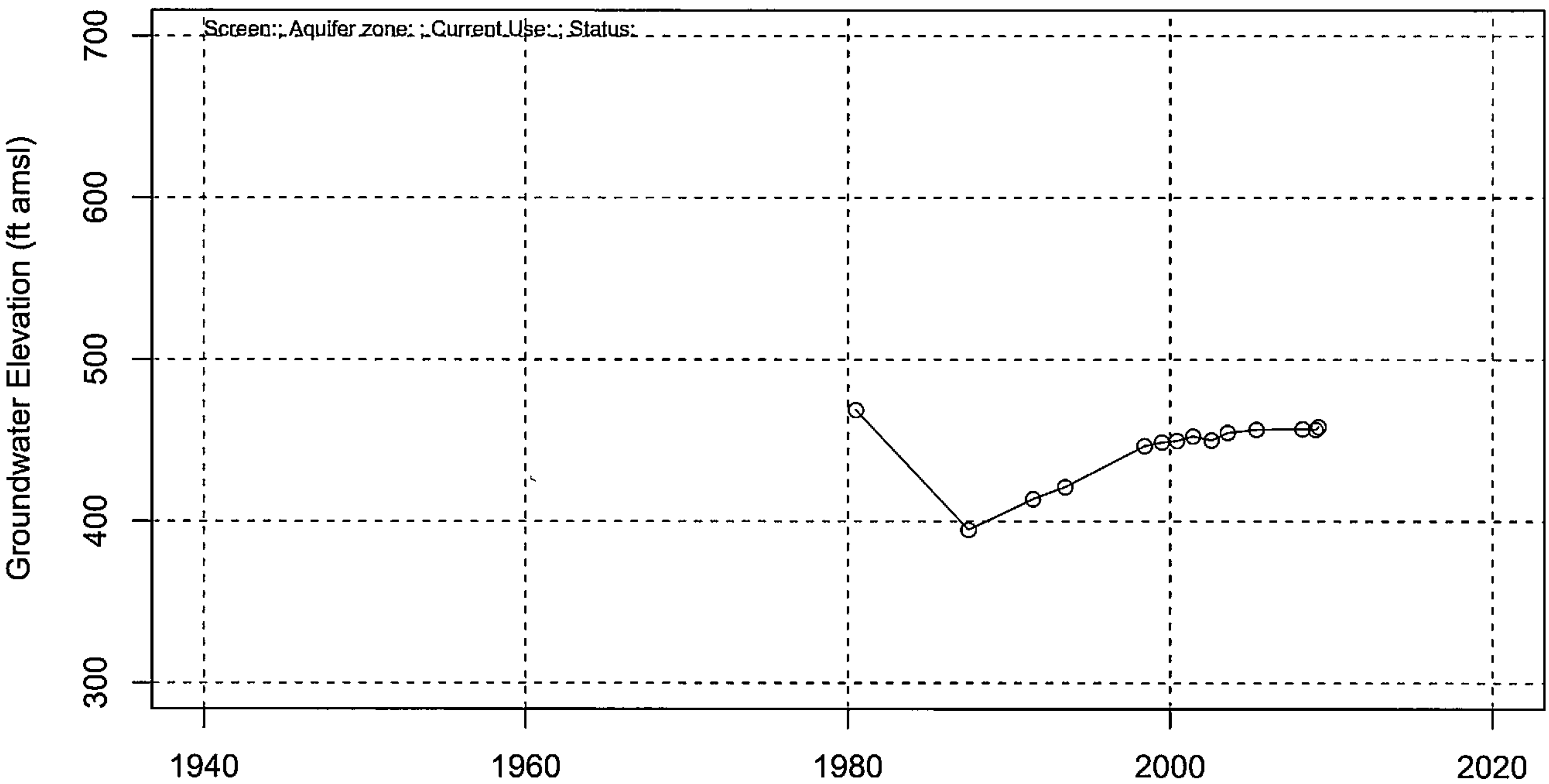
011S006E22D001S



Local ID: ID1−10 ; Number of Measuring Agenc(y/ies): 4

January 2020

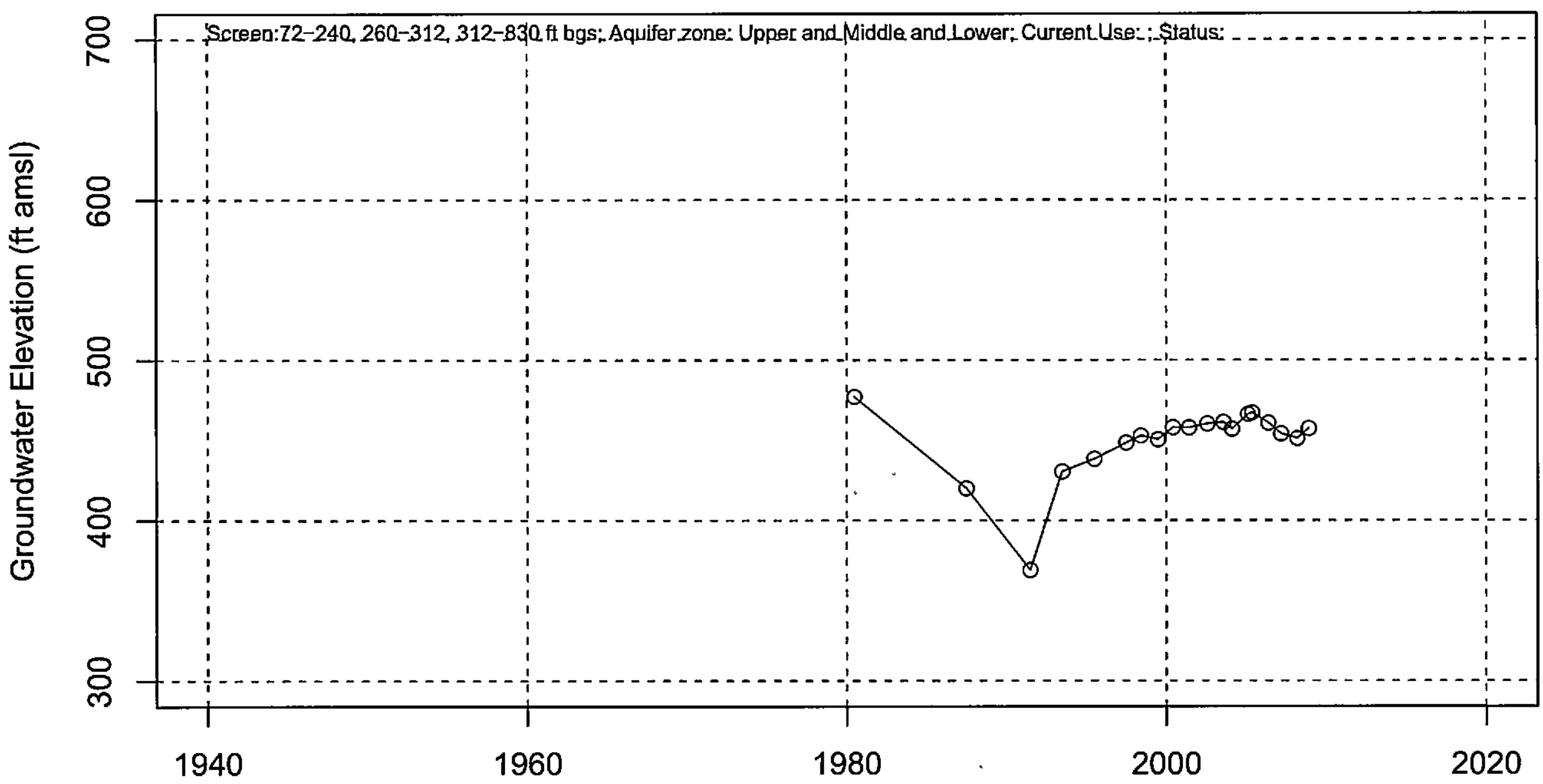
011S006E23E001S



Local ID: La Casa ; Number of Measuring Agenc(y/ies): 2

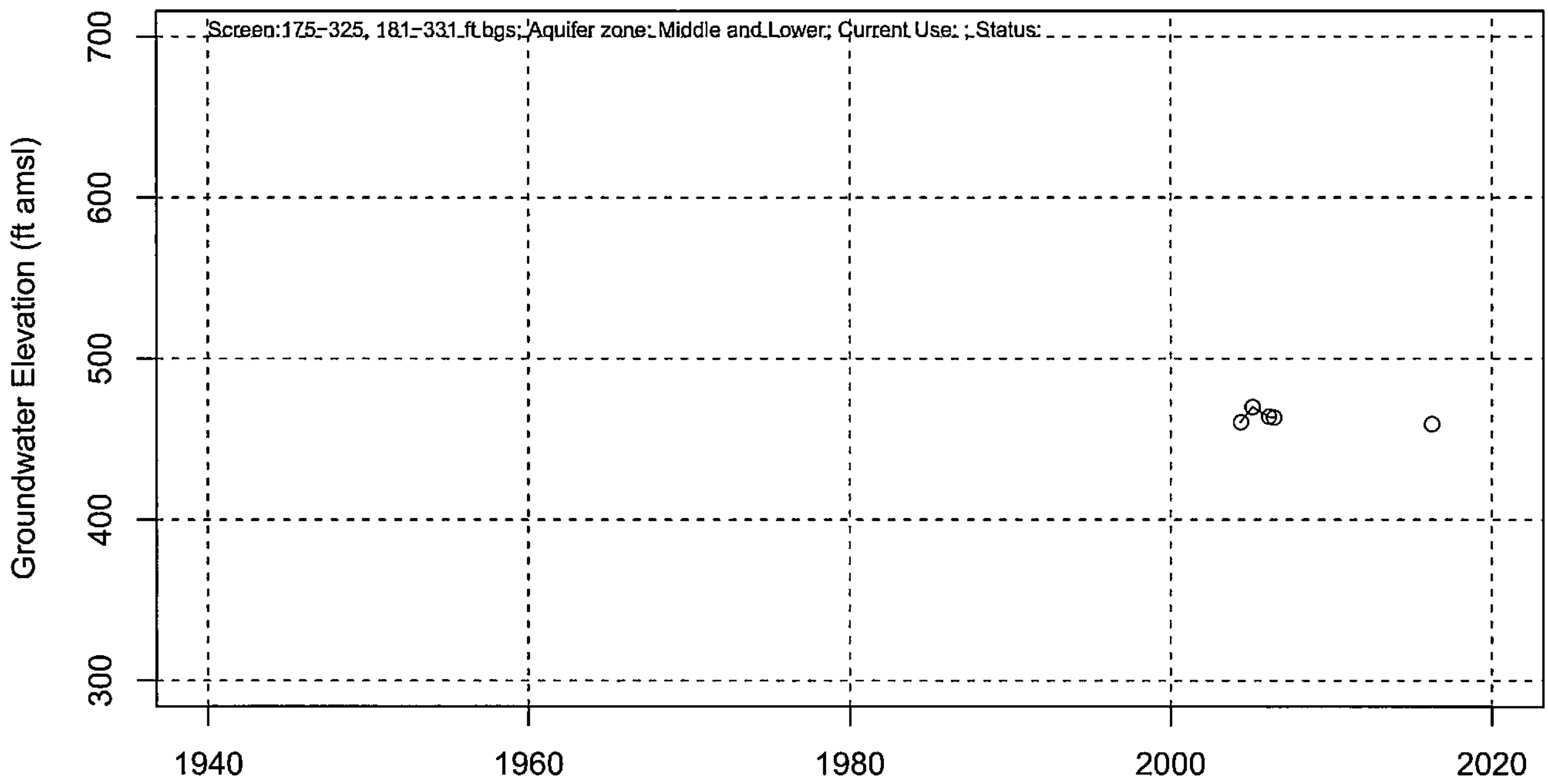
January 2020

011S006E23J001S



Local ID: ID1−8 ; Number of Measuring Agenc(y/ies): 2

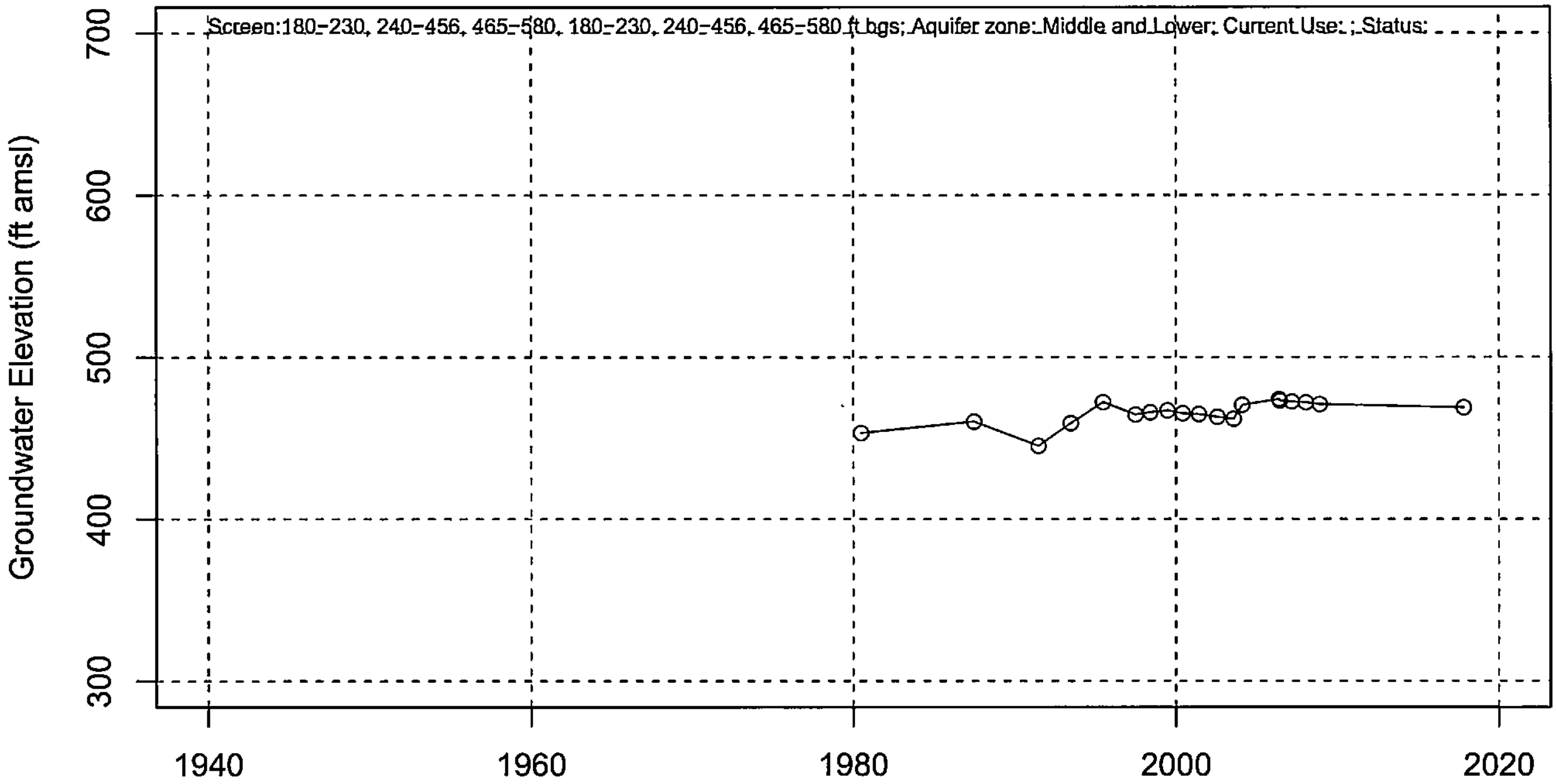
011S006E23J002S



Local ID: MW−3 ; Number of Measuring Agenc(y/ies): 4

January 2020

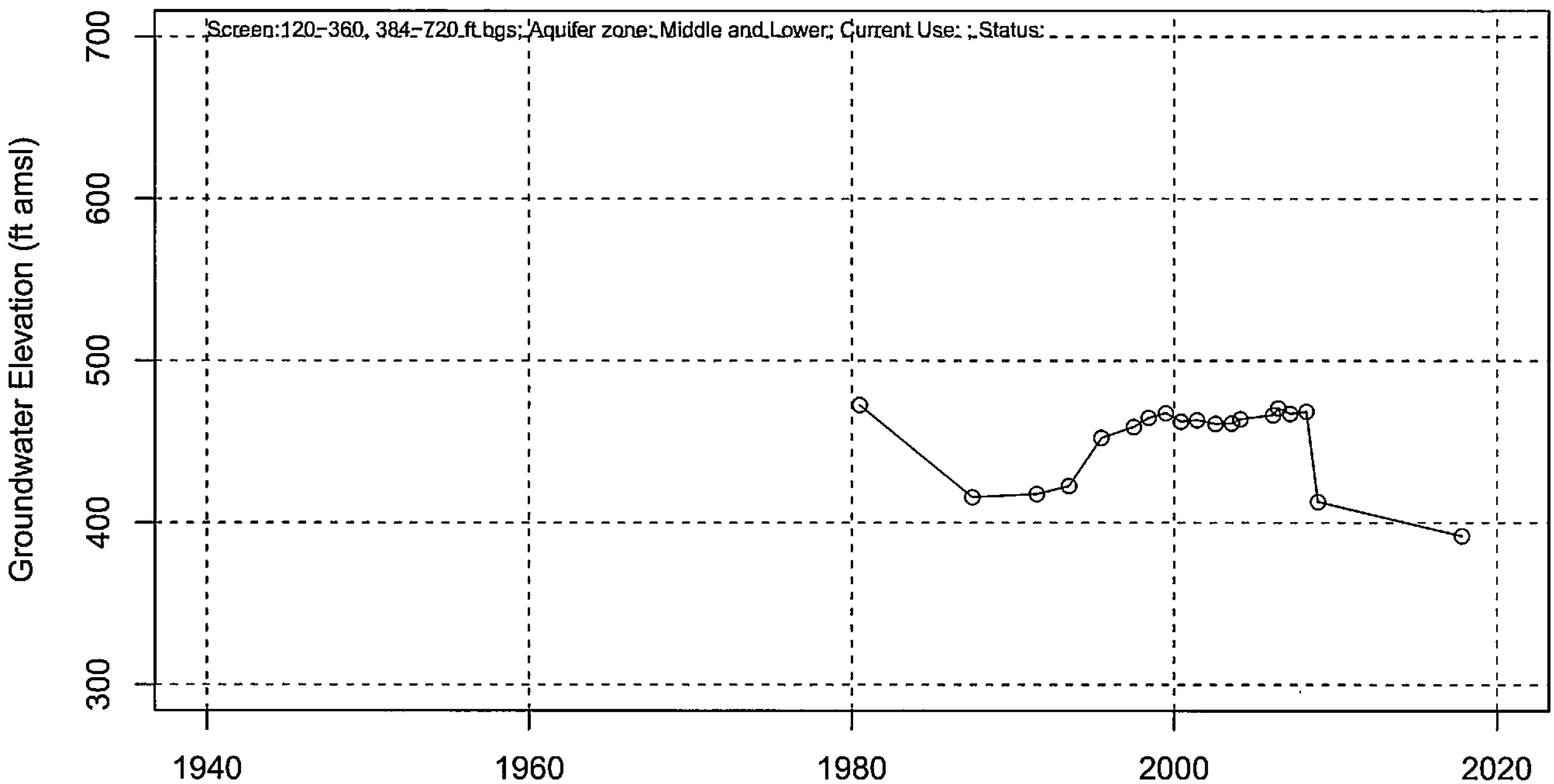
011S006E25A001S



Local ID: ID1-1 ; Number of Measuring Agenc(y/ies): 3

January 2020

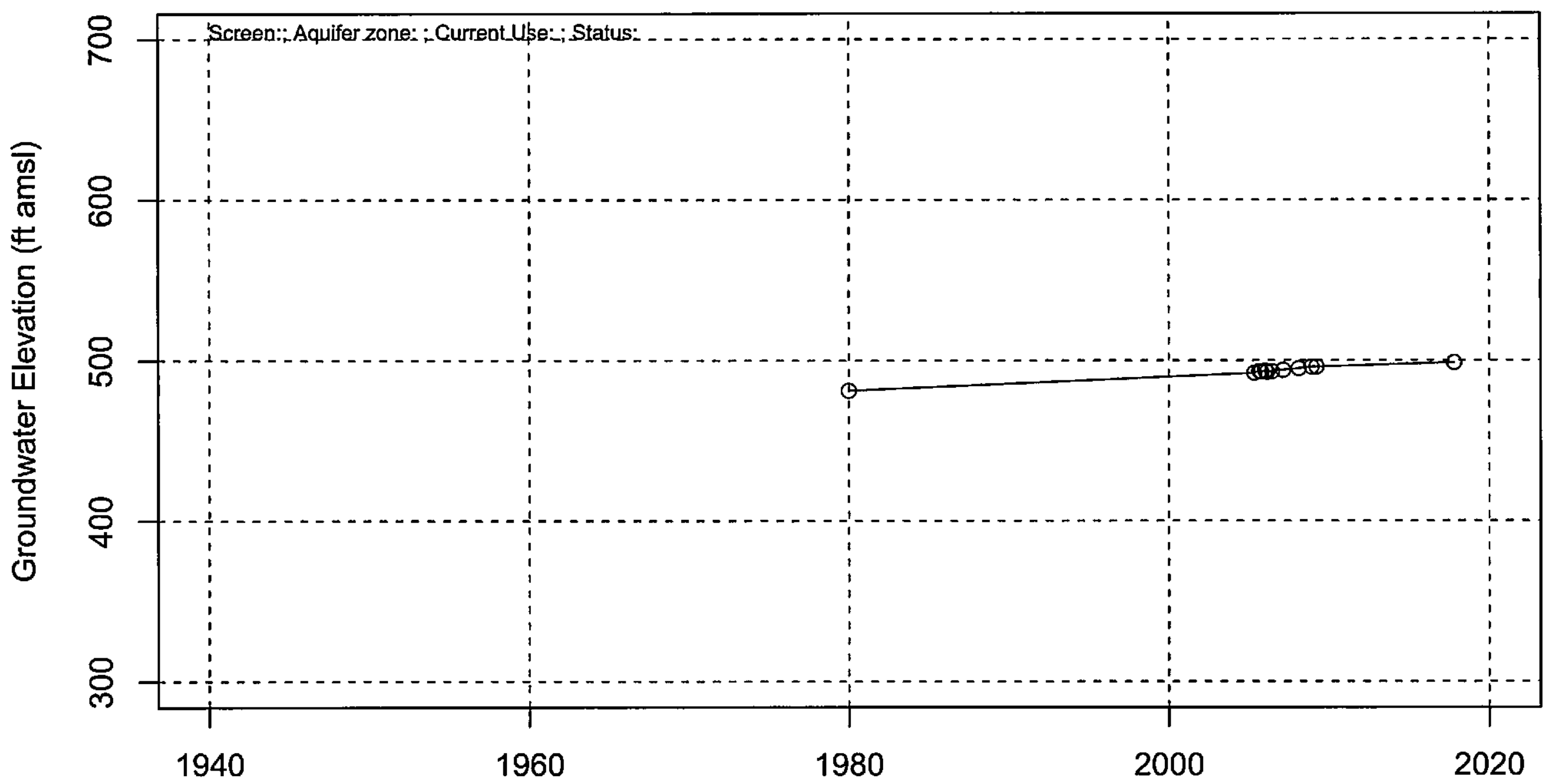
011S006E25C001S



Local ID: ID1−2 ; Number of Measuring Agenc(y/ies): 3

January 2020

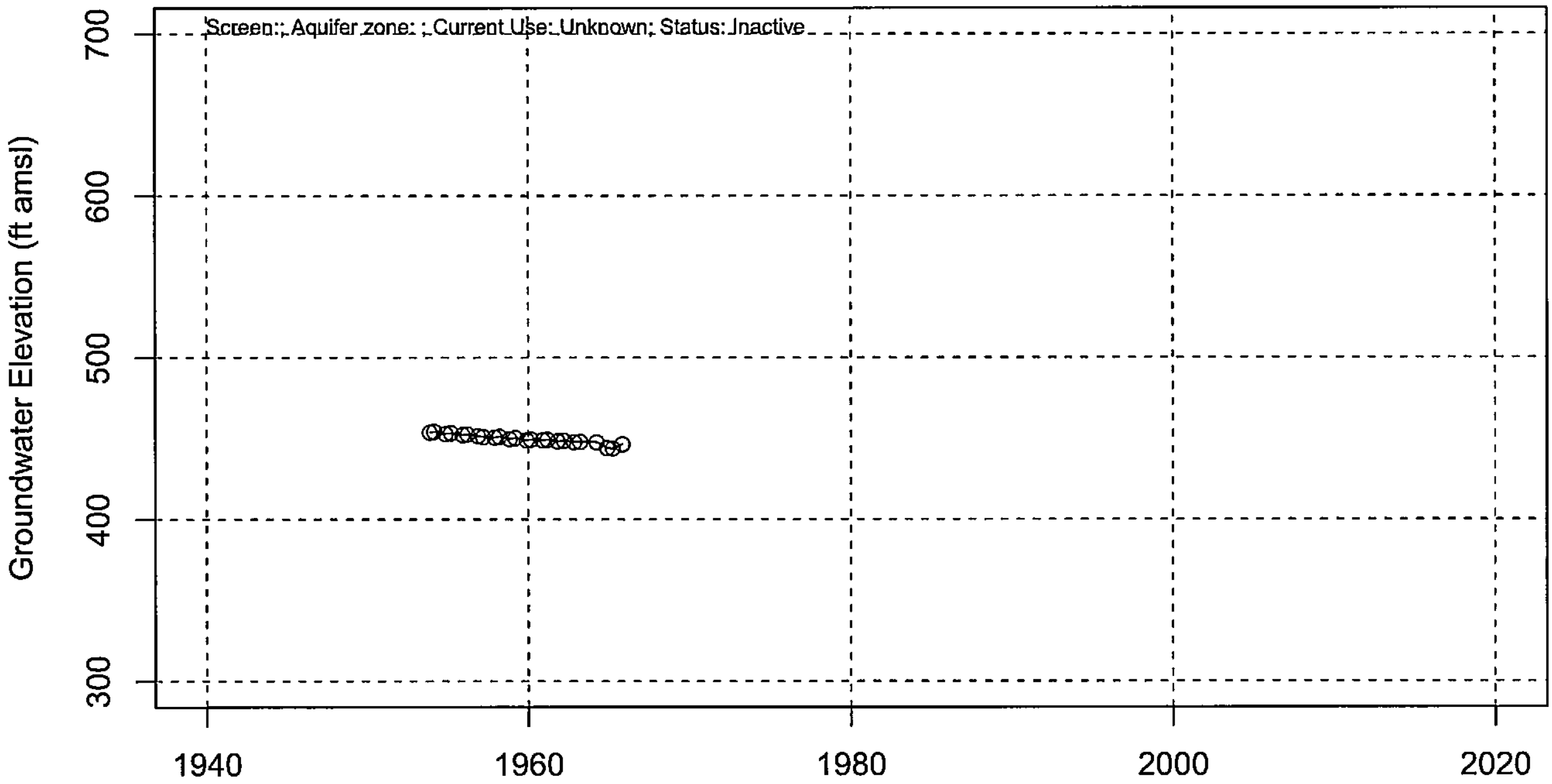
011S006E34A001S



Local ID: Army Well ; Number of Measuring Agenc(y/ies): 4

January 2020

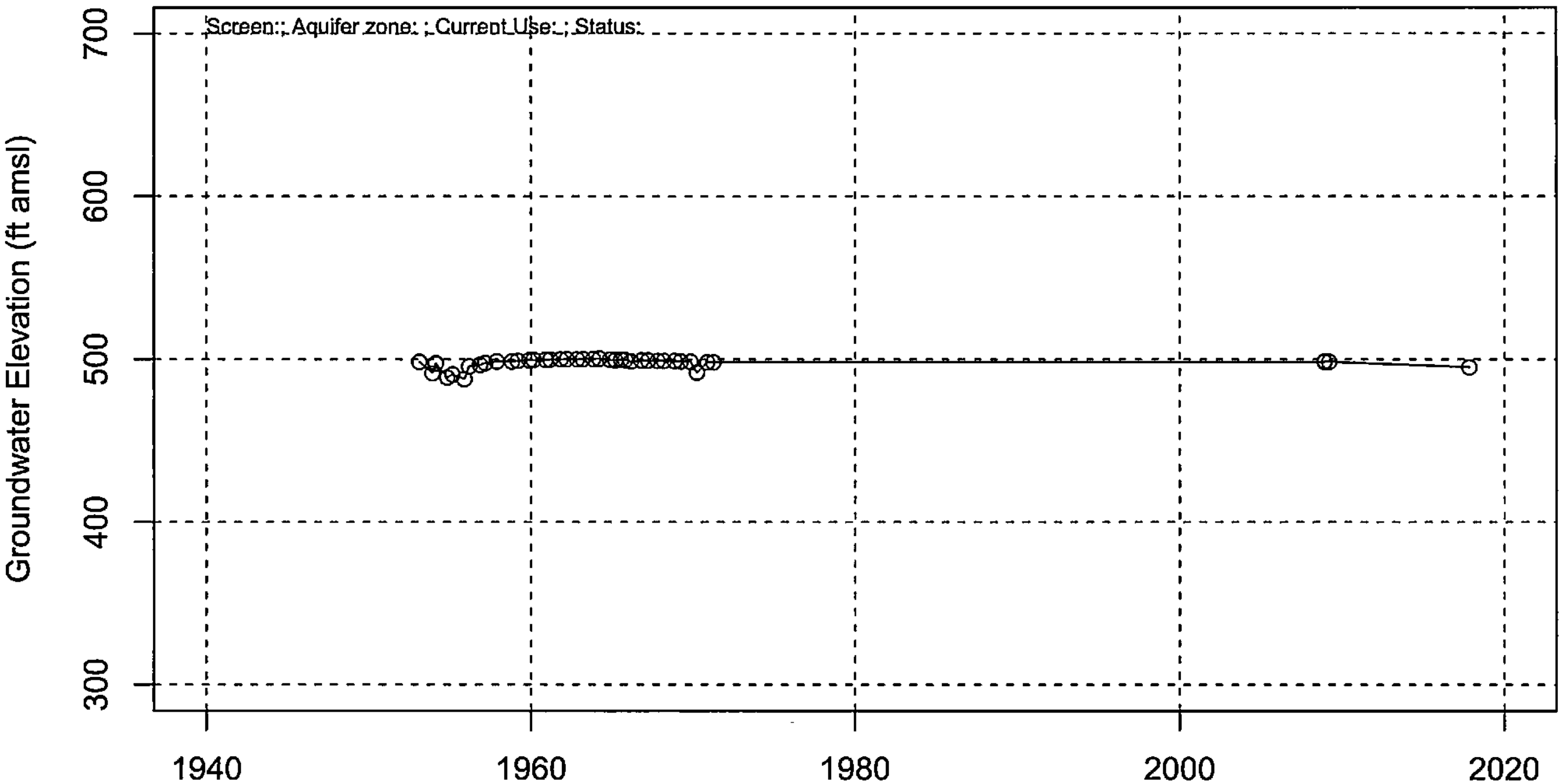
011S007E07N001S



Local ID: Sink – 7N1 ; Number of Measuring Agenc(y/ies): 3

January 2020

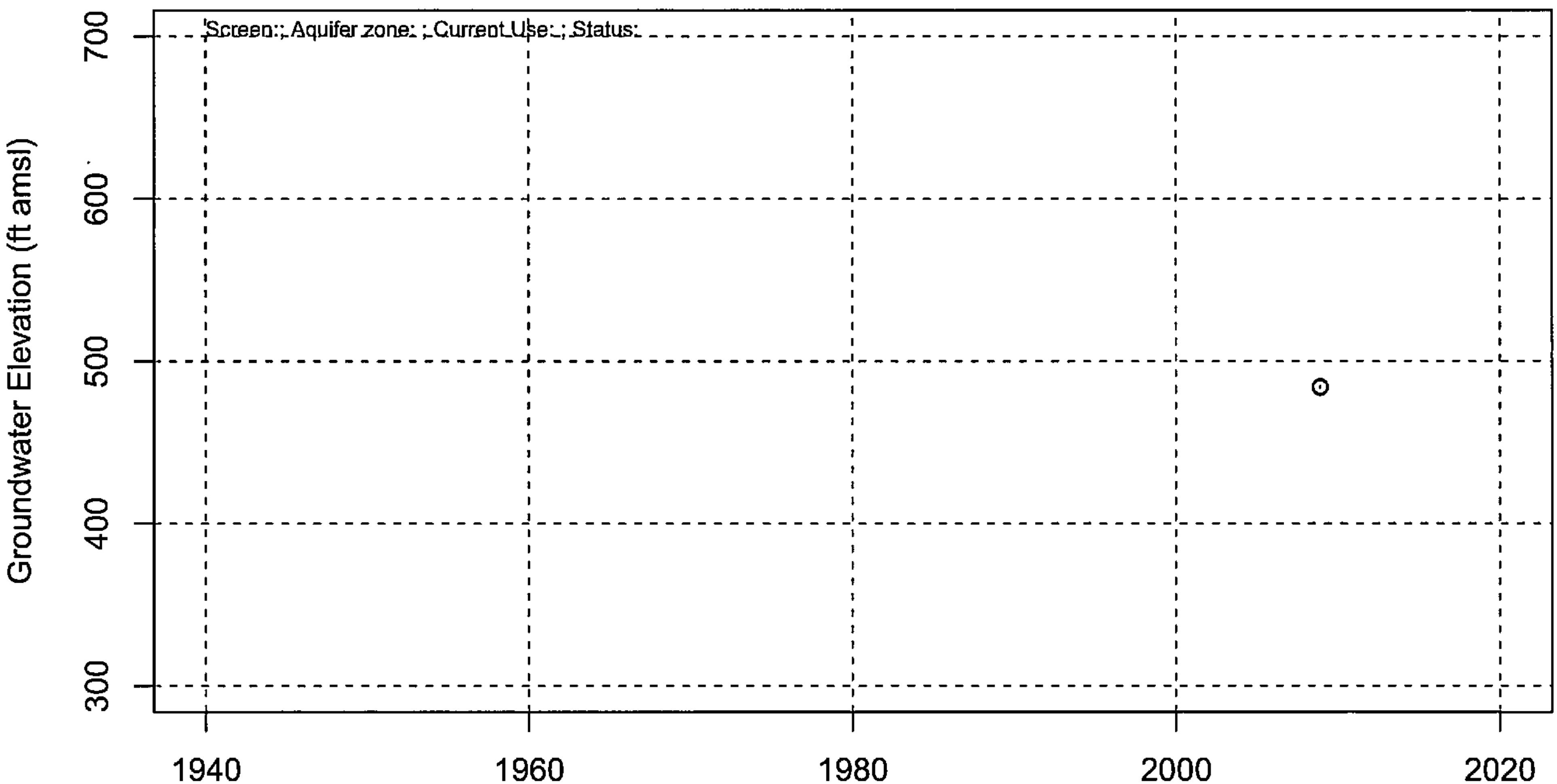
011S007E20P001S



Local ID: Bing Crosby Well (Sky Ranch) ; Number of Measuring Agenc(y/ies): 5

January 2020

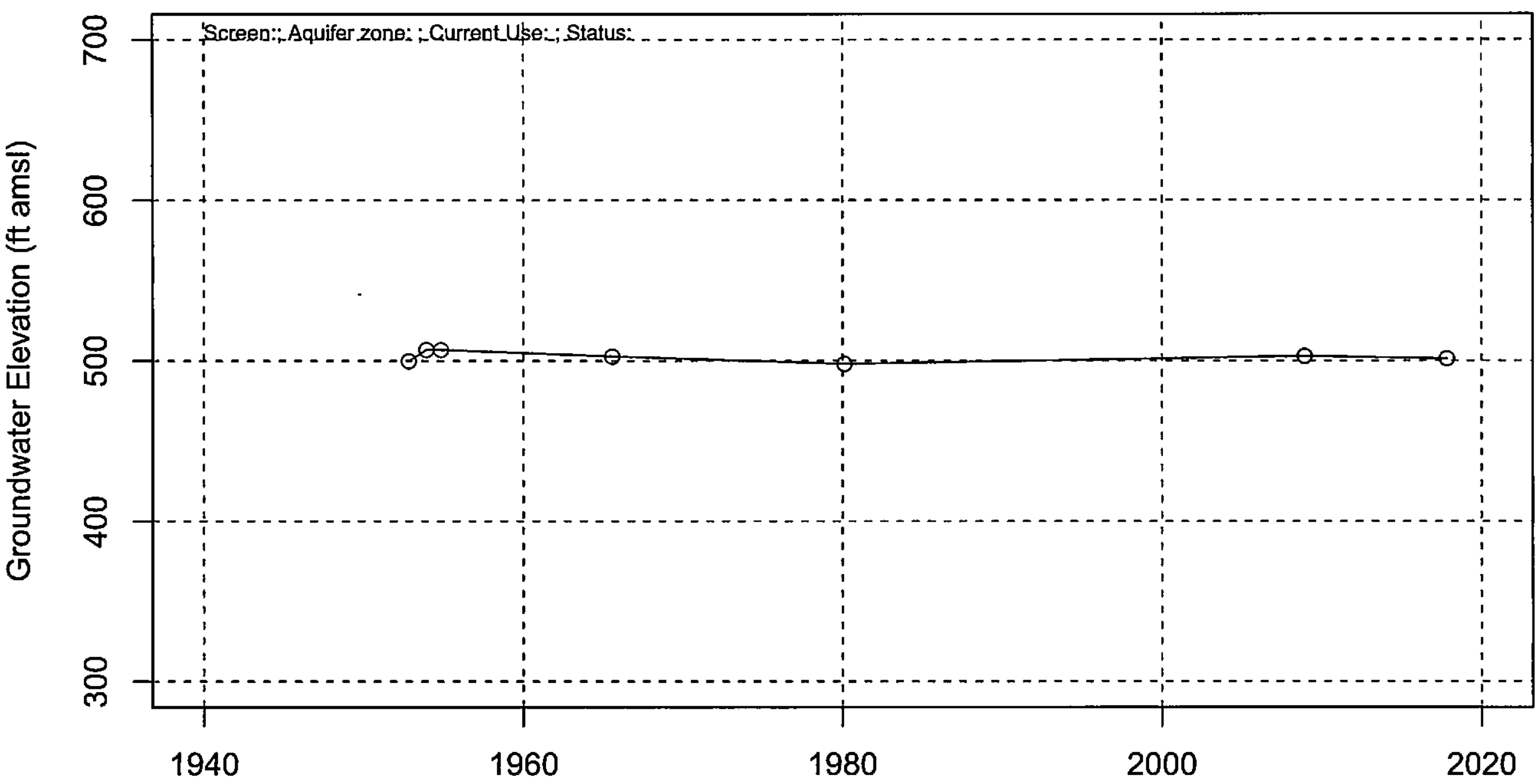
011S007E30G004S



Local ID: Sky Ranch ; Number of Measuring Agenc(y/ies): 2

January 2020

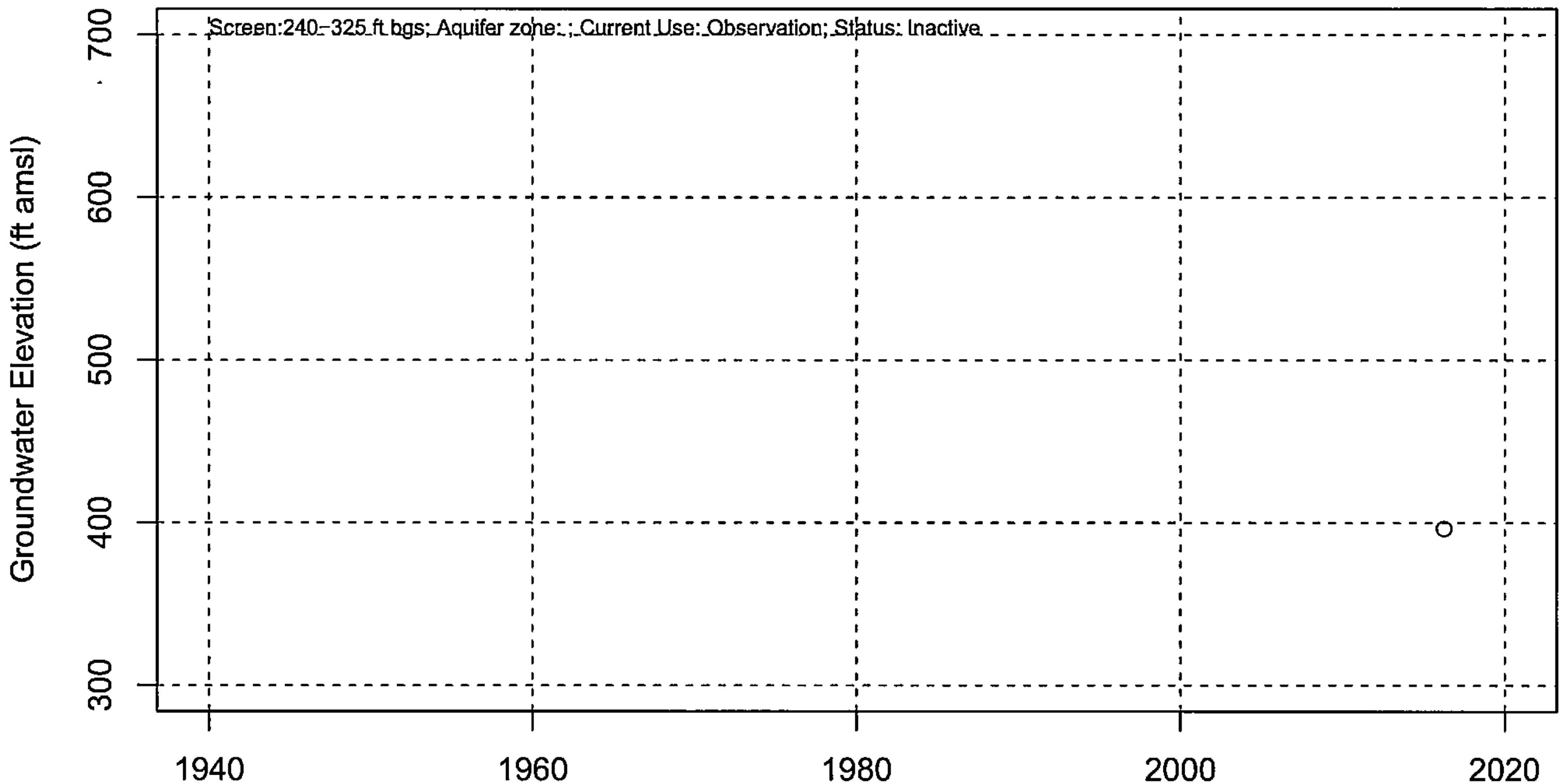
011S007E32Q001S



Local ID: Hayden (32Q1) ; Number of Measuring Agenc(y/ies): 3

January 2020

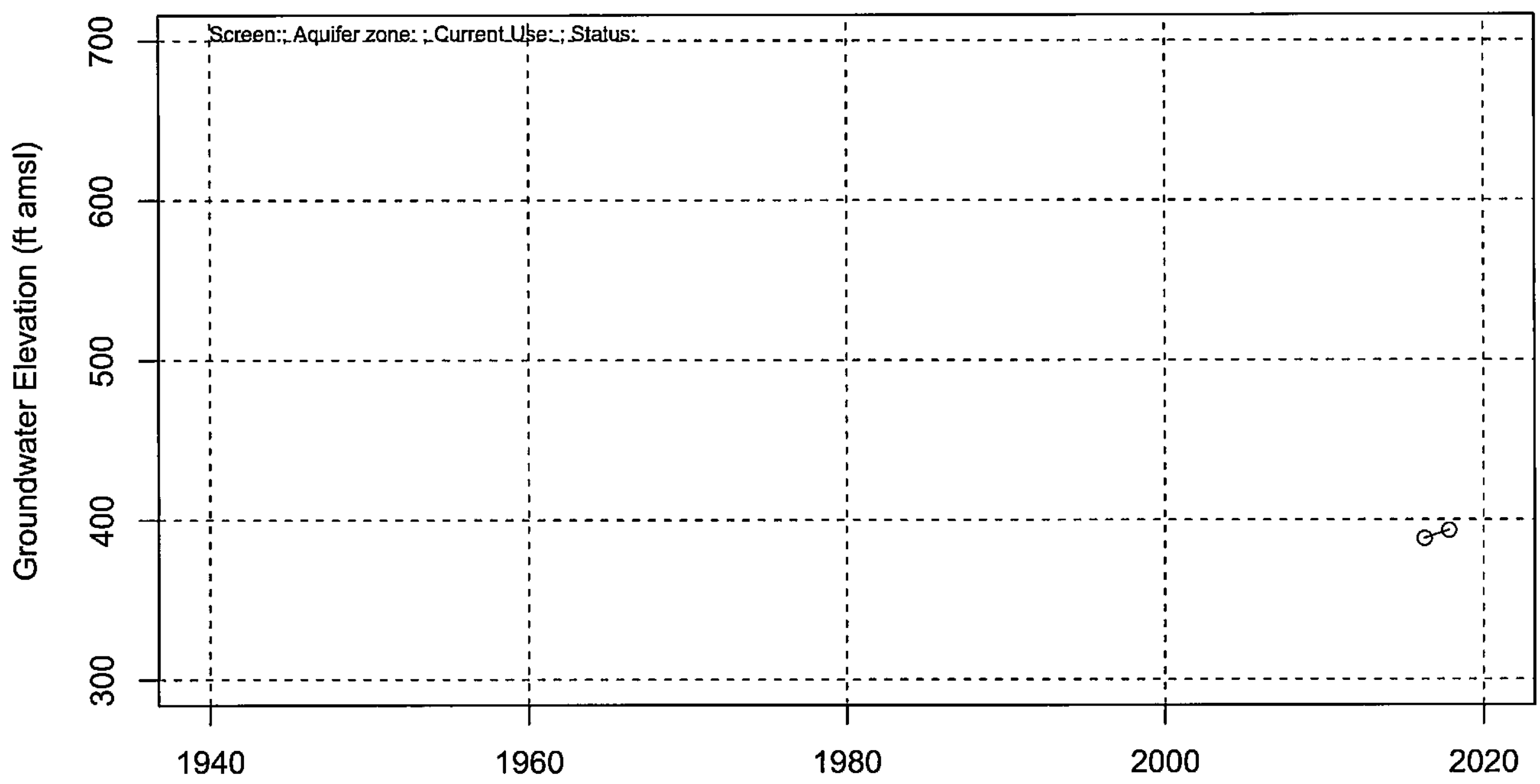
011S006E07Q003S



Local ID: ID4−2 ; Number of Measuring Agenc(y/ies): 1

January 2020

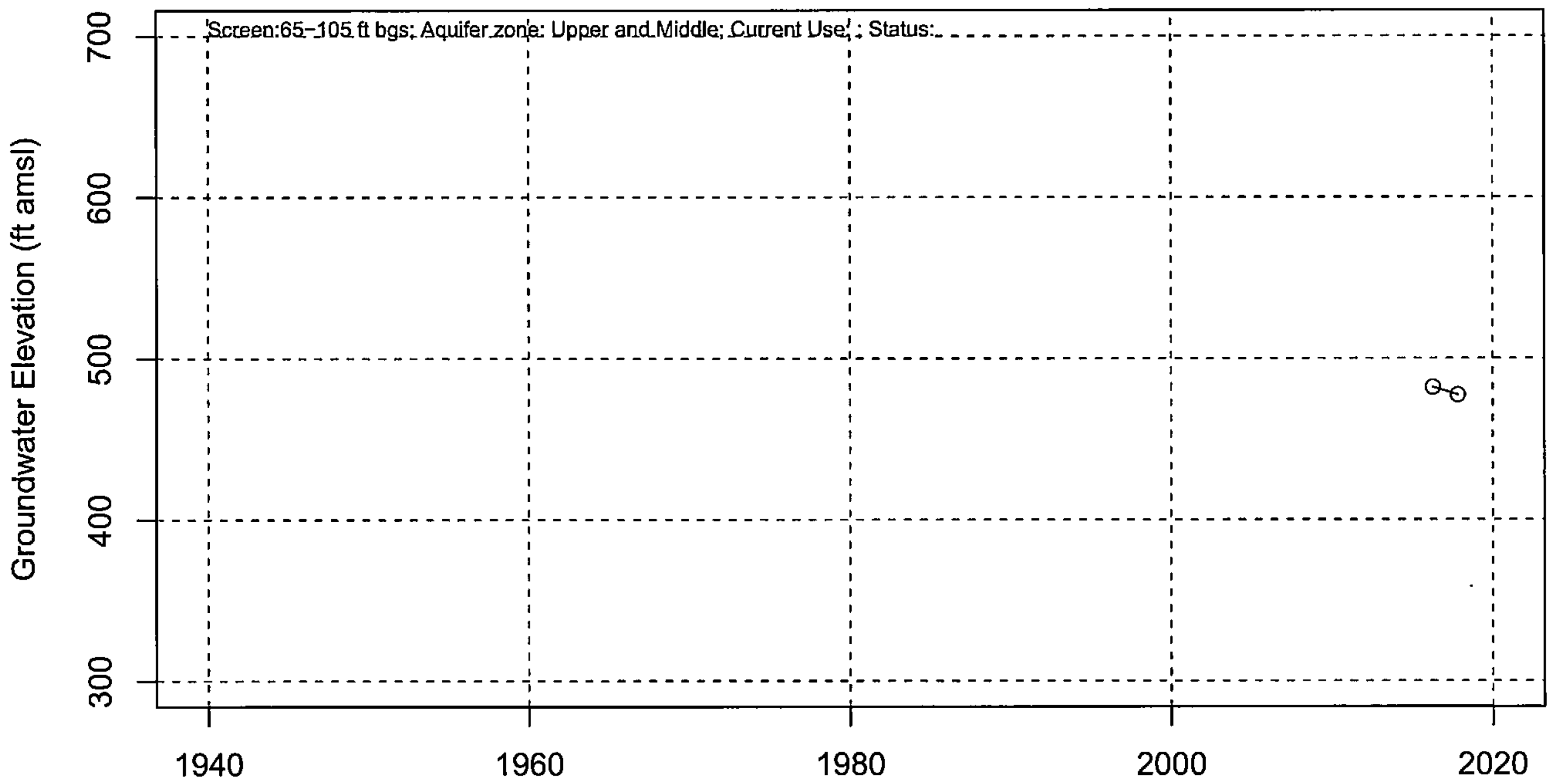
011S006E22E001S



Local ID: Anzio/Yaqui Pass ; Number of Measuring Agenc(y/ies): 2

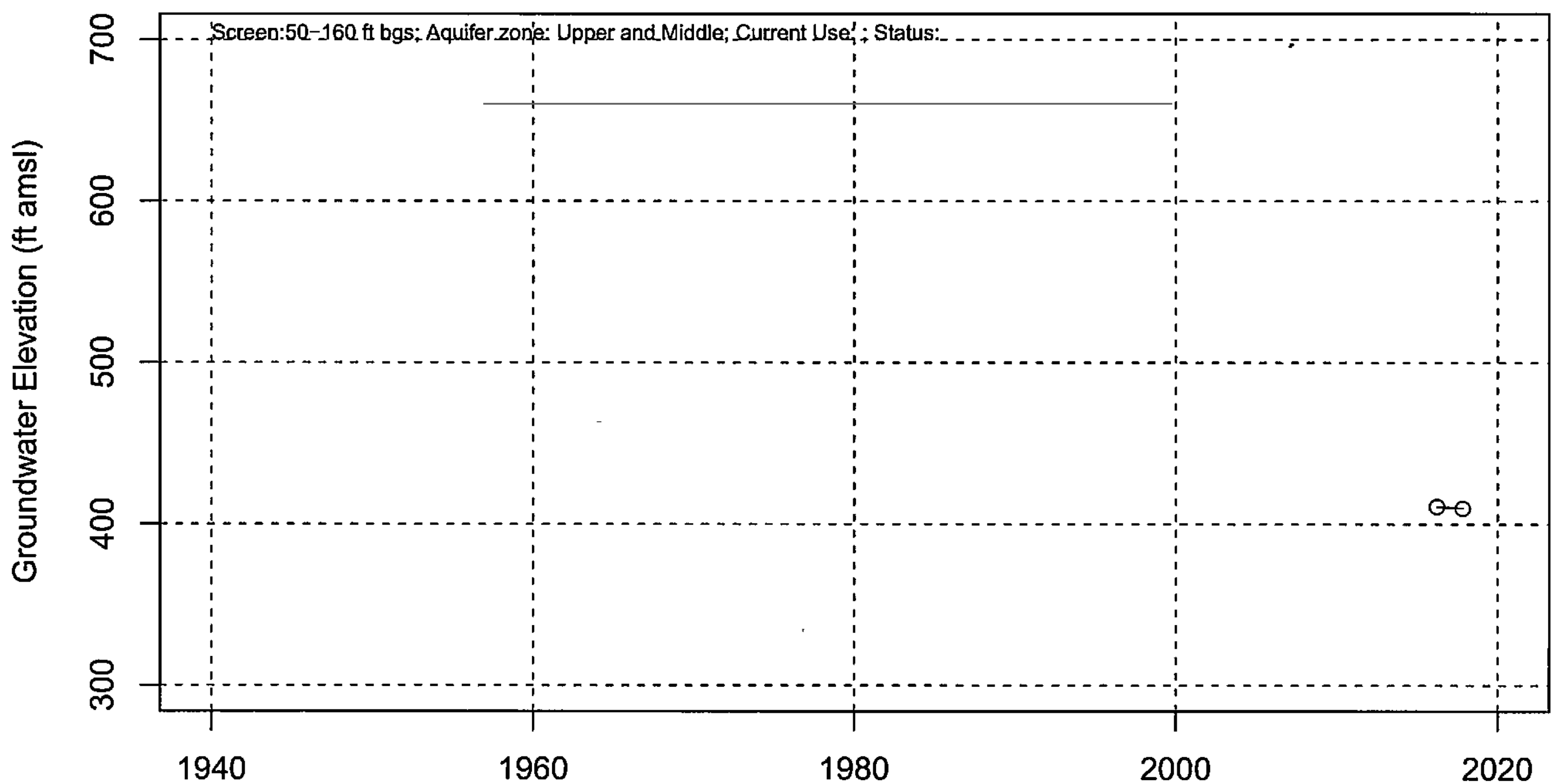
January 2020

011S006E23H001S



Local ID: WWTP−1 ; Number of Measuring Agenc(y/ies): 2

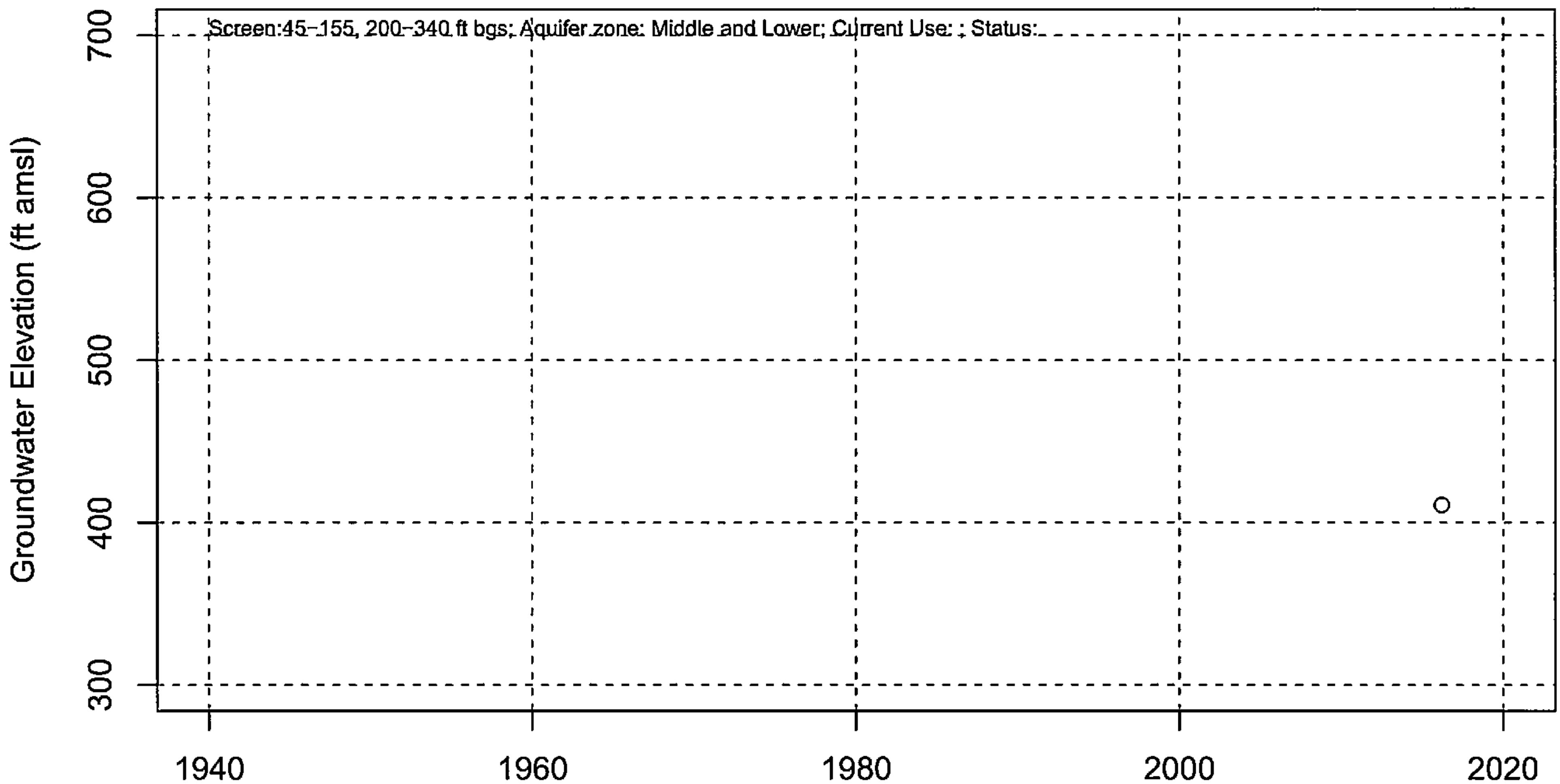
011S007E07R001S



Local ID: MW−5A (East−Lower) ; Number of Measuring Agenc(y/ies): 2

January 2020

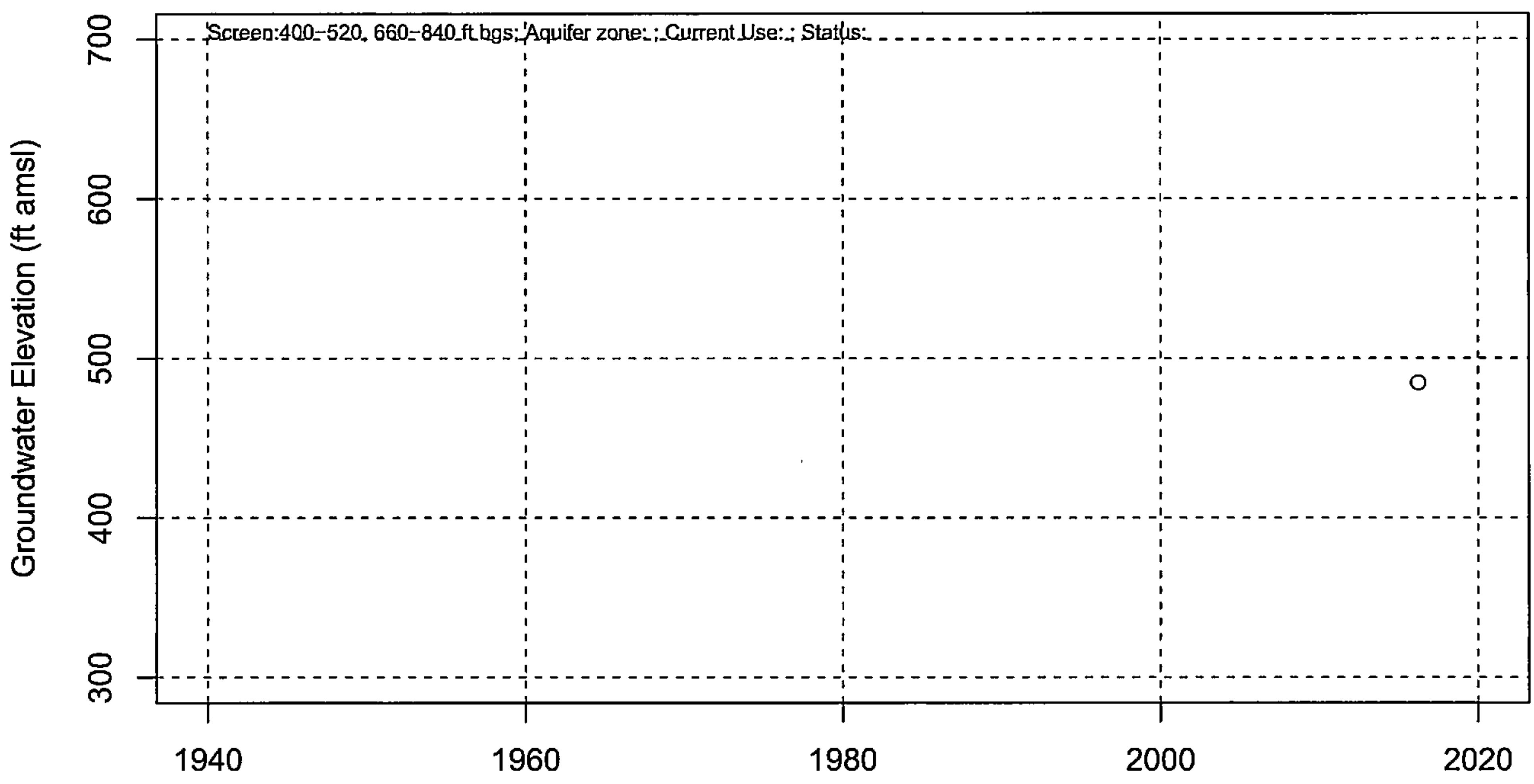
011S007E07R002S



Local ID: MW−5B (West−Upper) ; Number of Measuring Agenc(y/ies): 1

January 2020

012S007E03L001S



Local ID: Nel Well (Dr Peter Nels) ; Number of Measuring Agenc(y/ies): 1

January 2020

APPENDIX D4

Borrego Springs Subbasin Groundwater Dependent Ecosytems

605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760 942 5147 F 760 632 0164

DRAFT FINAL TECHNICAL MEMORANDUM

To:	Jim Bennett, Leanne Crow (County of San Diego)
From:	Trey Driscoll, PG, CHG; Dylan Duvergé, PG
Subject:	Borrego Springs Groundwater Subbasin Potential Groundwater Dependent Ecosystems
Date:	February 28, 2019 (Revised July 24, 2019; Finalized August 21, 2019)
cc:	Geoff Poole, Lyle Brecht, David Duncan (Borrego Water District)
Attachment(s):	Figures 1–22, Attachments 1–2

The Sustainable Groundwater Management Act (SGMA) requires that all beneficial uses and users of groundwater, including environmental users of groundwater (Groundwater Dependent Ecosystems [GDEs]), be considered in Groundwater Sustainability Plans (GSPs) (California Water Code [CWC] Section 10723.2).[1] Each plan shall provide a description of current and historical groundwater conditions in the basin, including data from January 1, 2015, to current conditions, based on the best available information that includes: identification of groundwater dependent ecosystems within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information (Title 23 CCR Section 354.16[g]).[2] This memorandum has been prepared to comprehensively evaluate the status of mapped GDEs within the Borrego Springs Groundwater Subbasin (Subbasin).

1 Defining Interconnected Surface Waters and GDEs

The emergency regulations for the evaluation of GSPs adopted by the California Department of Water Resources (DWR) define interconnected surface waters as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted" (Title 23 CCR Section 351[o]). The definition of an interconnected surface water specifies that a surface water need only be hydrologically connected *at any point* to a groundwater source. The perennial portions of mapped creeks in the Subbasin may be considered as interconnected surface waters because at least a portion of their flow is from groundwater springs and/or seepage from the fractured rock aquifer occurring outside the Plan Area. However, changing conditions within the Subbasin, including declining groundwater levels from pumping, does not have a substantial effect on groundwater within the fractured rock aquifer. This is because fractured rock aquifers operate very differently from alluvial aquifers, and because springs/seeps derive their flow from deep percolation of rainfall through bedrock fractures at higher elevations outside the Plan Area. Not only is the Subbasin's groundwater level elevation hundreds of feet lower than the springs/seeps that contribute to stream flow, but activities within the

1 SGMA is codified in California Water Code (CWC), Part 2.75 (Sustainable Groundwater Management), Section 10720–10737.8, et al.

2 GSP Regulations refers to the emergency regulations adopted by DWR as California Code of Regulations (CCR), Title 23 (Waters), Division 2 (Department of Water Resources), Chapter 1.5 (Groundwater Management), Section 350 et seq. Title 23 CCR Section 353.2(B) states, "The Department [DWR] shall provide information, to the extent available, to assist Agencies in the preparation and implementation of Plans, which shall be posted on the Department's website."

Subbasin have no effect on the amount or frequency of recharge received in the mountains. Therefore, aquifer depletion and/or declining groundwater levels within the Subbasin has no effect on the occurrence, volume or frequency of flow within the interconnected portions of Coyote Creek, Borrego Palm Creek, and other creeks that enter the fringes of the Subbasin.

GDEs are defined under SGMA's implementing regulations as "ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" (Title 23 CCR Section 351[m]). GDEs encompass a wide range of natural communities, such as seeps and springs, wetlands and lakes, terrestrial vegetation and, rivers, streams, and estuaries. Within the boundaries of the Plan Area, groundwater does not emerge from the Subbasin's aquifer, and groundwater does not occur near the ground surface:

- **Seeps and Springs:** There are no seeps or springs within the boundaries of the Subbasin. The only springs mapped in public databases that are within the Subbasin are Old Borrego Spring and Pup Fish Pond Spring. Old Borrego Spring dried up sometime before 1963, and the artificial Pup Fish Pond Spring (in addition to the pupfish pond near the Palm Canyon Trailhead in Borrego Palm Canyon Campground) is not a spring, but is a pond sustained by the Anza-Borrego Desert State Park (ABDSP) public water system.
- **Depth to Groundwater:** The shallowest groundwater recorded throughout the Subbasin occurs at the Rams Hill Wastewater Treatment Facility (WWTF) monitoring well (SWID No. 011S006E23H001S) in the northern part of the South Management Area. In this location, the groundwater table was recorded to be 26 feet below ground surface (bgs) in Fall 2018, where discharge of treated effluent into evaporation-percolation ponds causes localized mounding of groundwater. Aside from this location, the shallowest groundwater is recorded at MW-5B, located east-northeast of the Borrego Sink. In this location, the groundwater table was 55 feet bgs in Fall 2018. In locations where creeks, such as Coyote Creek and Borrego Palm Creek, enter the Subbasin on its northern and eastern margins, the shallowest groundwater level recorded from available monitoring wells (State Well ID Nos. 009S006E31E003SI and 010S005E25R002S) is in excess of 285 feet bgs. The depth to groundwater from the available wells closest to Tubb Canyon (ID4-2 and ID4-10) and Henderson Canyon (ID4-3 and ID4-18) is in the range of 315 to 433 feet bgs. In Fall 2018, groundwater levels within the Subbasin were on average 181 feet bgs, with a range between 26 and 433 feet bgs.

Although pumping within the Subbasin has no effect on the interconnected portions of streams outside the Plan Area, and groundwater neither emerges from the Subbasin's aquifer nor occurs near the ground surface, desert phreatophytes[3] (e.g., honey mesquite) have deep taproots specially adapted to access groundwater that does not exist near the ground surface. The Nature Conservancy (TNC) defines a GDE as "plants, animals, and natural communities that rely on groundwater to sustain all or a portion of their water needs" (TNC 2018). This definition of a GDE is broader and more inclusive than the definition under SGMA regulations. For this reason, and because SGMA also requires that stakeholder concerns be addressed and the unique characteristics of each basin be recognized, the GSA has not eliminated from consideration potential GDEs in the Subbasin based solely on lack of groundwater emerging from the aquifer and the high depth to groundwater. The presence of perennial surface waters and the accompanying ecological communities in the arid desert basin is unique, ecologically important, and the source of considerable draw to the region. The economy within the Subbasin relies heavily on recreational opportunities and tourism in the Plan Area, with the ABDSP attracting hundreds of thousands of visitors per year.

---

3 Phreatophytes are long-rooted water loving plants that obtain water supply from groundwater or the capillary fringe just above the water table.

Accordingly, this memorandum evaluates the occurrence and historical trends in potential GDEs, using the best available science, to support development of the GSP.

2 Identifying Potential Groundwater Dependent Ecosystems

The Natural Communities Commonly Associated with Groundwater (NCCAG) dataset is provided by the Department of Water Resources (DWR) as a reference dataset and starting point for the identification of GDEs in groundwater basins (DWR 2018). Because the scale of the NCCAG dataset is statewide (i.e., coarse), and consists of a compilation of vegetation and surface hydrology feature (e.g., springs) mapping, it does not incorporate local, basin-specific groundwater conditions such as aquifer characteristics or current data on depth to groundwater. Therefore, the dataset is most appropriately used as an indicator of where GDEs, as defined by SGMA, are more likely to be present. A local, basin-specific analysis is required to verify the degree to which features mapped in the NCCAG dataset depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. Accordingly, features mapped as NCCAG dataset are referred to herein as "potential" GDEs.

The NCCAG dataset and its source data can be reviewed in context of local understanding of surface water hydrology, groundwater conditions, and geology. The NCCAG dataset is comprised of 48 publicly available state and federal agency mapping datasets.[4] After the vegetation, wetland, seeps, and springs data from these 48 datasets were compiled into the NCCAG dataset, data were screened to exclude vegetation and wetland types less likely to be associated with groundwater and retain types commonly associated with groundwater. This initial screening was conducted by DWR, California Department of Fish and Wildlife (CDFW) and the Nature Conservancy (TNC).

Potential GDEs were identified by completing a review of the NCCAG dataset and other pertinent datasets discussed further below. The GSA grouped potential GDEs mapped within the Borrego Springs Groundwater Subbasin (7-024.01; Subbasin) by the NCCAG dataset as follows: 1) GDE Unit 1 – Coyote Creek, 2) GDE Unit 2 – Borrego Palm Creek, and 3) GDE Unit 3 – Honey Mesquite (Borrego Sink) (Figure 1). In addition, the GSA grouped potential GDEs mapped outside of these three zones as "other" potential GDEs, which consist of areas are primarily located along the eastern flanks of the mountainous terrain that abuts the Subbasin to the west.

Watersheds contributing to the Subbasin were delineated using the U.S. Geological Survey's (USGS) StreamStats application (USGS 2017) (Figure 2). The watersheds were delineated from the point of intersection of major drainages with the downstream edge of the Subbasin boundary. A total of 10 watersheds were delineated to complete a detailed review of the NCCAG dataset, along with additional dataset comprised of County of San Diego vegetation communities associated with primarily riparian habitat; USGS's National Hydrography Dataset flow lines; perennial creeks, streams and springs mapped by the Anza-Borrego Desert State Park (ABDSP); springs identified

4 NCCAG dataset includes, but is not limited to, the following: VegCAMP – The Vegetation Classification and Mapping Program, California Department of Fish and Wildlife (CDFW); CALVEG – Classification and Assessment with Landsat Of Visible Ecological Groupings, USDA Forest Service; NWI V 2.0 – National Wetlands Inventory (Version 2.0), United States Fish and Wildlife Service; FVEG – California Department of Forestry and Fire Protection, Fire and Resources Assessment Program (CALFIRE FRAP); United States Geologic Survey (USGS) National Hydrography Dataset (NHD); and Mojave Desert Springs and Waterholes (Mojave Desert Spring Survey). NCCAG dataset viewer is available online at: https://gis.water.ca.gov/app/NCDatasetViewer/

on USGS quadrangle maps; land use data; and satellite color-infrared photography (Figure 3 through Figure 12).[5] Potential GDEs mapped within the contributing watersheds include, but are not limited to, Coyote Creek, Henderson Canyon, Borrego Palm Creek, Hellhole Palms Canyon, Culp Canyon, Tubb Canyon, San Felipe Creek, and other minor or unnamed stream segments entering the Subbasin (Figures 3 through Figure 12).

As the GSP is focused on the Subbasin, the potential GDEs should either be located within the Subbasin boundary or be sufficiently approximate to the boundary that there is a reasonable potential for a substantial nexus to exist between the Subbasin's regional groundwater levels and the potential GDEs.

2.1 Primary Potential GDEs

The three primary potential GDEs areas are discussed in the following subsections. These GDE "Units" were identified based on the presence of NCCAG mapped within the Subbasin boundary and their overlap/proximity to perennial segments of major streams that enter the Subbasin, namely Coyote Creek and Borrego Palm Creek.

Other potential GDEs identified in Figure 3 through Figure 12 include Henderson Canyon, Hellhole Canyon, Culp Canyon, Tubb Canyon, and other minor or unnamed stream segments entering the Subbasin. These areas were not selected for detailed evaluation because the potential GDEs mapped in these areas are edge cases confined to the outer fringes of the Subbasin boundary; their geographic confinement to the mountain front at the end of large watersheds indicates that the vegetation communities are supported by surface water flows originating outside the Subbasin (which are storm fed and/or spring-fed). These contributing watershed and fringe areas are described in Section 2.2. Table 1 provides information on the dominant plant species within each GDE unit, global estimates of their maximum rooting depths, and the area in acres mapped for each.

Table 1. Potential Groundwater Dependent Ecosystems within the Subbasin

GDE Unit	Dominant Species		Global Estimate of Maximum Rooting Depth	Area
	Common Name	Scientific Name	(Feet)	(Acres)
GDE Unit 1 (Coyote Creek)	Catclaw Acacia	*Acacia greggii*	18.0	3.5
	Desert Willow	*Chilopsis linearis*	5.2	3.5
	Honey Mesquite	*Prosopis glandulosa*	6.9–65.6	0.5
	Narrowleaf Willow	*Salix exigua*	–	1.3
	Tamarisk[1]	*Tamarix spp.*	32.8–65.6	0.4
			Subtotal	9.2
GDE Unit 2 (Borrego Palm Canyon/Creek)	California Fan Palm	*Acacia greggii*	18.0	0.4
	Catclaw Acacia	*Chilopsis linearis*	5.2	6.5
	Desert Willow	*Washingtonia filifera*	–	0.3
			Subtotal	7.1

5 The mapped location of springs was developed from multiple datasets including the ABDSP (2017), Water Quality Control Plan for the Colorado River Basin (Basin Plan) and National Hydrography Dataset.

Table 1. Potential Groundwater Dependent Ecosystems within the Subbasin

GDE Unit	Dominant Species		Global Estimate of Maximum Rooting Depth (Feet)	Area (Acres)
	Common Name	Scientific Name		
GDE Unit 3 (Borrego Sink)	Honey Mesquite	*Prosopis glandulosa*	6.9–65.6	13.2
			Subtotal	*13.2*
Other	Catclaw Acacia	*Acacia greggii*	18.0	3.2
	Desert Willow	*Chilopsis linearis*	5.2	1.7
	Tamarisk[1]	*Tamarix spp.*	32.8–65.6	0.1
			Subtotal	*5.0*
			TOTAL	**34.6**

Source: TNC 2018; Fan et al. 2017.
Notes: GDE = groundwater dependent ecosystem.
1 The species of tamarisk is not differentiated, so data provided is for the overall genera.

2.11 Coyote Creek Mapped GDEs (GDE Unit 1)

The NCCAG dataset has mapped both wetlands and vegetation within GDE Unit 1, Coyote Creek (Figures 1 and 3). These communities are narrowly focused within the riparian corridors associated with Coyote Creek. Potential GDE vegetation types mapped in association with Coyote Creek include: Desert Willow, Narrowleaf Willow, Honey Mesquite (*Prosopis glandulosa*), and Catclaw Acacia (drought deciduous [lacks leaves for most of the year]). The ecological conditions in Coyote Canyon have been evaluated by the ABDSP (Ostermann and Boyce 2002). The following information is excerpted from *Ecological Conditions in Coyote Canyon, Anza-Borrego Desert State Park® An Assessment of the Coyote Canyon Public Use Plan*:

> "Riparian vegetation covers approximately 120 acres at Lower Willows, 54 acres at Middle Willows, and 40 acres at Upper Willows" (Figure 3). "The biological importance of Coyote Canyon is largely a function of the perennial surface water and islands of tall-structured wetland vegetation in Lower, Middle and Upper Willows." "Five sensitive habitat or vegetation types occur in Coyote Canyon, including: Desert Fan Palm Oasis Woodland, Mesquite Bosque, Mojave Riparian Forest, Sonoran Cottonwood Willow Riparian Forest, and Sonoran Riparian Woodland. Several of these riparian vegetation associations have been recognized for their rarity and sensitivity by the state of California. Lower and Middle Willows are identified as Significant Natural Areas (SNA) in the California Department of Fish and Game's Natural Diversity Data Base because they contain sensitive Desert Fan Palm Oasis Woodland, Sonoran Riparian Forest, and nesting habitat for least Bell's vireo. Upper Willows contains the same resources but was not designated as an SNA due simply to an oversight (California Department of Parks and Recreation 1995). All riparian habitat in Coyote Canyon is considered wetlands and is protected under the Keene-Nejedly California Wetlands Preservation Act of 1976. There are a variety of vegetation types both within riparian areas, and canyon wide. The tall-statured willow-dominated vegetation in Coyote Canyon is largely dominated by red willow (*Salix laevigata*), accompanied by arroyo

willow (*Salix lasiolepis*), cottonwood (*Populus fremontii*), desert fan palm (*Washingtonia filifera*), and desert grape (*Vitis girdiana*). Perennial shrub species such as mulefat (*Baccharis salicifolia*), narrow-leaved willow (*Salix exigua*), and arrow weed (*Pluchea sericea*) are mixed with willow-dominated vegetation. Wetter portions of the wetlands are dominated by annual and perennial herbs such as cattail (*Typha latifolia*), tule (*Scirpus americanus*), and scratchgrass (*Muhlenbergia asperifolia*) (California Department of Parks and Recreation 2002). The boundary between wetland and upland habitats in Coyote Canyon is typically defined by stands of honey [mesquite] (*Prosopis glandulosa*) and screw-bean (*P. pubescens*) mesquite (California Department of Parks and Recreation 2002). These species have deep rooting systems and are able to better access subsurface moisture. Higher areas within the floodplain support sparse shrublands of low-statured drought-deciduous species such as alkali goldenbush (*Isocoma acradenia*), broom lotus (*Lotus rigidus*), and desert baccharis (*Baccharis sergiloides*) (California Department of Parks and Recreation 2002). It is the diversity and spatial arrangement of vegetation associations (i.e., wetland vegetation, mesquite bosque, dry wash vegetation, creosote bush scrub) in the Canyon, in combination with perennial surface water, that allow for a dense array of habitats and wildlife species. Vegetation is a key component of riparian habitat. It provides structure and cover for animals, shade which influences water temperature, and plays an important role in nutrient cycling and soil stabilization" (Ostermann and Boyce 2002).

Dominant vegetation types identified in the NCCAG dataset include Catclaw Acacia, Desert Willow, Honey Mesquite, Narrowleaf Willow, and Tamarisk over an area of 9.2 acres.

2.1.2 Borrego Palm Canyon/Creek Mapped GDEs (GDE Unit 2)

The NCCAG dataset has mapped primarily vegetation within GDE Unit 2, Borrego Palm Canyon/Creek (Figures 1 and 6). These communities are narrowly focused within the riparian corridors associated with Palm Creek. Dominant vegetation types mapped in association with Borrego Palm Canyon/Creek include Desert Willow, California Fan Palm, and Catclaw Acacia, and are collectively mapped in the NCCAG dataset over an area of 7.1 acres.

2.1.3 Honey Mesquite (Borrego Sink) Mapped GDEs (GDE Unit 3)

The NCCAG dataset has mapped primarily vegetation within GDE Unit 3, which consists of Mesquite Bosque narrowly focused along the Borrego Sink Wash east of the Borrego Sink (Figures 1 and 13). The dominant vegetation type associated with the Borrego Sink is honey mesquite, which is mapped as having an area of 13.2 acres in the NCCAG dataset. DWR removed a previously large area around and north of the Borrego Sink from the NCCAG dataset because it was determined that the habitat no longer met the criteria for inclusion in the database.

2.2 Contributing Watersheds Potential GDEs

Contributing watersheds along the eastern flanks of the mountainous terrain that abuts the Subbasin to the west were evaluated to identify potential GDEs. Watersheds were delineated from the point of intersection of major drainages with the downstream side of the Subbasin boundary. A total of 10 watersheds, including 28 subwatersheds, were delineated as listed in Table 2 and described in the following subsections.

2.2.1 Coyote Creek Watershed

The Coyote Creek watershed is comprised of two subwatersheds referred to as the Coyote Creek and Coyote Creek South subwatersheds. The area of the Coyote Creek watershed contributing to the Subbasin encompasses approximately 94,506 acres (Figures 1 and 3). The watershed is located almost entirely within the boundary of the ABDSP. Upper portions of the watershed are developed with rural residences in the Terwilliger Valley located in Riverside County. The maximum elevation of the watershed is 8,615 feet above mean sea level (amsl) on the flank of Toro Peak in the Santa Rosa Mountains that reaches a maximum 8,716 feet amsl at the peak. The minimum elevation of the watershed is approximately 1,200 feet at the Lower Willows. The Coyote Creek watershed is discussed further in Sections 3 and 6.

Table 2. Contributing Watersheds Area and Elevation

Contributing Watershed	Subwatershed	Area (Acres)	Total Area (Acres)[a]	Elevation (Feet, amsl)	
				Maximum	Minimum
Coyote Creek	Coyote Creek	92,722	94,506	8,615	1,200
	Coyote Creek South	1,784			
Horse Camp	North	556	1,931	3,700	940
	Middle North	569			
	Middle South	677			
	South	129			
Henderson Canyon	North 1	1,599	2,984	4,650	1,163
	North 2	123			
	North 3	209			
	South 1	45			
	South 2	582			
	South 3	426			
Borrego Palm Creek	NA	14,994	14,994	6,404	1,300
Hellhole Canyon	Panoramic Overlook Canyon	407	6,667	6,142	962
	North Fork	504			
	Middle Fork	1,535			
	South Fork	4,221			
Dry and Culp Canyons	Dry Canyon	1,009	6,140	4,491	956
	Culp Canyon	5,131			
Tubb Canyon	Tubb Canyon	2,396	3,095	4,520	920
	Road North	265			
	Road Middle	190			
	Road South	244			
Glorietta Canyon	Glorietta Canyon	1,852	2,595	4,589	1,250
	South Fork	743			
Yaqui Ridge	North 1	1,042	2,903	3,864	1,252
	North 2	47			
	North 3	979			
	Yaqui Pass	581			
	Yaqui Ridge	110			
	Cactus Valley	144			

Table 2. Contributing Watersheds Area and Elevation

Contributing Watershed	Subwatershed	Area (Acres)	Total Area (Acres)[a]	Elevation (Feet, amsl)	
				Maximum	Minimum
San Felipe Creek	NA	117,339	117,339	5,719	992

Source: Watersheds delineated using StreamStats, USGS 2017.
Notes: amsl = above mean sea level; NA = not applicable.
[a] Total area of the contributing watersheds does not include areas within the Subbasin.

2.2.2 Horse Camp Watershed

The Horse Camp watershed is comprised of four subwatersheds referred to as the North, Middle North, Middle South and South subwatersheds (Figure 4). In total, the Horse Camp Watershed area is 1,931 acres. The Horse Camp subwatersheds are characterized by narrow canyons that drain the eastern foothills of the San Ysidro Mountains. The maximum elevation of the watershed is 3,700 feet amsl attained in the Middle South subwatershed and the minimum elevation is about 940 feet amsl in the South subwatershed. The NCCAG dataset indicates no mapped vegetation, wetlands or springs in the watershed. An isolated pocket of mapped vegetation is noted where the Horse Camp drainages converge in a wash on the edge of the valley. These potential GDEs are edge cases mapped in areas confined to the outer fringes of the Subbasin boundary; their geographic confinement to the mountain front indicates that the vegetation communities are supported by surface water flows originating outside the Subbasin and not sustained by the regional groundwater table.

2.2.3 Henderson Canyon Watershed

The Henderson Canyon watershed is comprised of six subwatersheds referred to as the North 1, North 2, North 3, South 1, South 2, and South 3 subwatersheds (Figure 5). The total Henderson Canyon watershed area is 2,984 acres. The maximum elevation of the watershed is 4,650 feet amsl attained in the North 1 subwatershed and the minimum elevation is about 1,163 feet amsl in the North Fork subwatershed. No springs are mapped in the watershed. Potential GDEs vegetation is mapped by the NCCAG dataset in the North 2 and South 2 subwatersheds. The mapped vegetation occurs along narrow corridors associated with ephemeral drainages. Mapped vegetation occurs in the Subbasin at the upper portion of the alluvial fans that originate from the watersheds. These potential GDEs are edge cases mapped in areas confined to the outer fringes of the Subbasin boundary; their geographic confinement to the mountain front indicates that the vegetation communities are supported by surface water flows originating outside the Subbasin and not sustained by the regional groundwater table.

2.2.4 Borrego Palm Creek Watershed

Borrego Palm Creek watershed encompasses approximately 14,994 acres (Figures 1 and 6). The watershed is located almost entirely within the boundary of the ABDSP. The watershed rises to a maximum elevation of 6,404 feet amsl near Hot Springs Mountain, the highest peak in San Diego County at an elevation of 6,535 feet amsl. The minimum elevation of the watershed in 1,300 feet amsl at the First Palm Grove. The Borrego Palm Creek Watershed is discussed further in Sections 3 and 6.

2.2.5 Hellhole Canyon Watershed

The Hellhole Canyon watershed is comprised of four subwatersheds referred to as the Panoramic Overlook Canyon, North Fork, Middle Fork, and South Fork subwatersheds (Figure 7). The total Hellhole Canyon watershed area is 6,667 acres. The maximum elevation of the watershed is 6,142 feet amsl attained in the South Fork subwatershed and the minimum elevation is about 962 feet amsl in the North 3 subwatershed. The Hellhole Canyon subwatersheds discharge through narrow canyons to the Subbasin where the constricted canyons broaden onto an alluvial fan. Vegetation on the alluvial fan is sparse compared to the dense vegetation in the South Fork subwatershed. The County vegetation layer maps a narrow corridor of riparian habitat in the South Fork. Satellite-color infrared photography reveals vegetation along additional drainage segments of the South Fork and lesser vegetation in the Middle Fork. One spring is mapped in the Middle Fork subwatershed. Four springs are mapped in the South Fork. None of the springs or GDEs identified within the watershed occur within the Subbasin.

2.2.6 Dry Canyon and Culp Canyon Watersheds

The Dry Canyon and Culp Canyon watersheds are comprised of two watersheds (Figure 8). The total Dry Canyon and Culp Canyon watersheds area is 6,140 acres. Dry Canyon is intersected by Montezuma Valley Road in the middle to lower part of the watershed. Dry Canyon is sparsely vegetated with no mapped potential GDEs or springs. Culp Canyon extends to a much higher elevation reaching 4,591 feet amsl where it abuts the community of Ranchita. Much of the watershed is located above 3,000 feet amsl where 14 springs are mapped. No vegetation is mapped in the area of the springs; however, review of aerial photography reveals narrow corridors of vegetation associated with the spring complexes. Where Culp Canyon enters the valley it joins with several canyons, including Tubb Canyon, to form an alluvial fan. The NCCAG dataset maps vegetation on the alluvial fan. These potential GDEs are edge cases mapped in areas confined to the outer fringes of the Subbasin boundary; their geographic confinement to the mountain front indicates that the vegetation communities are supported by surface water flows originating outside the Subbasin and not sustained by the regional groundwater table.

2.2.7 Tubb Canyon Watershed

Tubb Canyon is comprised of four subwatersheds referred to as Tubb Canyon, and Tubb Canyon Road North, Middle and South subwatersheds. The total Tubb Canyon watershed area is 3,095 acres. The maximum elevation of the watershed is 4,520 feet amsl and the minimum elevation (i.e., outlet) is about 920 feet amsl. Tubb Canyon watershed discharges through a narrow canyon to the Subbasin where it broadens into an alluvial fan (Figure 9). Three springs are mapped in the watershed and include Big Spring, Middle Spring, and Tubb Canyon Spring (ABDSP 2017). In the vicinity of Big Spring, seepwillow, catclaw, and mesquite have been identified (San Diego Reader 2010). The satellite color-infrared photography indicates green, healthy vegetation as the color red (high reflection of near-infrared wavelengths). In a desert environment, the green healthy vegetation could represent a potential GDE. A narrow band of habitat appears in the Tubb Canyon Creek channel primarily associated with the mapped springs. A band of vegetation is mapped by the NCCAG dataset where Tubb Canyon opens into the Subbasin near Dry and Culp Canyons. As previously discussed for the Dry and Culp Canyon watersheds, this potential GDE is supported by surface water flows originating outside the Subbasin and not sustained by the regional groundwater table.

2.2.8 Glorietta Canyon Watershed

Glorietta Canyon watershed is comprised of two subwatersheds referred to as Glorietta Canyon and South Fork subwatersheds (Figure 10). The total Glorietta Canyon watershed area is approximately 2,595 acres. The maximum elevation of the watershed is 4,589 feet amsl and the minimum elevation (i.e., outlet) is about 1,250 feet amsl. The watershed discharges to the Yaqui Meadows area of the Subbasin. No springs are mapped in the Glorietta Canyon. The satellite color-infrared photography indicates limited vegetation associated with Glorietta Canyon, which agrees with the lack of mapped springs, vegetation, and wetlands. No springs or potential GDEs are mapped in the Subbasin in the vicinity of Glorietta Canyon watershed.

2.2.9 Yaqui Ridge Watershed

The Yaqui Ridge watershed is comprised of six subwatersheds scattered along the ridgeline and referred to as the North 1, North 2, North 3, Yaqui Pass, Yaqui Ridge South and Cactus Valley subwatersheds (Figure 11). The total Yaqui Ridge watershed area is 2,903 acres. The maximum elevation of the watershed is 3,864 feet amsl and the minimum elevation (i.e., outlet) is about 1,252 feet amsl. Yaqui Pass Road crosses the Yaqui Ridge South subwatershed. No vegetation or springs are mapped within the Yaqui Ridge Watershed. Sparse vegetation within the drainage channels is shown on aerial photography. No springs or potential GDEs are mapped in the Subbasin in the vicinity of Yaqui Ridge watershed.

2.2.10 San Felipe Creek Watershed

The San Felipe Creek watershed is comprised of one large watershed of approximately 117,339 acres (Figure 12). The watershed rises to a maximum elevation of 5,719 feet amsl in the Vulcan Mountains north of the town of Julian, and the minimum elevation (i.e., outlet) is about 992 feet amsl. San Felipe Creek enters the valley though a narrow canyon ("narrows") that cuts through Yaqui Ridge. A deeply incised broad wash extends from the narrows to the valley floor and beyond to the Palo-Verde Wash. Borrego Springs Road crosses the broad San Felipe Creek wash at what is known as the "Texas dip." This wash is often the location of periodic and dramatic flash floods. The San Felipe Creek wash forms the southern boundary of the Subbasin. The NCCAG dataset and County vegetation datasets map extensive vegetation in the upper portion of the watershed and in narrow corridors in the lower portions of the watershed. Limited vegetation is also mapped in the wash near where the San Felipe Creek enters the Subbasin. None of the potential GDE habitat identified occurs within the Subbasin.

3 Streamflow

3.1 Coyote Creek

Streamflow in the Coyote Creek watershed has been documented by USGS as the number one source of groundwater recharge to the Subbasin via stream flow leakage (i.e., infiltration of surface water runoff primarily during flood events). An estimated 65% of the surface water inflow to the Borrego Valley comes from Coyote Creek (USGS 1982).

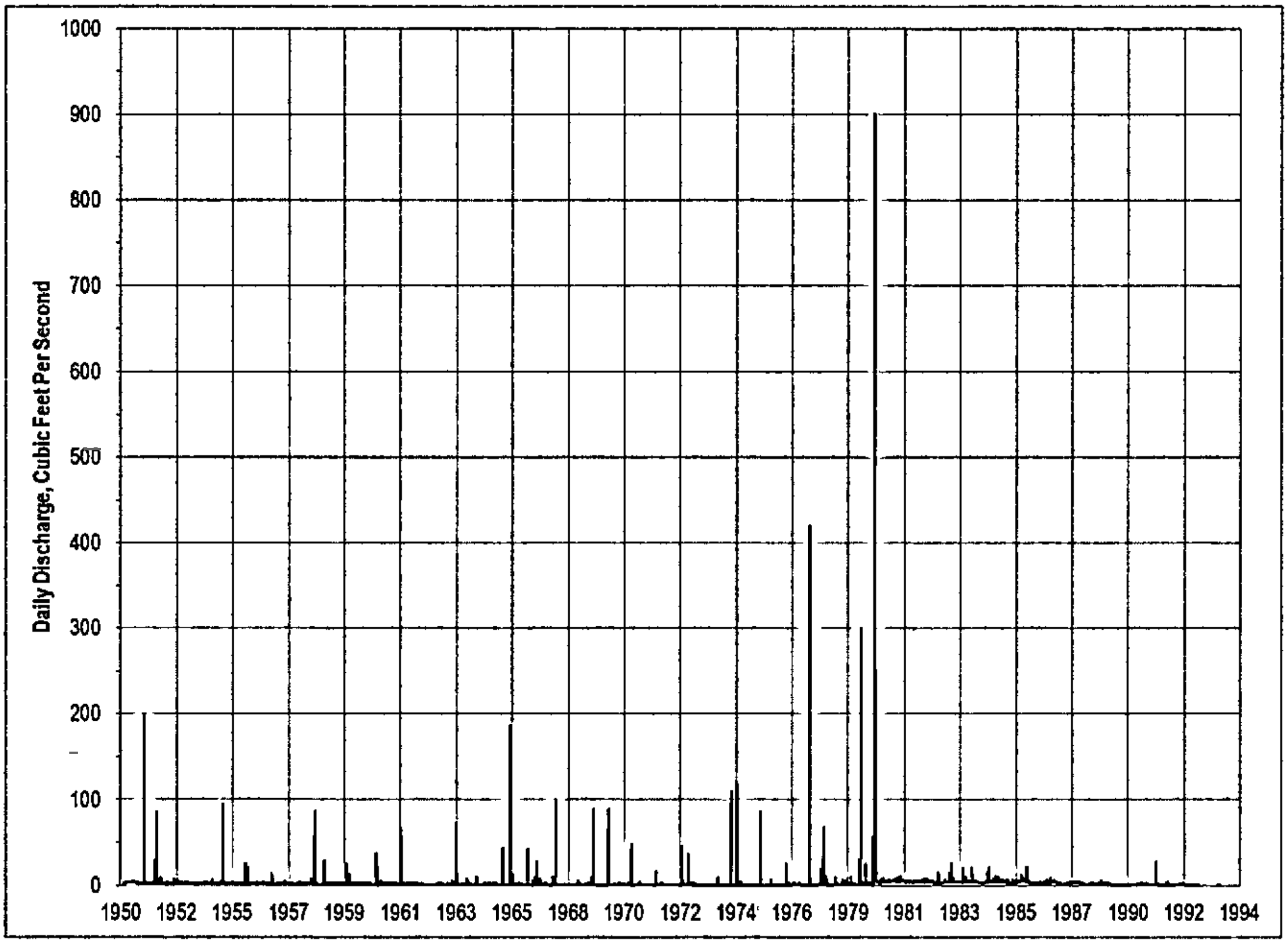
Perennial stream flow in Coyote Creek occurs in the northern most section of the Subbasin. Groundwater daylights at lower elevations in the Collins Valley at the Oasis at Santa Catarina Spring and Lower Willows Spring where the stream is restricted by a narrow hard rock canyon. The restrictive canyon appears to act as a subsurface dam causing groundwater to daylight at the spring and flow into the Subbasin as surface water flow in Coyote Creek. This occurs approximately 1 mile upstream from the Subbasin boundary at an elevation of about 1,300 feet amsl. The spring was first documented in 1774 by members of the Anza Expedition near the site of a large Cahuilla Indian village.[6] "The creek contains three reaches where bedrock forces groundwater to the surface throughout the year, resulting in perennial surface or near-surface water. These areas, referred to as Lower, Middle, and Upper Willows, form three of the most verdant riparian wetlands of the California desert" (Ostermann and Boyce 2002). As the creek flows through the Subbasin, the alluvium becomes deeper and the surface flow either infiltrates into the Subbasin, is consumed by the riparian vegetation through transpiration and/or evaporates. During high rainfall events, flow extends Coyote creek further into the Subbasin for short periods of time.

Historical Stream Flow Measurements

There are two historical streamgages along Coyote Creek located at the northernmost boundary of the Subbasin, one of which stopped recording streamflow in 1983 and the other stopped recording flow in 1993. USGS Station Number 10255800 (Upper–Northern) recorded daily discharge data from 1950–1983; at this station, annual average stream flow was measured to be 1,831 acre-feet per year (USGS 2019). USGS Station Number 10255805 (Lower–Southern) recorded daily discharge data from 1983–1993; at this station, annual average stream flow was measured to be 1,774 acre-feet per year (USGS 2019).

6 Over 85 archeological sites have been recorded along the main creek in the Coyote Canyon, including major villages, food processing centers, rock art, and ceremonial and cremation sites (Ostermann and Boyce 2002).

Exhibit 1. U.S. Geological Survey 10255800 and 10255805 Coyote Creek Stream Flow 1950 to 1993



Source: USGS 2019.
Notes:
Discharge data from 1950 to 1983 was recorded at the upper-northern Coyote Creek USGS gage (10255800), while data from 1983 to 1993 was recorded at the lower-southern gage (10255805).

Annual variability of stream flow over the period measured ranges from 326 acre-feet to 10,715 acre-feet. This large annual variability is a function of large annual variability of precipitation falling on the Coyote Creek watershed. Coyote Creek stream flow is generally correlated with precipitation and spring discharge from Clark Valley. Exhibit 1 shows the combined daily discharge from Coyote Creek USGS streamgages 10255800 and 10255805 for the period from 1950 to 1993.

Manual Stream Flow Measurements

To evaluate the potential GDEs associated with Coyote Creek, the GSA has investigated whether the perennial and ephemeral creek segments are gaining water or losing water to the underlying aquifer system. To complete this analysis, the GSA has commenced mapping the perennial extent of flow in to the Subbasin on a semi-annual basis (spring and fall). The upper historical streamgage is the GSA's manual monitoring point for Coyote Creek. At this location, the GSA manually measured an instantaneous stream flow of 0.46 cubic feet per second (CFS) in Spring 2018, which converts to 206.5 gallons per minute. At that time, the former lower historical USGS streamgage station was observed to be dry.

In Spring 2018, the perennial extent of flow in Coyote Creek was documented to cease downstream of the third-crossing and upstream of the second crossing. No flow was observed in Spring 2018 at the lower inactive USGS streamgage, which is one of the permanent locations for manual flow readings. In Fall 2017, stream flow extended almost half-way from the second crossing to the first crossing. The crossings refer to where an unimproved trail crosses the creek bed, and are shown in Figure 1. In Fall 2017, there was a precipitation event in the Coyote Creek watershed that produced runoff in Coyote Creek; however, no stream flow measurements are available for this event. Flow in the stream was observed to decrease incrementally from the upper inactive USGS streamgage to two locations measured downstream.

"From 1951 to 1992, average daily streamflow in the creek measured at Lower Willows [USGS gages 10255800 and 10255805] was relatively stable and ranged from 0.5 cubic feet per second (cfs) to 4.9 cfs, with the exception of 1980, when the average was 14.8 cfs" (Ostermann and Boyce 2002). The streamflow measurements taken by the GSA at approximately the same location are within the range of historical measurements. The evidence gathered thus far indicates that the reach of Coyote Creek that was mapped as potential GDE by DWR is a "losing" stream, and that this habitat, where it occurs, is supported by intermittent storm events and/or flows emanating from the upland watersheds and basins. The evidence points to a losing stream because despite having a watershed size of 94,506 acres, Coyote Creek loses flow with distance downstream (i.e., within 1–2 miles of its crossing into the Subbasin). Stream flow, or lack thereof, has a clear and immediate relationship with runoff events from precipitation. If groundwater emanating from the Borrego Springs Subbasin were contributing to base flow within Coyote Creek, there would be a less rapid and obvious response to precipitation, and rather than going dry upon entering the Subbasin, flow would be expected to be maintained (or even increase) with distance downstream. Additionally, the depth to the regional groundwater table in the Subbasin in the vicinity of Coyote Creek is hundreds of feet below ground surface (288 feet at State Well ID No. 009S006E31E003SI) and disconnected from surface flows.

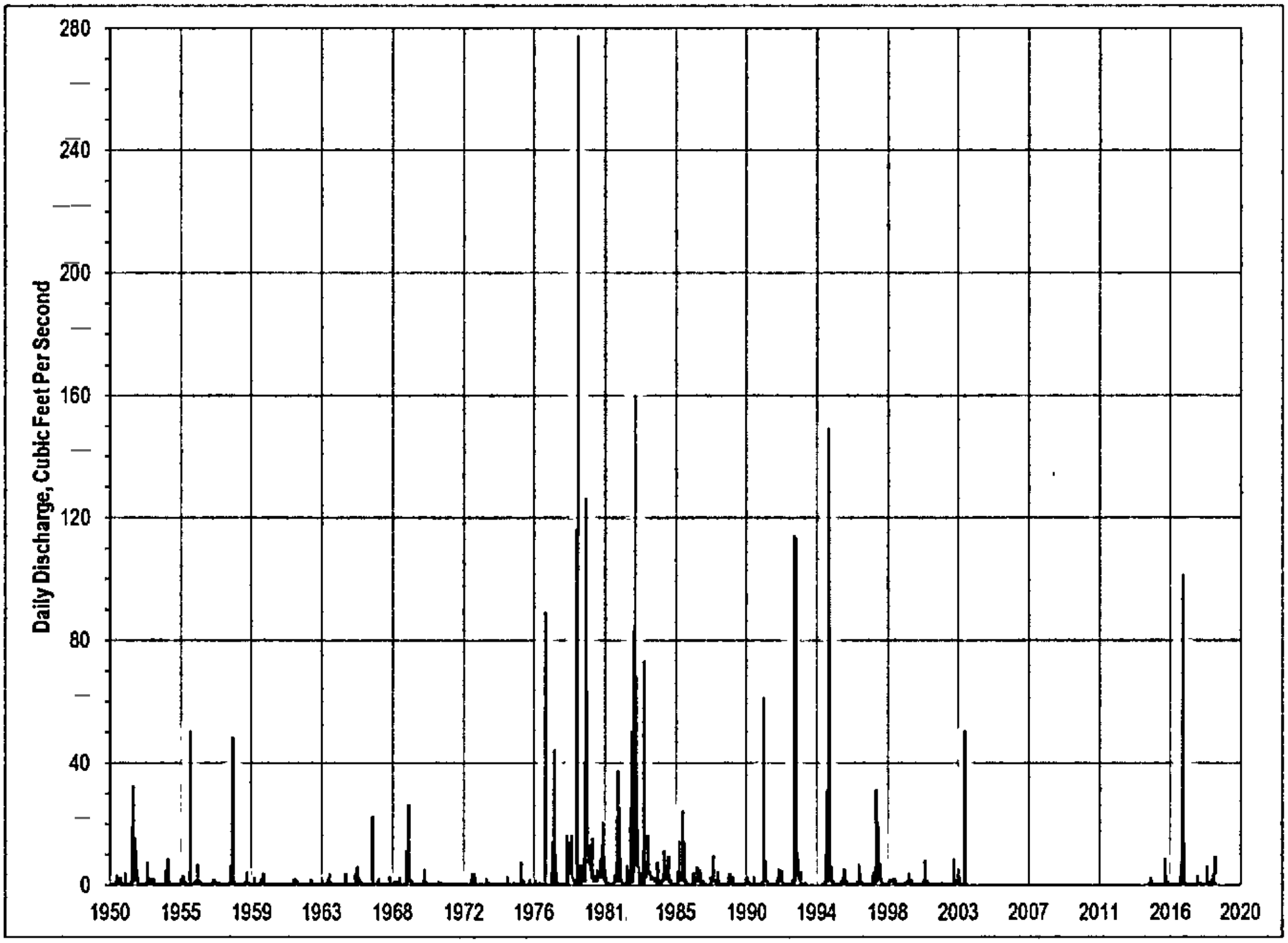
3.2 Borrego Palm Creek

Intermittent stream flow from the Borrego Palm Creek watershed is an important source of recharge to the Subbasin. Perennial flow occurs in Borrego Palm Creek upstream of the palm oasis but apart from wetter periods, the perennial flow infiltrates into the ground along the steep alluvial fan that emerges into the Subbasin.

Historical/Active Stream Flow Measurements

An active streamgage, USGS Station Number 10255810, is located on Borrego Palm Canyon downstream on the palm oasis. This streamgage has a 55-year period of record with sub-daily data (15 minute) from 2015 to 2019, and daily data from 1950 to 2003 (USGS 2019). The data indicate little to no flow over most of the period of record punctuated by higher flows associated with individual precipitation events. During wet years, prolonged stream flow after individual precipitation events is often recorded, but in most years little to no base flow is recorded in the summer months. Brief runoff events occur during occasional thunderstorms. Exhibit 2 shows the daily discharge from Borrego Palm Canyon USGS streamgage 10255810 for the period from 1950 to 2003, and 2015 to 2019. Similar to Coyote Creek, Borrego Palm Creek shows a high annual variability in stream flow, but with a smaller watershed, base flows rarely persist throughout the year, and peak flows are lower. As shown in Exhibit 2, peak flows above 80 cfs have occurred in 1977, 1979, 1980, 1983, 1993, 1995, and 2017. In most years, peak flow remains under 10 cfs, The highest peak flows on have occurred in the summer and winter, while average baseflow peaks in the winter. Total average flow at Borrego Palm Creek streamgage over the period of record is just shy of 1 cfs.

Exhibit 2. U.S. Geological Survey 10255810 Borrego Palm Canyon Stream Flow 1950 to 2019



Source: USGS 2019.
Notes: Streamgage was inactive September 30, 2003, to January 6, 2015.

Manual Stream Flow Measurements

The USGS regularly performs manual streamflow monitoring of its active gages including the Borrego Palm Canyon streamgage. A total of 19 manual measurements were taken by USGS staff in 2018 and 2019 with recorded stream flow of no flow to 7.26 cubic feet per second (449 gpm) (USGS 2019). The clear and consistent relationship between seasonal and episodic precipitation and the patterns of recorded stream flow indicates that the reach of Borrego Palm Creek that was mapped as potential GDE by DWR is a "losing" stream, and that this habitat, where it occurs, is supported by intermittent storm events and/or flows emanating from the upland watersheds and basins.

4 Honey Mesquite (Borrego Sink)

According to the USGS (2015), the Borrego Sink, a topographic low where the water table prior to development was within 10 feet of land surface, was the site of about 450 acres of honey mesquite and other native phreatophytes, indicating that shallow groundwater and occasional accumulations of surface water was historically sufficient to support a healthy groundwater dependent ecosystem. The chronic decline in groundwater levels that has occurred in the Subbasin since the 1940s caused a rapid decline in both the health and extent of the historical honey mesquite habitat early on in this period. As stated in General Plan Update Groundwater Study completed by the County of San Diego (2010): "The mesquite bosque, a rare and sensitive groundwater-dependent habitat, is believed by many experts to be desiccating in portions of Borrego Valley, even though their taproots can reach down to 150 feet for water." The green area in Figure 1 depicts the pre-pumping mapped historical extent of phreatophytes in the Subbasin by USGS (USGS 2015). The pink area depicts the mapped pre-January 1, 2015, extent of potential GDEs (SANGIS 2017); and the orange area depicts the extent of mapped GDEs by the NCCAG dataset (DWR 2018).

4.1 Historical Accounts (Old Borrego Spring)

Prior to development, mesquite trees, salt grass, willow and rushes were reported to be abundant in the valley (USGS 1909). The habitat is thought to have covered an approximate four-square mile area. Its extent and health benefitted greatly from the presence of a flowing spring (Old Borrego Spring) and groundwater levels estimated to be 10 feet bgs. A shallow groundwater table and Old Borrego Spring is likely to have provided significant support for the recruitment of seedlings, asexual regeneration, and the early stages of maturity.

In 1963, Lester Reed wrote in Old Time Cattlemen and Other Pioneers of the Anza-Borrego Area,

> Since so much recent pumping of water in the Borrego Valley, the old spring no longer flows. This spring was one of the watering places upon which the Indians, and the old-timers could depend, although the water was of poor quality. The first time I visited Old Borrego Spring was just two or three days before Christmas 1913 when my brother Gilbert (Gib), and I were riding though on horseback from Imperial Valley to spend the holidays with our parents at the Mud Spring Ranch about fifteen miles southeast of Hemet. Since early boyhood, I heard old-timers talk about Borrego Springs water; so I thought I would try it. As I have said many times before, I found it to taste but very little better than the treated water we are expected to drink today. (Reed 2004)

The Old Borrego Spring was located in the vicinity of the Desert Lodge anticline, fold axes running perpendicular to the Veggie Line fault (notice uplifted sediments located south of the Old Borrego Spring and mapped NCCAG vegetation), Coyote Creek fault and Yaqui Ridge/San Felipe anticline associated with the San Jacinto fault zone (Steely 2009) (Figures 1 and 13). The faulting and folding effectively compartmentalize the deep sediments of the Subbasin from the adjacent Ocotillo Wells Groundwater Subbasin. When groundwater levels were closer to the surface in the Subbasin this resulted in 'daylighting' of groundwater at the Old Borrego Spring.

4.2 Ecology and Rooting Depth

Honey mesquite are an adaptable species characterized by a dimorphic root system capable of utilizing both surface water and groundwater resources opportunistically. Honey mesquite exhibit mechanisms of drought tolerance, including seasonally changing stomatal sensitivity and osmotic adjustment. Sharifi et al. (1982) stated: "Desert phreatophytes are a complex group of species with varied adaptive mechanisms to tolerate or avoid drought and should not be considered simply as a group of species that avoid desert water stress by utilizing deep ground water unavailable to other desert species of drought tolerance and avoidance." Similarly, Ansley et al. (1991) stated: "in regions where accessible groundwater is minimal, honey mesquite often appear to be less than fully phreatophytic. [...] These plants have developed an extensive system of lateral roots and respond rapidly to precipitation." Thus, with a sufficiently rapid and large decline in groundwater levels, Honey Mesquite can transition to a less than phreatophytic state, retaining the ability to utilize surface water and/or localized pockets of soil moisture perched above the groundwater table.

Within the Borrego Subbasin, this transition has manifested itself through a reduction in the extent, abundance, and health of the honey mesquite community. Figure 1 shows the historical extent of the honey mesquite habitat north and west of the Borrego Sink in pink and blue (as mapped by USGS and the County), and the current extent of the honey mesquite GDE in orange (from the NCCAG dataset). Since pre-development times, the honey mesquite's habitat has shrunk considerably, from about 450 acres in pre-development times to 13.2 acres today, as mapped in the NCCAG dataset. A significant decline in the health of the honey mesquite GDE is confirmed by a preliminary comparison of vegetation transects—one in Clark Valley and the other near the Borrego Sink—provided to the GSA by Mark Jorgenson (former ABDSP superintendent) (Jorgenson 2019). The percentage Honey Mesquite trees counted as dead was 11% in the Clark Valley, which overlies an undeveloped aquifer untapped by pumpers, compared with 53.8% in the Borrego Sink area. Though the methods and criteria used in the population count is not known by the GSA at this time, this further supports the information provided by USGS (2015), indicating that the Honey Mesquite community experienced significant stress and has desiccated, likely as a result of loss of access to groundwater.

Estimates of maximum rooting depths for honey mesquite vary considerably. According to the Fire Effects Information System compiled by the U.S. Forest Service, honey mesquite, in the absence of available subsurface water, can have taproots of up to 190 feet (Sosebee and Wan 1989, as cited in Steinberg 2001). For the genera as a whole (not limited to the *Prosopis glandulosa* species), *Prosopis* roots have been found at a depths of 52 meters (170 feet) in soils (Phillips 1963 as cited in Nilsen et al. 1983), and stands of Prosopis survive in regions with little to no recorded rainfall by tapping underground water resources (Mooney et al. 1980 as cited in Nilsen et al. 1983). The Nature Conservancy published a database of maximum rooting depths for GDE species from published scientific literature and expert opinion through a crowd sourcing campaign, including local and international studies. A compilation of 23 studies of *Prosopis* found their mean root depths to be 20 feet, with a standard deviation of 34 feet (Fan et al. 2017). As shown on Table 1, estimates for maximum rooting depth of honey mesquite species throughout the American southwest range from 6.9–65.6 feet, with the higher values in this range occurring in Texas (Fan et al. 2017).

While honey mesquite has been broadly reported to have extremely deep taproots, the best available information does not support the occurrence of extremely deep taproots. The USGS (2015) notes that the maximum rooting depth for phreatophytes found locally in around the Borrego Sink and areas to the north was 15.3 feet. This is within the range of the closest study of honey mesquite in TNC's database compiled in response to SGMA, which reports the maximum rooting depths to be between 13.12 and 19.69 feet at Harper's Well, California (Nilsen et al. 1983). Given Harper's Well is located approximately 20 miles southeast of the Subbasin, this is considered the best available information on the maximum honey mesquite rooting depth in the Plan Area. With the lack of site-specific information on the root depth of the honey mesquite community, there is very high uncertainty associated with these values. Given the characteristics of honey mesquite as a drought tolerant species with a dimorphic root system able to transition to a less than phreatophytic state, simple comparisons between known groundwater levels and maximum root depths likely oversimplifies the evaluation of impacts to GDEs. The degree to which honey mesquite relies upon surface water must be considered, along with an evaluation of trends over time. This analysis is provided in Section 6.3.

4.3 Groundwater Level Trends and Plant Water Use

Recent groundwater levels from wells adjacent to the current and historical honey mesquite habitat range shown in Figure 1 occur at depths from approximately 55 to 134 feet below the ground surface. Since 1955, pumping in the Subbasin has resulted in a groundwater level decline in the vicinity of the Borrego Sink (MW-5A/B) of about 44 feet. The average rate of decline over this period is approximately 0.67 feet per year. The 1955 groundwater level (as measured at Well No. "Sink-7N1") was about 11 feet below ground surface and the most recent groundwater level measured in Fall 2018 (MW-5A/B) was 55 feet below ground surface. As indicated above, this area is thought to have had groundwater levels nearly to the ground surface, based on the presence of a flowing Old Borrego Spring. The "Sink" wells shown in Figure 1 (i.e., 12G1 and 7N1) have become dry based on measurements performed by DWR. Groundwater level measurements collected in 2009 of Sink Well 12G1 and well MW-5B indicated similar groundwater level elevations, which suggests that well MW-5B is sufficiently representative of depth to the groundwater table in the area of the Borrego Sink.

Groundwater levels have long since declined below a level that can support the estimated rooting depth of the habitat, as evidenced by the lack of significant change in habitat health since 1985 (see Section 6.3). Natural discharge determined from the Borrego Valley Hydrologic Model (BVHM) attributable to evapotranspiration was approximately 6,500 acre-feet per year prior to development, but has been virtually zero in the last several decades (1990–2010) (USGS 2015). The BVHM includes a component of evapotranspiration in the water budget, and estimates close to 400 acre-feet of percolating surface water throughout the Subbasin is lost to evapotranspiration under existing conditions. Based on the land uses and mapped vegetation incorporated into the BVHM, this is dominated by losses from non-native tamarisk, and other land uses.

5 Potential GDEs Ecological Condition

To assess the ecological condition of potential GDEs, several additional datasets were reviewed.

5.1 Threatened and Endangered Species

The Environmental Conservation Online System (ECOS) contains spatial data of critical habitat for threatened and endangered species. Critical habitat for Peninsular bighorn sheep is identified in the Subbasin (Figure 14). Critical habitat for Least Bell's vireo is also identified in the vicinity of the Subbasin near where Coyote Creek enters the Subbasin. Potential effects to these critical habitats must be analyzed along with the endangered species themselves during the California Environmental Quality Act (CEQA) review of the GSP Projects and Management

Actions. The U.S. Fish and Wildlife Information for Planning and Consultation (IPaC) lists the other endangered species in the larger contributing watershed to the Subbasin: 2 mammals, 24 migratory birds, 1 reptile, 2 amphibians, 2 fishes, 2 insects, and flowering plants (USFWS 2018). An official consultation based on the CEQA project description is required with the resource agencies in order to evaluate potential impacts, get an official species list, and make species determinations. TNC has generated a list of freshwater species located within each groundwater basin in California. This list, included as Attachment 1, is provided as a reference to describe the environmental beneficial users of surface water in the Subbasin. Adoption of the GSP is not anticipated to have any adverse impact on this list of species because, as discussed in Section 1, there is no hydrologic connection between the Subbasin's groundwater aquifer and the overlying surface waters.

5.2 Areas of Conservation Emphasis

The Areas of Conservation Emphasis (ACE) is a California Department of Fish and Wildlife non-regulatory tool that brings together the best available map-based data in California to depict biodiversity, significant habitats, connectivity, climate change resilience, and other datasets for use in conservation planning. ACE project contains spatial data on native species richness, rarity, endemism, and sensitive habitats for six taxonomic groups: birds, fish, amphibians, plants, mammals, and reptiles. Information on the location of four sensitive habitat types (i.e., wetlands, riparian habitat, rare upland natural communities, and high-value salmonid habitat) are also summarized. The ACE dataset is available statewide based on watersheds using hydrologic units at the 12-digit code level (HUC12) for aquatic habitat. The Borrego Valley HUC12 subwatershed has a low Significant Aquatic Habitat Rank (Figure 15).

The ACE dataset is available statewide at a 2.5-square-mile hexagon grid for terrestrial habitat. The color ramp has been coded at the USDA Ecoregion level with each color approximate to the 20th percentile of land area in the Colorado Desert Ecoregion. The developed areas of Borrego Springs have a terrestrial habitat rank of 0 (Figure 16). Moving outward from the developed area of Borrego Springs the rank increases to higher terrestrial habitat values.

Species Biodiversity Summaries combine the three measures of biodiversity developed for ACE into a single metric. These three measures include: (1) native species richness, (2) rare species richness, and (3) irreplaceability. Much of western flank of the Subbasin is ranked as high species biodiversity [grey hexagons] depicted in Figure 17. Interestingly, the Species Biodiversity Rank seems to conflict with the previous Significant Terrestrial Habitat Rank for the hexagons located in the central portion of the Subbasin.

The California National Diversity Database (CNDDB) or California Special Status Species contains text and spatial information on California's special status species (rare plants and animals). It is a positive detection database. Records in the database exist only where species were detected. This means there is a bias in the database towards locations that have more survey work. Also, the database is proprietary and shall be displayed at such a scale (no larger than a scale of 1:350,000), or in such a way that the viewers/users cannot determine exact location information of the elements mapped in the system. Several positive detections are noted in the CNDDB within the Subbasin (Figure 18).

The California Protected Areas Database (CPAD) contains GIS data about lands that are owned in fee and protected for open space purposes by over 1,000 public agencies or non-profit organizations. This dataset shows that the majority of lands surrounding Borrego Springs are protected areas managed by the Anza Borrego Desert State Park (Figure 19). Additional parcels are managed within the Subbasin by the Anza Borrego Foundation, Borrego Water District (BWD) and County.

6 Potential GDEs Hydrogeologic Conceptual Model

A Hydrogeologic conceptual model has been developed for the entire Subbasin to provide the framework for the development of water budgets, analytical and numerical models, and monitoring networks. A HCM differs from a mathematical (analytical or numerical) model in that it does not compute specific quantities of water flowing through or moving into or out of a basin, but rather provides a general understanding of the physical setting, characteristics, and processes that govern groundwater occurrence and movement within the basin. Figure 20 presents the parameters of the HCM developed for the Subbasin, which conceptually depicts basin boundaries, stratigraphy, water table, land use, and the components of inflow and outflow from the Subbasin. In order to better evaluate potential GDEs, it was necessary to refine the Subbasin-wide HCM to address specific areas of the Subbasin representative of the GDE Units. As such, large scale HCMs have been developed for the ephemeral and perennial creeks and drainages (Contributing Watersheds) and the Borrego Sink (honey mesquite) to provide a better understanding of the physical setting, characteristics and processes that govern groundwater occurrence and movement in these unique settings within the larger HCM. The location-specific HCMs are described in the following subsections and shown where they occur in the context of the Subbasin-wide HCM in Figure 20.

6.1 Ephemeral and Perennial Creeks and Drainages (Contributing Watersheds)

A HCM was developed for the potential GDEs identified in the Subbasin and at the Subbasin margins. Figure 21 depicts a HCM applicable to GDE Unit 1 – Coyote Creek, GDE Unit 2 – Borrego Palm Creek and other similar canyons that drain mountainous terrain adjacent to the Subbasin. This HCM illustrates that the source of water for potential GDE Units 1 and 2, and other similar canyons is stream flow that originates from outside of the Subbasin. Ephemeral and perennial streams transition to disconnected streams as they flow across the numerous alluvial fans that descend on the Subbasin. Stream flow percolates into a thick unsaturated zone. The regional groundwater table is often hundreds of feet below the streams. At Coyote Creek, the nearest well, State Well ID No. 009S006E31E003SI, has a depth to groundwater of 288 feet below land surface. At Borrego Palm Canyon Creek, the nearest well, State Well ID No. 010S005E25R002S, has a depth to groundwater of 348 feet below land surface. Other wells located adjacent to the Subbasin margins all have depths to groundwater several hundred feet below land surface.

The hydrogeological conceptual model (HCM) of the Subbasin indicates that the groundwater table may shallow within the narrow "fingers" of alluvium that extend into the canyons on the northern and western margins of the Subbasin (fringe areas), because the subsurface boundary between the alluvium and bedrock steeply rises in these locations. The groundwater monitoring network does not extend into these fringe areas; however, the deepest groundwater levels in the Subbasin are consistently recorded in monitoring wells located less than one mile away (i.e., State Well ID Nos. 009S006E31E003SI and 010S005E25R002S, ID4-2, ID4-3, ID4-10, and ID4-18). Desert alluvial fans such as those abutting the mountain front are natural recharge zones, meaning that groundwater declines in the Subbasin do not affect surface water conditions underlying the mouths of the canyons or at the head of these alluvial fans. Alluvium extending into these canyons can be conceptualized as containing groundwater that is perched on bedrock shelves hundreds of feet above the Subbasin's aquifer. Both field observations and aerial photography show that stream flows that emerge from the canyons, when present, rapidly diminish with distance from the canyons as flow is lost to recharge. The Subbasin as a whole is therefore a system whose surface waters are disconnected from the underlying groundwater table (i.e., losing streams), which exists at considerable depths.

Groundwater extraction from water wells in the Subbasin does not effect GDEs associated with ephemeral and perennial creeks and drainages because the groundwater accessed by the wells is not water that is accessible or available to the potential GDEs.

6.2 Borrego Sink (Mesquite Bosque)

A HCM was developed for the Borrego Sink (Mesquite Bosque) to evaluate potential GDEs. Figure 22 depicts a HCM for potential GDE Unit 3 - Borrego Sink (Mesquite Bosque). The Borrego Sink is a topographic low in the Subbasin. The sink in all but the most exceptional wet years acts as closed or terminal basin where flood waters pool and fine sediment settles. After flood events, most of the water that reaches the sink evaporates leaving a white crust of salt that is often visible on the surface of the sink. Some of the flood waters that reach the sink percolate into the fine sediment and may locally support perched groundwater zones. As previously discussed in Section 4, Old Borrego Spring no longer discharges to the Borrego Sink.

Driller's logs for wells located in the vicinity of the Borrego Sink were reviewed to characterize the subsurface lithology. In particular, the log for MW-5A and 5B and Rams Hill test borehole No. 12 were reviewed.

MW-5 is a multicompletion well constructed in 2006 drilled to a depth of 480 feet bgs under the oversight of the BWD and DWR. MW-5 is located about 1.2 miles northeast of the Borrego Sink.

> In general, the boring encountered variably thick interbedded materials (silt and clay). Based on the borehole cuttings and the geophysical logs, the geologic materials encountered can be separated into three main zones or sequences divided at prominent clay layers: an upper zone dominated by poorly consolidated coarse grained materials from the surface to about 165 feet bgs; a middle zone of moderately consolidated interbedded fine- and coarse-grained materials between 165 feet and 355 feet bgs; and a lower zone of consolidated or lithified beds for fine-grained and coarse-grained material between 355 to 480 feet bgs. (DWR 2007)

MW-5B is screened from 45 to 155 feet below ground surface and appears to sufficiently represent the depth of the groundwater table in the vicinity of the Borrego Sink though it is possible that it represents a semi-confined potentiometric surface rather than the unconfined water table. MW-5A is screened from 200 to 340 feet and has a similar groundwater level to the shallower MW-5B suggesting potentially unconfined conditions in this part of the Subbasin; however, it is uncertain whether a good well seal was obtained during installation of the multicompletion monitoring well.

Test borehole No. 12 was drilled in 2014 about 0.5 mile south of the Borrego Sink, immediately south of the Rams Hill Wastewater Treatment Facility. Interbedded sand, silt and clay was encountered to a total borehole depth of 764 bgs. Coarser material was only encountered at the surface to a depth of about 30 feet, and in one zone from 490 to 610 feet bgs. Thick clay zones with thin interbedded silty sands were encountered from 30 to 490 feet and form 610 feet to 764 feet (Dudek 2014). The depositional environment indicated by log is often one of low energy as evidenced by thick fine grain deposits. The depositional environment of the upper portion of the log is consistent with that of a desert playa (current depositional environment) and lacustrine setting (lake setting that occurred in desert basins during the last ice age [Pleistocene Epoch]). Deeper sections of the borehole may have encountered the Palm Springs Formation. The Borrego Sink HCM illustrates the predominantly fine sediment characterized in the subsurface in the vicinity of the Borrego Sink with coarser sediment shown proximal to mountainous terrain from which the sediments are derived (Figure 22).

Groundwater levels in the vicinity of the Borrego Sink have been measured at "Sink" wells 7N1 and 12G1 since 1953 and 1965, respectively, and MW-5A and MW-5B since 2006. The "Sink" wells have since become dry based on measurements performed by DWR in 2009. It is not known exactly when the Sink wells went dry; however, the groundwater level in well 7N1 was last measured by the USGS in 1965 at a depth of 36.0 feet bgs and well 12G1 was measured by the DWR in 2009 at a depth of 64.0 feet bgs. The total well depth of 7N1 is 30.0 feet and 12G1 is 65.2 feet as measured by DWR.[7] The overlap of a groundwater level measurement in 2009 of Sink Well 12G1 with MW-5B has a similar groundwater level elevation suggesting that well MW-5B is sufficiently representative of depth to the unconfined groundwater table in the area of the Borrego Sink. The depth to groundwater at MW-5B in Spring 2018 was 55 feet bgs. The groundwater table in the vicinity of the Borrego Sink has declined approximately 44 feet over the period from 1953 to 2019. The decline in the groundwater table in the vicinity of the Borrego Sink has resulted in the drying of Old Borrego Spring and desiccation of the honey mesquite as previously discussed in Section 4. Given that groundwater levels likely will not substantially recover under current climate conditions and pumping volumes, the impacts to the Borrego Sink are considered permanent and irreversible.

6.3 Evaluation of Remote Sensing Data

Comparison of aerial photography shows GDE Units 1 and 2, and other GDEs mapped around the western margins of the Subbasin have remained in place since the early 1950s, despite a long term and persistent trend of declining groundwater levels in the Subbasin. This suggests that these communities are being supported by surface water entering the Basin from perennial and ephemeral waters originating outside its boundaries, rather than the regional water table within the Subbasin. See Attachment 2 for aerial photograph comparison.

As discussed in Section 4.2, the estimate of rooting depth for honey mesquite is based on the best available data, but has a high degree of uncertainty. Based on the GDEs HCM discussed above (Section 6.2), water levels are believed to have dropped below the root depth of the honey mesquite early in the Subbasin's history of pumping (i.e., prior to 1985). TNC's GDE Pulse tool was used was used to evaluate if declining groundwater levels since 1985 have had any effect on the honey mesquite community (GDE Unit 3) mapped in the NCCAG dataset. The GDE pulse dataset provides annual data averaged for each NCCAG-mapped polygon that assess plant greenness and moisture indices (Klausmeyer et al. 2019):

- The Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. The average NDVI for each GDE polygon from Landsat data during the driest part of the year (July 9-Sept 7) was calculated to estimate vegetation health when the plants are most likely dependent on groundwater.
- The Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short Wave Infrared (SWIR) channels. The average NDVI for each GDE polygon from Landsat data during the driest part of the year (July 9-Sept 7) was calculated to estimate vegetation health when the plants are most likely dependent on groundwater.

---

[7] The total well depth of Sink well 7N1 measured by DWR at 30 feet is less than the last groundwater level measured by USGS in 1965 of 36.0 feet. Sink well 7N1 likely either collapsed at 30.0 or is filled with sediment in the bottom of the well.

Using the annual dry-month medoids, Klausmeyer et al. (2019) calculated the NDVI and NDMI vegetation metrics (VMs) as a useful means to provide a proxy for vegetation growth and water stress, which are helpful variables for inferring ecosystem health. Klausmeyer et al. (2019) states the following:

> Living vegetation absorbs radiation in portions of the visible spectrum and reflects in the near-infrared (NIR), whereas radiation in the red as well as shortwave-infrared (SWIR) is absorbed by water present in the vegetation. Therefore, NIR and red wavelengths are sensitive to variations in photosynthetic chlorophyll, and SWIR wavelengths are sensitive to variations in moisture. Numerous spectral vegetation indices have been used to study vegetation health, drought impacts on vegetation, and deforestation. NDVI is the most widely used VM in the literature and is a reliable measure of the photosynthetic chlorophyll content in leaves and vegetation cover (Figure 1) (Rouse et al. 1974; Jiang et al. 2006). NDVI has been used in several studies to identify terrestrial ecosystems and wetlands that depend on groundwater based on the principle that ecosystems that are able to maintain consistent greenness during a prolonged dry period, are defined as potentially groundwater-dependent (Gou, Gonzales, and Miller 2015; Barron et al. 2014; Doody et al. 2017). NDMI is based on the NIR and SWIR bands and is also widely used in the literature as a metric of vegetation moisture stress. (Wilson and Sader 2002; Jinand Sader 2005)

Because of the highly arid environment in Borrego Springs, NDVI is selected as the most useful metric to document plant health. Klausmeyer et. al (2019) provides an example that characterizes "healthy" vegetation as having a NDVI of 0.72 and an "unhealthy" vegetation as having an NDVI of 0.14. It should be noted that such qualifications are species specific, and that at the time that Landsat images are taken (summer), honey mesquite is in its dormant phase.

Tables 3a and 3b present yearly average NDVI by dominant species for NDVI and NDMI, respectively. For all species other than Tamarisk, the long term trend has been one of "little to no change" as categorized in TNC's GDE Pulse mapper. Furthermore, When the data is summarized by GDE Unit, the picture is similar. NDVI changes very little in the period between 1985 and 2018. Exhibit 3 relates the average NDVI and NDMI in the NCCAG-mapped polygons to groundwater levels and annual precipitation. A statistical correlation analysis between the VMs, groundwater levels and precipitation found the following:

- There is no correlation between the NDVI index and groundwater levels between 1985 and 2018. During this time frame, groundwater levels are estimated to have declined by 21 feet, based on groundwater level monitoring in Well MW-5A/B and in Sink Wells 12G1 and 7N1.
- There is a moderately positive correlation between the NDVI index and precipitation.
- Changes in NCCAG plant health indices after 1985—throughout the Subbasin, and regardless of the time interval chosen—are on average flat, slightly increasing, or slightly decreasing.

Evaluation of plant health indices derived from Landsat data have shown that there have been minimal changes in vegetation moisture and/or greenness since 1985 within any of the potential GDEs mapped within the Subbasin. Changes observed by year between 1985 and 2015 have been minor, and have tracked consistently with changes in annual precipitation occurring over the same time frame, rather than the steady decline in groundwater levels.

If potential GDEs were relying primarily on the regional groundwater table, one would expect to see a steady decline in community health over the 20 year period.

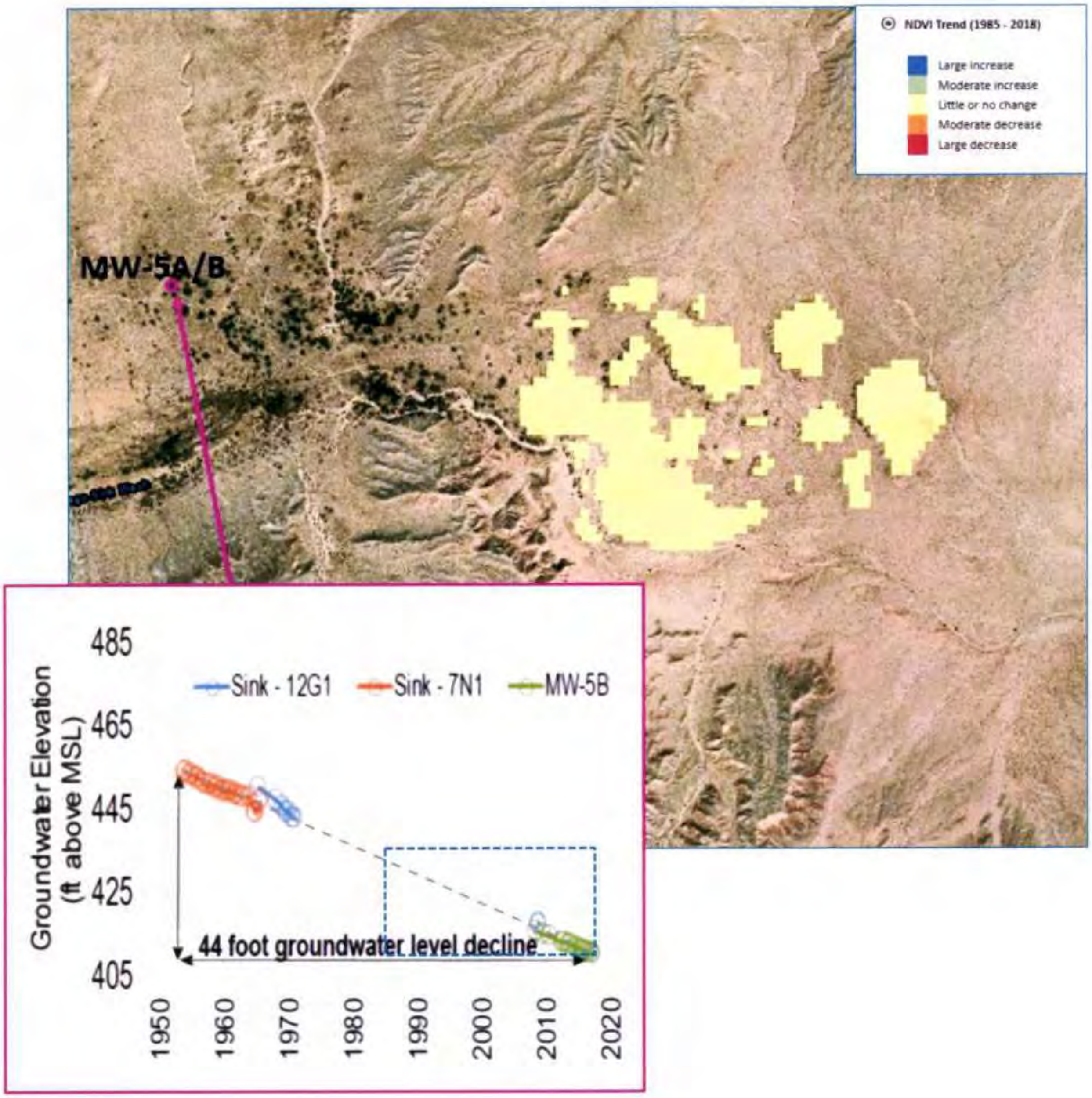
Table 3a. Yearly Average Normalized Difference Vegetation Index Statistics by Dominant Species (1985–2018)

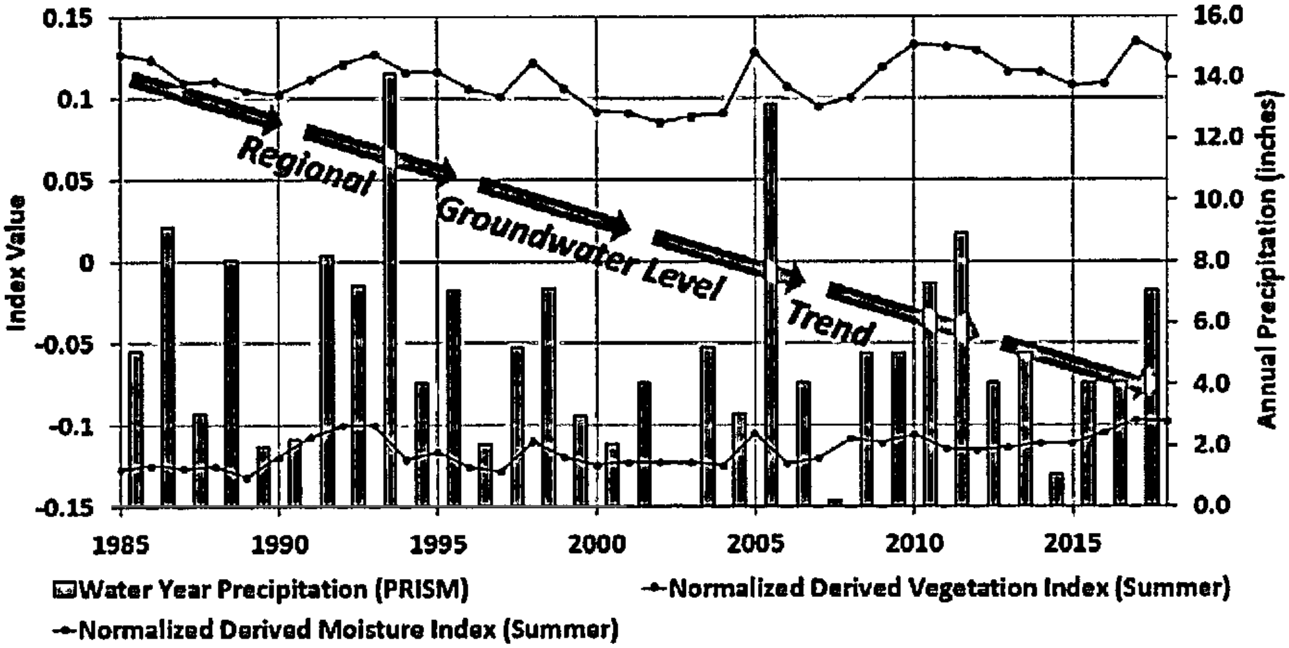
	Catclaw Acacia	Desert Willow	Honey Mesquite	Narrowleaf Willow	Tamarisk	California Fan Palm
Average	0.1211	0.1085	0.1161	0.1162	0.2621	0.2512
Minimum	0.0928	0.0783	0.0887	0.0889	0.2660	0.2501
Maximum	0.1458	0.1363	0.1379	0.1449	0.2702	0.2489
Change (1985 to 2018)	0.0075	0.0074	-0.0006	-0.0006	-0.1540	0.0092

Table 3b. Yearly Average Normalized Difference Vegetation Index Statistics by Groundwater Dependent Ecosystem Unit (1985–2018)

	GDE Unit 1	GDE Unit 2	GDE Unit 3	Other
Average	0.1481	0.1719	0.1002	0.1224
Minimum	0.1148	0.1138	0.0756	0.0986
Maximum	0.1783	0.2057	0.1271	0.1639
Change (1985 to 2018)	0.0348	-0.0143	-0.0150	-0.0015

Exhibit 3. Relationship between Groundwater Dependent Ecosystem Health Indicators, Groundwater Levels, and Precipitation





7 Evaluation of Nexus of GDEs with Subbasin Groundwater

The SGMA definition of GDEs was applied to evaluate reliance of ecological communities and species on Subbasin groundwater. The evaluation revealed that Subbasin creeks can be characterized as losing streams in that they primarily act as groundwater recharge areas rather than local discharge of groundwater from the Subbasin to the stream reach. Potential GDEs that exist within Subbasin creek drainages rely on both periodic surface flows and soil moisture, and not directly on the regional groundwater table, which based on groundwater levels recently measured adjacent to the creek drainages indicate groundwater levels are beyond the rooting depth zone of existing vegetation mapped as potential GDEs.

The impact of rapidly declining groundwater levels on GDE vegetation is most apparent in the Borrego Sink. The honey mesquite that previously flourished in the Borrego Sink has desiccated and its areal extent has decreased significantly as groundwater levels have dropped in response to increased groundwater extraction. Pumping in the Subbasin has resulted in a groundwater level decline of about 44 feet over the last 65 years in the vicinity of the Borrego Sink. Recent groundwater levels from wells adjacent to the main mapped habitat range from approximately 55 to 134 feet below the ground surface. Because of the long-term imbalance of pumping with available natural recharge, an irreversible impact has occurred to the honey mesquite, which is mostly desiccated prior to January 1, 2015.

Vegetation that occurs in the Borrego Sink has access to soil moisture in the unsaturated zone and potentially perched groundwater where present. Perched groundwater consists of local pockets (or lenses) of low permeability sediment (e.g., clay and silt) that "pinch out," meaning they are not laterally extensive enough to be considered a regionally significant aquitard. These zones are considered "perched" because they occur above the regional groundwater table, and thus are disconnected from changes experienced within regional aquifer (including outflows such as pumping). With these types of subsurface conditions, surface water may be slower to percolate into the underlying regional groundwater table, possibly providing conditions necessary to sustain remnant stands of honey mesquite and/or support ongoing recruitment in combination with periodic storm flow events. The percolating groundwater used by this vegetation removes water that would otherwise constitute recharge. In other words, rather than the regional aquifer being a water source for the vegetation, the vegetation subtracts from the water available for deep infiltration.

8 Conclusion and Recommendations

A review of available pertinent spatial datasets, historical data including stream flow and groundwater levels, satellite-derived vegetation metrics, and geology was completed to develop a robust HCM to evaluate nexus of GDEs with Subbasin regional groundwater levels. Because of the long-term imbalance of pumping with available natural recharge, an irreversible impact has likely occurred on the honey mesquite community from a decline in groundwater levels, an impact which, based on the best available science, was completed and became permanent sometime prior to 1985. The comprehensive assessment revealed potential GDEs identified within the Subbasin no longer have direct reliance on groundwater emerging from aquifers or on groundwater occurring near the ground surface, and instead are sustained by periodic stormwater flows, soil moisture, and potentially perched groundwater where present. These findings indicate that based on best available data there is no need for the GSP to address minimum groundwater level thresholds with respect to potential GDEs.

Detailed mapping of vegetation is lacking for the area in the vicinity of the Borrego Sink. Groundwater level monitoring of wells located in the vicinity of the Borrego Sink should continue.

9 References Cited

ABDSP (Anza-Borrego Desert State Park). 2017. GIS Package of Hydrologic Feature Data. Received 10/17/2017.

Ansley R.J., P.W. Jacoby, and R.A. Hicks. 1991. Leaf and whole plant transpiration in honey mesquite following severing of lateral roots. Journal of Range Management. 44(6). November 1991.

County of San Diego. 2010. Final County of San Diego Department of Planning and Land Use General Plan Update Groundwater Study. Prepared by James J. Bennett. April 2010.

DWR (California Department of Water Resources). 2007. An Interpretation of Geologic Materials Encountered in the Boring of Borrego Water District Monitoring Well MW-5. Technical Information Record SD-07-02. Prepared by D. Ellis and T. Ross. April 2007.

DWR. 2018. Summary of the "Natural Communities Commonly Associated with Groundwater Dataset and Online Web Viewer. April 2018.

Dudek. 2014. Log of Test Hole No. 12 Rams Hill. Borrego Springs, California. October 2014.

Fan, Y., G. Miguez-Macho, E.G. Jobbágy, R.B. Jackson, and C. Otero-Casal. 2017. Hydrologic Regulation of Plant Rooting Depth. PNAS Vol.114 No.40 (pp. 10572-10577). October 3, 3017.

Klausmeyer, K.R., T. Biswas, M.M. Rohde, F. Schuetzenmeister, N. Rindlaub, and J.K. Howard. 2019. GDE Pulse: Taking the Pulse of GroundwaterDependent Ecosystems with Satellite Data. San Francisco, California.Available at https://gde.codefornature.org.

Jorgensen, M. 2019. Comment Letter on the Draft GSP for the Borrego Springs Groundwater Subbasin. Addressed to Mr. Bennett, Planning and Development Services, County of San Diego. May 17, 2019.

Nilsen E.T., S.M. Rasoul, P.W. Rundel, W.M. Jarrell, and R.A. Virginia. 1983. Diurnal and Seasonal Water Relations of the Desert Phreatophyte Prosopis Glandulosa (Honey Mesquite) in the Sonoran Desert of California. Ecology, Vol. 64, No. 6 (Dec., 1983), pp. 1381-1393. December 1983.

Ostermann, S.D., and W.M. Boyce. 2002. Ecological conditions in Coyote Canyon, Anza-Borrego Desert State Park®: an assessment of the Coyote Canyon Public Use Plan. Report prepared for California State Parks Colorado Desert District. 67 pages. July 2002.

Reed, L. 2004 (1963 First Edition). Old Time Cattlemen and Other Pioneers of the Anza-Borrego Area. Third Edition, Second Printing. Published by the Anza-Borrego Desert natural History Association. Borrego Springs, California. 2004.

San Diego Reader. 2010. Tubb Canyon. Borrego Springs. Jerry Schad. March 3, 2010.

SANGIS. 2017. "ECO_VEGETATION_CN" Layer. Regional Vegetation to illustrate the vegetation communities and disturbed areas throughout San Diego County. Available at http://www.sangis.org/download/available.html. Last update 10/29/2017.

Sharifi, R.M., E.T. Nilsen, P.W. Rundel. 1982. Biomass and net primary production of Prosopis glandulosa (Fabaceae) in the Sonoran Desert of California. American Journal of Botany. 69(5): 760-767. [5469].

Steely, A.N., S.U. Janecke, R.J. Dorsey, and G.J. Axen. 2009. "Early Pleistocene Initiation of the San Felipe Fault Zone, SW Salton Trough, during Reorganization of the San Andreas Fault System." Geological Society of American Bulletin (121): 663-687. DOI: 10.1130/B26239.1.

Steinberg, P. 2001. Prosopis glandulosa. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: https://www.fs.fed.us/database/feis/plants/tree/progla/all.html [2019, July 24].

TNC (The Nature Conservancy). 2018. Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act Guidance for Preparing Groundwater Sustainability Plans. January 2018.

USFWS (U.S. Fish and Wildlife Service). 2018. Information for Planning and Consultation. Endangered Species List. Accessed at https://ecos.fws.gov/ipac/. 2018.

USGS (U.S. Geological Survey). 1909. Some Desert Watering Places in Southeastern California and Southwestern Nevada. Water-Supply Paper 224. Prepared by Walter C. Mendenhall.

USGS (U.S. Geological Survey). 1982. Water Resources of Borrego Valley and Vicinity, California: Phase 1–Definition of Geologic and Hydrologic Characteristics of Basin. Open-File Report 82-855. Prepared by W.R. Moyle Jr. in cooperation with the County of San Diego.

USGS. 2015. Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California. Scientific Investigations Report 2015–5150. Prepared by Claudia C. Faunt, Christina L. Stamos, Lorraine E. Flint, Michael T. Wright, Matthew K. Burgess, Michelle Sneed, Justin Brandt, Peter Martin, and Alissa L. Coes in cooperation with the Borrego Water District. DOI: 10.3133/sir20155150.

USGS. 2017. StreamStats, Version 4. Fact Sheet 2017-3046 4 p., [Supersedes USGS Fact Sheet 2008–3067.] Prepared by Ries, K.G., III, Newson J.K., Smith, M.J., Guthrie, J.D., Steeves, P.A., Haluska, T.L., Kolb, K.R., Thompson, R.F., Santoro, R.D., and Vraga, H.W. https://doi.org/ 10.3133/fs20173046.

USGS. 2019. The National Map. Watershed Boundary Dataset. Web Map Viewer. Accessed at https://viewer.nationalmap.gov/advanced-viewer/. Accessed June 2019.

10 Advisory Committee Meeting GDEs Presentations

GDE presentations by DUDEK at SGMA Borrego Valley GSP Advisory Committee meetings in chronological are as follows:

ACM 2017.11.27	Coyote Creek
ACM 2018.05.31	Groundwater Dependent Ecosystems
ACM 2018.07.26	Groundwater Dependent Ecosystems
ACM 2019.01.31	Groundwater Dependent Ecosystems (GDEs) Approach in GSP
ACM 2019.07.25	Groundwater Dependent Ecosystems Response to Public Comments

Presentations are available from the County of San Diego's Borrego Valley Groundwater Basin website: https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html

Tables, Figures, and Attachments

Table List

Exhibit List (exhibits are located within body of text)

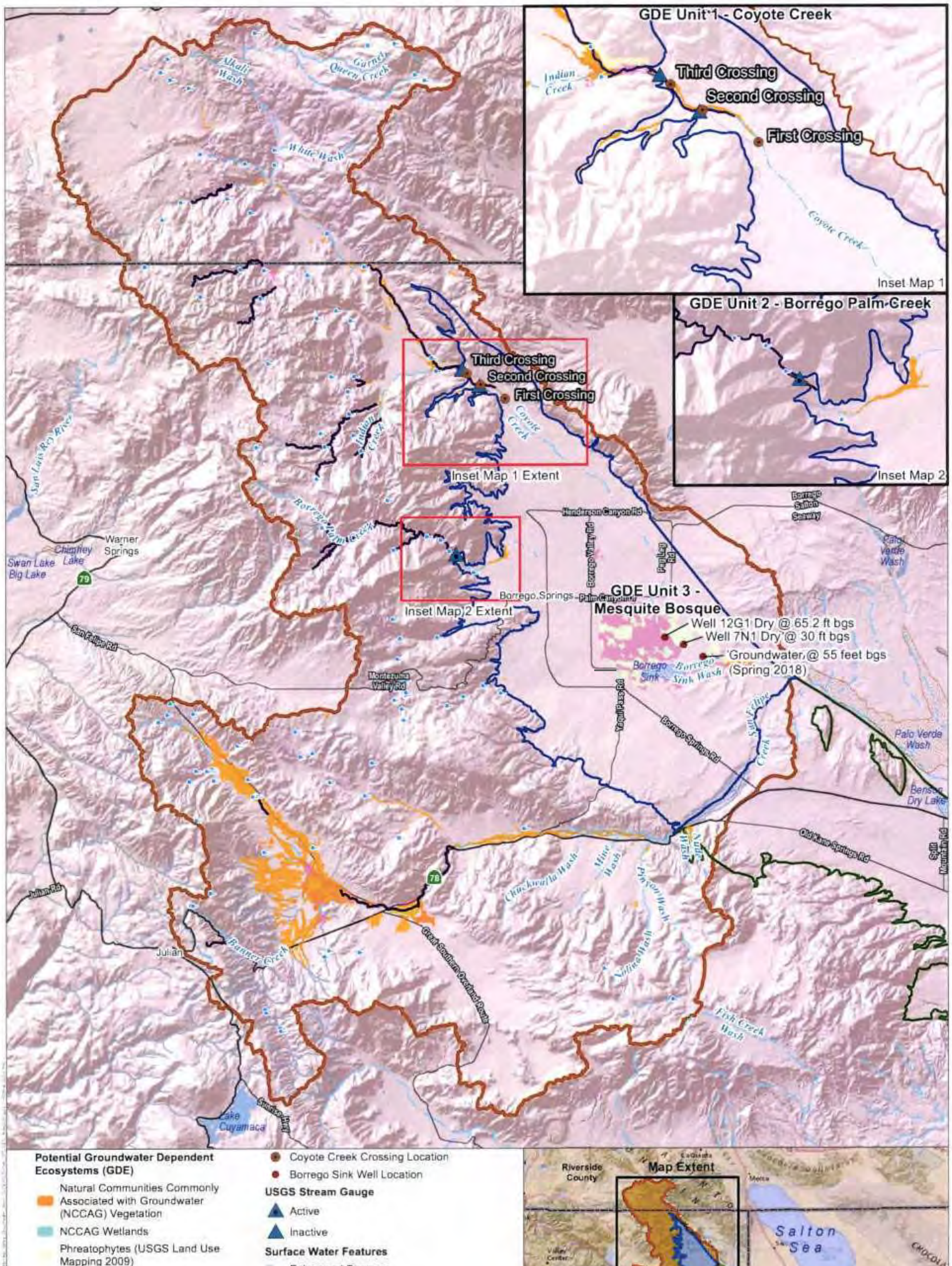
Figure List

Attachments

Attachment 1 California Freshwater Species Database (Borrego Springs Groundwater Subbasin)
Attachment 2 Aerial Photography Comparison

Figures 1–22

January 2020



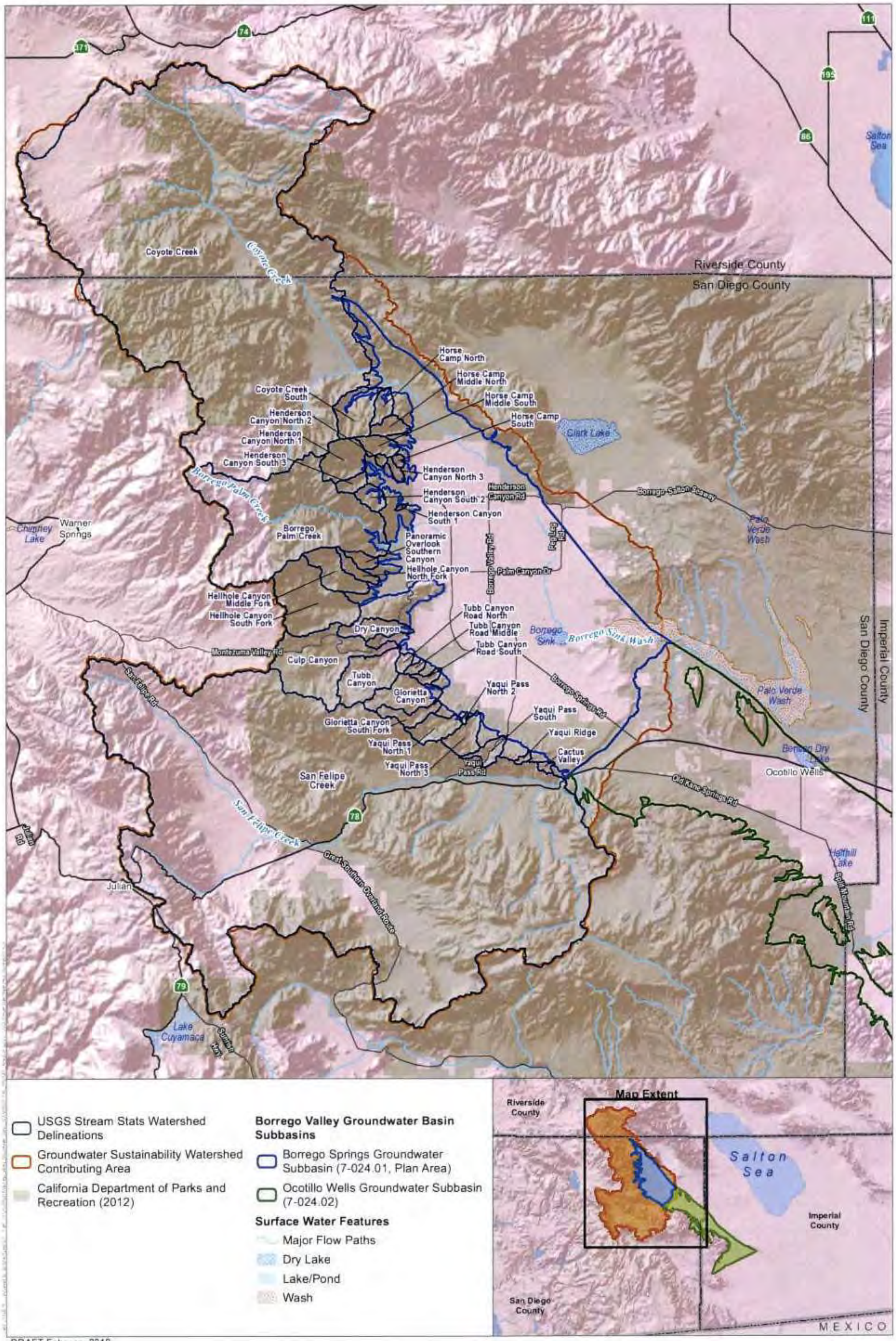
DRAFT March 2019

DATUM: NAD 1983 DATA SOURCE: DWR 2018, USGS NHD 2017, State Parks 2017, SanGIS 2017

DUDEK

Figure 1
Borrego Springs Subbasin and Potential Groundwater Dependent Ecosystems

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



DRAFT February 2019

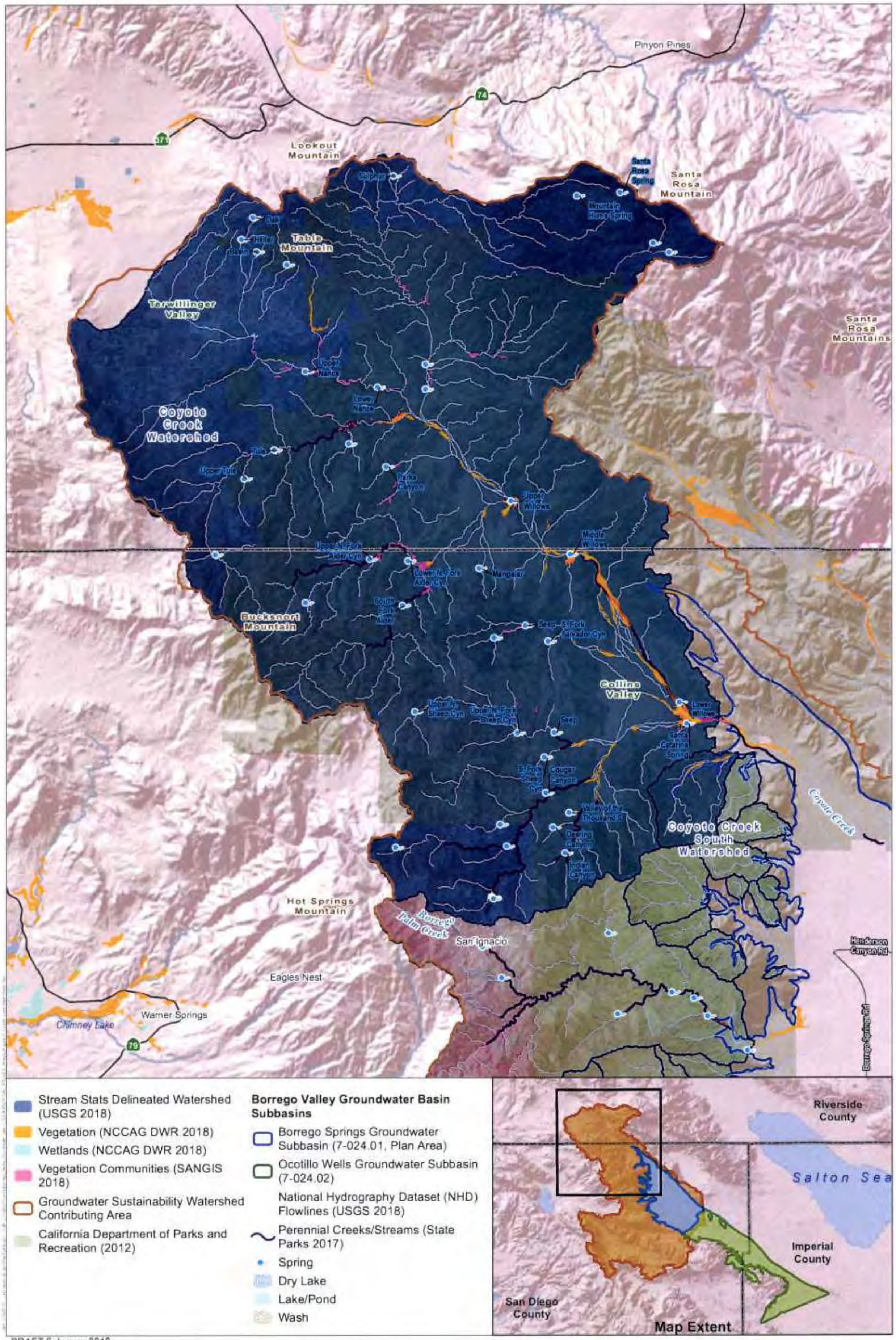
DATUM: NAD 1983 DATA SOURCE: USGS Stream Stats 2018

DUDEK

Figure 2

USGS Stream Stats Watershed Delineations

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

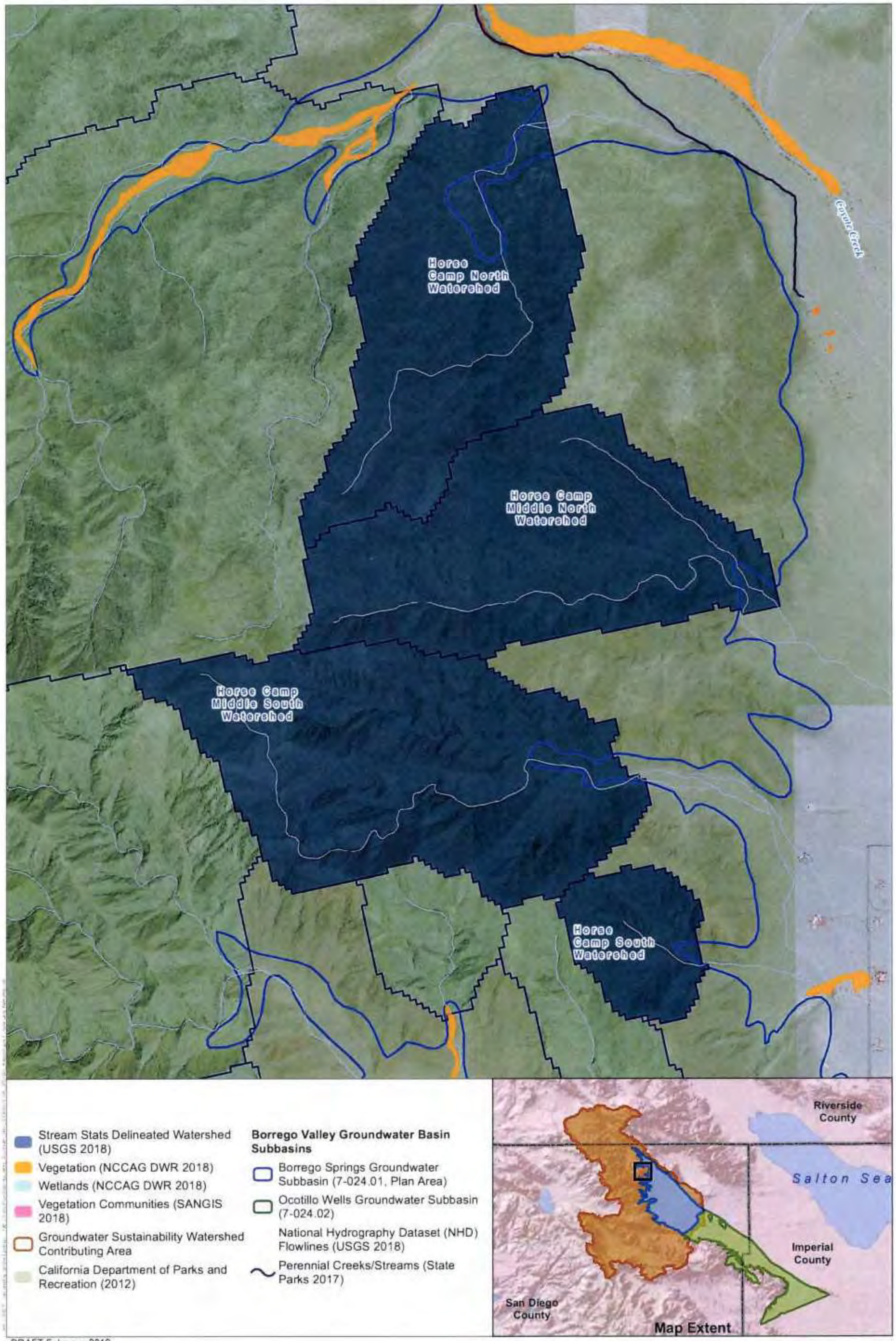


DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: USGS NHD 2018; USGS Stream Stats 2018; California State Parks 2017; USDA 2016; DWR 2018

DUDEK January 2020

Figure 3
Coyote Creek Watersheds
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



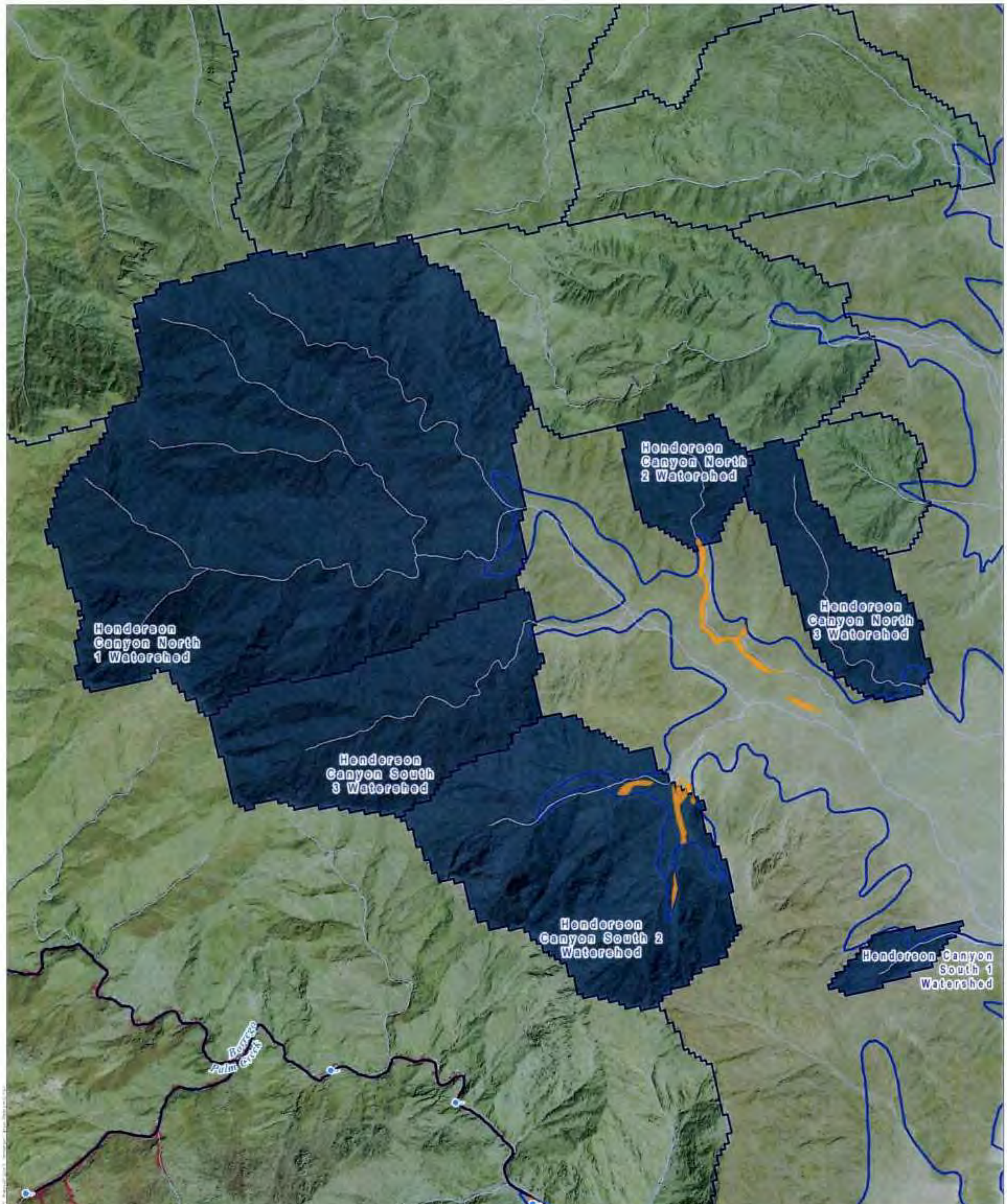
DRAFT February 2019

DATUM: NAD 1983. DATA SOURCE: USGS NHD 2018; USGS Stream Stats 2018; California State Parks 2017; USDA 2016; DWR 2016

DUDEK January 2020

Figure 4
Horse Camp Watersheds

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



Stream Stats Delineated Watershed (USGS 2018)

Vegetation (NCCAG DWR 2018)

Groundwater Sustainability Watershed Contributing Area

California Department of Parks and Recreation (2012)

Borrego Valley Groundwater Basin Subbasins

Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)

Ocotillo Wells Groundwater Subbasin (7-024.02)

National Hydrography Dataset (NHD) Flowlines (USGS 2018)

Perennial Creeks/Streams (State Parks 2017)

Spring

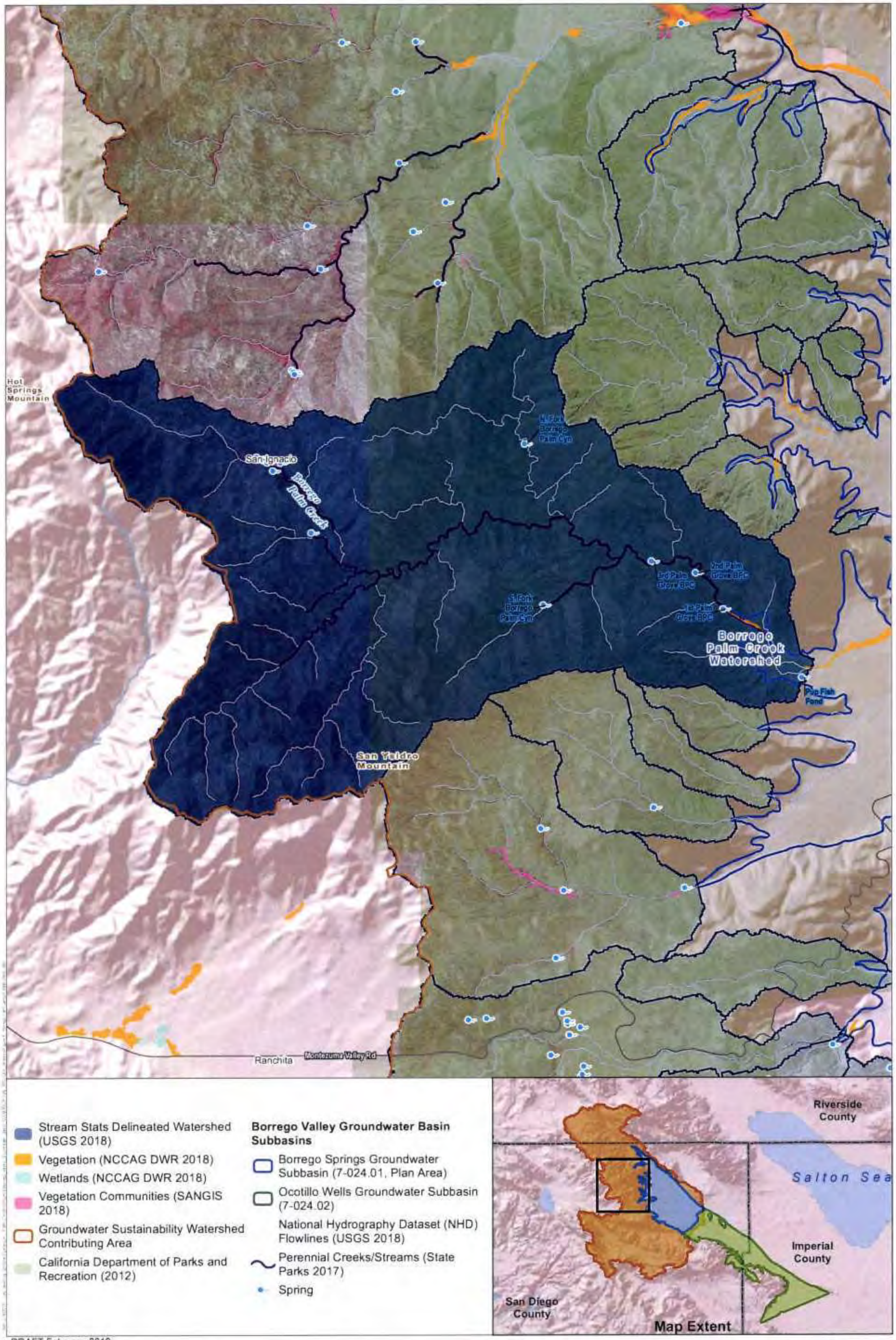
DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: USGS NHD 2018, USGS Stream Stats 2018, California State Parks 2017, USDA 2016, DWR 2018

DUDEK January 2020 0 0.5 1 Miles

Figure 5
Henderson Canyon Watersheds

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

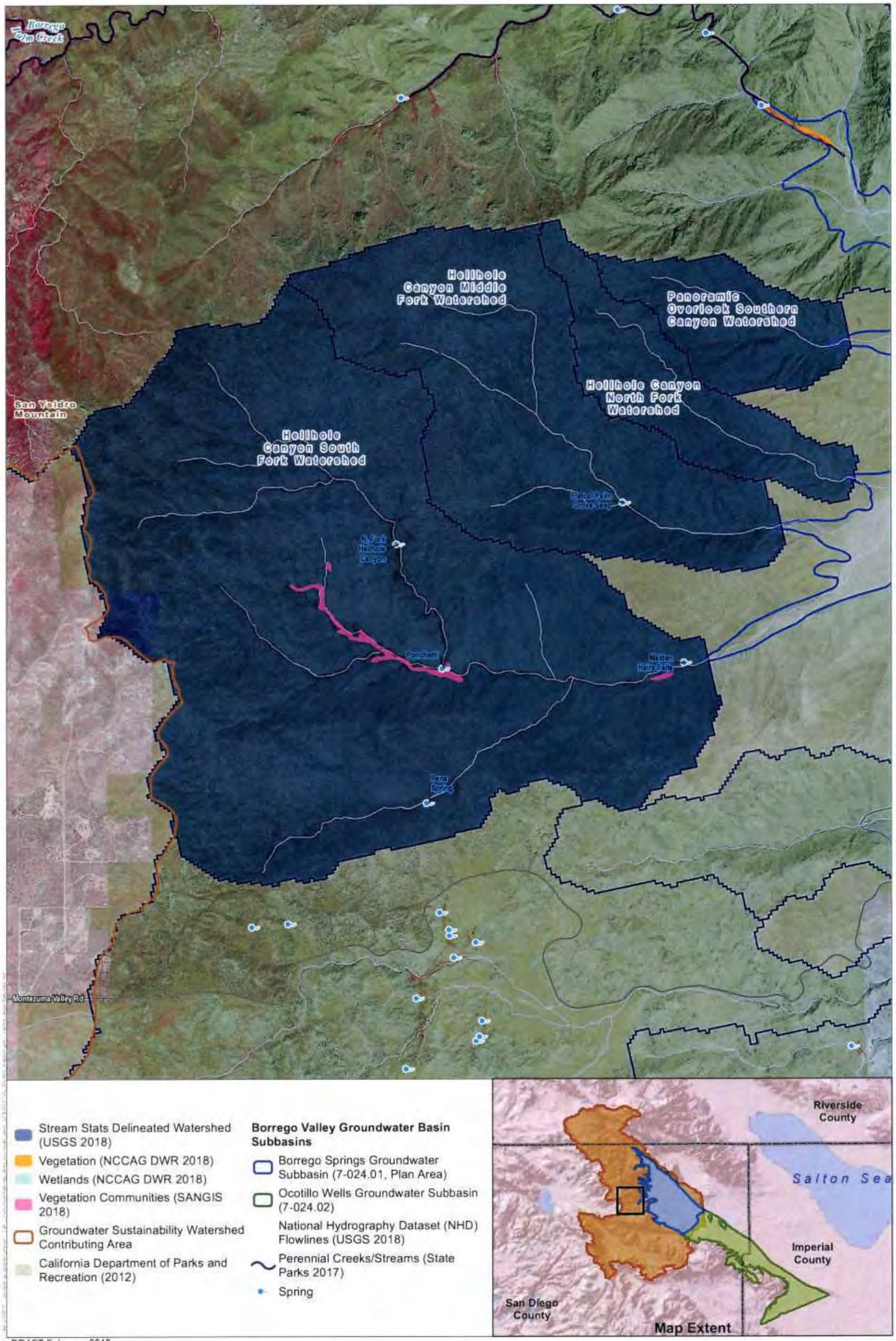


DRAFT February 2019

DATUM NAD 1983 DATA SOURCE USGS NHD 2018; USGS Stream Stats 2018, California State Parks 2017 USDA 2016 DWR 2018

DUDEK January 2020

Figure 6
Borrego Palm Canyon Watersheds
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

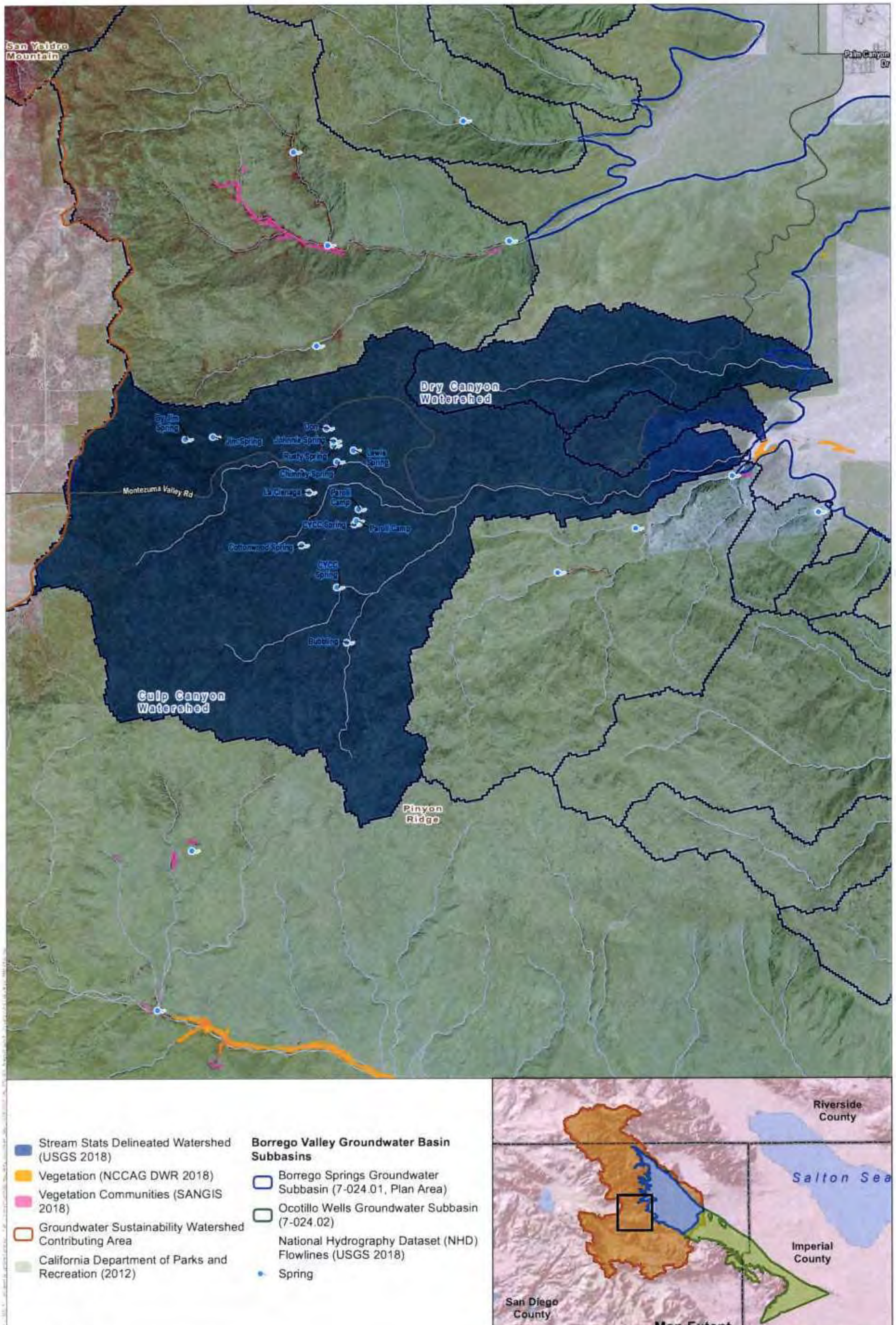


DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: USGS NHD 2018, USGS Stream Stats 2018, California State Parks 2017, USDA 2016, DWR 2018

DUDEK January 2020

Figure 7
Hellhole Canyon Watersheds
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

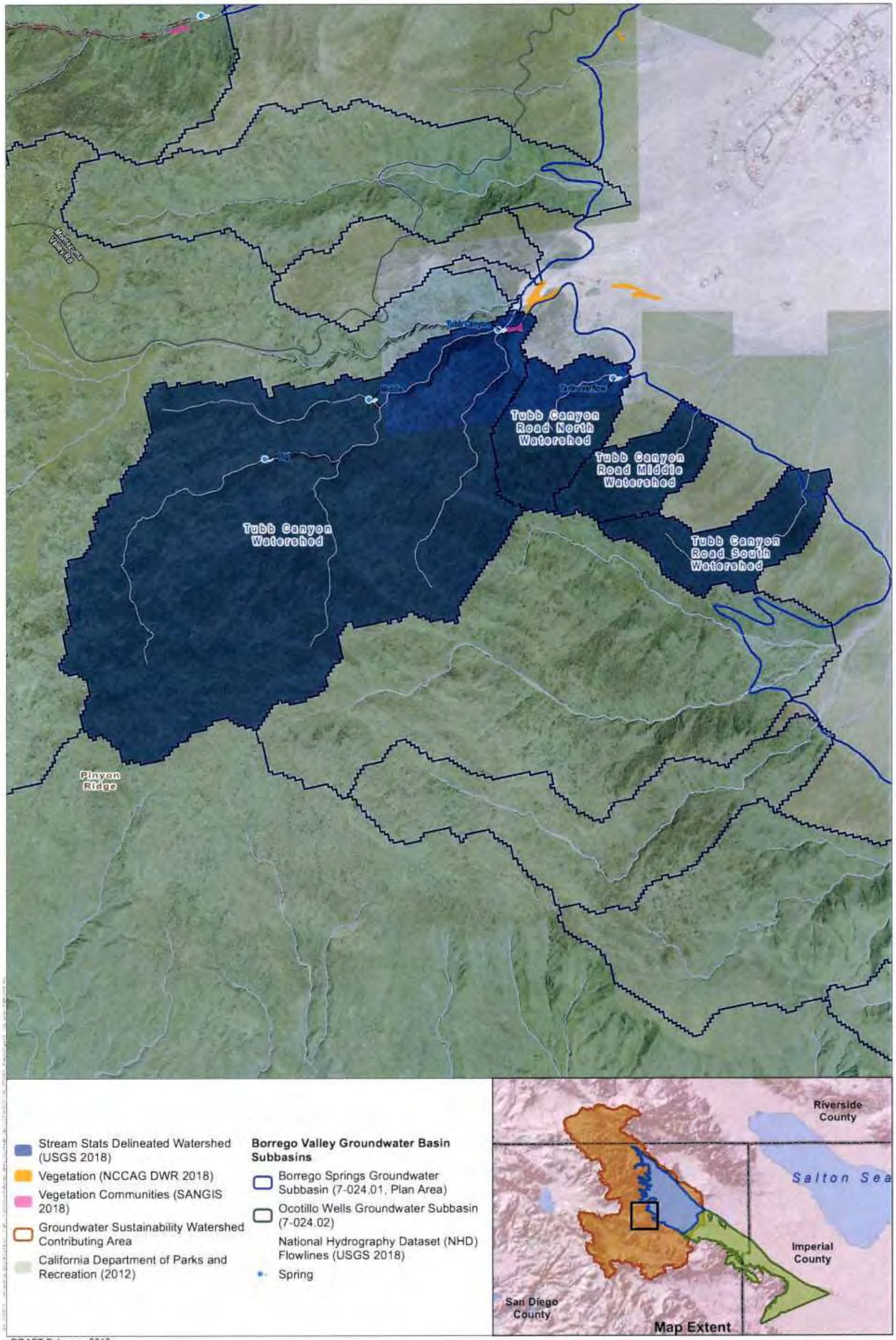


DRAFT February 2019

DATUM NAD 1983 DATA SOURCE USGS NHD 2018, USGS Stream Stats 2018, California State Parks 2017, USDA 2016, DWR 2018

DUDEK January 2020 0 0.5 1 Miles

Figure 8
Dry Canyon and Culp Canyon Watersheds
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



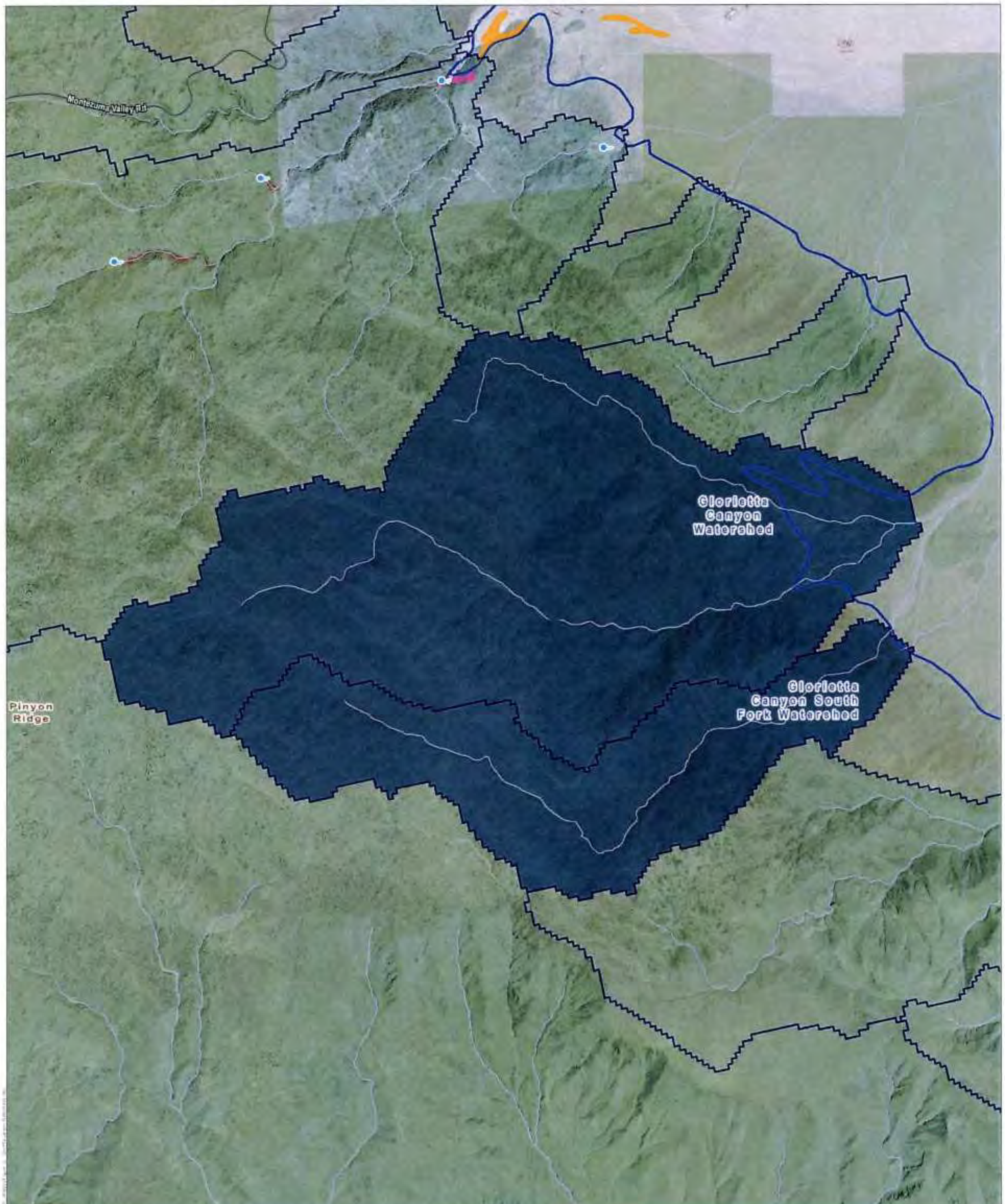
DRAFT February 2019

DATUM NAD 1983 DATA SOURCE: USGS NHD 2018; USGS Stream Stats 2018; California State Parks 2017; USDA 2016; DWR 2018

DUDEK January 2020

Figure 9
Tubb Canyon Watersheds

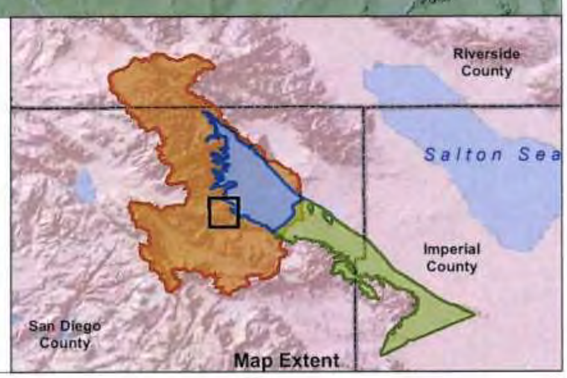
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



- Stream Stats Delineated Watershed (USGS 2018)
- Vegetation (NCCAG DWR 2018)
- Vegetation Communities (SANGIS 2018)
- Groundwater Sustainability Watershed Contributing Area
- California Department of Parks and Recreation (2012)

Borrego Valley Groundwater Basin Subbasins

- Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
- Ocotillo Wells Groundwater Subbasin (7-024.02)
- National Hydrography Dataset (NHD) Flowlines (USGS 2018)
- Spring



DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: USGS NHD 2018, USGS Stream Stats 2018, California State Parks 2017, USDA 2016, DWR 2018

DUDEK January 2020 0 0.5 1 Miles

Figure 10
Glorietta Canyon Watersheds
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

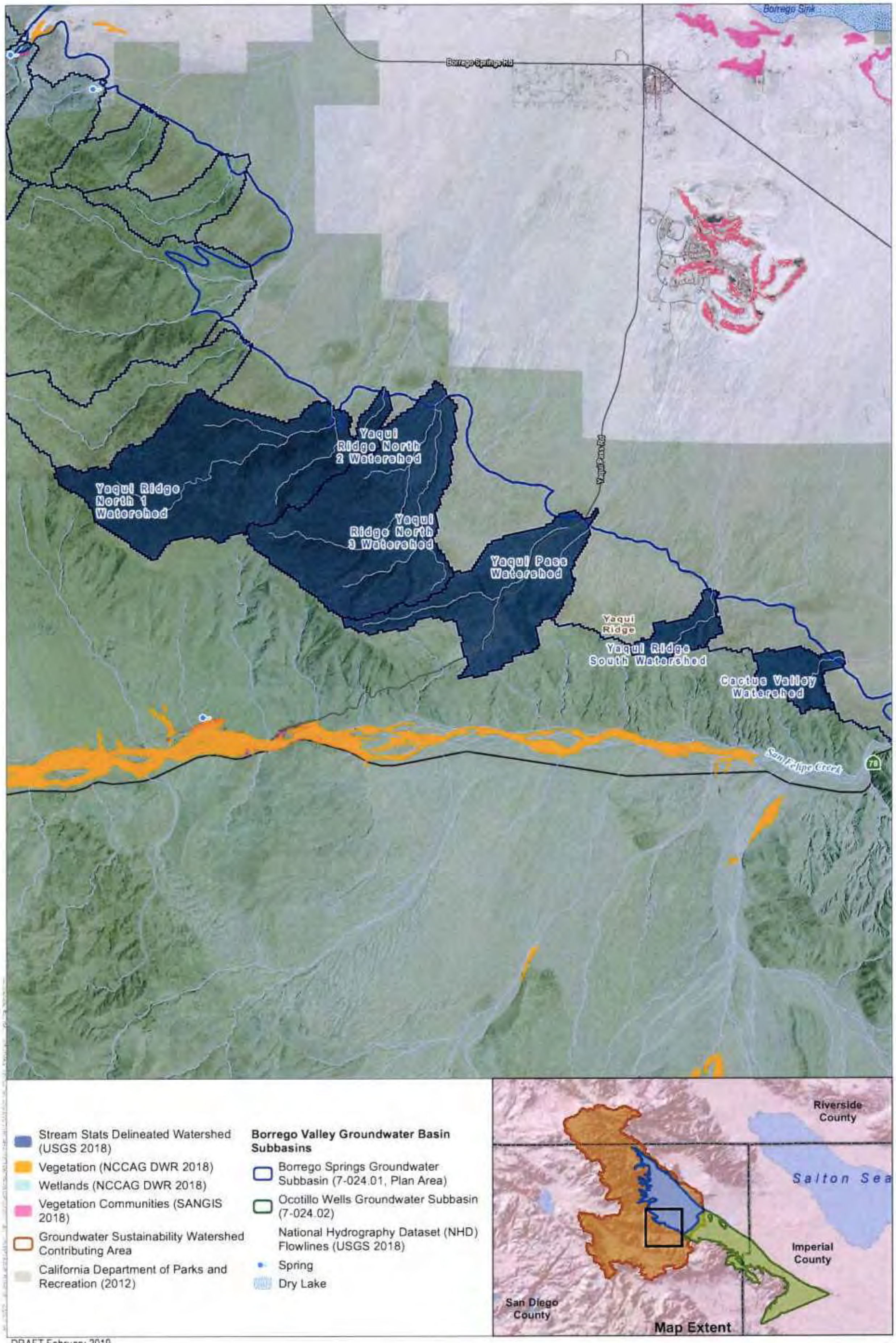
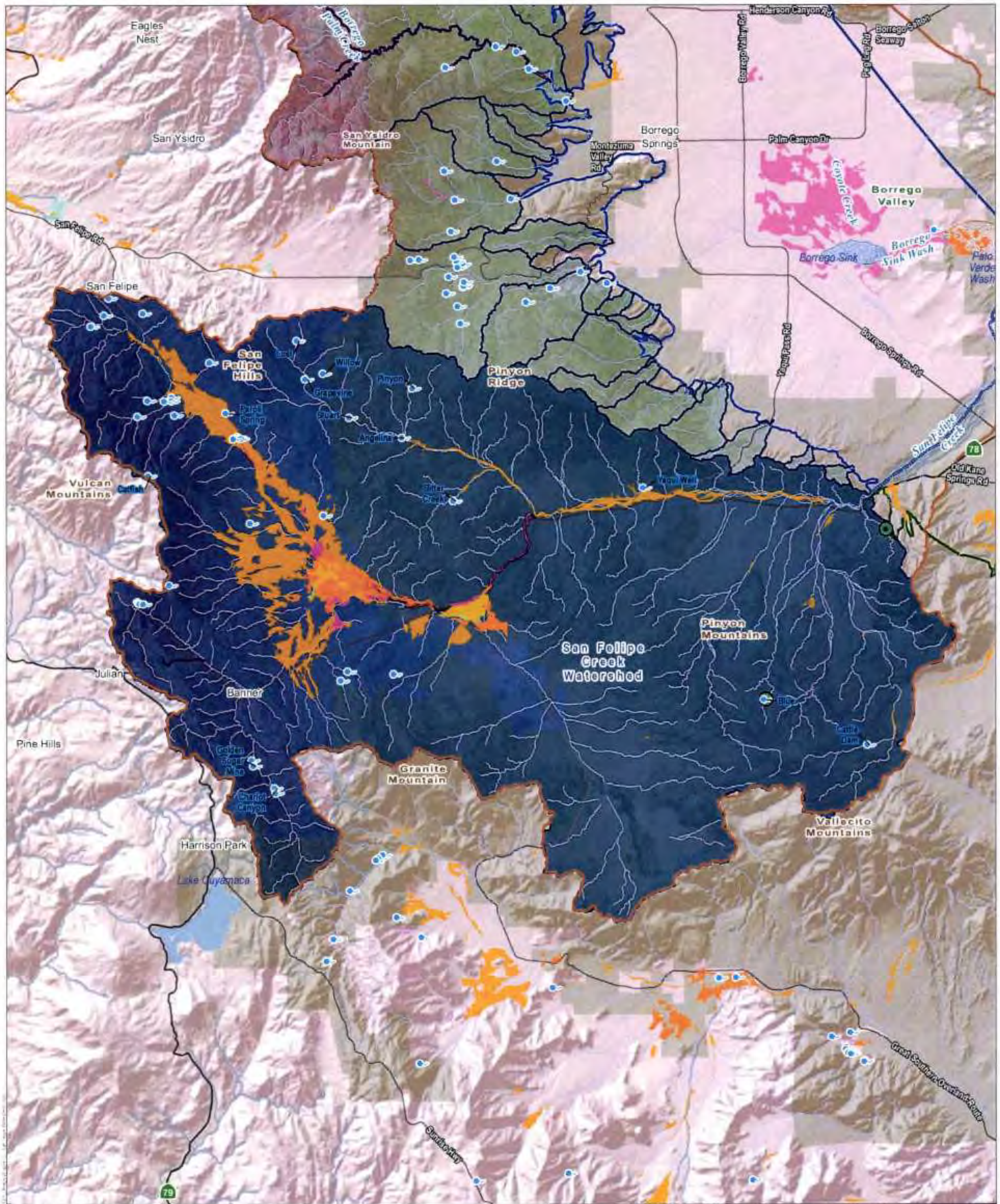
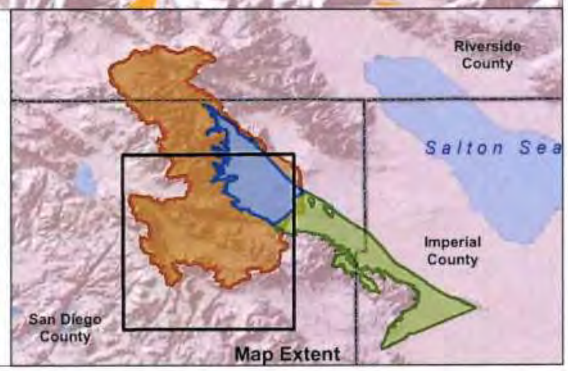


Figure 11
Yaqui Ridge Watersheds

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



Stream Stats Delineated Watershed (USGS 2018)	**Borrego Valley Groundwater Basin Subbasins**
Vegetation (NCCAG DWR 2018)	Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
Wetlands (NCCAG DWR 2018)	Ocotillo Wells Groundwater Subbasin (7-024.02)
Vegetation Communities (SANGIS 2018)	National Hydrography Dataset (NHD) Flowlines (USGS 2018)
Groundwater Sustainability Watershed Contributing Area	Perennial Creeks/Streams (State Parks 2017)
California Department of Parks and Recreation (2012)	Spring
	Tenaja
	Dry Lake
	Lake/Pond
	Wash



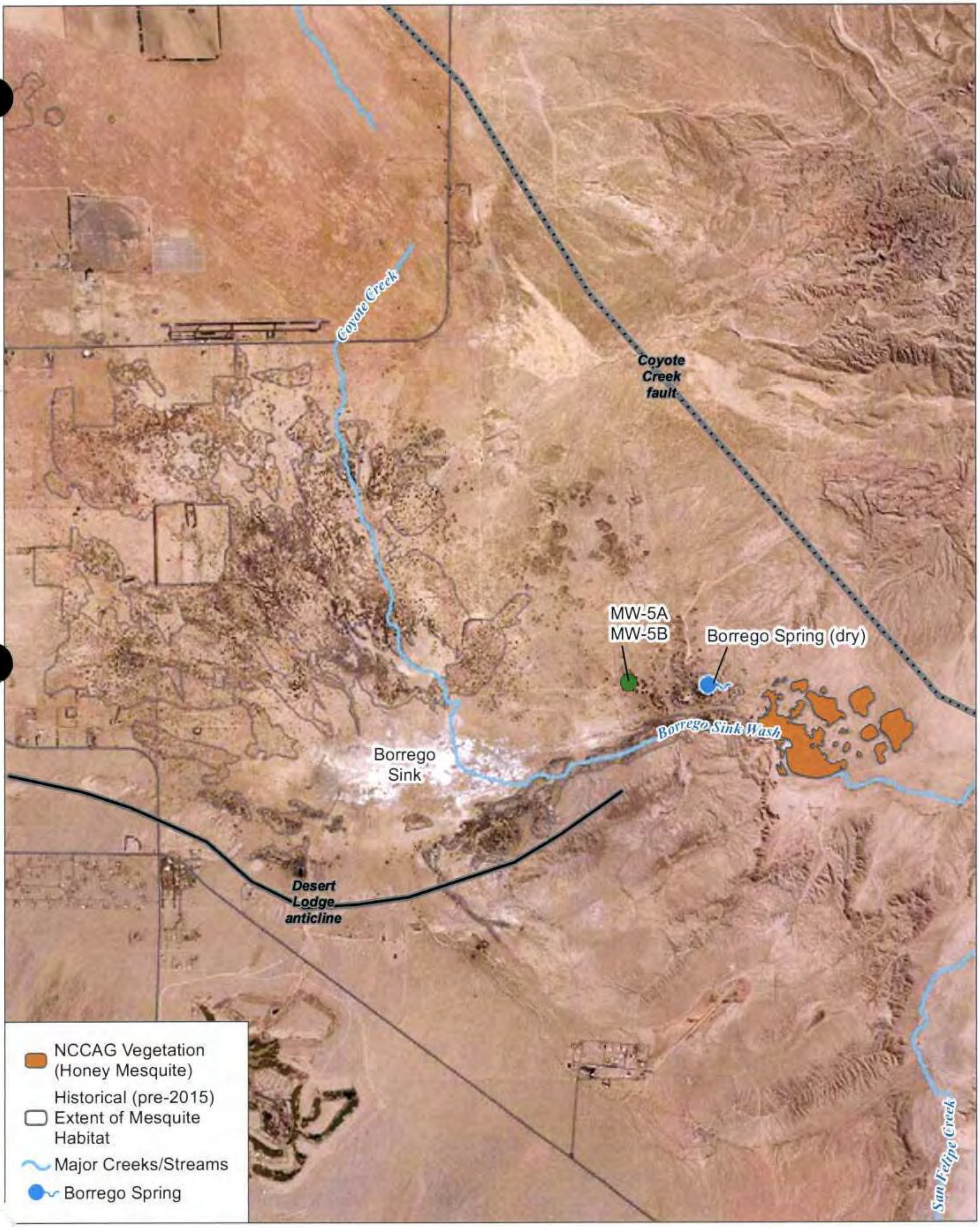
DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: USGS NHD 2018; USGS Stream Stats 2018; California State Parks 2017; USDA 2016; DWR 2018

DUDEK January 2020 Miles

Figure 12
San Felipe Watersheds

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



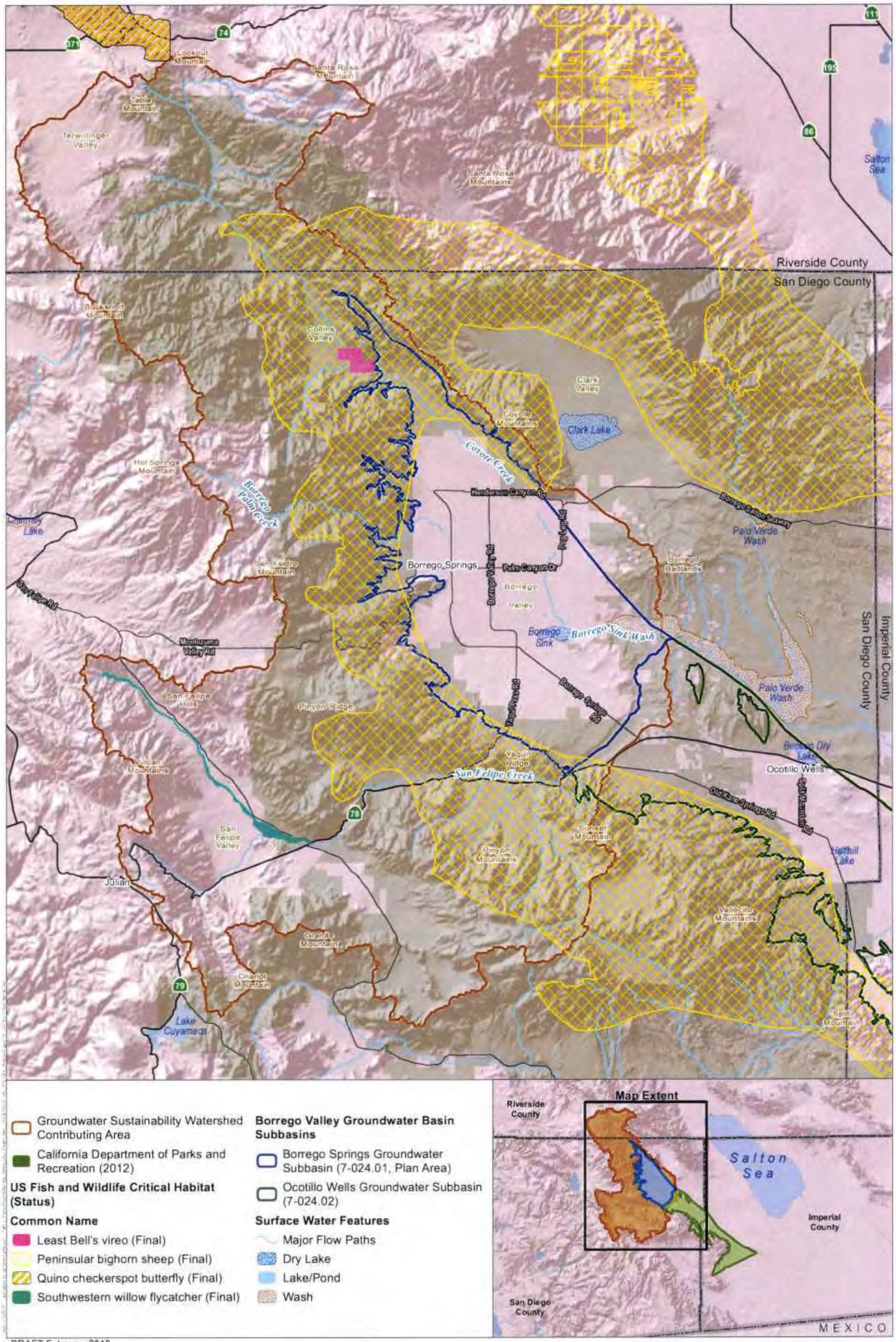
SOURCE: DWR, USGS NHD, SanGIS

DUDEK January 2020

0 0.5 1 Miles

Figure 13
Borrego Sink Potential GDEs

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



DRAFT February 2019

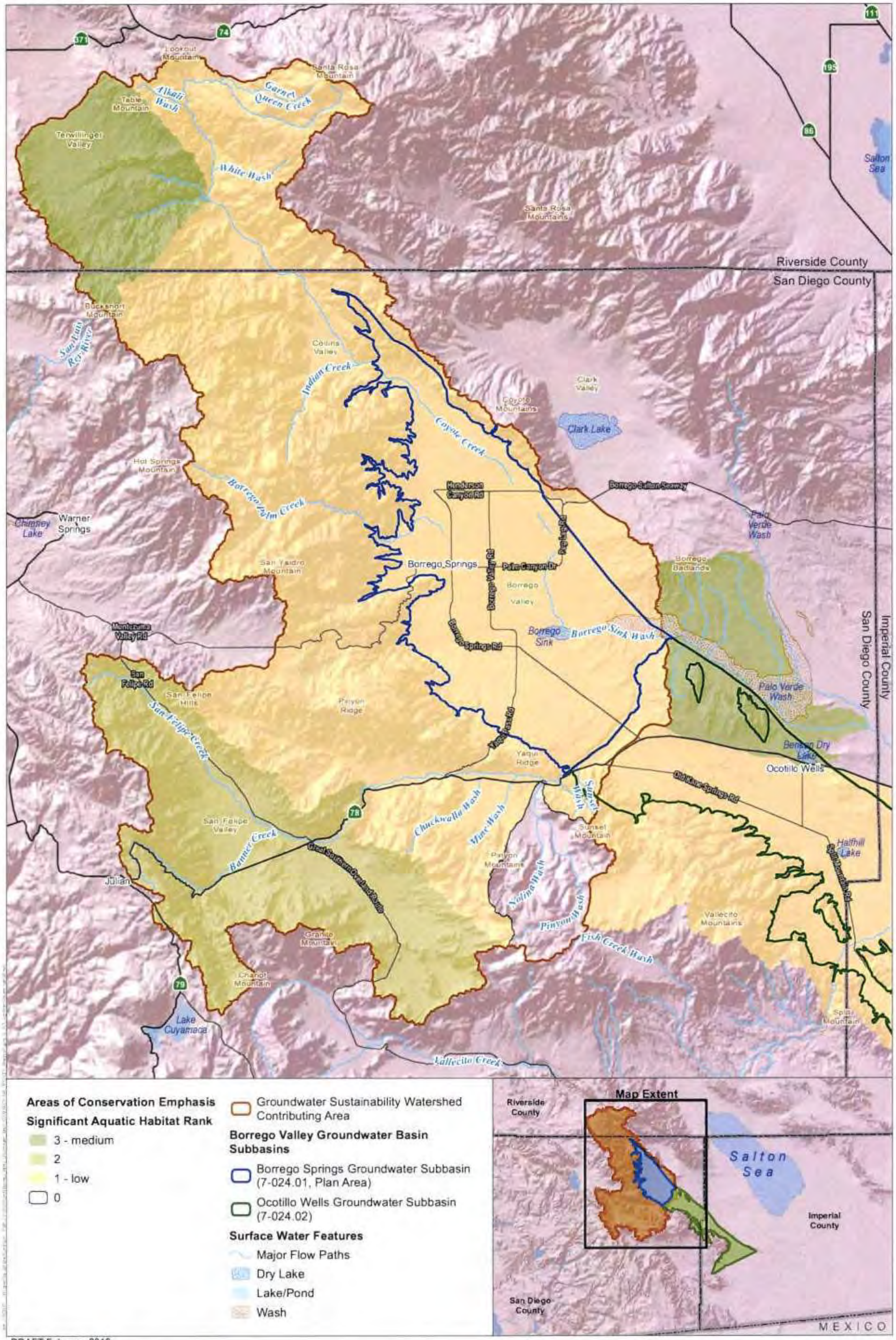
DATUM NAD 1983 DATA SOURCE USFWS 2018

DUDEK January 2020

0 2 4 Miles

Figure 14
US Fish and Wildlife Critical Habitat

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

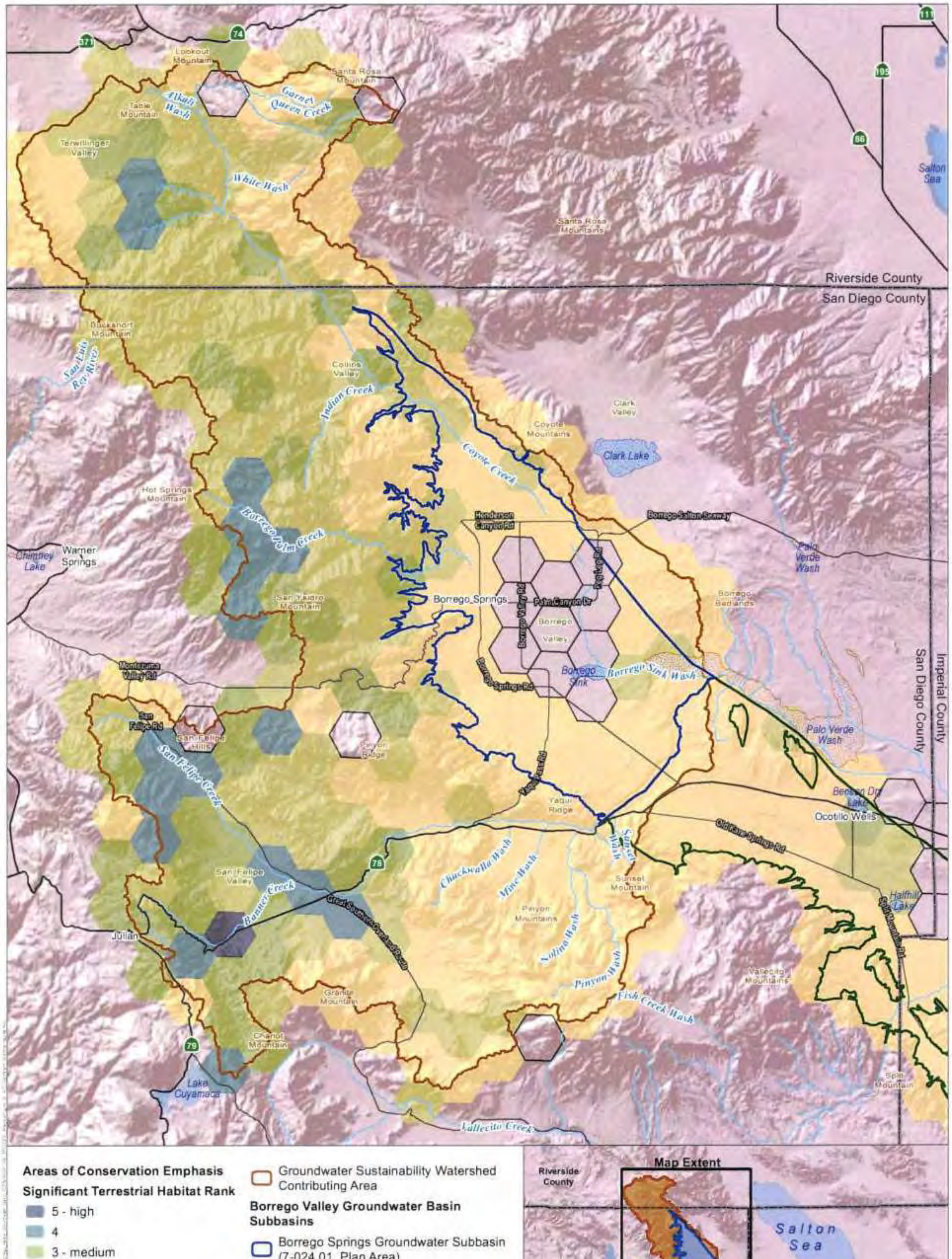


DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: CDFW 2018

DUDEK

Figure 15
Areas of Conservation Emphasis (ACE) - Significant Aquatic Habitat
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

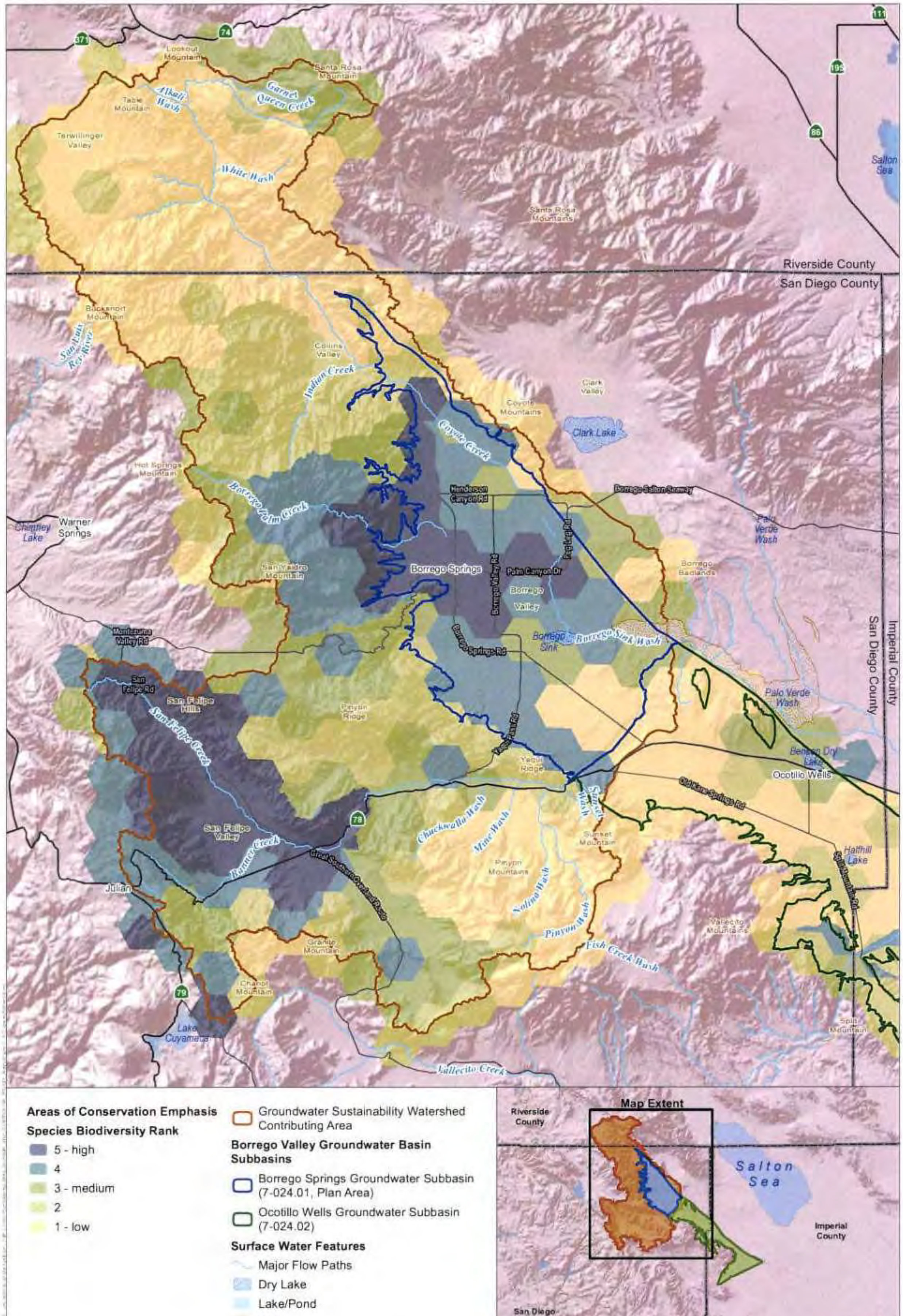


DRAFT February 2019

DATUM: NAD 1983; DATA SOURCE: CDFW 2018

DUDEK January 2020

Figure 16
Areas of Conservation Emphasis (ACE) - Significant Terrestrial Habitat
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

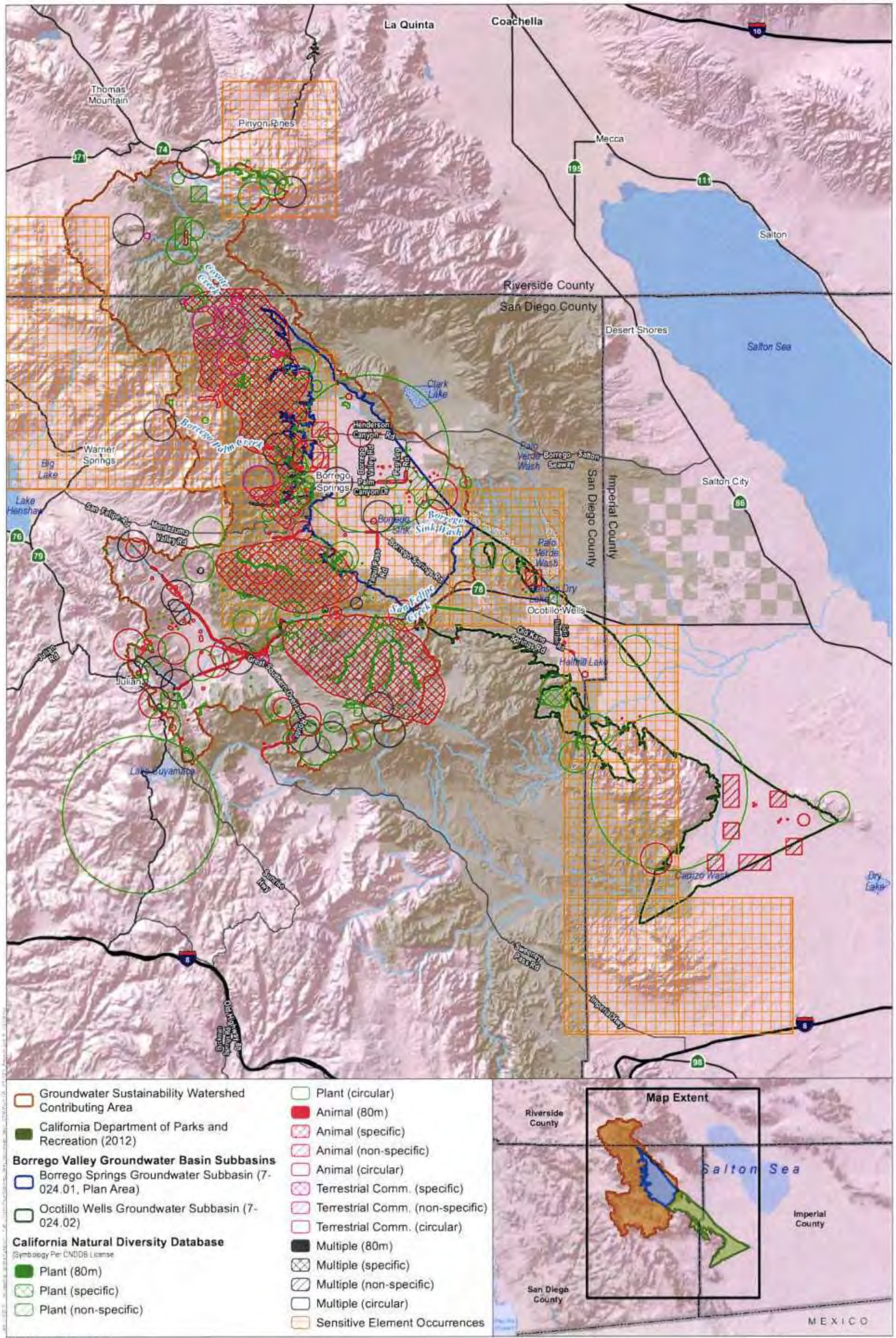


DRAFT February 2019

DATUM NAD 1983 DATA SOURCE CDFW 2018

DUDEK

Figure 17
Areas of Conservation Emphasis (ACE) - Species Biodiversity
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



DRAFT February 2019

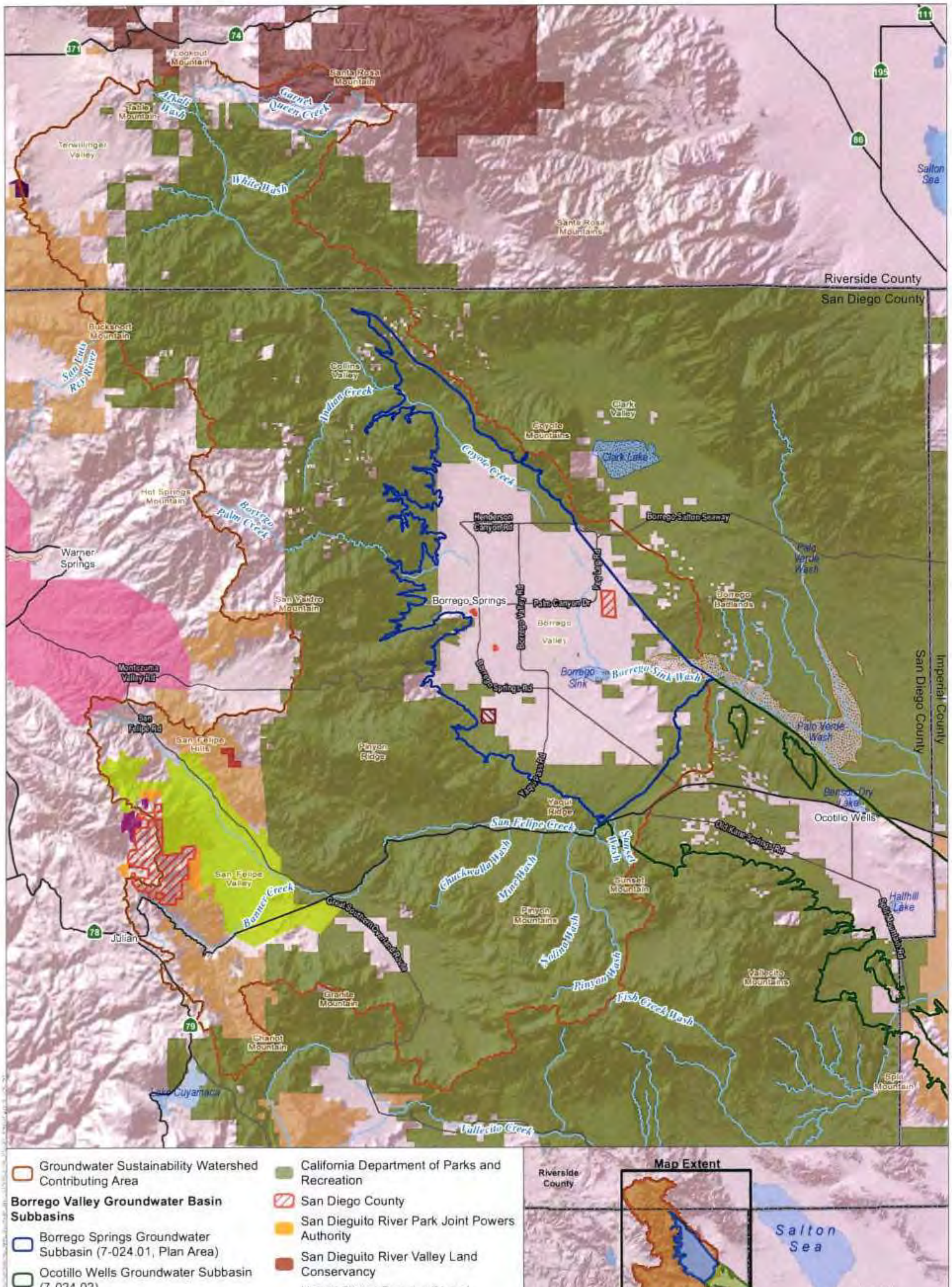
DATUM: NAD 1983 DATA SOURCE: CDFW 2018

DUDEK January 2020

Scale Per CNDDB License Agreement

Figure 18
California Natural Diversity Database (CNDDB)

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

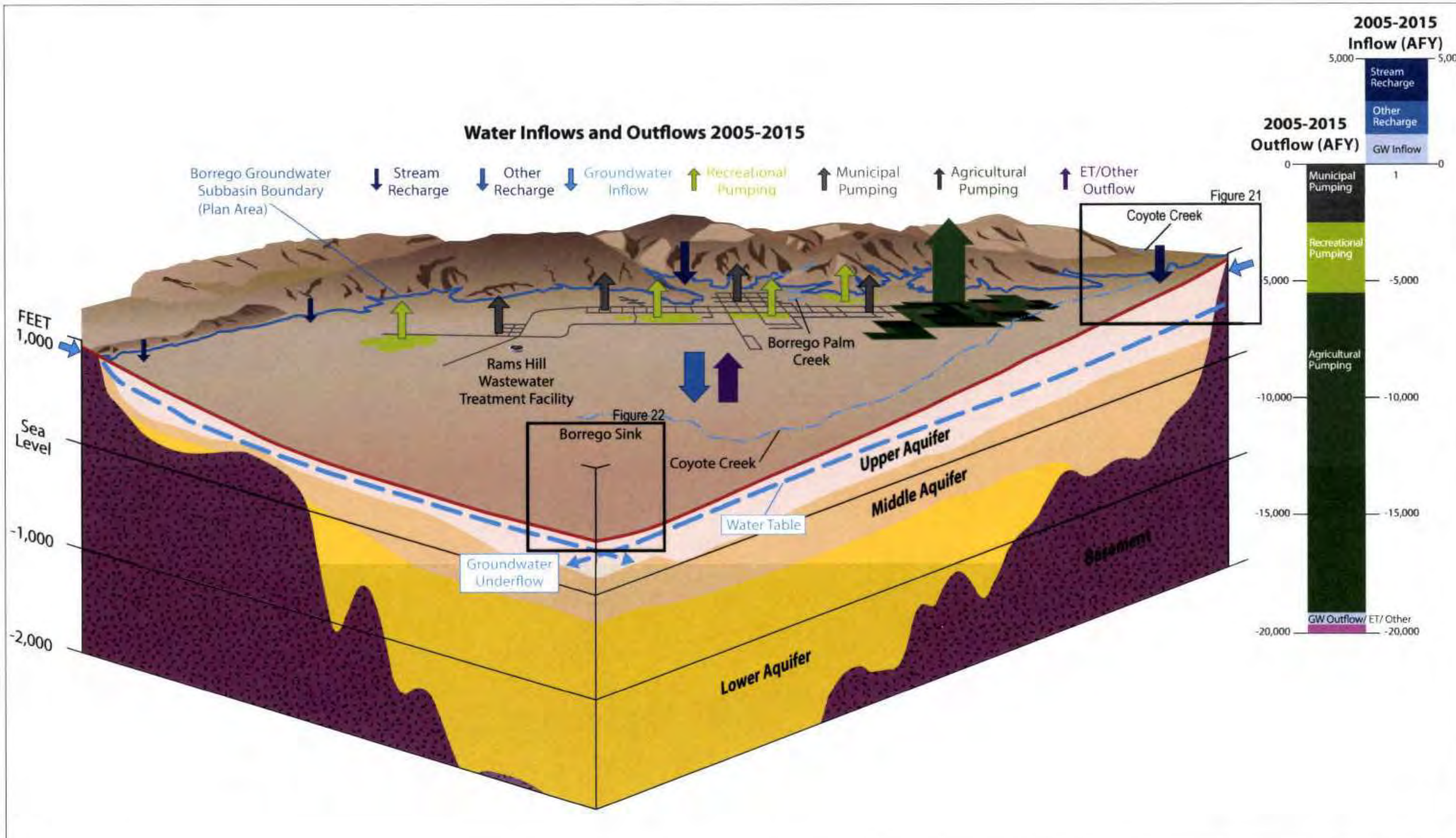


DRAFT February 2019

DATUM: NAD 1983 DATA SOURCE: CPAD 2017a

DUDEK January 2020

Figure 19
California Protected Areas Database (CPAD)
Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



SOURCE: USGS 1982 and USGS 2015

FIGURE 20

Borrego Valley Hydrogeologic Conceptual Model

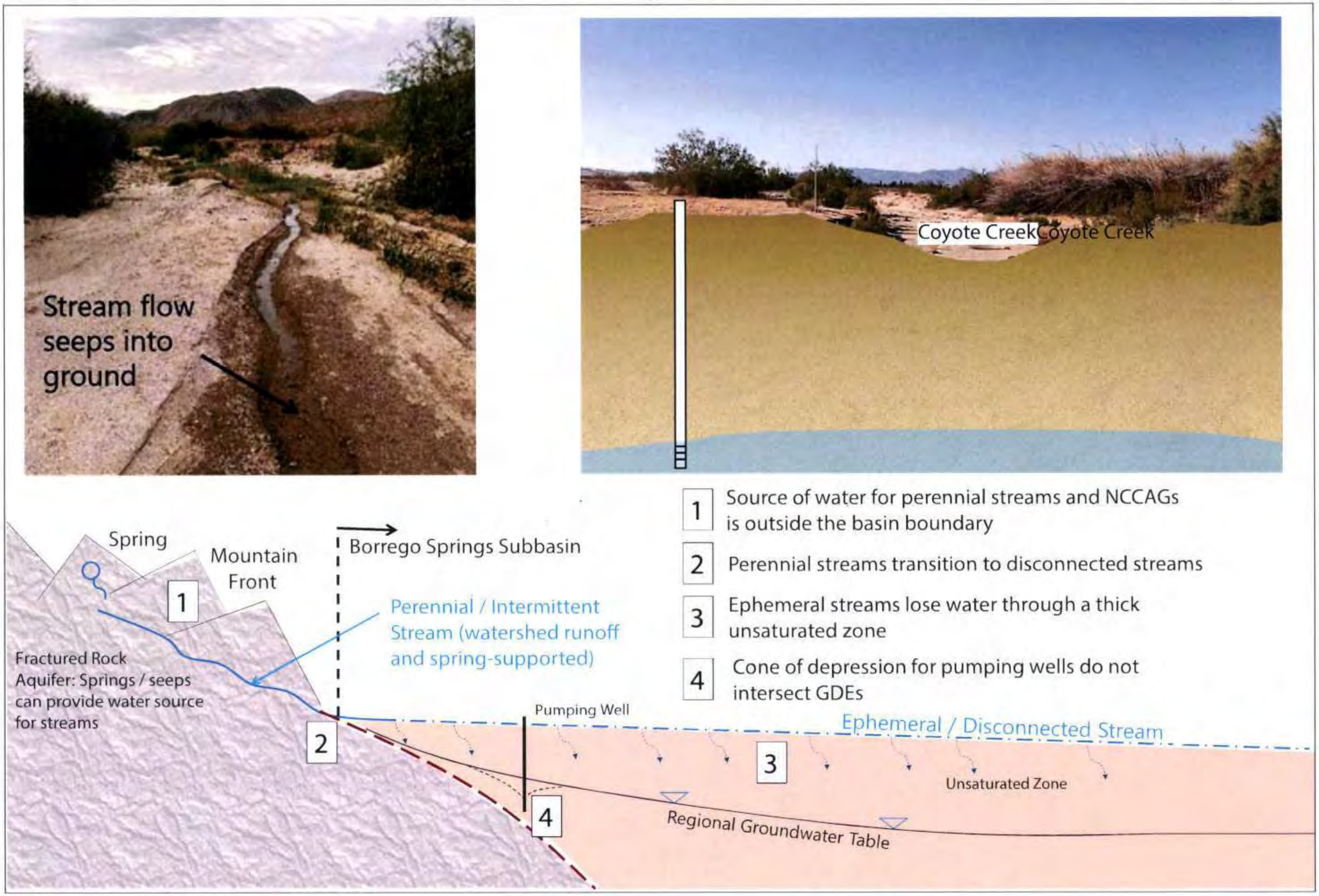
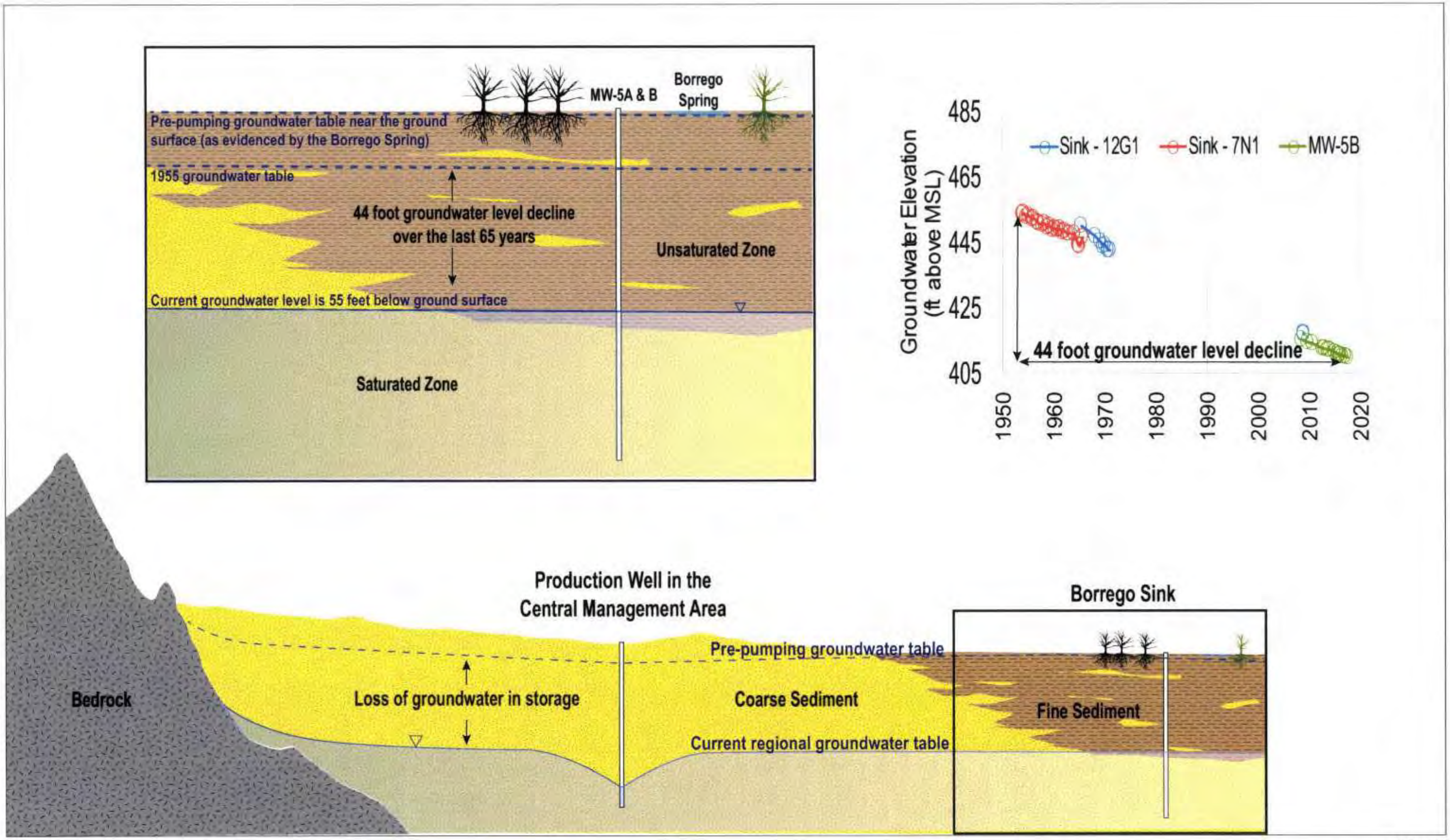


FIGURE 21

Contributing Watersheds Hydrogeologic Conceptual Model

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems



DUDEK January 2020

FIGURE 22

Borrego Sink (Mesquite Bosque) Hydrologic Conceptual Model

Attachment 1

California Freshwater Species Database (Borrego Springs Groundwater Subbasin)

Group	Scientific Name	Common Name	Federal List	State List	Other List	Agency	Type of Observation	Specificity	Source
Birds	Vireo bellii pusillus	Least Bell's Vireo	Endangered	Endangered		BLM	Current observations (post 1980)	Polygon	California Natural Diversity Database (4/2016)
Herps	Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC	BLM, USFS	Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Herps	Anaxyrus boreas boreas	Boreal Toad					Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Herps	Anaxyrus californicus	Arroyo Toad	Endangered	Special Concern	ARSSC		Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Herps	Anaxyrus punctatus	Red-spotted Toad					Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Herps	Pseudacris cadaverina	California Treefrog			ARSSC		Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Herps	Thamnophis hammondii hammondii	Two-striped Gartersnake		Special Concern	ARSSC	BLM, USFS	Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Mammals	Castor canadensis	American Beaver			Not on any status lists		Modeled habitat/ generalized observation	Polygon	California Wildlife Habitat Relationships
Birds	Actitis macularius	Spotted Sandpiper					Current observations (post 1980)	Point	CLO EBIRD
Birds	Aechmophorus occidentalis	Western Grebe					Current observations (post 1980)	Point	CLO EBIRD
Birds	Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority	BLM	Current observations (post 1980)	Point	CLO EBIRD
Birds	Aix sponsa	Wood Duck					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas acuta	Northern Pintail					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas americana	American Wigeon					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas americana	American Wigeon					Current observations (post 1980)	Point	CLO EBIRD_CA

Birds	Anas americana	American Wigeon					Current observations (post 1980)	Point	CLO GBBC
Birds	Anas americana	American Wigeon					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Anas clypeata	Northern Shoveler					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas crecca	Green-winged Teal					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas crecca	Green-winged Teal					Current observations (post 1980)	Point	CLO GBBC
Birds	Anas cyanoptera	Cinnamon Teal					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas cyanoptera	Cinnamon Teal					Current observations (post 1980)	Point	CLO GBBC
Birds	Anas discors	Blue-winged Teal					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas platyrhynchos	Mallard					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas platyrhynchos	Mallard					Current observations (post 1980)	Point	CLO EBIRD_CAN
Birds	Anas platyrhynchos	Mallard					Current observations (post 1980)	Point	CLO GBBC
Birds	Anas platyrhynchos	Mallard					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Anas strepera	Gadwall					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anas strepera	Gadwall					Current observations (post 1980)	Point	CLO GBBC
Birds	Anser albifrons	Greater White-fronted Goose					Current observations (post 1980)	Point	CLO EBIRD
Birds	Anser albifrons	Greater White-fronted Goose					Current observations (post 1980)	Point	CLO EBIRD_CA
Birds	Anser albifrons	Greater White-fronted Goose					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Ardea alba	Great Egret					Current observations (post 1980)	Point	CLO EBIRD
Birds	Ardea alba	Great Egret					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Ardea herodias	Great Blue Heron					Current observations (post 1980)	Point	CLO EBIRD
Birds	Aythya affinis	Lesser Scaup					Current observations (post 1980)	Point	CLO EBIRD

Birds	Aythya americana	Redhead		Special Concern	BSSC - Third priority		Current observations (post 1980)	Point	CLO EBIRD
Birds	Aythya collaris	Ring-necked Duck					Current observations (post 1980)	Point	CLO EBIRD
Birds	Aythya collaris	Ring-necked Duck					Current observations (post 1980)	Point	CLO GBBC
Birds	Aythya valisineria	Canvasback		Special			Current observations (post 1980)	Point	CLO EBIRD
Birds	Aythya valisineria	Canvasback		Special			Current observations (post 1980)	Point	CLO GBBC
Birds	Botaurus lentiginosus	American Bittern					Current observations (post 1980)	Point	SDNHM Birds
Birds	Bucephala albeola	Bufflehead					Current observations (post 1980)	Point	CLO EBIRD
Birds	Butorides virescens	Green Heron					Current observations (post 1980)	Point	CLO EBIRD
Birds	Calidris mauri	Western Sandpiper					Current observations (post 1980)	Point	CLO EBIRD
Birds	Calidris minutilla	Least Sandpiper					Current observations (post 1980)	Point	CLO EBIRD
Birds	Calidris minutilla	Least Sandpiper					Current observations (post 1980)	Point	SDNHM Birds
Birds	Chen caerulescens	Snow Goose					Current observations (post 1980)	Point	CLO EBIRD
Birds	Chen rossii	Ross's Goose					Current observations (post 1980)	Point	CLO EBIRD
Birds	Chroicocephalus philadelphia	Bonaparte's Gull					Current observations (post 1980)	Point	CLO EBIRD
Birds	Chroicocephalus philadelphia	Bonaparte's Gull					Unknown	Point	SDNHM Birds
Birds	Cistothorus palustris palustris	Marsh Wren					Current observations (post 1980)	Point	CLO EBIRD
Birds	Egretta thula	Snowy Egret					Current observations (post 1980)	Point	CLO EBIRD
Birds	Egretta thula	Snowy Egret					Current observations (post 1980)	Point	CLO EBIRD_CA
Birds	Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered		USFS	Current observations (post 1980)	Point	CLO EBIRD
Birds	Empidonax traillii brewsteri	Willow Flycatcher	Bird of Conservation Concern	Endangered			Current observations (post 1980)	Point	SDNHM Birds

Birds	Fulica americana	American Coot					Current observations (post 1980)	Point	CLO EBIRD
Birds	Fulica americana	American Coot					Current observations (post 1980)	Point	CLO GBBC
Birds	Fulica americana	American Coot					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Gallinago delicata	Wilson's Snipe					Current observations (post 1980)	Point	CLO EBIRD
Birds	Himantopus mexicanus	Black-necked Stilt					Current observations (post 1980)	Point	CLO EBIRD
Birds	Icteria virens	Yellow-breasted Chat		Special Concern	BSSC - Third priority		Current observations (post 1980)	Point	CLO EBIRD
Birds	Limnodromus scolopaceus	Long-billed Dowitcher					Current observations (post 1980)	Point	CLO EBIRD
Birds	Lophodytes cucullatus	Hooded Merganser					Current observations (post 1980)	Point	CLO EBIRD
Birds	Megaceryle alcyon	Belted Kingfisher					Current observations (post 1980)	Point	CLO EBIRD
Birds	Megaceryle alcyon	Belted Kingfisher					Current observations (post 1980)	Point	CLO GBBC
Birds	Mergus serrator	Red-breasted Merganser					Current observations (post 1980)	Point	CLO EBIRD
Birds	Nycticorax nycticorax	Black-crowned Night-Heron					Current observations (post 1980)	Point	CLO EBIRD
Birds	Nycticorax nycticorax	Black-crowned Night-Heron					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Oreothlypis luciae	Lucy's Warbler		Special Concern	BSSC - Third priority	BLM	Current observations (post 1980)	Point	CLO EBIRD
Birds	Oreothlypis luciae	Lucy's Warbler		Special Concern	BSSC - Third priority	BLM	Current observations (post 1980)	Point	iNaturalist Observations
Birds	Oxyura jamaicensis	Ruddy Duck					Current observations (post 1980)	Point	CLO EBIRD
Birds	Oxyura jamaicensis	Ruddy Duck					Current observations (post 1980)	Point	CLO GBBC
Birds	Oxyura jamaicensis	Ruddy Duck					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority		Current observations (post 1980)	Point	CLO EBIRD
Birds	Phalacrocorax auritus	Double-crested Cormorant					Current observations (post 1980)	Point	CLO EBIRD
Birds	Phalacrocorax auritus	Double-crested Cormorant					Current observations (post 1980)	Point	CLO EBIRD_CAN

Birds	Phalacrocorax auritus	Double-crested Cormorant					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Piranga rubra	Summer Tanager		Special Concern	BSSC - First priority		Current observations (post 1980)	Point	CLO EBIRD
Birds	Plegadis chihi	White-faced Ibis		Watch list			Current observations (post 1980)	Point	CLO EBIRD
Birds	Plegadis chihi	White-faced Ibis		Watch list			Current observations (post 1980)	Point	iNaturalist Observations
Birds	Podiceps nigricollis	Eared Grebe					Current observations (post 1980)	Point	CLO EBIRD
Birds	Podiceps nigricollis	Eared Grebe					Current observations (post 1980)	Point	iNaturalist Observations
Birds	Podilymbus podiceps	Pied-billed Grebe					Current observations (post 1980)	Point	CLO EBIRD
Birds	Porzana carolina	Sora					Current observations (post 1980)	Point	CLO EBIRD
Birds	Rallus limicola	Virginia Rail					Current observations (post 1980)	Point	CLO EBIRD
Birds	Rallus limicola	Virginia Rail					Unknown	Point	SDNHM Birds
Birds	Setophaga petechia	Yellow Warbler			BSSC - Second priority		Current observations (post 1980)	Point	CLO EBIRD
Birds	Setophaga petechia	Yellow Warbler			BSSC - Second priority		Current observations (post 1980)	Point	iNaturalist Observations
Birds	Setophaga petechia	Yellow Warbler			BSSC - Second priority		Current observations (post 1980)	Point	SDNHM Birds
Birds	Tachycineta bicolor	Tree Swallow					Current observations (post 1980)	Point	CLO EBIRD
Birds	Tachycineta bicolor	Tree Swallow					Current observations (post 1980)	Point	CLO EBIRD_CA
Birds	Tachycineta bicolor	Tree Swallow					Current observations (post 1980)	Point	CLO GBBC
Birds	Tringa melanoleuca	Greater Yellowlegs					Current observations (post 1980)	Point	CLO EBIRD
Birds	Tringa semipalmata	Willet					Current observations (post 1980)	Point	CLO EBIRD
Birds	Tringa solitaria	Solitary Sandpiper					Current observations (post 1980)	Point	CLO EBIRD
Birds	Vireo bellii	Bell's Vireo					Current observations (post 1980)	Point	CLO EBIRD

Birds	Vireo bellii arizonae	Arizona Bell's Vireo	Bird of Conservation Concern	Endangered		BLM	Current observations (post 1980)	Point	SDNHM Birds
Birds	Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority		Current observations (post 1980)	Point	CLO EBIRD
Birds	Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority		Current observations (post 1980)	Point	SDNHM Birds
Fishes	Cyprinodon macularius	Desert pupfish	Endangered	Endangered	Endangered - Moyle 2013		Current observations (post 1980)	Point	California Natural Diversity Database (4/2016)
Herps	Anaxyrus boreas boreas	Boreal Toad					Current observations (post 1980)	Point	CAS HERP
Herps	Anaxyrus boreas boreas	Boreal Toad					Current observations (post 1980)	Point	iNaturalist Observations
Herps	Anaxyrus boreas boreas	Boreal Toad					Current observations (post 1980)	Point	SDNHM Herps
Herps	Anaxyrus boreas halophilus	California Toad			ARSSC		Current observations (post 1980)	Point	CAS HERP
Herps	Anaxyrus punctatus	Red-spotted Toad					Current observations (post 1980)	Point	iNaturalist Observations
Herps	Pseudacris cadaverina	California Treefrog			ARSSC		Current observations (post 1980)	Point	CAS HERP
Herps	Pseudacris cadaverina	California Treefrog			ARSSC		Current observations (post 1980)	Point	iNaturalist Observations
Herps	Pseudacris cadaverina	California Treefrog			ARSSC		Current observations (post 1980)	Point	SDNHM Herps
Herps	Pseudacris regilla	Northern Pacific Chorus Frog					Current observations (post 1980)	Point	CAS HERP
Insects & other inverts	Abedus spp.	Abedus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Anax junius	Common Green Darner					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Argia nahuana	Aztec Dancer					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Argia spp.	Argia spp					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012

Insects & other inverts	Argia vivida	Vivid Dancer					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Argia vivida	Vivid Dancer					Unknown	Point	CASENT Arthropods
Insects & other inverts	Argia vivida	Vivid Dancer					Unknown	Point	LACMENT
Insects & other inverts	Baetis adonis	A Mayfly					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Baetis spp.	Baetis spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Belostomatidae fam.	Belostomatidae fam.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Callibaetis spp.	Callibaetis spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Chaetarthria pallida				Not on any status lists		Unknown	Point	SBMNH SBMNH-ENT
Insects & other inverts	Chironomidae fam.	Chironomidae fam.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Coenagrionidae fam.	Coenagrionidae fam.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Cricotopus spp.	Cricotopus spp					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012

Insects & other inverts	Cryptochironomus spp.	Cryptochironomus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Enallagma civile	Familiar Bluet					Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Erpetogomphus compositus	White-belted Ringtail					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Erpetogomphus spp	Erpetogomphus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Erythemis collocata	Western Pondhawk					Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Eucorethra underwoodi				Not on any status lists		Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Eukiefferiella spp.	Eukiefferiella spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Fallceon quilleri	A Mayfly					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Fallceon spp.	Fallceon spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Gomphidae fam.	Gomphidae fam.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Helichus spp.	Helichus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012

Insects & other inverts	Helicopsyche spp.	Helicopsyche spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Hetaerina americana	American Rubyspot					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Hetaerina americana	American Rubyspot					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Heterelmis obesa				Not on any status lists		Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Heterotrissocladius spp.	Heterotrissocladius spp					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Hydropsyche spp.	Hydropsyche spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Hydropsychidae fam.	Hydropsychidae fam					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Hydroptila spp.	Hydroptila spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Hydroptilidae fam.	Hydroptilidae fam.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Laccobius spp.	Laccobius spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012

Insects & other inverts	Larsia spp.	Larsia spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Lauterborniella spp.	Lauterborniella spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Lethocerus americanus				Not on any status lists		Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Libellula croceipennis	Neon Skimmer					Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Libellula saturata	Flame Skimmer					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Libellula saturata	Flame Skimmer					Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Libellulidae fam.	Libellulidae fam.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Macrodiplax balteata	Marl Pennant					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Meropelopia spp.	Meropelopia spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Nilotanypus spp.	Nilotanypus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Ochrotrichia spp.	Ochrotrichia spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012

Insects & other inverts	Ophiogomphus spp.	Ophiogomphus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Orthemis ferruginea	Roseate Skimmer					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Pachydiplax longipennis	Blue Dasher					Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Paltothemis lineatipes	Red Rock Skimmer					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Pantala flavescens	Wandering Glider					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Paracladopelma spp.	Paracladopelma spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Parametriocnemus spp.	Parametriocnemus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Paratendipes spp.	Paratendipes spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Peltodytes spp.	Peltodytes spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Pentaneura spp.	Pentaneura spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Perithemis intensa	Mexican Amberwing					Current observations (post 1980)	Point	iNaturalist Observations

Insects & other inverts	Phaenopsectra spp.	Phaenopsectra spp					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Polypedilum spp.	Polypedilum spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Postelichus spp.	Postelichus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Pseudochironomus spp.	Pseudochironomus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Radotanypus spp.	Radotanypus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Rhagovelia spp.	Rhagovelia spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Rheotanytarsus spp.	Rheotanytarsus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Rhionaeschna multicolor	Blue-eyed Darner					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Sanfilippodytes spp.	Sanfilippodytes spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Simulium spp.	Simulium spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012

Insects & other inverts	Sperchon spp.	Sperchon spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Stictotarsus striatellus				Not on any status lists		Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Stictotarsus striatellus				Not on any status lists		Unknown	Point	SBMNH SBMNH-ENT
Insects & other inverts	Sympetrum corruptum	Variegated Meadowhawk					Current observations (post 1980)	Point	California dragonfly and damselfly database
Insects & other inverts	Sympetrum corruptum	Variegated Meadowhawk					Current observations (post 1980)	Point	iNaturalist Observations
Insects & other inverts	Sympetrum spp.	Sympetrum spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Tanytarsus spp.	Tanytarsus spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Insects & other inverts	Tinodes spp.	Tinodes spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Mollusks	Physa spp.	Physa spp.					Current observations (post 1980)	Point	SWAMP via CEDEN. Download 10 April 2014, Obs before 13 July 2012
Plants	Baccharis salicina				Not on any status lists		Current observations (post 1980)	Point	SD SD
Plants	Castilleja minor minor	Alkali Indian-paintbrush					Current observations (post 1980)	Point	SD SD
Plants	Castilleja minor spiralis	Large-flower Annual Indian-paintbrush					Current observations (post 1980)	Point	Calflora
Plants	Castilleja minor spiralis	Large-flower Annual Indian-paintbrush					Current observations (post 1980)	Point	SD

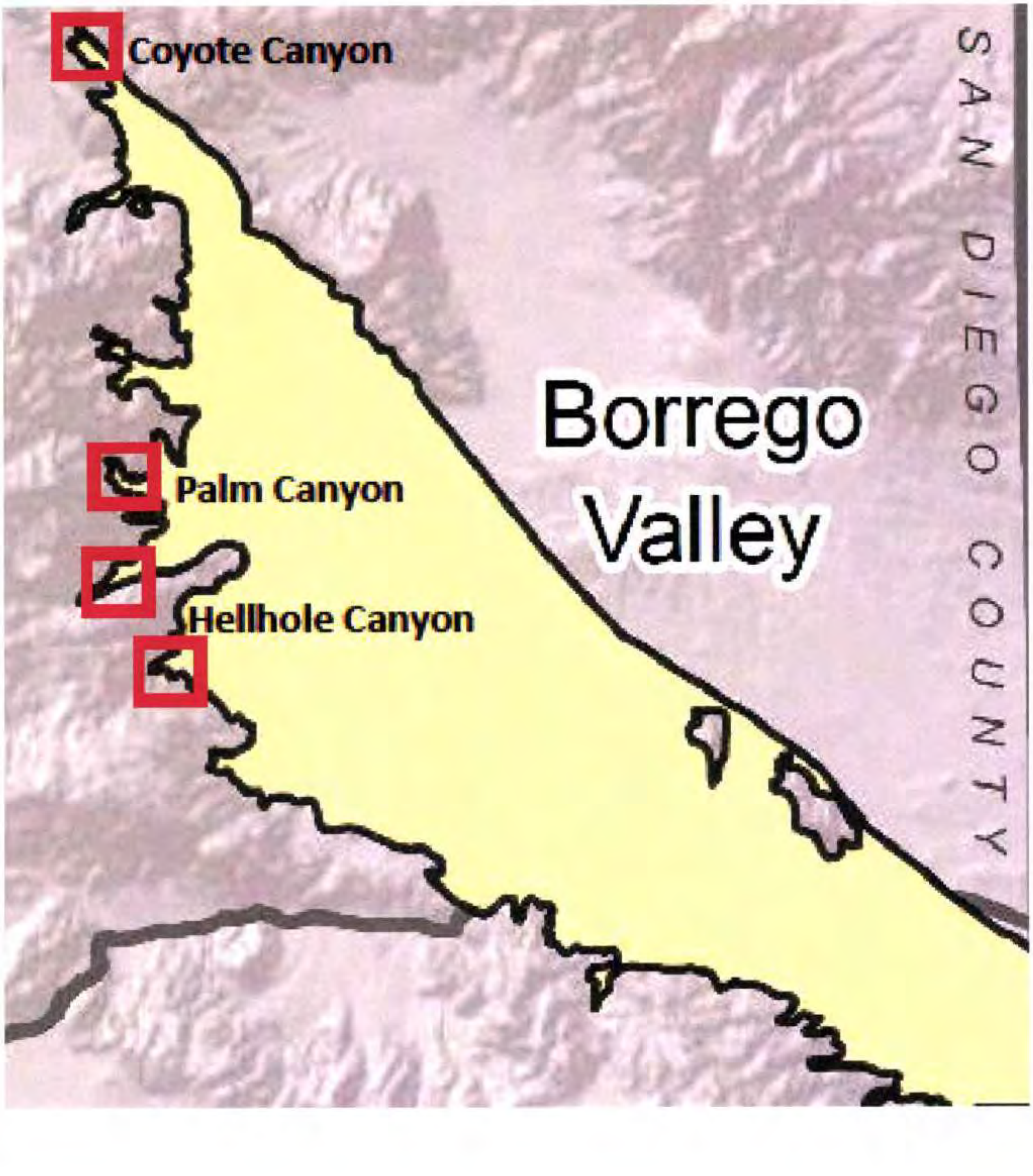
Plants	Datisca glomerata	Durango Root					Current observations (post 1980)	Point	SD
Plants	Datisca glomerata	Durango Root					Current observations (post 1980)	Point	SD SD
Plants	Juncus dubius	Mariposa Rush					Current observations (post 1980)	Point	SD SD
Plants	Juncus rugulosus	Wrinkled Rush					Current observations (post 1980)	Point	SD
Plants	Juncus xiphioides	Iris-leaf Rush					Current observations (post 1980)	Point	SD
Plants	Juncus xiphioides	Iris-leaf Rush					Current observations (post 1980)	Point	SD SD
Plants	Lythrum californicum	California Loosestrife					Current observations (post 1980)	Point	Herbarium ARIZ
Plants	Lythrum californicum	California Loosestrife					Current observations (post 1980)	Point	SD
Plants	Lythrum californicum	California Loosestrife					Current observations (post 1980)	Point	SD SD
Plants	Lythrum californicum	California Loosestrife					Current observations (post 1980)	Point	SEINET
Plants	Mimulus guttatus	Common Large Monkeyflower					Current observations (post 1980)	Point	Calflora
Plants	Mimulus guttatus	Common Large Monkeyflower					Current observations (post 1980)	Point	SD
Plants	Phacelia distans	NA					Current observations (post 1980)	Point	Calflora
Plants	Phacelia distans	NA					Current observations (post 1980)	Point	SD
Plants	Phacelia distans	NA					Current observations (post 1980)	Point	SD SD
Plants	Phacelia distans	NA					Unknown	Point	UC UC
Plants	Platanus racemosa	California Sycamore					Current observations (post 1980)	Point	Calflora
Plants	Platanus racemosa	California Sycamore					Current observations (post 1980)	Point	SD
Plants	Platanus racemosa	California Sycamore					Current observations (post 1980)	Point	SD SD
Plants	Pluchea sericea	Arrow-weed					Current observations (post 1980)	Point	Calflora
Plants	Pluchea sericea	Arrow-weed					Current observations (post 1980)	Point	SD

Plants	Pluchea sericea	Arrow-weed					Current observations (post 1980)	Point	SD SD
Plants	Salix exigua exigua	Narrowleaf Willow					Current observations (post 1980)	Point	Calflora
Plants	Salix exigua exigua	Narrowleaf Willow					Current observations (post 1980)	Point	RSA RSA
Plants	Salix exigua exigua	Narrowleaf Willow					Current observations (post 1980)	Point	SD SD
Plants	Salix gooddingii	Goodding's Willow					Current observations (post 1980)	Point	SD
Plants	Salix gooddingii	Goodding's Willow					Current observations (post 1980)	Point	SD SD
Plants	Salix laevigata	Polished Willow					Current observations (post 1980)	Point	SD
Plants	Salix laevigata	Polished Willow					Current observations (post 1980)	Point	SD SD
Plants	Schoenoplectus americanus	Three-square Bulrush					Current observations (post 1980)	Point	SD
Plants	Schoenoplectus americanus	Three-square Bulrush					Current observations (post 1980)	Point	SD SD
Plants	Typha domingensis	Southern Cattail					Current observations (post 1980)	Point	RSA
Plants	Typha domingensis	Southern Cattail					Current observations (post 1980)	Point	RSA RSA
Plants	Typha domingensis	Southern Cattail					Current observations (post 1980)	Point	SD
Plants	Typha domingensis	Southern Cattail					Current observations (post 1980)	Point	SD SD
Plants	Veronica anagallis-aquatica	NA					Current observations (post 1980)	Point	Calflora
Plants	Veronica anagallis-aquatica	NA					Current observations (post 1980)	Point	SD
Plants	Veronica anagallis-aquatica	NA					Current observations (post 1980)	Point	SD SD

Attachment 2

Aerial Photography Comparison

January 2020


Coyote Canyon
Borrego
Valley
Palm Canyon
Hellhole Canyon
SAN DIEGO COUNTY

Coyote Canyon 1954

Coyote Canyon 2017

SOURCE: USGS

Palm Canyon 1954

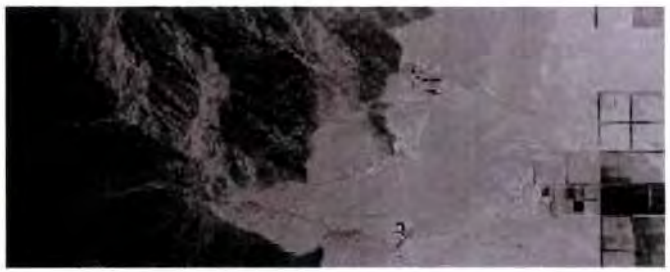
Palm Canyon 2017

SOURCE: USGS

Hellhole Canyon 1954

Hellhole Canyon 2017

SOURCE: USGS

	1954	2017
Coyote Canyon:		
Hellhole Canyon:		
Palm Canyon:		

SOURCE: USGS

Groundwater Dependent Ecosystems Comparison

Borrego Springs Subbasin Potential Groundwater Dependent Ecosystems

APPENDIX E

Monitoring Protocols and Metering Plan

E1: Borrego Sampling and Analysis Plan and Quality Assurance Plan

E2: Borrego Metering Plan

APPENDIX E1

Borrego Sampling and Analysis Plan and Quality Assurance Plan

The Sampling and Analysis Plan and Quality Assurance Plan has been modified and superseded by Section 4.3 of the Settlement Agreement and Section VI.B. of the Judgment, whereby the interim Watermaster will continue the County-initiated program of water quality monitoring in the Basin that was conducted through March 2019 as part of GSP development on an interim basis until the Court approves the permanent Watermaster and the Watermaster adopts its own Plan.

SAMPLING AND ANALYSIS PLAN AND QUALITY ASSURANCE PROJECT PLAN
Borrego Springs Subbasin

Prepared for

Borrego Valley Groundwater Sustainability Agency

Prepared by

Geosyntec consultants

engineers | scientists | innovators

2355 Northside Drive, Suite 250
San Diego, California 92108

OCTOBER 2017

TABLE OF CONTENTS

Section **Page No.**

TABLE OF CONTENTS (CONTINUED)

Section **Page No.**

APPENDICES

TABLES

ACRONYMS AND ABBREVIATIONS

COPC	constituent of potential concern
DMS	data management system
DQO	data quality objective
DWR	California Department of Water Resources
EPA	United States Environmental Protection Agency
GSP	Groundwater Sustainability Plan
HDPE	high-density polyethylene
LCS	laboratory control sample
LIMS	laboratory information management system
mL	milliliter
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
QAPP	Quality Assurance Project Plan
QA	quality assurance
QC	quality control
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
Subbasin	Borrego Springs Subbasin

INTENTIONALLY LEFT BLANK

1 INTRODUCTION

The Borrego Springs Subbasin (Subbasin) of the Borrego Valley Groundwater Basin has been identified by the California Department of Water Resources (DWR) as subject to critical conditions of overdraft (DWR 2016a). As such, in accordance with California's Sustainable Groundwater Management Act, a Groundwater Sustainability Agency has been formed to develop and implement a basin-specific Groundwater Sustainability Plan (GSP). The general purpose of the GSP is to facilitate a long-term groundwater withdrawal rate less than or equal to the sustainable yield of the Subbasin within the 20-year implementation period mandated by the Sustainable Groundwater Management Act.

The objective of this Sampling and Analysis Plan (SAP) is to establish consistent field data collection and laboratory analytical procedures, including protocols for measuring groundwater levels and protocols for sampling groundwater quality. The SAP incorporates pertinent protocols presented in DWR's Best Management Practices for the Sustainable Groundwater Management of Groundwater Monitoring Protocols, Standards, and Sites (DWR 2016b).

1.1 Project Overview and Applicability of the SAP/QAPP

The GSP is currently being developed for the Subbasin. An interim Monitoring Plan was prepared in support of the GSP that outlines the types of monitoring necessary to address the six DWR-designated sustainability indicators in the Subbasin (Dudek 2017). This SAP serves to supplement the Monitoring Plan by establishing consistent monitoring procedures associated with the two primary sustainability indicators for the Subbasin: (1) chronic lowering of groundwater levels and (2) degraded water quality. The Monitoring Plan identifies these two sustainability indicators as the primary drivers of the anticipated undesirable effects from overdraft in the Subbasin. Although the data collected to address the above-referenced sustainability indicators will also be used to evaluate reduction in groundwater storage, other DWR-designated sustainability indicators (i.e., seawater intrusion, depletion of interconnected surface water, and land subsidence) are not considered significant in the Subbasin at this time (Dudek 2017). Therefore, this SAP does not provide protocols for monitoring seawater intrusion, measuring streamflow, or measuring subsidence.

Included within this SAP is a Quality Assurance Project Plan (QAPP). The QAPP provides a framework for implementing procedures for field sampling, chain-of-custody, sample transportation, laboratory analysis, and reporting that will yield defensible data of known quality. Together, the SAP and QAPP are designed to facilitate data collection such that data are of acceptable quality to meet project requirements.

INTENTIONALLY LEFT BLANK

2 SAMPLING AND ANALYSIS PLAN

The following section describes the sampling methodology, analytical parameters, and sample handling procedures to be followed for routine groundwater monitoring activities in the Subbasin. Specific sampling locations and pertinent well specifications are identified in the Monitoring Plan (Dudek 2017).

2.1 Health and Safety

A project-specific Health and Safety Plan will be prepared and implemented to address potential hazards that may be encountered in the field. Safety meetings will be held at the commencement of the project and each day before work begins to discuss safe work practices during field activities.

2.2 Sampling Objectives

The objectives of monitoring activities are to collect accurate and defensible groundwater elevation data, and to collect representative groundwater samples to evaluate concentrations of constituents of potential concern (COPCs) in groundwater. The purpose of monitoring activities is to track groundwater conditions in the Subbasin throughout implementation of the GSP to evaluate progress toward achieving measurable objectives and sustainable management of the Subbasin, as defined in the Monitoring Plan (Dudek 2017).

2.3 Constituents of Potential Concern

Groundwater samples collected from the site will be analyzed for the site-specific COPCs defined in the Monitoring Plan, including the following:

Routine Constituents

- Arsenic
- Fluoride
- Nitrate
- Sulfate
- Radionuclides (gross alpha particle activity)
- Total dissolved solids

Baseline Constituents

- Anions (bicarbonate, carbonate, chloride, fluoride, hydroxide, nitrate, sulfate, total alkalinity)

- Cations (calcium, magnesium, potassium, sodium, and total hardness)

Additional detail regarding COPCs is presented in Section 3.5, Analytical Methods, of this SAP.

2.4 Groundwater Monitoring Frequency

Groundwater elevation measurements and water quality sampling will be performed on a semi-annual schedule. The initial water quality sampling event will include sampling and analysis for cations and anions to establish baseline chemistry; analysis for cations and anions in subsequent sampling events is not currently planned.

2.5 Groundwater Monitoring Methods

Groundwater monitoring procedures described herein were compiled in consideration of the DWR's best management practices (DWR 2016b), the County of San Diego's Site Assessment and Mitigation Manual (County of San Diego 2012), and professional judgment. See Appendix A for an example groundwater elevation monitoring field form.

2.5.1 Groundwater Elevation Monitoring

Groundwater elevation monitoring will be conducted using the following procedures:

- Groundwater elevation data should approximate conditions at a discrete period in time; therefore, groundwater levels will be collected within as short a time interval as possible, preferably within a 1- to 2-week period.
- The sampler will have the previous depth to water measurements available in the field.
- The water level indicator will be decontaminated after each well.
- An electronic water level that employs a battery-powered probe assembly attached to a cable marked in 0.01-foot increments will be used. When the probe makes contact with the water surface, an electrical impulse is transmitted in the cable to activate an audible alarm. The equipment will be equipped with a sensitivity adjustment switch that enables the operator to distinguish between actual and false readings caused by the presence of conductive, immiscible components on top of groundwater. The manufacturer's operating manual should be consulted for instructions on use of the sensitivity adjustment.
- The well cap or cap covering the access port will be unlocked and removed.
- The sampler will listen for pressure release while removing the lid. If a release is observed, the measurement will wait to allow the water level to equilibrate. Additionally, multiple measurements will be collected to ensure that the well has reached equilibrium such that no significant changes in water level are observed.

- All parts of the water level indicator that may come into contact with liquids in the well will be thoroughly rinsed or sprayed with deionized water immediately prior to lowering the probe into the well.
- The probe will be lowered through the access port or well casing to the anticipated depth of water.
- When the water level probe signals contact with water, the depth will be read on the tape from a datum point permanently marked on the well casing. Continue until two consecutive readings are within 0.01 foot of each other. The depth will be recorded on the Water Level Measurement Log.
- Measurements will be taken at an established reference point, generally at the top of the casing at the surveyor's mark. The mark should be permanent (e.g., a notch or mark at the top of casing). If the surveyor's point is not marked at the time of the water level, the north side of the casing will be used and marked.
- If water is not encountered in the well, the depth to water will be recorded as "dry" on the Water Level Measurement Log.
- If the water level in the well has dropped below the top of the dedicated pump, the probe will not be lowered past the pump. If feasible, remove the dedicated pump. Once the pump has been removed, allow the water level to equilibrate and measure the water level according to the method described above.
- Rewind the probe, replace the well cap, and relock the well.
- The sampler will calculate the groundwater elevation by subtracting the depth to water from the reference point elevation. The sampler must ensure that all measurements are consistent units of feet, tenths of feet, and hundredths of feet. Measurements at reference point elevations should not be recorded in feet and inches.
- The sampler will record the well identifier, date, time (24-hour format), reference point elevation, height of reference point above the ground surface (stick-up), depth to water, groundwater elevation, and comments regarding any factors that may affect the depth to water readings such as weather, recent well pumping or nearby irrigation cascading water, or well condition. If there is a questionable measurement or the measurement cannot be obtained, it will be noted.
- All relevant data will be entered into the Groundwater Sustainability Agency's data management system (DMS) as soon as possible. Care will be taken to avoid data entry mistakes, and the entries will be checked by a second person for compliance with data quality objectives (DQOs).

Pressure Transducers

Groundwater levels and/or calculated groundwater elevations may be recorded using pressure transducers equipped with data loggers installed in monitoring wells. When installing pressure transducers, care must be exercised to ensure that the data recorded by the transducers is confirmed with hand measurements.

The following general protocols will be followed when installing a pressure transducer in a monitoring well:

- The sampler will use an electronic sounder and follow the protocols listed above to measure the groundwater level and calculate the groundwater elevation in each well to properly program and reference the installation. It is recommended that samplers use transducers to record measured groundwater levels to conserve data capacity; groundwater elevations can be calculated at a later time after downloading.
- The sampler will note the well identifier, the associated transducer serial number, transducer range, transducer accuracy, and cable serial number.
- Transducers must be able to record groundwater levels with an accuracy of at least 0.1 foot. The installer of the transducer will consider battery life, data storage capacity, range of groundwater level fluctuations, and natural pressure drift of the transducers at the time of installation.
- The sampler will note whether the pressure transducer uses a vented or non-vented cable for barometric pressure compensation; appropriate corrections for natural barometric pressure changes will be implemented.
- Manufacturer specifications will be followed for installation, calibration, data logging intervals, battery life, correction procedure (if non-vented cables used), and anticipated life expectancy to assure that DQOs are being met for the GSP.
- The cable will be secured to the well head with a well dock or another reliable method. The cable will be marked at the elevation of the reference point with tape or an indelible marker to allow for estimate of potential future cable slippage.
- The transducer data will be regularly checked against hand-measured groundwater levels to monitor electronic drift or cable movement. This will happen during routine site visits, at least semi-annually, or as necessary to maintain data integrity.
- Data will be downloaded as necessary to ensure no data is lost and will be entered into the Groundwater Sustainability Agency's DMS following the established quality assurance/quality control (QA/QC) program. Data collected with non-vented data logger cables will be corrected for atmospheric barometric pressure changes, as appropriate. After

the sampler is confident that the data have been safely downloaded and stored, the data will be deleted from the data logger to ensure that adequate data logger memory remains.

2.5.2 Groundwater Quality Monitoring

Groundwater quality monitoring and sampling will be conducted using the following procedures. See Appendix B for an example groundwater quality monitoring field form.

- Prior to sampling, the sampler must contact the selected California-certified environmental laboratory to schedule laboratory time, obtain appropriate sample containers, and clarify any sample holding times or sample preservation requirements.
- Each well used for groundwater quality monitoring must have a unique identifier. This identifier must appear on the well housing or the well casing to avoid confusion.
- Groundwater elevation will be measured in the well following appropriate protocols, as described above.
- General well specifications for the wells to be sampled should be available in the field, most notably the screened interval and total well depth.
- Sample containers will be labeled prior to sample collection. The sample label must include sample ID, sample date and time, sample personnel, sample location, preservative used, and analyses and analytical method.
- Samples will be collected under laminar flow conditions. Laminar flow occurs when fluid flows in parallel layers, with limited lateral disruption or mixing of the layers. This may require reducing pumping rates prior to sample collection to minimize turbulent flow of groundwater entering the well screen.
- All field instruments will be calibrated daily and evaluated for drift throughout the day. Calibration will be documented in field logs.
- All samples requiring preservation must be preserved as soon as practically possible, ideally at the time of sample collection. Samples will be appropriately filtered, as recommended for the specific analyte. Samples to be analyzed for metals (i.e., arsenic) will be field-filtered prior to preservation; unfiltered samples will not be collected in a preserved container.
- If pumping during sampling or purging causes a well to go dry, the condition will be documented and the well will be allowed to recovery to within 90% of the original level measured prior to pumping. Professional judgement should be used about to whether the sample will meet the DQOs, and will be adjusted as necessary.

- The following will occur for groundwater wells equipped with a functioning dedicated pump:
  1. Samples will be collected at or near the wellhead. Samples will not be collected from storage tanks, at the end of long pipe runs, or after any water treatment.
  2. After cleaning the sampling port, a new, clean length of flexible clear plastic tubing will be connected to the sample access port. The tubing will be inserted into the sample bottle. The sample access port will be opened slowly. It will be verifies that the liquid stream is not flowing greater than 100 milliliters (mL) per minute.
  3. The sample bottle will be filled so that no air space remains. The bottle will be capped and then wiped clean after capping. The completed label will then be adhered to the sample bottle.
  4. Field measurements for depth to water, pH, specific conductance, temperature, turbidity, dissolved oxygen, oxygen-reduction potential, and color will be collected and documented after the samples are collected.
- The following will occur for groundwater wells requiring sample collection using a temporary pump:
  1. The pump will be lowered slowly down the well, positioning the well intake at the middle of the well screen or at the predetermined selected sampling depth.
  2. Disturbance of the water column in the well will be minimized by initiating pumping at a low rate (see below). Dedicated tubing (left in place between sampling events) is recommended to minimize disturbance to the water column before and during sampling.
  3. Pumping will begin at a steady rate of 100 mL per minute and the depth to water will be measured frequently (e.g., every 1 minute for the first few minutes) to ensure that less than 0.1 feet of drawdown occurs. The pumping rate may be increased if drawdown is less than 0.1 feet, but the pumping rate will not exceed 500 mL per minute.
  4. Field parameters and depth to water will be recorded on field data sheets a minimum of every 5 minutes while purging. Purging will continue until pH, temperature, specific conductance, oxidation reduction potential, dissolved oxygen, and turbidity stabilize (three consecutive readings), which is defined as follows:
     a. ±0.2 units for pH
     b. ±3%–5% for specific conductance
     c. ±20 millivolts (mV) for oxidation reduction potential
     d. ±10% for temperature
     e. ±10% for turbidity

f. ±0.2 milligrams per liter for dissolved oxygen

5. Dissolved oxygen and turbidity tend to stabilize last and are better measures of sufficient purging. Drawdown will be minimized during purging and/or sampling, not exceeding 0.1 feet, if possible.
6. In the case that the above criteria for stabilization are not met before three well volumes have been pumped, then a maximum of five well volumes will be pumped before samples are taken. Also, if stabilization has not occurred after 2 hours of purging regardless of well volume status, samples will be collected at this point. In the spirit of water conservation, this method will be avoided if possible.
7. For protocol regarding variances, consult the Site Assessment and Mitigation Manual (County of San Diego 2012).

- If pumping during sampling or purging causes a well to go dry, the condition will be documented and the well will be allowed to recovery to within 90% of the original level measured prior to pumping. Professional judgement will be used as to whether the sample will meet the DQOs and adjusted as necessary.
- After sample collection, the sealed sample bottle will be placed in a "zip-lock" style bag and placed inside an ice chest filled with ice to maintain a sample temperature of 4°C to prevent degradation of the sample. At the completion of sampling, the completed chain-of-custody will be placed in the ice chest, which will be sealed and labeled. The samples will be transported from the site to the laboratory by courier service or other means. The samples will be delivered to the laboratory within 24 hours after the sample has been collected.

2.6 Sample Handling

The following section details methods that are to be used for sample labeling, identification, containerizing, preservation, transportation, and maintaining proper chain-of-custody. Samples will be handled in accordance with San Diego County's Site Assessment and Mitigation Manual (County of San Diego 2012) and the United States Geological Survey's National Field Manual for the Collection Water Quality Data sampling protocols (USGS 2014).

2.6.1 Sample Handling and Identification

Each groundwater sample collected for analysis will be designated with a unique identification (ID) number. The sample identification number will include information to identify the sample location, date, and field QC classification, if applicable.

The following identifying factors will be used:

- Local well ID (e.g., ID4-18)
- Date (i.e., year, month, day)
- Field QC classification, if applicable (e.g., "D" for field duplicate)

For example:

- Sample identification number "ID4-18-20170704" would represent a groundwater sample collected from well ID4-18 on July 4, 2017.

2.6.2 Sample Containers and Transportation

Groundwater samples will be collected in the following containers:

- Arsenic by United States Environmental Protection Agency (EPA) Method 6010B: 250 mL high-density polyethylene (HDPE) bottle preserved with hydrochloric acid
- Cations and anions: 1 liter unpreserved HDPE
- Fluoride by SM 4500-F C: 250 mL unpreserved HDPE
- Nitrate by EPA 300.0: 250 mL unpreserved HDPE
- Radionuclides (gross alpha particle activity) by EPA 900.0: 1 liter unpreserved HDPE
- Sulfate by EPA 300.0: 250 mL unpreserved HDPE
- Total dissolved solids by SM 2540 C: 1 liter unpreserved HDPE

Analyte-specific laboratory holding times as described in Section 3.5.3 will be reviewed to plan for samples to be received by the laboratory within the appropriate timeframe.

2.6.3 Chain-of-Custody Procedures

A chain-of-custody form will be used to record possession of the samples from the time of collection to the time of arrival at the laboratory. The individual who collects the samples will prepare them for shipment, complete the chain-of-custody form, and sign the form when transferring the samples to the laboratory courier. The samples will be released to the laboratory by the courier signature on the chain-of-custody form and signed as received by laboratory receiving personnel. The laboratory receiving personnel will verify that all samples listed on the chain-of-custody form are present, sample integrity, and that proper sample preservation procedures were used.

2.6.4 Equipment Decontamination

Prior to sampling, re-usable sampling equipment (e.g., submersible pumps) will be decontaminated using an Alconox wash, a potable water rinse, then a distilled water final rinse (i.e., the three-bucket wash method).

2.6.5 Investigative-Derived Waste

Evidence of hazardous concentrations of COPCs has not been identified in Subbasin wells. If purge water is generated from a groundwater well it will be discharged to the ground away from the wellhead. Additionally, investigative-derived wastes (e.g., sampling gloves, disposable sampling devices, tubing) will be disposed of off site as municipal solid waste.

2.6.6 Field Documentation

Field logbooks will be maintained during confirmation sampling field activities. The field logbooks will serve to document observations, personnel on site, equipment activity, field procedures, and other vital information. Logbook entries will be complete and accurate enough to permit reconstruction of field activities. The following information for each sampling area will be documented on field forms:

- Field crew names
- Date of sampling
- Wells names
- Names and times of samples collected
- Chain-of-custody number
- General observations

2.6.7 Photographs

Photographs will be taken at sample locations and other relevant areas on site. The photographs will serve to verify information entered in the field logbooks.

INTENTIONALLY LEFT BLANK

3 QUALITY ASSURANCE PROJECT PLAN

3.1 Roles and Responsibilities

Brief descriptions of key personnel responsibilities are provided below.

The sampling project manager is a member of the project team who will provide oversight and serve as the point of contact for the responsible parties. The sampling project manager will have responsibility for the overall project performance.

The QA manager will be responsible for ensuring the integrity of the SAP/QAPP and will coordinate all QA-specific activities. The QA manager will do the following:

- Ensure that the appropriate analytical methods and sampling equipment are selected.
- Be responsible for data validation and advise the sampling project manager with respect to data management and statistical evaluation of the data.
- Be responsible for performance and/or systems audits of the laboratory, should they be required.

The field manager or designated representative will be located at the site during field activities and will coordinate the technical field activities in accordance with approved plans, including the Monitoring Plan (Dudek 2017), QAPP, and Health and Safety Plan. The field manager will be responsible for verifying that the field work (to include sampling operations and sampling QC) is performed within the approved guidelines. The field manager will be responsible for implementing and maintaining overall operating standards and field QA responsibilities. Such responsibilities will include the following:

- Appropriate calibration and maintenance of field instruments
- Appropriate equipment decontamination
- Compliance with QA/QC sampling requirements (e.g., field duplicate collection)

In addition, the field manager will coordinate safety and technical activities occurring at the site, and conduct daily briefing sessions prior to work on the site. Although various field functions will be performed by individuals, the field manager will bear field responsibilities.

The laboratory project manager will be responsible for the day-to-day management of the laboratory work, to include data processing and data processing QA, verification that laboratory QA/QC procedures are being maintained, and verification that technical review of reports has been performed. Although various laboratory functions will be performed by different individuals, the laboratory project manager will provide signature approvals to laboratory-generated information and bear laboratory responsibilities.

3.2 Quality Objectives and Criteria

The DQO process is used to derive qualitative and quantitative statements in relation to a particular data collection event (or group of events). Performing the DQO process is generally one of the prerequisite steps to data collection. The DQO process is described in EPA Guidance (EPA 2006). The steps of the DQO process are as follows:

- State the problem
- Identify the goals of the study
- Identify information inputs
- Define the boundaries of the study
- Develop the analytic approach
- Specify performance or acceptance criteria
- Develop the plan for obtaining data

The steps of the DQO process for the project are summarized below:

- The problem: Groundwater quality in the Subbasin, as observed through groundwater samples collected from monitoring and production wells, is potentially degrading. Overdraft conditions are potentially exacerbating impacts from naturally occurring COPCs, which may result in undesirable effects such as degraded water quality that is unsuitable for irrigation and/or drinking.
- The goals: Evaluate baseline and long-term trends in COPC concentrations for comparison to measurable objectives to be established in the GSP.
- Information inputs: Obtain analytical data for groundwater samples using the tests outlined in Section 3.5.1 of this SAP.
- The boundaries of the study: Samples will be collected from groundwater wells within the Subbasin, as designated in the Monitoring Plan (Dudek 2017).
- The analytic approach: Concentrations of COPCs will be tracked and studied throughout implementation of the GSP, as described in the Monitoring Plan.
- Performance or acceptance criteria: The usability of the data collected for this phase of work will be based on measurement activities, consistent with accepted guidance

documents such as SW846 Test Methods. Testing results will be evaluated against performance-based acceptance criteria.

- The plan for obtaining data: The overall plan is outlined within the Monitoring Plan (Dudek 2017), and sampling details are presented in Section 2 of this SAP.

3.3 Special Training/Certification

No specialized training is required. Standard training specifications will be outlined in the project-specific Health and Safety Plan.

3.4 Documentation and Records

Documentation will involve generating, maintaining, and controlling field data, laboratory analytical data, field logs, reports, and any other data relevant to the project. Bound field log books, loose-leaf drilling logs, or automated field data entry records generated with personal data assistants are examples of documents. This project will have dedicated field log books, forms, and a DMS that will not be used for other projects. Entries will be dated and the time of entry will be recorded. Sample collection data and visual observations will be documented on forms or personal data assistants, or, when forms are not available or applicable, in the field log book. Any sample collection equipment, field analytical equipment, and equipment used to make physical measurements will be identified in the field documentation. Calculations, results, equipment usage, maintenance, and repair and calibration data for field sampling, and analytical and physical measurement equipment will also be recorded in field documentation. Once completed, the field forms, field databases, and field log book will become part of the project file.

Office data management will involve establishing and maintaining a project file. The project file will include the following:

- Planning documents, such as the QAPP
- Plans and schedules
- Standard operating procedures (SOPs) (for both the field and laboratory)
- Field sampling logs
- Field screening data
- QA auditing and inspection reports
- Laboratory analytical data
- Calculations
- Drawings and figures

- Reports
- External and internal correspondence
- Notes/minutes of meetings and phone conversations
- Contract/purchase orders
- Change orders
- Bid evaluations

All project-related information will be routed to the sampling project manager who will be responsible for distributing the information to appropriate personnel. Project documentation will be archived for a minimum of 15 years. Pertinent documentation will be uploaded to the project's online DMS.

3.5 Analytical Methods

3.5.1 Laboratory Methods

The following laboratory methods will be used during groundwater sample analysis activities:

- Arsenic by EPA Method 6010B
- Cations and anions by Methods 300.0, SM 2340C, and SM 2320B
- Fluoride by SM 4500 F C
- Nitrate by EPA 300.0
- Radionuclides by EPA 900.0
- Sulfate by EPA 300.0
- Total dissolved solids by SM 2540 C

3.5.2 Required Reporting Limits and Method Detection Limits

Reporting limits represent the lowest normally obtainable measurement level achieved and reported by the laboratory under practical and routine laboratory conditions for a variety of sample matrices. The method detection limit (MDL) is the minimum concentration that can be measured with 99% confidence that the analyte concentration is greater than zero by an analytical procedure in a given matrix containing the analyte. Sample-specific reporting limits may vary as a result of sample matrix and compound concentration. Samples with no positive results (down to the MDL) are typically reported as "ND" (indicating "not detected") by the laboratory. Positive results below the reporting limit but above the MDL are reported as estimated values by the laboratory. Reporting limits and MDLs are adjusted for dilutions, as necessary, by the laboratory. A summary of the MDLs and reporting limits for the COPCs is presented in Table 1.

Table 1
Summary of Method Detection Limits and Reporting Limits

COPC	Method	Reporting Limit (mg/kg)
Fluoride	SM 4500-F C	0.10
Arsenic	6010B	0.0100
Calcium	6010B	0.100
Magnesium	6010B	0.100
Potassium	6010B	0.500
Sodium	6010B	0.500
Total Dissolved Solids	SM 2540 C	1.0
Chloride	300.0	1.0
Nitrate (as N)	300.0	0.10
Sulfate	300.0	1.0
Hardness (as $CaCO_3$)	SM 2340 C	2.0
Alkalinity	SM 2320B	1.0
Bicarbonate	SM 2320B	1.0
Carbonate	SM 2320B	1.0
Hydroxide	SM 2320B	1.0
Radionuclides (Gross Alpha Particle Activity)	900.0	Variable

COPC = constituent of potential concern; mg/kg = milligrams per kilogram

Laboratory analytical methods specified in Section 3.5.1 are generally consistent with those used during previous sampling performed in the Subbasin.

3.5.3 Holding Times

Knowledge of required holding times will have a direct impact on scheduling of sample collecting, packing, and shipping activities. To ensure proper sample handling, the sample container, volume, preservation, and holding times applicable to each analytical method are shown in Table 2.

Table 2
Borrego Springs Subbasin – Groundwater Sample Analytical Suite

Constituent	Method	Sample Container	Preservative	Holding Time (days)
Fluoride	SM 4500-F C	250 mL HDPE	Ice 4°C	28
Arsenic	6010B	250 mL HDPE	Ice 4°C	28
Calcium	6010B	250 mL HDPE	Ice 4°C	28

Table 2
Borrego Springs Subbasin – Groundwater Sample Analytical Suite

Constituent	Method	Sample Container	Preservative	Holding Time (days)
Magnesium	6010B	250 mL HDPE	Ice 4°C	28
Potassium	6010B	250 mL HDPE	Ice 4°C	28
Sodium	6010B	250 mL HDPE	Ice 4°C	28
Total Dissolved Solids	SM 2540 C	1 L HDPE	Ice 4°C	7
Chloride	300.0	125 mL HDPE	Ice 4°C	28
Nitrate (as N)	300.0	125 mL HDPE	Ice 4°C	2
Sulfate	300.0	125 mL HDPE	Ice 4°C	28
Hardness (as $CaCO_3$)	SM 2340 C	250 mL HDPE	Ice 4°C	180
Alkalinity	SM 2320B	250 mL HDPE	Ice 4°C	14
Bicarbonate	SM 2320B	250 mL HDPE	Ice 4°C	14
Carbonate	SM 2320B	250 mL HDPE	Ice 4°C	14
Hydroxide	SM 2320B	250 mL HDPE	Ice 4°C	14
Radionuclides	900.0	1 L HDPE	Ice 4°C	5

mL = milliliters; L = liters; HDPE = high-density polyethylene bottle

3.5.4 Field Methods

Procedures for using field measurement devices are presented in Section 3.6.4.

3.6 Quality Control

3.6.1 Introduction

This section addresses QC procedures associated with field sampling and analytical efforts. Included are general QC considerations, as well as specific QC checks that provide ongoing control and assessment of data quality in terms of precision and accuracy.

3.6.2 Field Quality Assurance/Quality Control

QA/QC for fieldwork refers to methods of measuring the quality of the field sampling techniques. Drilling, sampling, and field record keeping will be conducted in accordance with current sampling protocols for groundwater sampling, as applicable. Field instrumentation will be calibrated in accordance with the manufacturer's instructions at the beginning of each field day.

In addition to the primary samples, the following QA/QC samples will be collected:

- **Field Duplicate.** One field duplicate sample will be collected for every 20 samples collected. The field duplicates will be analyzed for the same COPCs as the primary samples, and will be used to evaluate field sample collection reproducibility. The location where the field duplicate is collected will be noted on the sampling logs. The duplicate sample name will be different than the original sample name.
- **Matrix Spike/Matrix Spike Duplicate (MS/MSD).** One MS/MSD sample will be selected as applicable, and noted on the chain-of-custody. The MS/MSD samples will be analyzed for the same COPCs as the primary samples, and will be used by the laboratory to check for the ability to accurately and precisely recover compounds of interest from the site-specific matrix.

Field blanks will not be collected for this scope of work because easily transferable constituents such as volatile organic compounds are not anticipated to be encountered. The results of the analyses of these QC sample types are used as independent, external checks on field sample collection techniques.

3.6.3 Laboratory Quality Control

To obtain data on precision and accuracy, the analytical laboratory will analyze the QC samples described below. The control limits and corrective actions for each parameter are specified in the pertinent laboratory analytical method SOPs. The analytical methods require analyses of the following QC samples:

- Calibration verification following instrument calibration and continuing calibration verification.
- Laboratory blank verification at instrument calibration and at the method required frequency thereafter for continuing blank verification.
- Method blank analysis at a rate of once per batch of samples or one per 20 samples of a single matrix, whichever is more frequent, to determine contamination levels during sample preparation.
- Laboratory control sample (LCS) analyses at a rate of one per batch. The LCS is used to verify that the analytical system is in control based on the percent recovery of the analyte(s).
- MS/MSD or MS/Laboratory Duplicate analyses will be conducted as applicable. The MS/MSDs and/or MS/Laboratory Duplicate are used to check for the ability to accurately and precisely recover compounds of interest from the matrix.

3.6.4 Field Procedures

Field monitoring and analytical equipment will be maintained in accordance with the manufacturers' recommended schedules and procedures. Maintenance activities will be documented by either field or laboratory personnel. Calibration will be performed on a routine basis and as otherwise required. Calibrating equipment or calibration standards will also be routinely recalibrated or replaced and documented. Routine inspection of equipment is intended to identify problems requiring maintenance before they cause a major disruption in field monitoring or analytical activities, or adversely affect the validity and precision of the data being measured.

3.6.5 Laboratory Procedures

The laboratory is responsible for maintaining laboratory equipment in accordance with manufacturers' recommended maintenance and procedures in order to minimize downtime of the analytical systems. Each analyst is responsible for conducting a daily inspection of critical systems on instruments under their charge. Inspections will include vacuum lines and pumps for the gas chromatograph/mass spectrometer, automatic injection systems, controlled reagent-feed motors, temperature-controlled ovens in gas chromatographs, capillary columns, detectors and support systems, gas control system for atomic adsorptions, and many others. Wear-dependent items, such as septa on gas chromatograph injection systems, will be replaced as needed. The performance of instruments will be checked against known standards at the beginning of each working day or shift. Failure to achieve proper performance indicates a system problem, which will be addressed by laboratory personnel or by the manufacturer's service representative.

In addition, laboratory personnel or the manufacturer's service representative will service working systems according to a fixed schedule. A record of service and repairs, whether accomplished by laboratory personnel or by the manufacturer's service representative, will be maintained in a log book kept with each instrument.

3.7 Inspection/Acceptance of Supplies and Consumables

Critical field supplies and consumables include the following:

Sample bottleware

- Decontamination fluids
- Personal protective equipment
- General sampling consumables (e.g., ice, plastic bags, paper towels, aluminum foil)

For bottleware, the acceptance criteria will entail an inspection upon receipt of analytical testing to confirm the absence of cross-contamination and the presence of appropriate preservatives. For decontamination fluids, field staff will ensure that the fluids meet the necessary requirements for concentration and quality grade (e.g., reagent-grade methanol). Personal protective equipment will be inspected to confirm integrity and ensure that the appropriate sizes are available as required by sampling team members.

3.7.1 Laboratory Supplies

The inspection and acceptance criteria for analytical reagents will be performed in accordance with the selected California-certified laboratory's SOPs.

3.8 Assessments and Response Actions

The project team may conduct performance and systems audits of field and laboratory activities, as necessary. Following is a discussion of audits, corrective action, and reporting procedures.

3.8.1 Systems Audit

A systems audit consists of the evaluation of key components of the measurement systems to determine their proper selection and use. When required by the EPA or alternative regulatory authority, systems audits are performed prior to or shortly after systems are operational. This audit includes a careful evaluation of field and laboratory QC procedures, which are explained below.

Field Systems Audits

Field systems audits are on-site audits that focus on data collection systems, using the appropriate SAP/QAPP as a reference. Specific activities vary with the scope of the audit, but can include a review of sample collection activities, decontamination practices, equipment calibration techniques and records, decontamination and equipment cleaning, background and training of personnel, sample containers and preservation techniques, and chain-of-custody procedures.

Laboratory Systems Audit

The laboratory systems audit is a review of laboratory operations to verify that the laboratory has the necessary facilities, equipment, staff, and procedures to generate acceptable data.

Specific activities vary with the scope of the audit, but can include a review of equipment suitability and maintenance/repair; SOPs; background and training of personnel; laboratory control charts and support systems; and QA samples, including performance evaluation samples, chain-of-custody procedures, data logs, data transfer, data reduction, and validation.

3.8.2 Performance Audits

After systems are operational and generating data, a performance audit may be requested to determine the accuracy of the total measurement system(s) or component parts thereof. Similar to the systems audit, there are two types of performance audits, as explained below.

Field Performance Audit

Performance audits of sampling activities will be conducted using review of laboratory sample receipt forms.

An inspection for suitability of the samples for proper laboratory analysis will serve as the performance audit of the sample collection procedures. Insufficient sample volume for analysis, or improper preservation of samples, will be noted by the analytical laboratory. A preponderance of such reports of unsuitable samples will indicate that the sampling procedures are poor or unacceptable. Analytical results will be reviewed by the sampling project manager and the QA manager to assess the performance and adequacy of sample collection procedures.

Proper execution of sampling procedures will be audited by the sampling project manager and the QA manager. The sampling project manager and QA manager will audit these project operations on a regular basis over the life of the project through review of the field log book and audit forms, and through discussion with the field manager.

Laboratory Performance Audits

The project laboratories participate in a variety of federal and state programs that subject laboratories to stringent performance audits on a regular basis. QA policies and procedures currently in place at the laboratories, and actions that will be included in sampling activities to ensure QA, include the following:

- Inter-laboratory check samples
- Periodic audits
- Laboratory control samples analyzed at applicable analytical method frequencies
- Performance evaluation samples to be submitted to laboratories by the project team to each laboratory during major sampling events that use the particular laboratory

Laboratory performance in these areas will be monitored by the project team QA manager. If necessary, the project team QA manager will conduct an on-site audit of field operations or the analytical laboratory.

3.8.3 Corrective Action for Measurement Systems

When a problem situation arises regarding any significant impediment to the progress of the SAP during site characterization, corrective action will be implemented to identify the problem and its source. Appropriate documentation of this action will be recorded in the project file.

Personnel responsible for the initiation and approval of corrective action will be the laboratory QA manager (for corrective action at the laboratory) and the project team project manager (for corrective actions identified during field activities and/or during the data validation effort).

3.8.4 Quality Assurance Reporting Procedures

Below are the QA reporting procedures that will be implemented for this project.

Reporting Responsibility and Recordkeeping

Comprehensive records will be maintained by the project team to provide evidence of QA activities. These records will include the following:

- Results of performance and systems audits
- Data validation summary
- QA problems and proposed corrective action
- Changes to the project documents

The proper maintenance of QA records is essential to provide support in any evidentiary proceedings. The original QA records will be kept in the QC manager's records.

Access to working files will be restricted to project personnel.

Audit Reports

Should audits be requested, the corresponding audit reports will be distributed to the following project personnel, as appropriate:

- Project Manager/Project Director
- Field Manager
- Laboratory QA/QC Manager

3.9 Data Reduction, Review, Verification, and Validation

This section addresses the stages of data quality assessment after data have been received. It addresses data review, verification, and validation. It also sets procedures for evaluating the usability of data with respect to the DQOs set forth in Section 3.2.

3.9.1 Data Reduction

Raw analytical data generated in the laboratory are collected on printouts from the instruments and associated data system, generated electronically and stored in a laboratory information management system (LIMS), or manually recorded into bound notebooks. Analysts review data as they are generated to determine that the instruments are performing within specifications. This review includes calibration checks, surrogate recoveries, blank checks, retention time reproducibility, and other QC checks as specified in the laboratory's SOPs. If problems are noted during the analytical run, corrective action will be taken and documented.

Each analytical run is reviewed for completeness prior to interpretation and data reduction.

3.9.2 Data Review

Data review is an initial and relatively non-technical step of data assessment that primarily addresses issues of completeness and data handling integrity. In data review, the reviewer will ensure that all necessary reporting components have been included in laboratory reports, such as necessary fields (e.g., collection/analysis dates, units) and the presence of (but not implications of) QA/QC data components (e.g., LCS records, surrogate results).

3.9.3 Data Verification and Validation

Data verification is a more technical process than data review in that the core technical aspects of data quality (e.g., precision, accuracy) are evaluated through a review of the results of QA/QC measures, such as LCSs and surrogates.

Following interpretation and data reduction by an analyst, data are transferred to the LIMS either by direct data upload from the analytical data system or manually. The data are reviewed by the group leader or another analyst and recorded in the LIMS as being verified. The person performing the verification reviews all data, including QC information, prior to verifying the data. The laboratory will complete the appropriate forms summarizing the QC information and transfer copies of all raw data (e.g., instrument printouts, spectra, chromatograms) to the project management group for the final laboratory deliverable. This laboratory project manager will combine the information from the various analytical groups and the analytical reports from the LIMS into one package. This package will be reviewed by the laboratory project manager for conformance with SOPs and to ensure that all project QC goals have been met. Any analytical problems are discussed in the case narrative, which is also included with the data package deliverables. A Level 2 data deliverable will be required for this project.

Following data verification by the laboratory, data validation will be conducted on 100% of the laboratory data by an entity independent of the laboratory. The following level of validation will be performed:

- Stage 1: 100% of samples collected

If systematic errors with the laboratory data are identified, further validation may be necessary. Data validation may be performed on hard-copy data or electronically, as applicable. General compliance to the August 2014 National Functional Guidelines for Inorganic Data Review and the National Functional Guidelines for Superfund Method Organic Data Review (EPA 2014), and EPA Region 9 validation guidance will be used as the basis for the validation. The guidance documents provide structured approaches for the assignment of data qualifiers based on observations made in the data verification process, and will be used in conjunction with the specific EPA method criteria and the QA criteria set forth in the project-specific SAP.

3.9.4 Data Validation and Usability Determination

Data verification is a technical process to evaluate data, but it does not answer the final question of the usability of the data and the implications of any departures from data expectations. The data validation process is designed to assign data qualifiers based on the data verification results, and provide a case-by-case review of data quality issues with respect to QAPP objectives to render a final assessment of data usability.

3.10 Data Evaluation Roles and Responsibilities

The following components of data evaluation will be performed:

- Data reduction will be performed by the analytical laboratory
- Data review will be performed by both the laboratory and by the project team
- Data verification will be performed by the laboratory
- Data validation and usability determination will be performed by the project team

3.11 Data Reporting

Laboratory reports will contain the following:

- **Case Narrative:** Description of sample types, tests performed, any problems encountered, corrective actions taken, and general comments.
- **Analytical Data:** Data are reported by sample or by test. Pertinent information, such as dates sampled, received, prepared, and extracted, will be included on each results page. The reporting limit and method detection limit for each analyte will also be recorded. In addition to a report saved as a pdf, the laboratory will provide an electronic data deliverable in a text format corresponding to each analytical report.
- **Laboratory Performance QC Information:** The results for all of the associated laboratory QC samples and practices will be reported (e.g., LCS, method blanks, surrogate recoveries).
- **Matrix-Specific QC Information:** Results of any sample duplicates, MSs, MSDs, or other project-specific QC measures that are requested will be reported.
- **Methodology:** The reference for the applied analytical methodology will be cited.

4 REFERENCES

County of San Diego, Department of Environmental Health. 2012. *Site Assessment and Mitigation Manual.* Updated June 21, 2012.

Dudek. 2017. *Borrego Springs Subbasin, Monitoring Plan.* 21 August.

DWR (California Department of Water Resources). 2016a. *Bulletin 118. Interim Update.* California Department of Water Resources. December 22, 2016.

DWR. 2016b. *Best Management Practices for the Sustainable Groundwater Management of Groundwater – Monitoring Protocols, Standards, and Sites.* California Department of Water Resources, Sustainable Groundwater Management Program. December 2016.

EPA (United States Environmental Protection Agency). 2006. *Guidance on Systematic Planning Using the Data Quality Objectives* Process (EPA QA/G-4). February 2006.

EPA. 2014. C*ontract Laboratory Program, National Functional Guidelines for Superfund Organic Data Review*, EPA 540-R-014-002, August 2014.

USGS (United States Geological Survey). 2014. *National Field Manual for the Collection Water Quality Data, Techniques and Methods, Handbooks for Water-Resources Investigations*, Version 3.1. United States Geological Survey. Updated April 2014.

INTENTIONALLY LEFT BLANK

APPENDIX A

Example Groundwater Elevation Monitoring Field Form

Geosyntec consultants

SAN DIEGO COUNTY WELL MONITORING DATA SHEET
BORREGO SPRINGS SUBBASIN
GROUNDWATER GAUGING SHEET

Date ______________________
Sampler: ______________________

State Well #	No Measurement	Questionable Measurement	Depth to Water	Groundwater Elevation	Previous DTW	Gauge Time	Well Box Type	Well Cap Type	Survey Point (Reference Point)	Comments

Notes:

NO MEASUREMENT: 0 Measurement discontinued 1. Pumping 2. Pump house Locked 3. Tape hung up 4. Can't get tape in casing 5 Unable to locate well 6 Well has been destroyed 7 Special 8 Casing leaky or wet 9 Temporarily inaccessible

QUESTIONABLE MEASUREMENT. 0 Caved or deepened 1. Pumping 2. Nearby pump operating 3 Casing leaky or wet 4 Pumped recently 5 Air or pressure gauge measurement 6 Other 7 Recharge operation at or nearby well 8. Oil in casing

Notate depth in feet, tenths of feet, and/or hundredths of feet Do not notate in inches

January 2020

APPENDIX B

Example Groundwater Quality Monitoring Field Form

SAN DIEGO COUNTY LOW FLOW WELL MONITORING DATA SHEET

DATE:________

Project Name: Borrego Springs Subbasin	Project Address:
Sampled by:	Project Number:
Sampling Company:	Well GPS Latitude: ________
Well ID:	Longitude:
Borehole Diameter: inches	Well Diameter: inches
Static Water Level (ft. btc): Time_____	Referenced to: Top of PVC Casing
Reference Point Elevation (ft. MSL):	
Total Well Depth (ft. btc) (WD):	
Meter type/ID: Ultrameter YSI 556 YSI 550 ID:______________	
Water Level Indicator Type: GeoSlope Indicator ID:______________	
Decontamination Method: Steam/High Pressure Wash 3 Stage Rinse Other	
Sampling Equipment: __Other: ________________	

Purge Method: Low Flow
Pump Depth (ft btc): ______________ Date Pump Installed: ________
Purge Rate:______________ Start Purge:______________

Time	Temp (°C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Depth to Water (ft btc)	Water Removed (ml)	Observations
Stabilization Parameters*	+/-3%	+/0 2 units	+/-3-5%	+/-10%	+/0 2 units	+/-20 mV			

Sampling Date:	Sampling Time:	Depth to Water:
Sample I.D.:	Laboratory:	

Analyzed for:	Volume	Container	Filtered	Pres.	Parameters

EB I.D. (if applicable): Time	Duplicate I.D. (if applicable):
Field Sheet Checked By:	License #:

COMMENTS:

* 3 Consecutive Readings

APPENDIX E2

Borrego Metering Plan

DRAFT

GROUNDWATER EXTRACTION METERING PLAN BORREGO SPRINGS GROUNDWATER SUBBASIN

Prepared for

Borrego Valley Groundwater Sustainability Agency
County of San Diego Planning and Development Services
5510 Overland Avenue
San Diego, California 92123
Contact: Jim Bennett and Leanne Crow

Prepared by

Geosyntec consultants

engineers | scientists | innovators

2355 Northside Drive, Suite 250
San Diego, California 92108
Contact: Doug Baumwirt, PG, CHG

DUDEK
605 Third Street
Encinitas, California 92024
Contact: Trey Driscoll, PG, CHG

MARCH 2019

TABLE OF CONTENTS

Section **Page No.**

APPENDICES

INTENTIONALLY LEFT BLANK

1 INTRODUCTION

The Borrego Springs Groundwater Subbasin (Subbasin) of the Borrego Valley Groundwater Basin (BVGB) has been identified by the California Department of Water Resources (DWR) as subject to critical conditions of overdraft (DWR 2016). As such, in accordance with California's Sustainable Groundwater Management Act (SGMA), a Groundwater Sustainability Agency (GSA) has been formed to develop and implement a basin-specific Groundwater Sustainability Plan (GSP). The general purpose of the GSP is to facilitate a long-term groundwater withdrawal rate less than or equal to the sustainable yield of the Subbasin within the maximum 20-year implementation period mandated by SGMA.

This Groundwater Extraction Metering Plan (Metering Plan) is a foundational component of the GSP that will facilitate the reporting of groundwater extraction data. Collection and reporting of these data are integral to enable proactive and adaptive management of groundwater resources and documentation of seasonal fluctuation in water demand. Agricultural pumping was identified as one of the greatest sources of uncertainty in the Borrego Valley Hydrological Model (BVHM), because the groundwater use was indirectly estimated using potential evapotranspiration, crop coefficients, and irrigation efficiencies. Collecting metered data is one of the three primary recommendations proposed to improve the accuracy of the BVHM, which in turn improves the GSA's tools for adaptive management. Furthermore, the collection of metered pumping data is a key metric for evaluating the effectiveness of four out of the six projects and management actions being undertaken by the GSA (i.e., the water trading program, water conservation, pumping reduction program, and the voluntary fallowing of agricultural land). The GSA derives its authority to require groundwater extraction metering pursuant to the SGMA § 10731.

This plan has also been prepared consistent with Borrego Valley GSP Advisory Committee (AC) Policy Recommendation #1 – Questions #1 and #2 (AC Agenda and Minutes November 2017). AC Policy Recommendation #1 – Question #1 recommended meters to be installed on all wells with the exception of wells that use two acre-feet per year (AFY) (651,702 gallons/year) or less within the Subbasin.

AC Policy Recommendation #1 – Question #2 provided two options to the AC for consideration as follows:

> <u>Option 1</u>: The GSA inspects and monitors/reads the meter on a monthly basis and ensures the accuracy of the data including meter calibration. The GSA would provide an annual statement setting forth the total extraction in gallons from each

well. The GSA will keep data confidential to the maximum extent allowed by law (California Govt. Code 6254(e)).

Option 2: The property owner (or third-party contractor acceptable to the GSA) monitors/reads the meter on a monthly basis. A third-party contractor acceptable to the GSA would inspect and read the meter on a semi-annual basis to verify the accuracy of data including meter calibration. On behalf of the property owner, the third-party contractor would provide an annual statement to the GSA with verification of the total extraction in gallons from each well and verification that each flow meter is calibrated to within factory acceptable limits. The GSA will keep data confidential to the maximum extent allowed by law (California Govt. Code 6254(e)).

Although the AC did reach consensus on requiring meters to be installed on all wells except those wells that use two AFY or less, consensus was not achieved for AC Policy Recommendation #1 – Questions #2 as indicated by Level 5 and 6 AC member votes. As such, that issue was returned to the Core Team without a recommendation as per the Borrego Valley GSP AC By-laws adopted and approved January 29, 2017. This Plan has been prepared under the presumption that the Core Team accepts both Option 1 and Option 2 presented in AC Policy Recommendation #1 – Question #2 as acceptable.

1.1 Applicability of the Metering Plan

An interim Monitoring Plan was prepared in support of the GSP, outlining the types of monitoring necessary to address the applicable DWR-designated SGMA sustainability indicators in the Subbasin (Dudek 2017). This Metering Plan serves to supplement the Monitoring Plan by outlining consistent groundwater extraction metering procedures required for all groundwater production wells in the Subbasin which pump in excess of two AFY. However, *de minimis* groundwater production wells that pump less than two AFY are exempt from the metering requirement defined herein pursuant to SGMA § 10721e.

Implementation and compliance with this Metering Plan will be mandatory for all non-*de minimis* wells in the Subbasin beginning 90 days from adoption of the GSP. The GSA may require metered data from any well located in the Subbasin if it is uncertain whether it qualifies as de minimis groundwater production.

This Metering Plan will be implemented to address the following:

- The GSA is currently relying on estimates of pumping, which is considered a source of uncertainty in the Subbasin's numeric groundwater model at this time. Initially these data will be used to refine existing groundwater extraction estimates for non-de minimis groundwater production wells in the subbasin. Additionally, the data will be used to verify and refine the sustainable yield of the Subbasin.

- Groundwater extraction metering data will be integrated with other data being collected (i.e., groundwater level data) to track changing conditions in the Subbasin in order to evaluate the SGMA sustainability indicators: chronic lowering of groundwater levels, reductions in groundwater storage, and the potential for water quality impacts to municipal supply as groundwater levels decline.
- Groundwater extraction metering data will be used throughout the GSP implementation period to quantitatively track compliance with prescribed pumping allocations and reductions.

The Metering Plan outlines a procedure that will facilitate confidential collection and reporting of groundwater extraction data to the GSA, which will not be subject to public review pursuant to Government Code 6254(e).

The Metering Plan has been modified and superseded by Section VI.A of the Judgment, whereby the parties will install, at their own expense, meters approved by the Watermaster that can electronically transmit a recording of the amount of groundwater pumped from the Basin and other data to Watermaster in real-time on a schedule determined by the Watermaster.

INTENTIONALLY LEFT BLANK

2 METERING PLAN

This section describes the metering objectives and acceptable approaches, meter types and installation configurations, and meter maintenance and calibration requirements for routine groundwater extraction metering activities in the Subbasin.

2.1 Metering Objectives

The purpose of this Metering Plan is to outline the procedures for the metering of all non-*de minimis* groundwater extraction wells (>2 AFY) within the Subbasin to enable proactive management of water resources. The GSA may request metered data from any well located in the Subbasin if it is uncertain whether it qualifies as *de minimis* groundwater production.

2.2 Approach

All non-*de minimis* wells will be required to register with the GSA upon GSP adoption, which will include identification of flow meter type, San Diego County Assessor's Parcel Number (APN) for each parcel served by each well and farm identification, golf course identification or other type of water use identification. Figure 1 illustrates an example of one well serving multiple parcels within a farm:

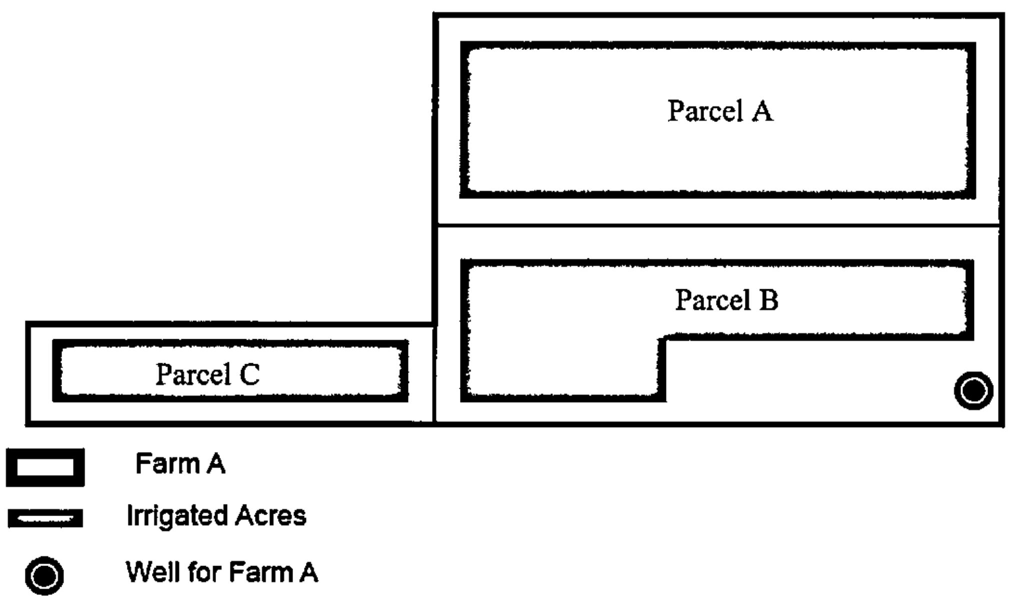


Figure 1. Example Documentation of Parcels Served by a Well for a Farm

Registration of non-*de minimis* production wells is achieved by submittal of the registration form to the GSA and is due within 90 day of GSP adoption. A copy of the registration form is provided as **Attachment A,** which specifies details for electronic submittal of the form. At the time of form submittal, the GSA will verify parcels served by each well and current area of irrigation based on aerial photography and GIS analysis.

Subsequent to registration, each applicable well owner that does not already have an appropriate flowmeter installed (as reported on registration form and verified by GSA) will be required to have one installed near the wellhead. The registrants will be required to install the flowmeter within 60 days of registration, or as determined appropriate by the GSA at time of GSP adoption. The meter is required to be read and recorded monthly and reported to the GSA annually. Registrants will be required to begin recording groundwater production immediately following installation. A third-party contractor acceptable to the GSA would inspect and read the meter on a semi-annual basis to verify the accuracy of data including meter calibration. An annual report will be required to be submitted to the GSA to demonstrate compliance with the Metering Plan.

2.3 Meters

Historically, basin-wide monitoring has included municipal reading of Borrego Water District Wells and San Diego County Major Use Permit readings for golf courses in the basin. Additional meters are required in the Subbasin to more accurately measure and document water usage.

Flow meters must be installed on existing production wells and should be installed at easily accessible above-ground portions of the well. Flow meters should be installed according to the meter's installation specification (e.g., correct upstream and downstream pipe length). Flow meters must include both an instantaneous flow rate and a totalizer recording the total volume of water extracted from the well. Appropriate meter types are described in the following subsections.

2.3.1 Meter Types

Wells owners can select the brand of flow meter to be installed on their well(s); however, meters must be calibrated as described in Section 3 of this Metering Plan. The propeller-type flow meter is recommended for installation as part of the GSP. Propeller-type meters have been used throughout the Subbasin, and have proven to be a reliable mechanism for long term monitoring. Also, additional implementation of propeller type meters would ensure data comparability to previous historical data.

Propeller Flow Meter:

- Propeller type flow meters use mechanical parts to record production and/or measure flow rate.
- Commonly used in agriculture and municipal settings (majority of meters in Borrego Valley are propeller meters).
- Propeller meters must be sized based on expected flow rate and pipe diameter.
- Historically reliable for long-term use.
- May require maintenance, as bearing wear can occur from the internal propeller, and calibration is also periodically required.
- Future data collected would be of comparable accuracy to historically collected flow meter data.
- Flow meter accuracy is commonly plus or minus 2%.

Figure 2. Example Propeller Type Flowmeter

Source: McCrometer 2017

Additionally, Automated Meter Infrastructure (AMI) can be implemented to remotely report measurements. AMI can be implemented to minimize visits to the wellhead, and remote communication options include satellite and cellular connections. Power options for AMI can include grid, battery-only, and rechargeable solar power.

Figure 3. Example Automated Meter Infrastructure

Source: McCrometer 2017

2.3.2 Typical Installation Configurations

Many wells in the Subbasin already have flow meters installed; however, many wells will require new flow meter installation, retrofits, or meter calibration. Installing each flow meter typically requires 4-8 hours, and must be performed by a licensed pump contractor. Well owners may have the option to allow installation of the flow meter through the GSA for a limited time with a subsidized program, or through an independent pump company at the expense of the well owner.

The meters must be installed in accordance with manufacturer's specifications. A typical installation configuration is depicted in Figure 4.

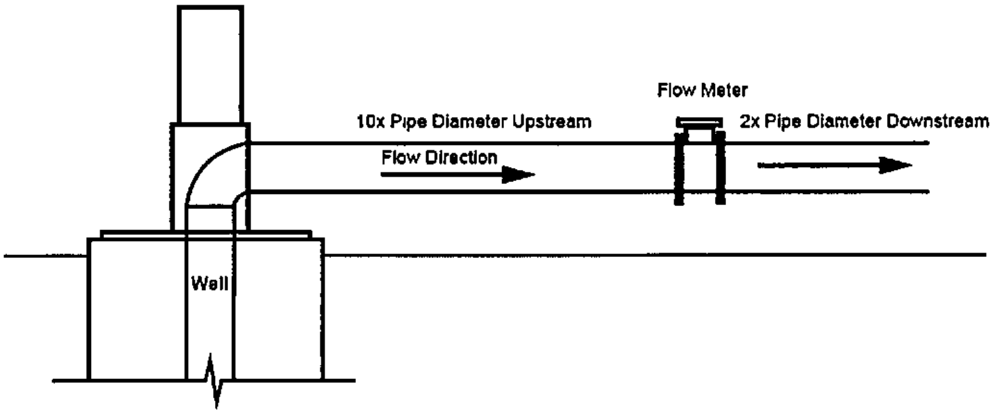


Figure 4. Typical Flowmeter Configuration

2.3.3 Maintenance and Calibration Considerations

Propeller flow meters are considered to be reliable for long-term use; however, routine maintenance of the flow meter will be required, and will be the responsibility of the well owner. Calibration will be conducted as needed semi-annually for propeller type flow meters, and annual meter accuracy checks must be conducted by a GSA-approved vendor. Calibration specifications are presented in Section 3 of this Metering Plan.

INTENTIONALLY LEFT BLANK

3 GROUNDWATER METERING COMPLIANCE REQUIREMENTS

3.1 Calibration and Validation

Proper calibration and verification is important for ensuring data quality, and necessary for meeting the objectives of the Metering Plan. Well owners are responsible for costs for installation (if needed), calibration, verification, and maintenance of meters. Under certain parameters, a flow meter may be deemed "commercial." The County of San Diego, Department of Agriculture, Weights and Measures (AWM) considers a meter to be commercial if it is being used to determine a fee or penalty charged to pumpers, and the meter is owned by the property owner. AWM requires commercial meters to be tested and sealed at the AWM testing facility prior to installation, and to be retested every ten years.

The AWM testing facility has the capability of testing flow meters up to two inches in diameter. Most of the meters subject to the Metering Plan are larger than two inches, and therefore, cannot be tested at the AWM laboratory. In lieu of AWM facility testing, flow meter testing and calibration shall be conducted by the meter manufacturer in conformance with National Institute of Standards and Technology (NIST) Handbook 44, as referenced in California Code of Regulations, Title 4, Division 9 Weights and Measures Field Reference Manual (2018) Section 3.36 Water Meters. Based on the GSA's review of existing, accessible meters in the Subbasin, most meters are manufactured by McCrometer, based in Hemet, California. McCrometer's calibration Standard Operating Procedure for applicable meters has been reviewed by the GSA and determined to be compliant with above-referenced NIST standards. Therefore, McCrometer's two California calibration facilities (Hemet and Porterville) are considered acceptable for meter calibration. Other meter manufacturers may also be acceptable for calibration procedures pending confirmation of NIST compliance.

Initial Calibration/Validation of Existing Meters

New meters will require a certificate of calibration which must be provided to the GSA and recorded. Existing meters in the Subbasin will need to be inspected and validated to ensure proper function and calibration. These activities must be conducted by a California-licensed pump contractor or GSA-approved vendor. This initial calibration and validation will be conducted at the beginning of the schedule of routine metering activities, and a certificate of calibration must be produced and recorded. Certificates of calibration for new and existing meters must be submitted with the initial semi-annual report (Section 3.4 of this Monitoring Plan).

Routine Calibration/Validation

Routine calibration checks (i.e., validation) must be conducted semi-annually. If variability exceeds 5% then manufacturer recalibration will be required. This typically involves removing the meter and having it factory calibrated. Routine validation can be conducted using either a temporary ultrasonic meter test to measure instantaneous flow rate, or other approved recalibration methods performed through professional services. Calibration can also include motor efficiency testing by the pump contractor or vendor to determine current efficiency and remaining useful life of the well motor. Replacing well motors when they become inefficient can save on electrical cost with the potential for regular maintenance resulting in cost savings to the pumper.

3.2 Meter Reads and Monthly Data Reporting

Upon GSP adoption, meter reads must be recorded monthly and submitted to the GSA team electronically on an annual basis with third party validated reports for pumpers who elect to not have GSA staff perform the meter reads. Compliance with GSA meter reading requirements can be achieved by one of two approaches:

3.2.1 Option 1 - GSA Performed Meter Reading

Provide access for the GSA to perform monthly visual meter reading. Enrollment in this approach requires execution of the access agreement provided in **Attachment A** of this Metering Plan. Currently numerous groundwater flow meters within the Subbasin are visually read and documented on a monthly basis.

3.2.2 Option 2 - Third-Party Contractor Performed Meter Reading

The property owner (or third-party contractor acceptable to the GSA) monitors/reads the meter on a monthly basis. A third-party contractor acceptable to the GSA would inspect and read the meter on a semi-annual basis to verify the accuracy of data including meter calibration. On behalf of the property owner, the third-party contractor would provide an annual statement to the GSA. Third party contractors shall possess an appropriate license, including Professional Geologist, Professional Engineer, California Well Drilling License (C-57), or other applicable professional license approved by the GSA.

3.3 Annual Reporting

Annual reports shall be submitted to the GSA on or before October 31st of each year. The reporting year will be defined as the water year from October 1st through September 30th. The water year is designated by the calendar year in which it ends.

Annual reports must contain the following:

- **Total Annual Water Use Per Well:** Tabulated results of monthly meter reads and cumulative annual water production amount.
- **Meter Calibration/Validation Documentation:** Semi-annual validation and annual calibration certificates produced by an appropriate pump or meter company.
- **Representative Parcel Numbers:** San Diego County APN for each parcel served by each well.
- **Farm Identification, if applicable**: Name of farm or farms served water by each well.
- **Meter Reading Method and Qualification:** Description of the meter reading method (e.g., visual read by Borrego Water District, remote automated reading infrastructure with confirmation by third party, etc.) and certification that the individual collecting that data meets the minimum qualifications of the GSA.

Annual reports shall be submitted electronically to the GSA in the required format. An example annual report template is provided as **Attachment B** to the Metering Plan which also specifies submittal details.

3.4 Data Confidentiality

To address concerns regarding the confidentiality of pumping data, the raw data will remain confidential pursuant to Government Code 6254(e). These data will be maintained for use by the GSA, and only publicly available as aggregate values by water use sector (i.e., Agriculture, Municipal, and Recreation).

3.5 Enforcement and Penalties

The GSA's enforcement of compliance with the Metering Plan is imperative to ensure effective implementation. Pump owners who fail to comply with the Metering Plan or who provide inaccurate data to the GSA will be subject to penalties. Specific enforcement and penalties will be outlined in a Fees and Penalties Plan to be approved by the GSA.

INTENTIONALLY LEFT BLANK

4 REFERENCES

Advisory Committee (AC) Agenda. 2017. Borrego Valley Groundwater Basin: Borrego Springs Subbasin. Sustainable Groundwater Management Act (SGMA). AC Meeting. November 27, 2017

Dudek. 2017. *Borrego Springs Subbasin, Draft Interim Monitoring Plan.* August 21, 2017.

DWR. 2016. *Best Management Practices for the Sustainable Groundwater Management of Groundwater – Monitoring Protocols, Standards, and Sites.* California Department of Water Resources, Sustainable Groundwater Management Program. December 2016.

INTENTIONALLY LEFT BLANK

ATTACHMENT A

Groundwater Extraction Facility Registration Form

Groundwater Extraction Facility Registration Form

Owner Information

Contact Name ____________________

Business Name ____________________

Farm/Entity ____________________

Address ____________________

City/State/Zip ____________________

Phone No. ____________________

Email Address ____________________

Operator Information *(if different than above)*

Contact Name ____________________

Business Name ____________________

Address ____________________

City/State/Zip ____________________

Phone No. ____________________

Email Address ____________________

Well Information

Owner's Well Name/No. ____________________

Well Location/Address ____________________

Public Land Survey Location; Township ________ Range ________ Section ________

GPS Coordinates; Latitude ____________ Longitude ____________

State Well No. (SWN) ____________________

State Well ID ____________________

Additional Well Information

County Well Permit No. ____________________

Date Drilled ____________________

Well Depth ____________ feet

Casing Diameter ____________ inches

Perforations ____________________ — feet from ground surface

Groundwater Extraction Facility Registration Form

Motor Type: Submersible or Turbine *(circle one)*

Motor/Engine ____________________HP

Existing Water Meter: Yes or No *(circle one)*

Manufacturer of Water Meter ____

Water Meter Size ________________ inches

Water Flow Meter (state what flowmeter reads in: acre-feet (AF), gallons, cubic feet (CF))

Serial No. of Water Meter ____

Electric Meter No. ____

Assessor's Parcel No. (APN) ____

Hydrogeologic Data (If any of the below data are available, check box and please provide documentation.)

☐ Driller Well Completion Report Available

☐ Groundwater Quality Data Available

☐ Groundwater Level Data Available

☐ Geologist Log Available

☐ Aquifer Test Data Available

☐ Geophysical (E-log) Available

Well Water Use Type

☐ Agricultural/Irrigation *(list number of acres and crop category(ies))* ____________________

☐ Stock Watering *(number and type of animals)* ______________________________

☐ Domestic *(number of persons served)* ___________________________________

☐ Municipal or Industrial ____

☐ Other *(describe)*

Groundwater Extraction Facility Registration Form

Property Access for Meter Readings and Groundwater Level Monitoring

Please provide your printed name and signature to allow for monthly meter readings and approximately semi-annual groundwater level monitoring.

Contact information for property access notification:

Contact Name ______________________________

Phone No. ________________________________

Email Address _____________________________

Signature ____________________ **Date** _________

Are additional active or inactive well located on the property? If so, provide number of well:

Number of Active Wells ____________________

Number of Inactive Wells ___________________

Please complete a separate Groundwater Extraction Facility Registration Form for each additional active well.

ATTACHMENT B

Example Data Submittal Format

BORREGO VALLEY GROUNDWATER SUSTAINABILITY AGENCY
ANNUAL
GROUNDWATER EXTRACATION STATEMENT

Contact: **Telephone:**

Well Operator: **Email:**

Address: **Usage/Acreage:** ______________________________

City, State, Zip:

☒ Please check box if your well(s) is/are used for domestic purposes (human or animal consumption) and delineate which well(s) by highlighting, circling, or "*" - noting which well (if more than 1)

Please carefully fill out the fields (1 - 10) in this form. You have well(s) within the Borrego Springs Subbasin. The Borrego Valley GSA requires that this form be completed, signed and submitted by each well owner and/or operator within 45 days of the due date. If this completed form and required payment is not received by the due date, Ordinance requires that the Borrego Valley GSA charge you interest at X% per month, as well as a late penalty assessed at X% per month.

State Well Number **Flow Meter Readings**

___N___W______	Current	-	Previous	=	Difference	x Mult	= Extraction (Units)
	____________		____________		____________	________	____________

Gallons ____________

Acre-feet ____________

**** PLEASE CALCULATE ACRE-FEET (AF) TO THE 3rd DECIMAL PLACE ****
If you get 50.0019 AF, correct entry = 50.002 AF

Annual Pumping Allocation **Extraction Charge**

Baseline Pumping Allocation ____________ AF ____________ **AF** x $X.00/AF = $ ________

Pumping Allocation _____ % Reduction Interest 1.5% x Months: + $ ________

Available Pumping Allocation ____________ **AF** Late Penalty: + $ ________

Actual Groundwater Extraction ____________ **AF** Overpumping Surcharge: + $ ________

(see rate breakdown below)

TOTAL AMOUNT ENCLOSED = $ ________

Overpumping Surcharge Rates
____________AF @ $X = $ ____________

Payment must be received within 45 days of the date the Annual Statement is issued by Borrego Valley GSA to avoid late penalties and interest.

I DECLARE under penalties of perjury that this groundwater extraction statement has been examined by me, and to the best of my knowledge and belief is a true, correct and complete statement.

Print Name: ______________________________ Date: ________________________

Signature: ______________________________

THIS STATEMENT IS NOT COMPLETE UNLESS ALL QUESTIONS ARE ANSWERED AND SIGNATURE PROVIDED.

January 2020

APPENDIX F

Baseline Pumping Allocation

APPENDIX F
Baseline Pumping Allocation Methodology

The Groundwater Sustainability Plan (GSP) includes a baseline pumping allocation for each identified non-de minimis groundwater user in the Borrego Springs Subbasin (Subbasin). The "baseline pumping allocation" is defined as the amount of groundwater each pumper in the Subbasin is allocated prior to SGMA-mandated reductions. It is further defined as the verified maximum annual production, in acre-feet per year (AFY), for each well owner over the baseline pumping period. The baseline pumping period is the 5-year period from January 1, 2010 through December 31, 2014. This was to consider water use that was being used prior to SGMA taking effect on January 1, 2015 (California Water Code 10720.5(a)).

The County of San Diego (County) sent letters via U.S. Mail to each non-de minimis pumper in January 2018, July 2018, and January 2019 with a request to provide the Groundwater Sustainability Agency (GSA) any historical groundwater production data or other information to help the GSA develop the baseline pumping allocation. Any data provided by pumpers was agreed to be kept confidential by the GSA to the maximum extent allowed by law including but not limited to Government Code 6254. Identified non-de minimis pumpers included one municipal pumper (Borrego Water District), 30 agricultural pumpers, 6 golf courses, and 4 other pumpers (Anza-Borrego Desert State Park, Borrego Air Ranch Water Company, Borrego Springs Elementary School, and La Casa Del Zoro Resort and Spa [Figure F-1]. In cases where the GSA could validate submitted historical groundwater data, the GSA used the data to develop the baseline pumping allocation.

After the GSA reviewed data submitted from pumpers, baseline pumping allocations utilizing validated historical production data were determined for Borrego Water District, Anza-Borrego Desert State Park (Palm Canyon), and one agricultural pumper. The GSA further determined for the Borrego Air Ranch Water Company (provides water to individual residences) that the baseline pumping allocation would be estimated based on a demand of 0.5 acre-feet per year for each residential unit. For all other pumpers, the GSA developed a water-use estimate approach (Evapotranspiration Method) discussed below. The County sent letters via U.S. Mail to each non-de minimis pumper in March 2019 to provide individual baseline pumping allocations. The baseline pumping allocations are summarized by beneficial use categories in GSP Chapter 2, Table 2.1-7.

EVAPOTRANSPIRATION METHOD

This approach includes the use of available aerial imagery to determine irrigated areas on each parcel, which is multiplied by a water use factor for each crop type. The following outlines the methodology for measuring total irrigated area and calculating the water use factor.

Area Irrigated: The area of irrigation was determined using ArcGIS (GIS), a computer based mapping and data analysis software. A 1:2,000 scale was used to create polygons of irrigated area over available aerial imagery from the National Agriculture Imagery Program (NAIP). Available years of aerial imagery included 2010, 2012, and 2014. The total area of each polygon was calculated using coordinate system NAD 1983, State Plane California VI, feet. One exception to this approach was for Rams Hill Golf Course. It was not in full production during the baseline period of 2010 through 2014 due to closure of the golf course that occurred in 2010. It was in full production prior to 2010 and again after 2014. Aerial imagery from 2017 was selected to capture full golf course irrigation.

Water Use Factor: The water use factor estimates the total applied groundwater lost through the evaporation from soil and transpiration from plants (evapotranspiration). These factors are specific to each vegetation type. Turf, ponds, palms, citrus, nursery, and potatoes were identified and considered for all sectors. Table F-1 provides the water use factors for each irrigation use type.

Table F-1
Water Use Factors

Use Type	Water Use Factor (Feet per Year)
Citrus	6.29
Date Palms[a]	7.74
Landscape (Decorative)	3.63
Landscape (Native)	2.76
Nursery	4.84
Palms (Ornamental)	4.03
Ponds[b]	5.75
Potatoes[c]	2.50
Turf	6.45

Source: Water Use Classification Landscape Species IV (WUCOLS IV), DWR 2018, Borrego Water District and County of San Diego 2013
Notes:
a. Includes additional water required for a 30% cover crop (turf) that is irrigated in the understory of the date palms.
b Applied to golf courses only. Surface water evaporation based on pan evaporation data from the Imperial Valley (Salton Sea Salinity Control Research Project U.S. Department of Interior 2004).
c. Approximately 2.5 acre-feet per acre are applied to potato fields per information obtained from the potato farmer in the Subbasin.

The water use factor is calculated using local station specific evapotranspiration (ETo), documented plant factors, and irrigation efficiency by irrigation type (Equation A). The water use factor for citrus and date palms also includes a factor for leaching (Equation B).

The equations below present the calculations used to determine the water use factor.

Equation A

$$Annual\ Water\ Use\ Factor = \frac{ETo * PF * 1\ Acre}{IE}$$

Equation B

$$Annual\ Water\ Use\ Factor = \left(\frac{ETo * PF * 1\ Acre}{IE} * CLF\right) + \left(\frac{ETo * PF * 1\ Acre}{IE}\right)$$

Where:

ETo = Reference Evapotranspiration (feet/year)
PF = Plant Factor
IE = Irrigation Efficiency
CLF = Citrus and Date Palms Leaching Factor

The following section describes the factors, which contribute to calculating the water use factors.

Reference Evapotranspiration: Reference evapotranspiration (ETo) is based on potential evapotranspiration (ET) from turf grass/alfalfa crop, which assumes a continuous source of moisture and does not consider summer plant dormancy. Therefore, ETo is an overestimation of actual ET, which varies with the vegetation type since some plants consume significantly more water than others. The ETo was determined from the California Irrigation Management Information System (CIMIS) station #207 located in Borrego Springs (DWR 2018). ETo was selected as 6.45 feet from 2010, which was the highest year during the 2010-2014 baseline period.

Table F-2
2010-2014 Reference Evapotranspiration (ETo) for Borrego Springs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total (Inches)	Annual Total (Feet)
2010	2.41	3.21	8.81	9.84	8.58	9.22	9.51	9.11	7.44	4.36	2.88	1.98	77.35	6.45
2011	2.68	3.35	5.55	7.12	8.77	8.23	7.98	8.47	6.43	4.92	2.72	2.11	68.33	5.69
2012	2.85	3.56	5.33	6.77	7.66	9.47	8.77	8.04	7.09	5.04	3.2	2.23	70.01	5.83
2013	2.54	3.57	5.75	7.56	8.64	9.02	8.01	7.57	6.46	5.05	3	2.27	69.44	5.79
2014	2.67	3.66	5.94	7.23	8.66	9.13	8.83	8	6.97	4.55	3.14	1.58	70.36	5.86

Source: Borrego Springs CIMIS Station #207 (DWR 2018).

Plant Factor: The plant factor is the percentage of evapotranspiration needed to maintain acceptable health, appearance, and growth of a specific plant type. Plant factors were obtained from the Water Use Classification of Landscape Species (WUCOLS) database. Additionally, the County has relied on documented plant factors used for assigning water credits, which are outlined in the Memorandum of Agreement between the Borrego Water District and the County of San Diego Regarding Water Credits (MOA). The plant factor used in this report either was based on an average of recent WUCOLS data or documented County plant factors, whichever was higher. For Date Palms, the highest plant factor range was selected.

Table F-3
Plant Factors

Type	Plant Factor (MOA)	Plant Factor Range (WUCOLS VI)	Proposed Plant Factor Used
Citrus	0.65[a]	0.4 - 0.6	0.65
Date Palms	N/A	0.4 – 0.6	0.6
Landscape (Decorative)	N/A	0.30 – 0.6	0.45
Landscape (Native)	N/A	>0.1 – 0.6	0.3
Nursery	0.6	0.4 - 0.6	0.6
Palms (Ornamental)	0.5	0.4 – 0.6	0.5
Potatoes	N/A	N/A[b]	N/A
Turf	0.63[c]	0.6 – 0.8	0.7

Source: BWD and County 2013, WUCOLS 2014, UCCE CDWR 2000
N/A = not available
a Source: UC Cooperative Extension and Department of Water Resources, A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California, 2000
b There is no plant factor for potatoes in WUCOLS VI. Approximately 2.5 acre-feet per acre are applied to potato fields per information obtained from the potato farmer in the Subbasin.
c An average of warm and cool season

Irrigation Efficiency: Irrigation efficiency is the amount of water supplied to a plant type compared to the amount consumed. Two common irrigation methods in the Subbasin are rotor and drip. The irrigation efficiency was determined from the Turf and Landscape Irrigation Best Management Practices prepared by the Water Management Committee of the Irrigation Association (Water Management Committee of the Irrigation Association 2004). Table 4 presents the irrigation efficiencies used by irrigation method.

Table F-4
Irrigation Efficiency

Irrigation Method	Irrigation Efficiency
Rotor[a]	0.7
Drip[b]	0.8

Source: BWD and County 2013, Water Management Committee of the Irrigation Association 2004.
a. Rotor used for turf and decorative landscaping
b Drip used for citrus, nursery, palms, and native landscaping

Salt Leaching: Leaching for salts is the overwatering of an area to flush excessive salts below the root zone. Leaching typically occurs in arid environments with high evapotranspiration rates. Because leaching is necessary for the health of citrus and date palms in the Subbasin, a leaching requirement of 20% of the water use factor is assumed based on optimal crop yield and source water with total dissolved solids (TDS) concentration of less than 1,000 mg/L.[1] The leaching requirement is provided in Equation C (Rhoades 1974; and Rhoades and Merrill 1976):

Equation C

$$LR = ECw/\,5(ECe) - ECw$$

where:

LR = the minimum leaching requirement needed to control salts within the tolerance (ECe) of the crop with ordinary surface methods of irrigation
ECw = salinity of the applied irrigation water in deciSiemens per meter[2] (dS/m)
ECe = average soil salinity tolerated by the crop as measured on a soil saturation extract.

---

1 A 20% leaching requirement for citrus and date palms is assumed taking into account typical Subbasin water quality (i.e. <1,000 mg/L TDS and average soil salinity tolerated by grapefruit of 1.8 dS/m for optimal yield (Ayers and Westcot 1985)

2 Soil and water salinity is often measured by electrical conductivity (EC). A commonly used EC unit is deciSiemens per metre (dS/m). The ratio of total dissolved solids (TDS) to EC of various salt solutions ranges from 550 to 700 ppm per dS/m, depending on the compositions of the solutes in the water. Simple relationships are used to convert EC to TDS, or vice Versa:
TDS (mg/L or ppm) = EC (dS/m) x 640 (EC from 0.1 to 5 dS/m)
TDS (mg/L or ppm) = EC (dS/m) x 800 (EC > 5 dS/m)
Source University of California Salinity management: http://ucanr.edu/sites/Salinity/Salinity_Management/Salinity_Basics/Salinity_measurement_and_unit_conversions/

INTENTIONALLY LEFT BLANK

APPENDIX G

GSP Comments and Responses

Comments received by BWD regarding the Stipulated Judgment and BWD's responses have been added at the end of this Appendix.

APPENDIX G
RESPONSES TO COMMENTS

Under the Sustainable Groundwater Management Act (SGMA), the County of San Diego (County) and Borrego Water District (BWD), as the Groundwater Sustainability Agency (GSA) for the Borrego Springs Groundwater Subbasin (Subbasin), has solicited and responded to comments from the public and from other agencies concerned with the Draft Groundwater Sustainability Plan (GSP). The Draft GSP was made available by the GSA for public review on March 22, 2019. The public comment period for the Draft GSP ended on May 21, 2019. Agencies, organizations, and individuals submitting comments on the plan are listed below, organized by category.

Letter Number	Organization/Commenter
C1	Borrego Springs Community Sponsor Group
I1	Janet Johnson
I2	Bill Carpenter
I3	Lee Grismer
I4	John Geyer
I5	Eric Nessa
I6	Larry Grismer
I7	Linda Goodrich
I8	Pat Hall
I9	Mike Himmerich
I10	Jeff Grismer
I11	Bill Bancroft
I12	Steve and Debbie Riehle
I13	Terry and Pam Rhodes
I14	Rebecca Falk
I15	Rebecca Falk
I16	Rebecca Falk
I17	Rebecca Falk
I18	Diane Johnson
I19	Bill Berkley
I20	Jack and Linda Laughlin
I21	Richard and Artemisa Walker
I22	Eric Nessa
I23	Marsha Boring
I24	John Peterson
I25	Robert Kleist
I26	Garold Edwards
I27	Mark Jorgenson
I28	Don Rideout
I29	Judy Davis
I30	Cary Lowe
I31	Bill Haneline

Letter Number	Organization/Commenter
I32	Hugh Dietz
I33	Cristin McVey
I34	Henry Liu
I35	Susan Boutwell
I36	Thomas Hall
I37	Rudy Monica
I38	Lance Lundberg
I39	Barry Berndes
I40	David Leibert
I41	Elena and John Thompson
I42	Joseph Tatusko
I43	Paul Ocheltree
I44	Ray Shindler
I45	Ray Shindler
I46	Saul Miller
I47	Gary Haldeman
I48	Gary Haldeman
I49	Diane Martin
I50	I Donald
I51	Herbert Stone
I52	Karen and Fred Wise
I53	Jack Sims
I54	Joanne Sims
I55	James Roller
I56	Jeff Meagher
I57	Heather Davidson
I58	Linda Roller
I59	John and Mary Delaney
I60	Ellen Fitzpatrick
I61	Michael Wells
I62	Harold and Joanne Cohen
I63	Jennifer Edwards
I64	Wayne Boring
I65	Barbara Coates
I66	Timothy Kight
I67	Mary Leahy
I68	Betsy Knaak
I69	Ginger Dunlap-Dietz
I70	Charlene Aron
I71	Sandy Jorgenson-Funk
I72	Sally Thenault
I73	Bob Theriault

Letter Number	Organization/Commenter
I74	Merrij Smith
I75	Linda Mocere
I76	D.E. and R.A. Owen
I77	Gary Funk
I78	Linda McBride
I79	Jeanne Gemmell
I80	Cyril Weaver
I81	Marjorie and Paul Schuessler
I82	Alfred DeVico
I83	Liesel Paris
I84	Sal Moceri
I85	Heidi Noyes
I86	Robin Montgomery
I87	William Bonnell
I88	James Rickard
I89	Grace Rickard
I90	Jim Wilson
O1	Agricultural Alliance for Water and Resource Education (AAWARE), Michelle Staples, Jackson Tidus, A Law Corporation
O2	AAWARE, Michelle Staples, Esq. and Boyd Hill, Esq., Jackson Tidus, A Law Corporation
O3	T2 Borrego (Owner of Rams Hill Golf Course), Russell McGlothlin, O'Melveny
O4	Tubb Canyon Desert Conservancy, J David Garmon, President
O5	The Nature Conservancy, Sandi Matsumoto, Associate Director, California Water Program
O6	San Diego Audubon Society, James A. Peugh, Conservation Chair
O7	Anza Borrego Foundation, Bri Fordem, Executive Director
O8	Clean Water Action, Jennifer Clary, Water Program Manager
O9	Borrego Village Association, J. David Garmon, Acting President
O10	Borrego Springs Unified School District, James L. Markman
O11	Borrego Springs Unified School District, Martha Deichler, School Community Liaison
O12	Borrego Stewardship Council, Diane Johnson
O13	Borrego Stewardship Council, Diane Johnson
O14	Borrego Water District, Kathy Dice, President, Board of Directors
O15	Borrego Valley Endowment Fund, Bob Kelly, President
S1	California Department of Fish and Wildlife, Leslie MacNair, Regional Manager, Inland Desert Region
S2	California State Parks, Gina Moran, District Superintendent

Notes: L = local agency; C= community, O = organization; I = individual; S = state agency.

All comments received on the Draft GSP have been coded to facilitate identification and tracking. Each of the written comment letters and public hearing comments received during the public comment period were assigned an identification letter and number, provided in the list above. These letters and public hearing comments were reviewed and divided into individual comments, with each comment containing a single theme, issue, or concern. Individual comments and the responses to them were assigned corresponding numbers. Each letter is the submittal of a single individual, agency, or organization. The comment letters' identification consists of two parts. The first part is the letter and number of the document and the second is the number of the comment. As an example, Comment S2-1 refers to the first comment made and addressed in Comment Letter S2. Copies of the bracketed comment letters may be requested by contacting the Plan Manager, or visiting the GSA's website at https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley/GSP.html.

To finalize the GSP, the GSA has prepared the following responses to comments that were received during the public review period.

RTC.1 MASTER RESPONSES

Baseline Pumping Allocation and Pumping Reduction Program

Issue Summary: Numerous comments have been received from the community stating that the GSP places a unreasonable burden on municipal uses, small water systems (e.g., Air Ranch), and the Anza-Borrego Desert State Park (ABDSP), in reducing water demands through the GSP implementation period, without acknowledging the significant water conservation that has already been achieved to date by municipal, domestic and recreational water users. Several commenters questioned how the period between 2010 and 2015 was selected as the period in which to determine the baseline pumping allocation (BPA) as this was a period in which conservation efforts were already underway. Commenters argue that this leaves little room for further conservation efforts, and are concerned that the Pumping Reduction Program (Project and Management Action [PMA] No. 3) will require cutbacks that cannot be achieved without jeopardizing health and safety, would unreasonably raise water rates, and could result in depreciation of property values. The primary request from commenters is that the municipal sector and small water systems, such as Air Ranch and ABDSP, not be subject to the same percentage reduction as is being applied to the recreation and agricultural sectors. The overarching sentiment is that it is unfair to require an "across the board" reductions of 75% for all sectors, when agricultural pumping has been the primary contributor to groundwater overdraft in the Subbasin.

Response: The Pumping Reduction Program (PMA No. 3) will determine how, where and by whom physical reductions in pumping are to be achieved. Although the Draft GSP establishes baseline pumping allocations for each sector, and sets a Subbasin-wide pumping reduction target of 75% by 2040, it neither mandates that the level of pumping reduction be equal across all sectors nor prescribes or predicts how actual pumping reductions will be distributed across sectors at the end of the implementation period. The Pumping Reduction Program is designed to work in conjunction with other PMAs, including the Water Trading Program (PMA No. 1), the Water Conservation Program (PMA No. 2), and the Voluntary Fallowing of Agricultural Land (PMA No.4) to optimize beneficial uses of groundwater while recognizing the need to bring the Subbasin into balance. The Draft GSP states that the Water Trading Program would allow groundwater users (including the BWD) to purchase needed baseline pumping allocation from others to maintain economic activities in the Subbasin. As implementation of the GSP proceeds, it is anticipated that annual pumping allowances published by the GSA will be adjusted to reflect transfer of baseline pumping allocation between pumpers.

In response to establishing 2010 through 2014 as the baseline pumping period, the GSA sought public input prior to determining the time period for the baseline pumping allocation. Please see meeting minutes from September 28, 2017, November 17, 2017, and January 25, 2018. They can be found on the County's SGMA website at: https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html.

Commenters are reminded that the Draft GSP does not set specific groundwater use reductions through its sustainable management criteria (i.e., GSP Chapter 3). As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of groundwater use reductions and a specific ramp down schedule. The Draft GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions and a specific ramp down schedule may be developed and agreed to by pumpers in the basin. On July 9, 2019, the BWD held a public meeting at which proposed stipulated agreement terms were made public.

Groundwater Dependent Ecosystems

Summary: Comments from public agencies and organizations—namely the California Department of Fish and Wildlife (CDFW), Anza Borrego Desert State Park (ABDSP), the Nature Conservancy (TNC), the San Diego Audubon Society, and Tubb Canyon Desert Conservancy—have raised concern that the Draft GSP has not adequately identified, evaluated and/or considered undesirable effects associated with interconnected surface water (and groundwater dependent ecosystems in particular), and has not included environmental uses of water as a beneficial use of groundwater within the Plan Area. In essence, commenters disagree with the GSA's Draft GSP's determination that undesirable results on interconnected surface water occurred from declining groundwater levels caused by groundwater pumping decades ago, and that there is no longer a significant nexus between the Subbasin's groundwater aquifer and the potential groundwater dependent ecosystems identified by TNC. Commenters believe that the GSA's conclusion is not adequately supported by the data presented in the GSP, and that at least, a data gap should be identified and further study is warranted.

Response: The Draft GSP, based on the best available data, describes a situation where there very likely are no undesirable effects associated with interconnected surface water and groundwater dependent ecosystems. Appendix D4 has been amended to provide additional resources newly made available by TNC after the public draft of the GSP was published that further demonstrates the disconnection of potential GDEs from the groundwater table underlying the Plan Area. This includes a rooting depth database, and a collection of Landsat data from NASA over a 30 year period that was processed to provide metrics for vegetation greenness and moisture for all of the Natural Communities Commonly Associated with Groundwater (NCCAG) areas mapped by TNC. In addition, Appendix D4 was amended to provide a comparison of aerial photography to further evaluate trends in vegetation communities in the Subbasin. The additional data provided in Appendix D4 indicates the following:

- Comparison of aerial photography shows potential GDEs mapped around the western margins of the Subbasin (i.e., GDE Units 1 and 2, Henderson Canyon, Hellhole Canyon, Culp Canyon, Tubb Canyon, and other minor or unnamed stream segments entering the Subbasin) have remained in place since the early 1950s, despite a long term and persistent trend of declining groundwater levels in the Subbasin. This suggests that these communities are being supported by surface water entering the Subbasin from perennial and ephemeral waters originating outside its boundaries, rather than the regional water table within the Subbasin.
- Evaluation of plant health indices derived from Landsat data have shown that there have been minimal changes in vegetation moisture and/or greenness since 1985 within any of the potential GDEs mapped within the Subbasin. Changes observed by year between 1985 and 2015 have been minor, and have tracked consistently with changes in annual precipitation occurring over the same time frame, rather than the steady decline in groundwater levels. If potential GDEs were relying primarily on the regional groundwater table, one would expect to see a steady decline in community health over the 20-year period.
- Evaluation of the plant root database released by TNC indicate that worldwide, Honey Mesquite have been observed to have maximum plant roots of at least 65 feet deep. This maximum depth was reported from a study in Israel. The database included one study completed closer to Plan Area, at base of the Fish Creek Mountains, about 9.3 miles west of the southern tip of the Salton Sea (Harper's Well site). In this location, the Honey Mesquite community was found to have roots extending to a maximum of 19.6 feet. The groundwater depth recorded at Well MW-5 in the Borrego Sink is 56 feet below the ground surface. There are inherent limitations to the root depth database in terms of both sample size (small) and study design (maximum depths reported may actually just correspond to maximum depth investigated).

The persistence of potential GDEs around the margins of the Subbasin, despite the occurrence of long term groundwater overdraft and declining groundwater levels in the Subbasin, provides inferential evidence that these plant communities are supported primarily by surface water, or groundwater originating from the fractured rock (i.e., springs) likely outside the Subbasin. There is also reasonable evidence that the roots of the potential GDEs may not extend hundreds of feet along the margins of the Subbasin to the regional groundwater table.

The groundwater table has most likely dropped below the likely rooting depth of the Honey Mesquite community identified in GDE Unit 3. Satellite-derived plant indices do not show any changes in aerial extent of the Honey Mesquite community from 1985 through 2018, a period with a documented steady decline in groundwater level. In GDE Unit 3, Honey Mesquite have a dimorphic root system that allows them to utilize soil moisture originating from surface water or the groundwater table, and thus adapt to the sources of water available. Thus, the GSA maintains its position that the Honey Mesquite community as it exists today is likely no longer being supported by the groundwater. This is also the reason no BPA for beneficial use of groundwater for environmental uses (which would result in GDEs becoming another beneficial user of groundwater) is identified in the Draft GSP.

The GSA would like to remind commenters that a groundwater dependent ecosystem is defined by the Department of Water Resources' (DWR's) implementing regulations as "ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" (Title 23 CCR Section 351[m]). Although "near the ground surface" is not defined, a groundwater table that is in excess of 50 feet bgs, for example, cannot be reasonably considered as being near the ground surface. Interconnected surface water refers to surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted (Title 23 CCR Section 351[o]). The Subbasin as a whole is a system whose surface waters are disconnected from the underlying groundwater system (i.e., losing streams). The occurrence of a hydraulic connection to the fractured rock system outside the Subbasin boundaries that sustain flow within portions of Coyote Creek, Palm Canyon Creek, and other creeks around the margins of the Subbasin is not necessarily evidence that conditions within the Subbasin has caused undesirable results with respect to interconnected surface waters.

Initial Estimate of Sustainable Yield

Summary: Numerous comments were received that raised concerns over how the sustainable yield estimate was determined, specifically regarding the accuracy and/or absence of specific water budget components, a perception that climate change was not adequately considered, and/or general sentiments that the budget it too restrictive.

Response: The GSA has reviewed comments related to the sustainable yield for the Subbasin and determined that the initial estimate proposed in the Draft GSP remains appropriate and based on the best available data and well-regarded modeling science[1]. However, GSP Section 2.2.3, and Section 2.2.3.6 in particular, has been revised to clarify how the sustainable yield estimate was developed.

The initial sustainable yield estimate used in the Draft GSP of 5,700 acre-feet per year (AFY) was based on the USGS' *pre-development scenario* that estimated natural inflows to the boundaries of the Borrego Valley Hydrologic Model (BVHM) for the period 1945 through 2010. The USGS referenced approximately 1,400 AFY that enters the basin as underflow from adjacent basins, but the USGS Model Update Report in the Draft GSP did not clarify the outflow components used in the *pre-development scenario.* Since calculations of sustainable yield must include both inflow and outflow

1 "Best available science" refers to the use of sufficient and credible information and data, specific to the decision being made and the time frame available for making that decision, that is consistent with scientific and engineering professional standards of practice (Title 23 CCR Section 351[h]).

components, the GSP has been updated to include the water budget from the modeling update to confirm the validity and appropriateness of using 5,700 AFY as the initial sustainable yield.

Use of 5,700 AFY as the initial estimate of sustainable yield for the Borrego Springs GSP is a reasonable approach recognizing the iterative and adaptive nature of SGMA to identify data gaps, acquire new data and update the estimate of sustainable yield at each 5-year check-in during GSP implementation.

INTENTIONALLY LEFT BLANK

Comment Letter S1

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H BONHAM, Director

May 20, 2019

Via Electronic Mail and Online Submission

James Bennett
Plan Manager
Borrego Valley Groundwater Sustainability Agency
5510 Overland Avenue
San Diego, CA 92123
jim.bennett@sdcounty.ca.gov
PDS.LUEGGroundWater@sdcounty.ca.gov

Subject: Comments on the Draft Borrego Valley Groundwater Basin Groundwater Sustainability Plan

Dear Mr. Bennett:

The California Department of Fish and Wildlife (Department) is providing comments on the Draft Borrego Valley Groundwater Basin Groundwater Sustainability Plan (GSP). As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species [Fish & Game Code §§ 711.7 and 1802]. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems and public trust resources depend on groundwater and interconnected surface waters, including ecosystems on Department lands that fall within an alluvial groundwater basin adjacent to the Borrego Springs Groundwater Subbasin (7-024 02)

COMMENT OVERVIEW S1-1

The Department is writing to support ecosystem preservation and enhancement under Sustainable Groundwater Management Act (SGMA) implementation in the context of the following SGMA statutory mandates and with the benefit of Department expertise.

SGMA affords ecosystems specific statutory and regulatory consideration

- Groundwater Sustainability Plans (GSPs) must consider impacts to **groundwater dependent ecosystems** [Water Code §10727.4(l)].
- GSPs must identify potential effects on **all beneficial uses and users of groundwater**, including fish and wildlife preservation and enhancement [Title 23

Conserving California's Wildlife Since 1870

California Code of Regulations §666], that may occur from undesirable results [Title 23 California Code of Regulations (CCR) §354 26(b)(3)].

- GSPs must **account for groundwater extraction for all Water Use Sectors** including managed wetlands, managed recharge, and native vegetation [Title 23 CCR §351(al), §356 2(b)(4)].

In consideration of these and other SGMA statute and GSP regulations, the Borrego Valley Groundwater Basin GSP does not adequately describe the basin setting, rely on the best available science to develop the water budget, adequately estimate sustainable yield, address data gaps associated with potential groundwater flux at the Coyote Creek fault, include undesirable results to groundwater dependent ecosystems (GDEs) in adjacent groundwater basins, and address data gaps in the proposed monitoring network. The Department recommends addressing these concerns before submitting the GSP to the Department of Water Resources for evaluation and assessment. S1-1 Cont.

COMMENTS AND RECOMMENDATIONS

The Department comments are as follows:

1. **Section 2.2 (Basin Setting).** The Basin Setting is not adequately described. In section 2 2.1.2, it is stated that the hydraulic connectivity across the Coyote Creek fault between the Borrego Springs Subbasin and the adjacent Ocotillo-Clark Valley basin is not precisely known and the range of flux across this fault is estimated to be anywhere between 32 acre-feet per year (AFY) and 3,200 AFY. This is noted as a data gap in section 2 2.2.1 (Groundwater Elevation Data), "Data Gaps" subsection as well. S1-2
   a. Issue. The basin cannot be accurately characterized with such a wide range of potential influx. This influx range is inadequate to define and assess reasonable sustainable management criteria as required by Title 23 CCR section 354 12. This issue has been identified as a data gap on p. 2-54.
   b. Recommendation: Address existing data gap through monitoring efforts (see Comment #8) prior to development of a water budget.
2. **Section 2.2.2.1 (Groundwater Elevation Data), Data Gaps Subsection.** Groundwater movement along (parallel to) the San Felipe fault should be included as a data gap. It is noted that on Figure 2.2-8 (Geologic Map) that the San Felipe fault may potentially be directing subsurface flow along the fault towards a low spot in groundwater elevation associated with the Borrego Sink (see Figures 2.2-13A) The Department recommends that monitoring wells be installed along the San Felipe fault to evaluate subsurface inflow and outflow S1-3

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 3

along the San Felipe fault in order to "...develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation" as required by Title 23 CCR section 354 34(a).

a. Issue Unknown groundwater movement along the San Felipe fault potentially affects subsurface flow to San Felipe Creek GDE. Groundwater declines at San Felipe Creek GDE are currently impacting the state- and federally-endangered desert pupfish (*Cyprinodon macularius*) habitat and Designated Critical Habitat (DCH) through dewatering spring-fed surface waters.

b. Recommendation· Plan and install monitoring wells along the San Felipe Fault.

S1-3 Cont.

3. **Section 2.2.3 (Water Budget).** Assumptions are used for the Borrego Valley Hydrologic Model (BVHM) that don't represent the best available science. The BVHM is used to develop the water budget and is appropriate to model groundwater in an agricultural setting with an arid/semi-arid environment. However, the output of the BVHM is dependent on the validity of the data set used by the model. If the data input is biased, it can yield a biased result. In section 2 2 3 3 it is noted that the Subbasin lost 7,300 AFY from storage during the 1945-2016 time-period, but the average loss for the last 10 years was 13,700 AFY. This information indicates that more recent years are characterized by higher extraction rates potentially associated with climatic shifts. Within Section 2.6.8 of *Update to United States Geological Survey Borrego Valley Hydrologic Model for Borrego Valley Sustainability Agency* (included as Appendix D1 of the Plan), the average annual natural recharge of water reaching the saturated zone was calculated to be 5,700 AFY based on a simulation period of 1929 to 2010. Inclusion of older data to develop the model output can introduce a bias into model output. The Plan does not adequately quantify the current inflows and outflows for the basin using the most recent hydrology, water supply, and water demand information as required by Title 23 CCR section 354 18(c)(1) or provide a quantitative assessment of the historic water budget as required in Title 23 CCR section 354.18(c)(2)(B).

S1-4

a. Issue: Using a long historical record of groundwater use can bias BVHM outputs and water budget calculations towards inflow/outflow numbers that are not reflective of current climate and groundwater use patterns.

b. Recommendation: The GSP should use datasets from the most recent 50-year period for precipitation, evapotranspiration, and streamflow information; and the GSP should use only the most recent 10-year period of a quantitative assessment of the historical water budget to estimate and

Conserving California's Wildlife Since 1870

project future water budget information and future aquifer response to proposed groundwater management practices. S1-4 Cont.

4. **Section 2.2.3.6 (Sustainable Yield Estimate).** In section 2.2.3.6 on p. 2-80, the average annual natural recharge of water reaching the saturated zone is estimated to be 5,700 AFY. However, this includes an average annual agricultural return flow of 1,473 AFY. As the pumping reduction and fallowing Project and Management Actions are implemented, the agricultural return flow can reasonably be expected to be reduced. This would result in an underestimate of the natural recharge in the water budget and would not provide an accurate estimate of the "Inflow to the groundwater water..." specified by Title 23 CCR section 354.18(b)(2). S1-5

   a. Issue: The water budget does not account for reduction in agricultural return flow associated with GSP implementation.

   b. Recommendation: Redesign water budget calculations to account for reduction in agricultural return flow.

5. **Section 3.3 (Minimum Thresholds).** Section 3.3 identifies on p. 3-16 that Title 23 CCR section 354.28(e) states, "the description of minimum thresholds shall include the following: ...How minimum thresholds have been selected to avoid undesirable results in adjacent basins or affecting the basins ability to achieve sustainability goals". Because of the unknown flux across the Coyote Creek fault and the known overdraft of the Borrego Valley Subbasin, groundwater extraction in the Borrego Valley Subbasin may be impacting recharge in the adjacent Ocotillo-Clark Valley Groundwater Basin. San Felipe Creek is a GDE within the Ocotillo-Clark Valley Basin that has been experiencing groundwater declines that is causing severe impacts to State- and federally-endangered desert pupfish (*Cyprinodon macularius*) and DCH for this species. S1-6

   a. Issue: Minimum thresholds do not include consideration of undesirable results in adjacent basins

   b. Recommendation. Include a consideration of GDEs in adjacent Ocotillo-Clark Valley groundwater basin within section 3.3.6 (Depletions of Interconnected Surface Waters-Minimum Thresholds) and section 3.4.6 (Depletions of Interconnected Surface Water-Measurable Outcomes).

6. **Section 3.3.1.3 (Minimum Threshold Impacts to Adjacent Basins).** Section 3.3.1.3 states that "...adjacent Ocotillo-Clark Valley Groundwater Basin and Ocotillo Wells Subbasin are both 'very low' priority basins not required to prepare GSPs. As such, they are not expected to develop descriptive undesirable results or quantitative minimum thresholds and measurable objectives." Title 23 CCR section 354.28(e) states, "the description of minimum thresholds shall include the S1-7

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 5

following How minimum thresholds have been selected to avoid undesirable results in adjacent basins or affecting the basins ability to achieve sustainability goals". Desert pupfish are protected under the California Endangered Species Act (CESA) and the federal Endangered Species Act (ESA). Potential impacts to desert pupfish and desert pupfish DCH at San Felipe Creek should be considered an undesirable result.

a. Issue: Minimum thresholds do not include consideration of undesirable results in adjacent basins

b. Recommendation: Include a consideration of GDEs in adjacent Ocotillo-Clark Valley Groundwater Basin within section 3.3.6 (Depletions of Interconnected Surface Waters-Minimum Thresholds) and section 3 4 6 (Depletions of Interconnected Surface Water-Measurable Outcomes).

S1-7 Cont.

7. **Section 3.5.4.2 (Identification of Data Gaps) Groundwater Elevation subsection.** Section 3 5.4.2 states on p. 3-45 that "Multicompletion wells or well clusters screened at discrete intervals in the upper, middle and lower aquifers would be required to determine potentiometric surface by aquifer unit. However, the average potentiometric surface measured at wells that are screened over one or more aquifer units appears to sufficiently represent groundwater conditions..." The Department does not agree that wells screened at more than one aquifer sufficiently represent groundwater conditions. The Department agrees with the recommendation included within section 6 on p.16 of the *Update to Borrego Valley Hydrologic Model* where it is recommended to "Conduct aquifer tests at wells screened only in the upper aquifer and only in the middle aquifer to obtain site-specific estimates of hydraulic conductivity and specific yield for each aquifer unit. This information may be used to enhance the calibration of the model to these hydraulic properties and our understanding of storage in the BVGB." This information is also identified in the "Borrego Valley Hydrologic Model" subsection of section 3 5.4.2 as a means to address the aforementioned data gap. The use of wells screened only for the upper and middle aquifers will "...develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation" as required by Title 23 CCR section 354.34(a).

a. Issue: Proposed use of wells screened at more than one aquifer could be inadequate to monitor groundwater conditions within each aquifer.

b. Recommendation: Plan and install multicompletion wells or well clusters screened only in the upper aquifer and only in the middle aquifer to specifically monitor aquifer conditions within these aquifers.

S1-8

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 6

8. **Section 3.5.4.2 (Identification of Data Gaps) Groundwater Elevation subsection.** The "Borrego Valley Hydrologic Model" subsection of section 3.5.4.2 also identifies the previously mentioned data gap associated with potential flux across the Coyote Creek fault. The Department recommends that monitoring wells be installed on both sides of the Coyote Creek fault to evaluate subsurface inflow and outflow along and across the Coyote Creek fault in order to "...develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation" as required by Title CCR section 354.34(a). S1-9

    a. Issue: There is an unknown amount of groundwater flux across and/or along the Coyote Creek Fault.

    b. Recommendation: Plan and install monitoring wells on both sides of the Coyote Creek Fault.

9. **Section 3.5.4.2 (Identification of Data Gaps) Groundwater Elevation subsection.** The "Borrego Valley Hydrologic Model" subsection of section 3.5.4.2 does not mention a data gap associated with the San Felipe Fault. However, it is noted that on Figure 2.2-8 (Geologic Map) that the San Felipe fault potentially may be directing subsurface flow along the fault towards a low spot in groundwater elevation associated with the Borrego Sink (see Figures 2.2-13A). The Department recommends that monitoring wells be installed along the San Felipe fault to evaluate subsurface inflow and outflow along the San Felipe fault in order to "...develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation" as required by Title 23 CCR section 354.34(a) S1-10

    a. Issue: There is an unknown amount of groundwater movement along the San Felipe Fault

    b. Recommendation: Plan and install monitoring wells along the San Felipe Fault.

10. **Section 3.5.4.2 (Identification of Data Gaps).** The "Borrego Valley Hydrologic Model" subsection of section 3.5 4 2 does not mention a data gap associated with spring systems However, Figure 2.2-17 identifies multiple spring systems that may be associated with the Borrego Springs Groundwater Basin. Springs constitute a GDE The Department recommends identifying what springs, if any, should be considered GDEs potentially impacted by the Plan through a phased approach. Springs that would potentially be impacted by groundwater decline in S1-11

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 7

the Borrego Springs Groundwater Basin would most likely be associated with a regional fault system that provides a hydrologic connection between the springs and the alluvial basin Springs associated with regional faults would likely exhibit elevated temperatures in comparison to springs that are not associated with the fault system A simple procedure of measuring temperatures of the neighboring springs can identify those associated with the basin. A second method, such as measurement of dissolved Helium isotope ratio of those springs with elevated temperatures can positively identify those systems associated with fault system. Waters with contact with regional fault systems tend to exhibit an atypical Helium isotope ratio (in comparison to surface waters) that is indicative of exposure to mantle derived Helium. If springs are associated with regional fault systems they should be considered potential GDEs and included within the Plan in order to "...develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation" as required by Title 23 CCR section 354.34(a). S1-11 Cont.

a. Issue It is unknown if springs have hydrologic connection to basin.

b Recommendation: Measure water temperatures among springs to identify those with potential hydrologic connection to regional fault systems and basin. Perform second test for Helium isotope ratio to verify potential GDEs.

11. **Appendix D1 (Update to Borrego Valley Hydrologic Model).** The Department recommends that recharge from streamflow be monitored and the estimated annual average recharge during the term of the Plan be revised as climatic changes occur. In addition, recharge estimates from agricultural return flow will be altered by implementation of the Plan itself. This will alter the estimated recharge used by the BVHM. Accounting for changes in recharge components over time will provide a description of current groundwater conditions as required by Title 23 CCR section 354 16 and will quantify the inflow to the groundwater system required by Title 23 CCR section 354 18 (b)(2). S1-12

a. Issue: Recharge associated with changing climate and changes in agricultural return flow are likely to be substantially altered during the term of the Plan.

b Recommendation: Revise the BVHM to be adaptive and incorporate systematic adjustments to input (e g agricultural return flow) used to calculate recharge.

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 8

12. **Appendix D1 (Update to Borrego Valley Hydrologic Model), Section 6.** As described in section 6 of the *Update to Borrego Valley Hydrologic Model*, considerable uncertainty exists about agricultural pumping and stream flow leakage. The Department supports the recommendations contained in section 6 to install stream gauges and well pumping meters to address these uncertainties. Implementing these recommendations provide information about flow directions, lateral and vertical gradients, and regional pumping patterns as required by Title 23 CCR section 354.16(a) and quantify the inflow to the groundwater system required by Title 23 CCR section 354.18 (b)(2). S1-13

    a. Issue: Considerable uncertainty exists regarding agricultural pumping and stream flow leakage.

    b. Recommendation: Install stream gauges and well pumping meters as recommended in section 6 of Appendix D1.

13. **Appendix D1 (Update to Borrego Valley Hydrologic Model), Figures 11 and 12.** Both residual plots (Update to the Borrego Valley Hydrologic Model – Figure 11) and the linear model plots (Figure 12) suggest potential changes and increased bias in the model between the first and second runs (1945-2010 and 2011-2016) Performing a statistical comparison would provide information about flow directions, lateral and vertical gradients, and regional pumping patterns as required by Title 23 CCR section 354.16(a). S1-14

    a. Issue: There are potential changes and increased bias in the model between the first and second runs (1945-2010 and 2011-2016).

    b. Recommendation: Use an appropriate statistical comparison (e.g. ANCOVA) to determine changes in the relationship between predicted and estimated head.

CONCLUSION

In conclusion, the Borrego Valley Groundwater Basin Groundwater Sustainability Plan does not comply with all aspects of SGMA statute and regulations, and the Department deems the plan insufficient to consider impacts fish and wildlife beneficial users of groundwater. The Department recommends that the Borrego Valley Groundwater Sustainability Agency address the above comments to avoid a potential 'incomplete,' or 'inadequate' plan determination, as assessed by the Department of Water Resources, for the following reasons derived from regulatory criteria for plan evaluation: S1-15

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 9

information and best available science. [CCR 355.4(b)(1)] (See Comments #1 and 3)

2. The Plan does not identify reasonable measures and schedules to eliminate data gaps. [CCR §355.4(b)(2)] (See Comments #2, 7, 8, 9, and 10)
3. The sustainable management criteria and projects and management actions are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Plan. [CCR §355 4(b)(3)] (See Comments #2, 4, 11, 12, and 13).
4. The projects and management actions are not feasible and/or not likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. [CCR §355.4(b)(5)] (See Comments #4, 11, 12, and 13) S1-15 Cont.
5. The Plan does not include a reasonable assessment of overdraft conditions or include reasonable means to mitigate overdraft, if present. [CCR §355.4(b)(6)] (See Comments #4, 11, 12, and 13)
6. The Plan will adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of its sustainability goal. [CCR §355 4(b)(7)] (See Comments #5, 6, and 8)

The Department appreciates the opportunity to provide comments. Please contact Nick Buckmaster at Nick.Buckmaster@wildlife.ca.gov or Charley Land at Charles.Land@wildlife.ca.gov with any questions

Sincerely,

Leslie MacNair

Leslie MacNair
Regional Manager,
Inland Desert Region

Conserving California's Wildlife Since 1870

James Bennett, Plan Manager
Borrego Valley Groundwater Sustainability Agency
May 20, 2019
Page 10

ec: California Department of Fish and Wildlife

Ed Pert, Regional Manager
South Coast Region
Ed.Pert@Wildlife.ca.gov

Erinn Wilson, Environmental Program Manager
South Coast Region
Erinn.Wilson@Wildlife.ca.gov

Robert Holmes, Environmental Program Manager
Statewide Water Program
Robert.Holmes@wildlife.ca.gov

Briana Seapy, Statewide SGMA Coordinator
Groundwater Program
Briana.Seapy@wildlife.ca.gov

Mary Ngo, Senior Environmental Scientist, Specialist R5
Water Rights/SGMA/FERC Coordinator
Mary.Ngo@Wildlife.ca.gov

California Department of Water Resources

Steven Springhorn, Supervising Engineering Geologist
Sustainable Groundwater Management Program
Steven.Springhorn@water.ca.gov

State Water Resources Control Board

Samuel Boland-Brien, Program Manager
Groundwater Management Program
Samuel.Boland-Brien@waterboards.ca.gov

Conserving California's Wildlife Since 1870

RTC.2 STATE AGENCIES

Letter S1

Commenter: Leslie MacNair, Regional Director, Inland Desert Region, California Department of Fish and Wildlife (CDFW)
Date: May 20, 2015

S1-1 This comment provides introductory information about CDFW's role as a trustee agency and summarizes the comments in the letter. Specific responses to issues raised are provided below (Responses S1-2 through S2-14). The Groundwater Sustainability Plan (GSP) adequately considers impacts to groundwater dependent ecosystems (GDEs) (GSP Section 2.2.2.7, Section 3.2.6, and Appendix D4), effects of beneficial uses and users of groundwater (GSP Section 2.1.4 and Chapter 3), and accounts for groundwater extraction for all sectors, including native vegetation (GSP Section 2.2.3). The Draft GSP, Appendix D4 in particular, has been revised to provide clarification and additional supporting information. However, the Groundwater Sustainability Agency (GSA) maintains there are likely no interconnected surface waters within the Plan Area, and that the potential GDEs mapped within the Subbasin are dependent on surface water, percolating or perched water within the unsaturated zone, and/or groundwater originating from springs outside the Subbasin. Because potential GDEs are disconnected from the Subbasin's groundwater aquifer, there are no undesirable effects occurring with respect to depletions of interconnected surface waters. Naturally, this conclusion extends to fish and wildlife species that may depend on habitats located within the Plan Area.

S1-2 The basin setting provided in Chapter 2 of the Draft GSP provides an adequate description of the Borrego Springs Subbasin. The U.S. Geological Survey (USGS) has a reasonable basis for considering the Coyote Creek Fault in its report as a no-flow barrier, including differences in groundwater levels across the fault and the orientation of groundwater contours. The description of the Subbasin in the Draft GSP is exhaustive and thorough, and includes the description of additional work done by graduate students under Dr. David Huntley that suggests the fault acts as a partial barrier to groundwater flow rather than a no-flow barrier (with an estimated inflow between 32 and 3,200 acre-feet per year [AFY]). This additional information satisfies the requirements under SGMA to identify data gaps and levels of uncertainty.

Although the potential inflow at the Coyote Creek fault could have additional inflow not accounted for in the Subbasin's water budget in GSP Section 2.2.3, it does not mean that the Subbasin has been inaccurately characterized. The Borrego Valley Hydrologic Model (BVHM) is a calibrated model based on observed groundwater levels, which means that if inflow across Coyote Creek Fault were added to the model, inflows and outflows for other model components would need to be redistributed to explain the same observed groundwater levels (finite difference model), such as an increase in the subsurface outflow to the Ocotillo Wells Subbasin, a decrease in stream recharge, or a decrease in subsurface inflow already estimated in the BVHM.

As stated in GSP Section 2.2.2.1,

> the GSA does not consider this a critical data gap because historical groundwater levels and trends suggest the flux would be into the Subbasin rather than out of the Subbasin (i.e., a potential missing input to the water budget), and because the Coyote Creek Fault is distant from the active pumping centers within the Subbasin. This data gap does not affect the GSP's establishment of sustainable management criteria in Chapter 3, or the effectiveness of projects and management actions described in Chapter 4.

In other words, if the flow across the Coyote Creek Fault into the Subbasin is substantial, it would have a positive rather than a negative effect on meeting the GSA's sustainability criteria. Data gaps and uncertainties do not make a water budget "inadequate" especially when they are clearly identified; instead, uncertainty is an expected part of the development of a water budget. As described in the GSP Section 3.5.4, the GSA will continue to assess and improve the monitoring network, and will re-evaluate the BVHM to improve the accuracy of key water budget components and model forecasts.

S1-3 The rationale for the southern and southeastern boundary of the Subbasin, marked by San Felipe Creek, is provided in Draft GSP Section 2.2.1.2, including a description of how the geologic structure associated with the San Felipe Fault (San Felipe Anticline) affects the geometry of the Subbasin. It is unclear why the commenter asserts that the San Felipe Fault may be directing subsurface flow to the Borrego Sink, as this is not indicated in the geologic map (GSP Figure 2.2-8), the groundwater level contours (GSP Figure 2.2-13A), or the HCM for the Subbasin (GSP Section 2.2.1). In addition, there are no potential GDEs along San Felipe Creek within the Subbasin, as described in GSP Section 2.2.2.7 and Appendix D4. Furthermore, the location of the Desert pupfish habitat is in the lower-most Imperial County reach of San Felipe Creek, near the Salton Sea, downstream of the confluence of Fish Creek with San Felipe Creek. This habitat is not within the Plan Area, but is more than 18 miles southeast of the closest part of the Borrego Springs Subbasin boundary.[2] The Desert pupfish habitat is located in the southern part of the Ocotillo-Clark Valley Groundwater Basin. There is no native Desert pupfish habitat located within the Plan Area. Several captive populations of Desert pupfish occur within the plan area, namely at Anza-Borrego State Park, Borrego Springs High School, and the UCR Palm Desert campus.[3] These artificial habitats are unaffected by groundwater conditions in the Plan Area.

Neither the existing conditions of the Plan Area, the sustainability criteria, nor the projects and management actions contemplated in this GSP would have the ability to impact (either positively or negatively) the desert pup fish habitat referenced by CDFW as "San Felipe Creek GDE." As there are no GDEs within the Plan Area along San Felipe Creek, and the designated critical habitat for the Desert pupfish is more than 18 miles away and not affected by the GSP, no data gap is identified for the San Felipe Fault.

S1-4 It is unclear why CDFW claims that inclusion of a longer period of record into datasets used in the BVHM results in biased outputs. The BVHM prepared by the USGS and updated by the GSA is based on basin conditions (like pumping) that change over time, so model outputs averaged over any particular period, such as the last 10 years, will naturally differ from the outputs from prior periods. The increased pumping in the recent past is incorporated into the BVHM and water budget (GSP Section 2.2.3), as is climate change considerations (GSP Section 3.3.1.1). Historical data on precipitation and evapotranspiration is used to the extent it is available. The U.S. Geological Survey uses the Basin Characterization Model (BCM), as described in GSP Section 2.2.3.1.

The projected water budget is based on the baseline pumping allocation and the planned pumping reduction program described in GSP Section 4.4, and the effects of the project pumping reductions on applicable sustainability indicators is described in GSP Chapter 3 (see Section 3.3.1.1). The level of pumping will be controlled by incrementally decreasing allocations to the target rate, not by climate change. In addition, the GSP recognizes that the long-term average for natural recharge may not be reproduced in the future, especially over shorter time intervals, as evaluated through a Monte Carlo Simulation (MCS) uncertainty analysis, described in GSP Section 3.3.1.1. This analysis found that the uncertainty

2 https://databasin.org/datasets/1aaf058b573a412bb0a43b47ecb107bd

3 https://www.wildlife.ca.gov/Regions/6/Desert-Fishes/Desert-Pupfish

associated with precipitation and recharge variability is much greater than that associated with climate change.

As a point of clarification, both the original USGS model and the model update start in the year 1929. However, the period from 1929 through 1944 is considered to be a "spin-up" period for the model, and the data for these years is considered less reliable. In all calculations made by the USGS in their original report and by the GSA in the model update, data from 1929 through 1944 is excluded.

S1-5 The sustainable yield of 5,700 AFY presented in the Draft GSP is based the USGS' pre-development scenario that estimated natural inflows to the boundaries of the Borrego Valley Hydrologic Model (BVHM) for the period 1945 through 2010 (USGS 2015), recognizing the adaptive management approach of SGMA and iterative process of updating the sustainable yield estimate at each 5-year check-in period during GSP implementation. Additionally, the USGS referenced approximately 1,400 AFY that enters the basin as underflow from adjacent basins but did not clarify the outflow components used in the pre-development scenario. Since calculations of sustainable yield must include both inflow and outflow components, a water budget from the GSP modeling update is presented to confirm the validity of using 5,700 AFY as the initial sustainable yield.

The USGS water budget using the BVHM for the developed condition for the years 1945 through 2010 and updated by Dudek for the years 2011 through 2016 indicate that average total inflows that includes groundwater subsurface inflow (specified flows), stream leakage, unsaturated zone recharge (UZF recharge) is 6,900 AFY for the period 1945 to 2010 and 6,800 AFY for the period 1945 to 2016. The 20-year and 10-year averages for the most recent periods are 5,800 AF and 4,700 AFY, respectively. These recent periods were comprised mostly of a drier climatic period compared to the longer scenarios beginning in 1945 that included both wet and dry periods. Historical inflows from 1945 to 2016 were compared to recent (past 10 years) groundwater outflows from the BHVM model update to estimate the initial sustainable yield of the basin. Average inflows from the entire run of the model update provide a reasonable estimate of potential basin inflows because they capture a variety of climatic conditions. Outflows from the most recent 10 years were considered to be more representative of potential basin outflows than the entire historical model period because the loss of native phreatophytes has decreased outflow from evapotranspiration in the basin. Using these assumptions, the surplus of inflows over outflows in the basin is estimated to be approximately 5,750 AFY.

S1-6 See response to Comment S1-3 regarding the commenter's reference to the potential GDEs along San Felipe Creek and the federally endangered desert pupfish. Regardless of the presence and/or magnitude of (1) the flux into the Borrego Springs Subbasin from the Ocotillo-Clark Valley Groundwater Basin across the Coyote Creek Fault or (2) the flux out of the Subbasin across its southern boundary (formed by San Felipe Creek), there would be no appreciable effects on DWR's priority status for adjacent basins due to conditions occurring in the Borrego Valley Subbasin. Furthermore, the minimum thresholds—as well as projects and management actions to avoid those thresholds—to be implemented under the GSP means that indirect effects on the adjacent basins, if any, would be positive in nature when compared to continuation of the status quo. In GSP Section 3.3, the GSA addresses impacts to adjacent basins as a subsection under the description of the minimum thresholds for each sustainability indicator.

S1-7 The response to this comment has been addressed under responses to Comment S1-3 and Comment S1-6.

S1-8 The sentence cited by the commenter (GSP Section 3.5.4.2, p. 3-45) accurately states that the average potentiometric surface (i.e., the theoretical groundwater level for each aquifer, if it was screened in isolation) across all three aquifers sufficiently represents groundwater conditions. The definition of aquifers in the BVHM is based on a textural model, which evaluates differences in grain size composition from a complete dataset of well completion reports (i.e., boring logs) within the Subbasin. The recommendation provided in the Draft GSP (e.g., GSP Section 3.5.4.2 and Appendix D1) to develop specific aquifer parameters for each of the three layers would help improve the academic understanding of the aquifer, but is not required to develop "representative information about groundwater conditions" (Title 23 CCR Section 354.34[a]).

There are no regionally significant confining layers (i.e., aquitards) present within the Subbasin. The lack of any confining layers means the potentiometric across the three aquifers are not sufficiently different to meaningfully affect the groundwater levels observed regardless of the screened interval of a well. Monitoring Well MW-5A/B is a multicompletion well near the Borrego Sink which has two well casings, one screened in the upper aquifer and one screened in the lower aquifer. The difference in the groundwater levels between the two was 0.03 feet as of Fall 2018 (GSP Figure 2.2-13B). Although it is the only dual-completion monitoring well in the Subbasin, groundwater monitoring data elsewhere validates this because monitoring wells, even where within short distances of each other, report similar groundwater levels despites having different screened intervals.

S1-9 This comment has been addressed in response to Comment S1-2.

S1-10 This comment has been addressed in response to Comment S1-3.

S1-11 The only springs identified within the Subbasin, as shown in GSP Figure 2.2-17, are Borrego Spring and Pup Fish Pond Spring. Borrego Spring dried up sometime before 1963, as stated on Draft GSP p. 2-86, and the artificial Pup Fish Pond (in addition to the pupfish pond near the Palm Canyon Trailhead in Borrego Palm Canyon Campground) is sustained by ABDSP's public water system, and not a spring. As discussed in Draft GSP Section 2.2.2.6, the water source for springs outside the Subbasin as well as perennial waters that may flow for a short length into the margins of the basin is runoff from the watershed, and/or springs or seeps originating from the fractured rock aquifer that make up the mountain front. These surface water sources are topographically higher than the groundwater elevation of the underlying basin, in many cases hundreds of feet higher. For reference, the GSP's elevation contours and labels have been added to the GSP's groundwater contour maps to further illustrate this. Neither the hydrogeological conceptual model (HCM) developed for the basin (GSP Section 2.2.1) nor the HCM developed to evaluate GDEs (GSP Appendix D4) support the idea that there would be a hydrologic connection between springs originating from bedrock outside the Subbasin, and the Quaternary age sediments that make up the Borrego Springs Subbasin.

S1-12 As described in GSP Section 2.2.3.1 and Appendix D1 (BVHM Update), flows from streams into the model domain are estimated using the modeled streamflow from the U.S. Geological Survey Basin Characterization Model (BCM), which is calibrated using the USGS streamgages for the periods when data are available from the streamgages within the Subbasin or its contributing watersheds. There are two historical streamgages along Coyote Creek, and one active streamgage on Borrego Palm Creek. Therefore, all available data from streamgages are incorporated into the BVHM. The GSA will continue to use the BCM in future model updates, and incorporate new streamflow records that may become available within the watershed, in accordance with adaptive management needs and as necessary to meet the GSP's sustainability goal.

Agricultural return flow is not an input to the BVHM and cannot be adjusted directly, but rather is calculated based on the estimated consumptive use in the model that is calculated using land use/crop type, farm efficiency factors, and climate data. Land use in the model future projections was left the same as land use in 2016 as determined during the BVHM update. The justification for this is presented in Draft GSP Section 2.1.3, which explains why the GSA expects little to no growth to occur in the Plan Area. Farm efficiency factors were estimated by the USGS based on the best available information, and will be adjusted in the future if and when data becomes available to support changes. Climate data was adjusted for future projections based on the DWR guidance. It should be noted that since applied water and return flows are calculated by the model using these consumptive use calculations, irrigation return flows decrease through time in the future model scenarios as applied water decreases.

S1-13 The level of study presented in the Draft GSP is appropriately at the Subbasin-wide scale, and thus with regard to stream gages, use of the BCM, as described in response to Comment S1-12, is appropriate and represents the best available data. With regard to agricultural pumping, the commenter is referred to Draft GSP Section 4.4, which describes the pumping reduction program. To implement this program, the GSA will require metering of production wells to allow direct measurements of pumping volumes by agricultural users. The quantification of agricultural pumping will be significantly improved upon implementation of the Metering Plan, included as Appendix E3 of the Draft GSP. With regard to past and current agricultural pumping, the indirect method of estimating irrigation needs used by the U.S Geological Survey and the GSA (i.e., the Farm Process Package) is the most appropriate method available. The GSA will incorporate the recommendations in Appendix D1 during the GSP's planning and implementation horizon, in accordance with adaptive management needs and as necessary to meet the GSP's sustainability goal.

S1-14 The commenter is referred to Sections 4 and 5 of Draft GSP Appendix D1 for a comparison of the USGS's BVHM from 1945 to 2010 and the GSA's BVHM Update to include the period from January 2011 to September 2016.

S1-15 The commenter provides conclusory remarks, and summarizes the comments provided in the letter. These issues have been responded to above under responses to Comment S1-2 through Comment S1-14.

INTENTIONALLY LEFT BLAN

Comment Letter S2

State of California • Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION
COLORADO DESERT DISTRICT
200 PALM CANYON DRIVE
BORREGO SPRINGS, CA 92004
760-767-4037

Gavin Newsom, Governor
Lisa Ann L. Mangat, Director

May 21, 2019

County of San Diego Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

RE Draft Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin

E-mail: PDS.LUEGGroundWater@sdcounty.ca.gov

Thank you for the opportunity to comment on the Draft Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin ("GSP") Anza-Borrego Desert State Park® ("ABDSP") is approximately 1,000 square miles and surrounds the approximate 98 square mile Borrego Springs Subbasin ("Subbasin") Since March 2017, a representative from the California Department of Parks and Recreation ("State Parks") has voluntarily been a member of the Borrego Springs Subbasin Advisory Committee State Parks takes the opportunity to participate in the committee seriously because ABDSP surrounds the community of Borrego Springs (GSP Figure 2 1-3) and supplies the majority of the natural groundwater recharge to the Subbasin (GSP Figure 2 2-1) Additionally, ABDSP is a Borrego Water District ratepayer, and ABDSP operates a public water system permitted since 2004 by the State Water Resources Control Board, Division of Drinking Water. S2-1

State Parks believes that the reduction requirements should be adjusted under the Pumping Reduction Program (GSP 4.4 1) using considerations other than a 74% reduction for each non-*de minimis* pumper [1] This approach does not take advantage of the flexibility the Sustainable Groundwater Management Act ("SGMA") provides the local agencies (Water Code § 10725 (b)) The draft GSP gives a great history and description of the Plan Area (GSP, Chapter 2), but does not apply that history to its Pumping Reduction Program S2-2

This letter recommends the Groundwater Sustainability Agency ("GSA") adjust the current shares of the estimated sustainable yield by considering proportion of land ownership, historic beneficial use, and feasibility of further reduction of water use State Parks is not suggesting that the GSA use any one of these considerations as the sole

[1] The term "*de minimis*" is used in this letter in reference to the GSP's use of the term. (See, e g , GSP 4 2 1 and 4 4 1)

Jim Bennett
May 21, 2019
Page 2 of 7

consideration, but that it apply a more nuanced approach using these considerations collectively In this way, the GSA should be able to take advantage of the flexibility SGMA intended to provide the local agency S2-2 Cont.

<u>Proportion of Land Ownership</u>

The draft GSP does not take into account the proportion of land each non-*de minimis* pumper services in the Subbasin Instead, it focuses only on prior use over a five year period (GSP 3 3 2 1) According to the draft GSP, ABDSP covers 27% of the land subject to the GSP (GSP Table 2 1-2.) The draft GSP also identifies that Anza-Borrego Foundation owns an additional 5% that will be transferred to ABDSP (GSP Table 2 1-2.) In other words, State Parks has, or will have, the responsibility of stewardship over 32% of the land that is subject to this GSP, but its water use consists of less than .07% of the total baseline pumping allocation [2] Yet under the draft GSP, it is still responsible for reducing its water use by 74% S2-3

Whereas State Parks is responsible for a large portion of the land and minimal water use, the agriculture sector's responsibility and use is the opposite According to the draft GSP, the agriculture sector comprises 4.2% of the Subbasin's surface area of 62,776 acres and uses 70% of the pumped water. (GSP Table 2 1-1; GSP 2.1.1, and GSP 3.1 4) Because recent usage data is the only method the GSA used to determine shares of the estimated sustainable yield, the agriculture sector is also being allocated around 71.7% of the total baseline pumping allocation. (GSP Table 2 1-7, and GSP Table 3-6)

The draft GSP states that two pumping-related depressions have been found to exist in the Subbasin, one in agricultural areas, and one north of Ram's Hill Country Club (GSP 2.2 2 1) The draft GSP also states that since the late 1970's when citrus cultivation gained presence in the valley, the groundwater levels have been dropping "at a relatively constant rate " (GSP 2.2.2 1) By considering only past recent use for determining allocations and reduction responsibilities, the Pumping Reduction Plan does not address the existing spatial patterns of groundwater extraction (See Green Nylen, Nell, Michael Kiparsky, Kelly Archer, Kurt Schnier, and Holly Doremus 2017 *Trading Sustainably· Critical Considerations for local Groundwater Markets Under the Sustainable Groundwater Management Act* ("Trading Sustainably"), p 28. Center for Law, Energy & the Environment, UC Berkeley School of Law, Berkeley, C. 90 pp law berkeley edu/trading-sustainably) S2-4

State Parks' responsibility of keeping ABDSP open to the public inextricably includes housing employees to provide safety and resource access, and providing water to the public for day use and overnight use so that the public can continue to enjoy this S2-5

[2] Calculated by the GSA's determination of State Parks' baseline pumping allocation of 15 acre feet per year, out of the total 21,938 acre feet. (See GSP Table 3-6, But see GSP 3.1 4 ("a total pumping allowance of 21,936 acre-feet per year . . . .", and GSP Table 2.1-7 ("Baseline Pumping Allocation" column does not add up to 21,938 or 21,936))

Jim Bennett
May 21, 2019
Page 3 of 7

tremendous resource The amount of water State Parks pumps from the groundwater basin is already incredibly minimal, especially given the amount of land that small amount of water supplies By failing to give any consideration to the amount of land sustained by each pumper's use, the GSP assigns a significant burden to ABDSP that may be impossible without shutting down the park or portions thereof, with diminishing returns for the Subbasin's primary goal of sustainability The 74% reduction is an ineffective method of obtaining sustainability, particularly where the current use is known to be concentrated in agricultural areas and the agriculture sector will be maintaining its 70% of the water use

SGMA does not prohibit the GSA from taking proportion of land ownership into account. Ownership is a concrete metric that State Parks believes could be used in conjunction with other considerations such as past use and purpose of use (Green Nylen, et al *Trading Sustainably*, p 14) State Parks recommends making some adjustment to the current shares of the estimated sustainable yield according to proportionate land ownership

S2-5 Cont.

Historic Beneficial Use

1 *Public Water System and Human Right to Water*

The GSP also does not consider the type of use in establishing the current shares of the estimated sustainable yield California law establishes the use of water for domestic purposes as the highest use of water (Water Code § 106) "Domestic purpose" includes uses such as "auto camps or resorts" (*Prather v Hoberg* (1944) 24 Cal 2d 549)

There are multiple historic and current purposes for State Parks' water use at ABDSP, including domestic use The Anza Borrego State Park Palm Canyon public water system conveys water to the Borrego Palm Canyon area of ABDSP Currently, the system supplies water for 10 employee residences, 6 employee trailer pads, the Borrego Palm Canyon Campground, and the ABDSP maintenance shop Of the 117 campsites, there are 52 RV sites with both potable water and sanitary sewer hookups and 65 tent sites without hookups There are also 9 group campsites Both the tent and group sites have dispersed potable water, flush toilets, and showers

In 2012, the State of California added section 106 3 to the California Water Code that is known as the human right to water: "It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes"

Because it supplies water to residents and visitors, the ABDSP Palm Canyon public water system is subject to the human right to water, which is not accounted for in the

S2-6

Jim Bennett
May 21, 2019
Page 4 of 7

draft GSP Applying the GSA's draft Policy for Human Right to Water ("Draft Policy"),[3] State Parks should be allocated more than double the water it is currently being allocated (https //www sandiegocounty gov/content/dam/sdc/pds/SGMA/Human-Right-To-Water-Presentation pdf) During the March 29, 2018 Advisory Committee meeting, a formula was provided to calculate the Human Right to Water for Borrego Water District by using the annual average sewage flows to the Ram's Hill Wastewater Treatment Facility To show the difference between what the draft GSP allocated and what State Parks could be allocated if the GSA had applied the human right to water policy to domestic users that are not within the Borrego Water District, here is an example calculation·

> Under the Draft Policy, the annual sewage generation is 126 gallons per day per equivalent dwelling unit ("EDU") Using ABDSP's 52 RV sites, 10 employee residences, and 6 employee trailer pads, we have 68 EDU's in Borrego Palm Canyon Campground that are eligible for the human right to water Multiplying 68 existing EDU by the annual sewage generation per EDU (126 gallons per day) results in a Borrego Palm Canyon right to water of 9 6 acre feet per year

S2-6 Cont.

(See https //www sandiegocounty gov/content/dam/sdc/pds/SGMA/Human-Right-To-Water-Presentation-Notes pdf)

Per the GSP, the baseline pumping allocation for the Palm Canyon system is 15 acre feet per year This allocation was determined from metered data. Page 4-21 of the GSP requires a 74% reduction in each non-*de minimis* pumper's baseline allocation over 20 years This reduction results in an allocation of 4 acre feet for ABDSP Palm Canyon public water system However, using the human right to water calculation for employee residences and RV sites, State Parks could require up to 9 6 acre feet per year for the RV's and employee residences alone State Parks recommends adjusting the current shares of the estimated sustainable yield to provide for the statutory human right to water

2 *Other Critical Beneficial Uses at Anza-Borrego Desert State Park*

Borrego Palm Canyon is a critical area that annually averages approximately 30,000 visitors for daily hikes and approximately 120,000 visitors for overnight camping. As S2-7

[3] The draft GSP does not discuss whether the Draft Policy will be implemented. In the minutes for the August 30, 2018 Subbasin's Advisory Committee Public Meeting, the Core Team was still considering the Human Right to Water allocation to Borrego Water District. (https //www.sandiegocounty gov/content/dam/sdc/pds/SGMA/AC-MINUTES-Aug-18-vFinal.pdf) However, it is unclear whether any further decision was documented regarding the Draft Policy, as the hyperlink for the January 31, 2019 meeting minutes directs website visitors to the August 30, 2018 meeting minutes (https //www.sandiegocounty gov/content/sdc/pds/SGMA/borrego-valley html (Last visited May 20, 2019))

Jim Bennett
May 21, 2019
Page 5 of 7

noted on page 2-6 of the GSP, the estimated revenue to the region generated by visitation to ABDSP is approximately $40 million annually

ABDSP also provides critical environmental habitat for endangered species In addition to supplying water subject to the human right to water statute, ABDSP's public water system supplies water to a lined pond that is a refuge for the federally and state endangered Desert Pupfish and is also a water source for the federally and state endangered Peninsular Bighorn Sheep The pond is a refuge listed under the September 1993 Desert Pupfish Recovery Plan The Peninsular Bighorn Sheep have increasingly used the pond, which is adjacent to the Borrego Palm Canyon trailhead parking lot, as a water source (Colby, Janene, and Randy Botta, California Department of Fish and Wildlife Peninsular Bighorn Sheep Annual Report 2017-18, p 22) State Parks is obligated to provide this habitat for both species. S2-7 Cont.

State Parks recommends adjusting the current shares of the estimated sustainable yield according to respective beneficial uses

Consideration of Prior Conservation Efforts

State Parks, in fulfilling its obligations as a state entity, already contributes to the reduction of water use in the Subbasin. As stated in State Parks' previous comment letter sent to the GSA on August 15, 2018, water use at ABDSP has already been subject to Executive Order (B-18-12) requiring a 20% reduction of water usage in state facilities by 2020 Therefore, State Parks has already implemented water conservation methods, the benefits of which are reflected in the metered data used for the ABDSP baseline pumping

Throughout the last decade, ABDSP has equipped its campground with low flow pay showers thereby reducing the amount of water used by each ABDSP visitor ABDSP has also removed most landscaping, antiquated irrigation systems, replaced corroded galvanized water distribution lines with PVC pipe, and replaced non-operating shut off valves As funding allows, low flow bathroom fixtures have been installed S2-8

The GSP indicates that the Borrego Water District, some golf courses, and agricultural users have implemented conservation methods (GSP 3 1 4) In establishing its baseline pumping allocations, the GSP states that it includes "allocations for water credits issued in conjunction with the County/[Borrego Water District] program for sites fallowed prior to adoption of the GSP, municipal water use previously reduced through end use efficiency and conservation efforts, and recreation use curtailed prior to GSP

Jim Bennett
May 21, 2019
Page 6 of 7

adoption." (GSP 3 3.1 4)[4] The GSP does not state that it included allocations for State Parks' state-mandated conservation efforts [5]

State Parks intends to make every effort to continue to implement any water conservation measures as appropriations allow However, State Parks recommends making some adjustment to the current shares of the estimated sustainable yield according to conservation methods implemented due to state mandate, since those conservation methods were not considered in determining State Parks' baseline pumping allocation Because it already has considered other conservation measures, it should also consider State Parks' conservation measures

S2-8 Cont.

Consequences of 74% Reduction at ABDSP

ABDSP strives to balance the visitor experience while conserving our precious natural resources and being stewards of the land A potential reduction to 4 acre feet per year at Borrego Palm Canyon in conjunction with the water conservation measures already in place would require ABDSP to close campground operations and would not meet the statutory human right to water for the Palm Canyon public water system

State Parks would be required to limit the occupation of employee residences and thus limit the operation of the ABDSP Visitor Center, limit an important educational experience for the school children of Borrego Springs, and limit the number of State Parks employees staffed to protect the park resources and visitors ABDSP would not be able to provide the high quality recreational experience that it has provided over the last several decades Therefore, State Parks recommends that the GSA apply a more nuanced approach than this 74% reduction plan by applying other considerations, such as those mentioned in this letter.

S2-9

General GSP Comments

State Parks supports the immediate implementation upon GSP approval of the mandatory metering program as detailed in Appendix E of the GSP. S2-10

There are data gaps in the water quality monitoring particularly in the North Management Area. Wells now in the process of being secured for water quality monitoring will not yield usable initial data for years The GSP should explicitly specify mandatory water quality monitoring of any major wells in the Subbasin As water quality

S2-11

[4] The GSP also states that water credits "are currently not included in the Baseline Pumping Allocation but may be converted to Baseline Pumping Allocation during GSP implementation " (GSP 3 3 1 4, FN 8)

[5] In its January 18, 2019 letter to the ABDSP, the County of San Diego described how it calculated baseline pumping allocations and gave State Parks until February 8, 2019 to comment before the GSA finalized the baseline pumping allocations on March 1, 2019 State Parks' allocation is based solely on metered use However, the letter did not indicate that in establishing the users' respective baseline pumping allocations it was considering previous municipal conservation efforts Therefore, State Parks is commenting on this in response to the draft GSP, rather than in response to the January 18, 2019 letter

Jim Bennett
May 21, 2019
Page 7 of 7

degrades and additional treatment is required, the cost for ratepayers, including ABDSP, will increase. The GSP should identify Ratepayers as stakeholders in the development of a Water Trading Program because pumped water in Borrego Springs is a matter of public concern about a public resource S2-11

While the Water Trading Program is referred to as an economic incentive that will lead to more water conservation (GSP 4.1), the Water Trading Program is not necessarily the key to water reduction. S2-12

Any consideration of the fallowing of agricultural land must include the removal of invasive weed species. There are two highly invasive weed species that threaten native habitats, wildflowers, and native species in ABDSP: Egyptian knapweed (*Volutana tubuliflora*) and Sahara mustard (*Brassica tournefortii*) Currently, there are fallowed agricultural fields that host these species State Parks devotes staff time and resources to remove and control these species in the Coyote Canyon area of ABDSP which borders the North Management Area. S2-13

State Parks recognizes the complexity of the GSA's task and appreciates the extensive work that the GSA has completed thus far. However, without further consideration of the historic and beneficial uses, proportion of land ownership, and pumpers' feasibility of reducing use (i.e. conservation methods accounted for in the historical data), the GSA is not taking advantage of the maximum degree of flexibility SGMA has provided it in order to achieve SGMA's goal of preserving water rights to the greatest extent possible while achieving sustainability. State Parks looks forward to continuing to work with you on this challenging and significant plan. S2-14

Sincerely,

Gina Moran

Gina Moran
District Superintendent
Colorado Desert District

INTENTIONALLY LEFT BLANK

Letter S2

Commenter: Gina Moran, District Superintendent, Colorado Desert District, California Department of Parks and Recreation (State Parks)
Date: May 21, 2019

S2-1 This comment provides introductory information about Anza-Borrego Desert State Park (ABDSP), its role in the Borrego Springs Subbasin Advisory Committee, as the major steward of watershed lands contributing to Subbasin, and its interest in protecting its permitted public water system.

S2-2 The Groundwater Sustainability Agency (GSA) has carefully developed the baseline pumping allocation (BPA) in coordination with members of the Advisory Committee and in concert with numerous public workshop and outreach efforts. Please see Advisory Committee meeting minutes from September 28, 2017, November 17, 2017, and January 25, 2018. They can be found on the County's SGMA website at:
https//www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html

The GSA acknowledges the commenter's request for flexibility in determining reductions other than proportional reductions. While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action (PMA) No. 3 – Pumping Reduction Program. As indicated in the Draft GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The Draft GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions may be developed. On July 9, 2019, the Borrego Water District (BWD) held a public meeting in which proposed stipulated agreement terms were made public.

For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

S2-3 See response to Comment S2-2 as well as the master response on the BPA.

S2-4 The commenter's assessment is accurate, but the goal of the Pumping Reduction Program is to meet the sustainable management criteria established in Chapter 3 of the Draft GSP. The GSP seeks to correct groundwater conditions on a Subbasin-wide scale, and does not establish a sustainability goal specific to the two pumping depressions cited in Chapter 2 (Section 2.2.2.1). However, the PMAs discussed in

Chapter 4, including the Pumping Reduction Program, the Voluntary Fallowing of Agricultural Land, and Intrabasin Water Transfers, are all actions that will be beneficial with regard to existing pumping depressions.

S2-5 See response to Comment S2-2 as well as the master response on the BPA.

S2-6 The BPA is based on metered data for ABDSP and this is an accurate accounting of the water use, and it spans the periods of high use and occupancy for the Borrego Palm Canyon Campground. Flexibility is built into the BPA because it uses the highest water recorded over a 5-year period. ABDSP's yearly water use has fluctuated between 4 and 15 AFY between 2010 and 2015. The commenter is also referred to the master response on the BPA.

S2-7 The GSA understands the importance of maintaining water for the lined pond, which acts as an artificial habitat for the Desert Pupfish, and as a drinking water source for the Peninsular Bighorn Sheep. A rough estimate for the amount of water needed to keep these ponds filled can be made by multiplying the ponds' combined areas by the average evapotranspiration rate as measured at the Subbasin's CIMIS station (No. 207). According to measurements from satellite imagery, the combined size of the two pupfish ponds is 800 square feet (approximately 400 square feet each), and pond evaporation is estimated to about 5.75 feet per year based on pan evaporation data from Imperial Valley (U.S. Department of Interior 2004). Therefore, the water needed to keep the ponds full can be expected to be about 4,600 cubic feet/year, or 0.11 AFY. This constitutes less than 1% of ABDSP's current BPA, and does not account for precipitation. The commenter is referred to the master response on the BPA.

S2-8 The commenter is referred to the master response on the Baseline Pumping Allocation. Water credits under the existing Demand Offset Mitigation Water Credits Policy, described in Draft GSP Section 2.1.2, were historically issued for physical removal of water using crops, namely agriculture, and in one case replacement of turf with native landscape. Water credits were only issued for entities who applied for and were issued credits under the program, and only for water reductions that were verifiable and permanent. It would not be appropriate for the GSA to assign water credits for temporary water curtailments (e.g., Executive Order [B-18-12] and unverifiable or temporary conservation efforts). The sentence quoted by the commenter in the Draft GSP has been modified accordingly.

S2-9 The commenter is referred to the master response on the BPA. The Water Trading Program can provide the ABDSP with flexibility to continue serving the demands of its employees, visitor uses, and operations. Furthermore, because the BPA is based on the highest metered use between 2010 and 2015, there is some flexibility built into the initial BPA. The metered use at ABDSP has gone as low as 4 AFY in the last 5 years.

S2-10 Comment noted.

S2-11 The Draft GSP states,

> Degraded water quality is significant and unreasonable if the magnitude of degradation at pre-existing groundwater wells precludes the use of groundwater for existing beneficial use(s), including through migration of contaminant plumes that impair water supplies, where alternative means of treating or otherwise obtaining sufficient alternative groundwater resources are not technically or financially feasible. At a minimum, for municipal and domestic wells, water quality must meet potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. The Basin Plan has not established numerical objectives for groundwater quality in the Plan Area but recognizes that in most cases irrigation return flows return to the aquifer with an increase in mineral concentrations such as TDS and nitrate (Colorado River RWQCB 2017), as well as potentially toxic chemicals. The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater and irrigation/fertilizer use best management practices. (Draft GSP Section 3.2.5; page 3-13)

The Draft GSP indicates that the GSA continues to work with private landowners to expand the monitoring network. The GSA will continue to use the existing water quality monitoring network to assess Subbasin conditions, and further develop the groundwater quality network over the GSP's planning and implementation horizon, in accordance with adaptive management needs and as necessary to meet the GSP's sustainability goal.

S2-12 Comment noted.

S2-13 The GSA acknowledges your comment regarding the environmental concerns over fallowing of agricultural land. The Draft GSP includes Project and Management Action No. 4 – Voluntary Fallowing of Agricultural Land. As indicated in the Draft GSP, the GSA will prepare policy development and CEQA documentation after

GSP adoption in advance of considering formal adoption and implementation of a voluntary fallowing program.

S2-14 Comment noted.

RTC.3 ORGANIZATIONS

Comment Letter O1

Jackson Tidus
A LAW CORPORATION

April 26, 2019

Direct Dial 949 851 7409
Email mstaples@jacksontidus.law
Reply to Irvine Office
File No 7588-122439

VIA EMAIL

Jim Bennett, CHG	Geoff Poole
County of San Diego	General Manager
Planning and Development Services	Borrego Water District
25510 Overland Avenue, Suite 310	806 Palm Canyon Drive
San Diego, CA 92123	Borrego Springs, CA 92004
jim.bennett@sdcounty.ca.gov	geoff@borregowd.org

RE: AAWARE REQUEST FOR GROUNDWATER SUSTAINABILITY AGENCY APPROVAL OF METER SYSTEM

Dear Messrs. Bennett and Poole:

We represent the Agricultural Alliance for Water and Resource Education ("AAWARE"). AAWARE's members comprise the majority of the agricultural property owners in Borrego Valley. By this letter, we ask that the Borrego Valley Groundwater Sustainability Agency approve acceptable propeller meter systems so that the AAWARE members can make plans to install groundwater production meters, and not have to wait until Groundwater Sustainability Plan approval to do so.

Enclosed is information on the SWIIM well meter system that Mike Seley of AAWARE has discussed with Geoff Poole. Benefits of the SWIIM meter system include significant cost savings by: O1-1

- Eliminating the need for manual, monthly readings of groundwater production (the meter system provides real time data by cellular transmission, or if cellular is interrupted, by radio transmission), and
- Eliminating the need for semi-annual calibration verification and annual meter accuracy checks. Under the service agreement, each flow meter is regularly checked for accuracy. The maintenance schedule also includes technician visits to each site at least every four to six weeks. In addition to maintaining the telemetry and solar charging systems during these visits, technicians perform visual inspections of flow meters to ensure there are no erratic or unreasonable flow readings, blank LCDs, or damaged registers.

Irvine Office
2030 Main Street, 12th Floor
Irvine, California 92614
t 949 752 8585 f 949 752 0597

Westlake Village Office
2815 Townsgate Road, Suite 200
Westlake Village, California 91361
t 805 230 0023 f 805.230 0087

www.jacksontidus.law

Borrego Valley GSA
c/o Mr Jim Bennett & Mr Geoff Poole
April 26, 2019
Page 2

We are additionally awaiting information on the similar McCrometer meter system and service agreement. Enclosed is information from the McCrometer web site about their meters and reporting technology

Please let us know as soon as possible whether the SWIIM or McCrometer meters, along with their data collection and reporting systems, and their calibration systems, are approved as acceptable metering systems. Please also let us know whether there are any other meter systems acceptable to the GSA.

O1-1 Cont.

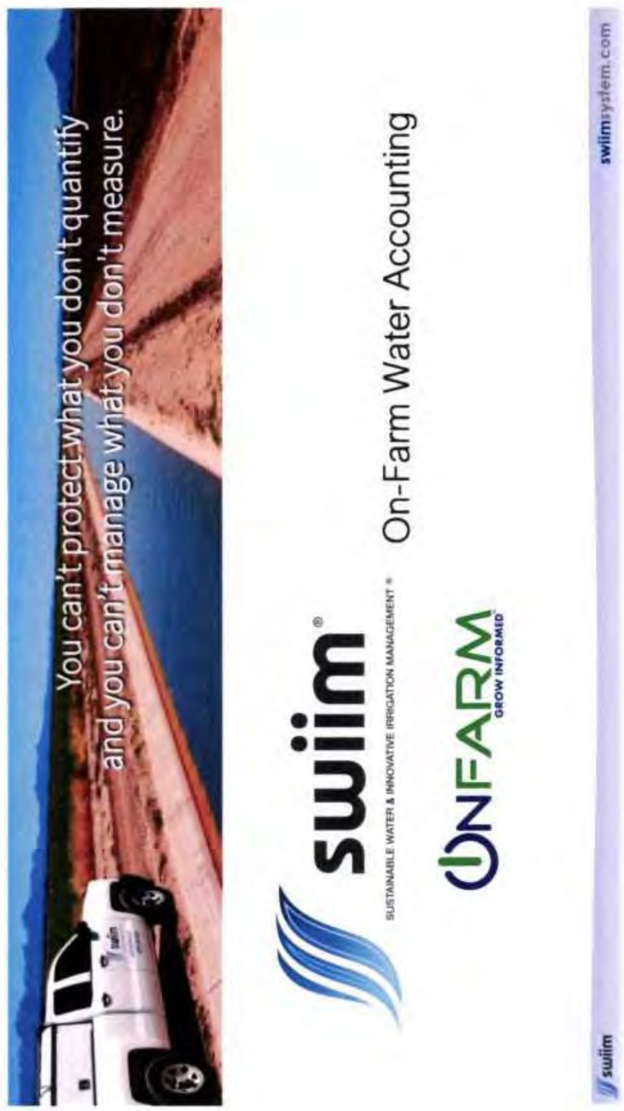
Sincerely,

Michele A Staples

Michele A Staples

Enclosures. SWIIM and McCrometer systems information

cc: Jim Seley, AAWARE*
Mike Seley, AAWARE*
Jack McGrory, AAWARE*
Boyd L. Hill, Esq, for AAWARE*
*by email only


You can't protect what you don't quantify
and you can't manage what you don't measure.
swiim®
SUSTAINABLE WATER & INNOVATIVE IRRIGATION MANAGEMENT®
On-Farm Water Accounting
ONFARM
GROW INFORMED
swiim
swiimsystem.com

1. Introduction
2. Case Studies
3. How SWIIM Works
4. Delivery & Water Balance Reports
5. Remote Sensing & Software
6. Questions & Discussion

swiim

swiimsystem.com


Introduction: SWIIM Overview
A full service, turn-key solution that produces a very accurate on-farm water budget. It provides cost-effective, field- or crop-level, actionable data. It includes a software suite that enables agricultural water users to plan, manage and optimize crop water use through the use of sensors, data loggers, telemetry and remote sensing via satellite.
OnFarm
Software Dashboard
Instrumentation
Full-service installation & maintenance
Remote Sensing
ET data with satellite images
Remote sensing via satellite and aircraft
swiim
swiimsystem.com

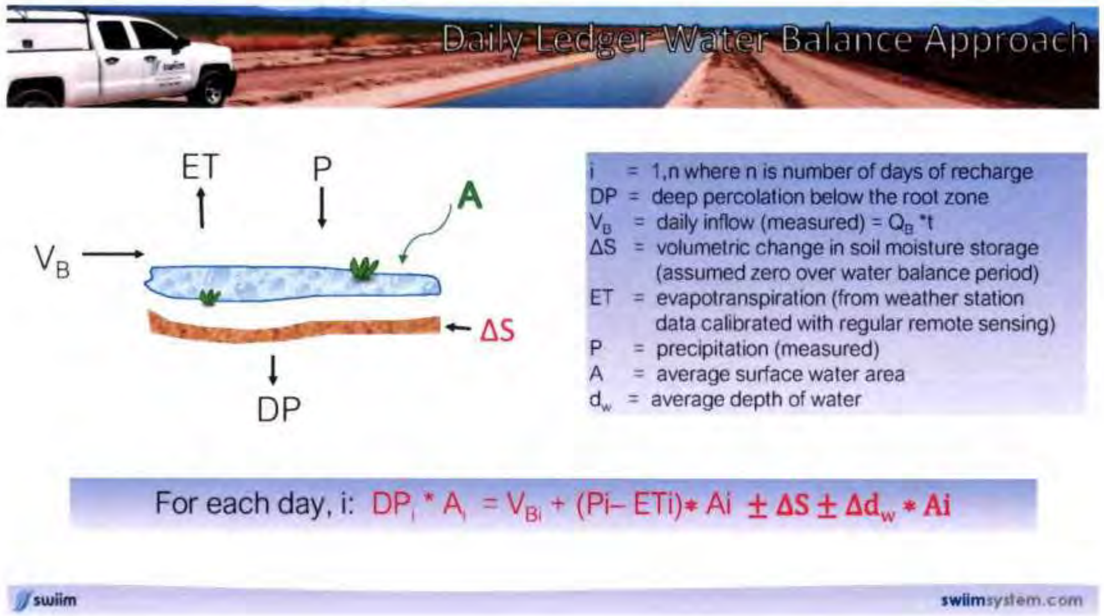
swiim®

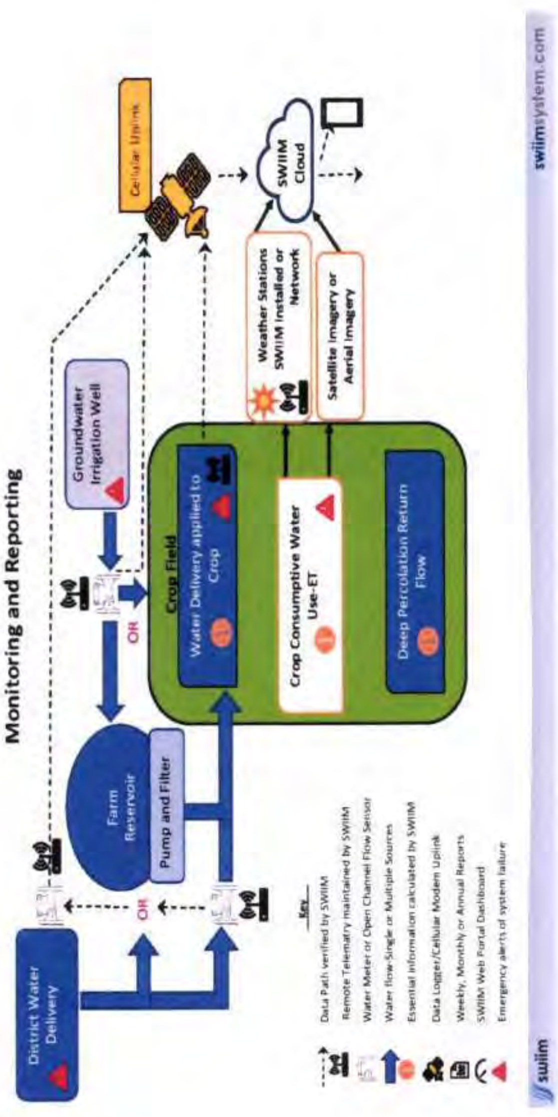
SUSTAINABLE WATER & INNOVATIVE IRRIGATION MANAGEMENT ®

How SWIIM Works

swiim

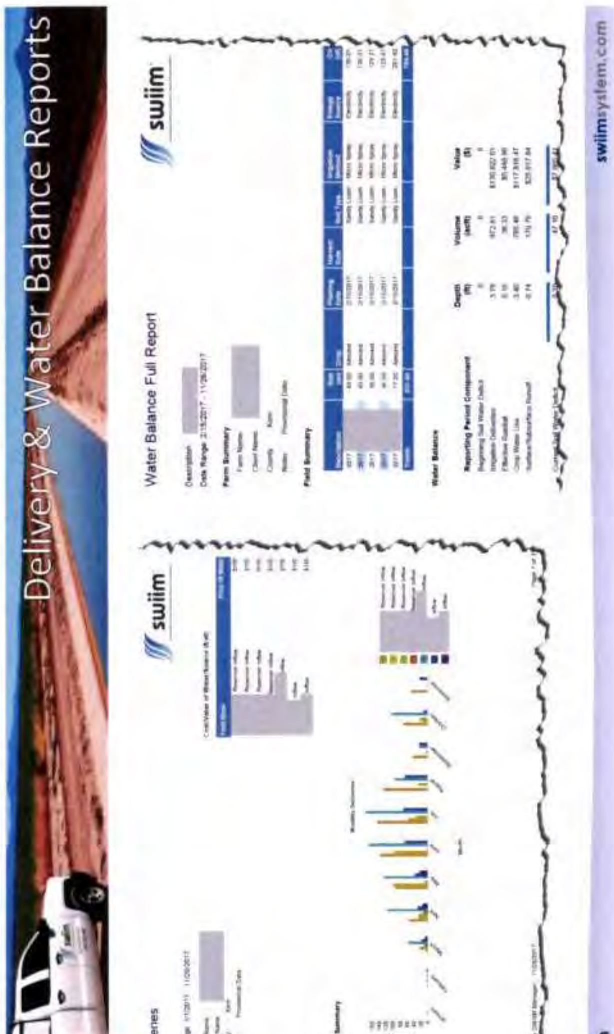
swiimsystem.com

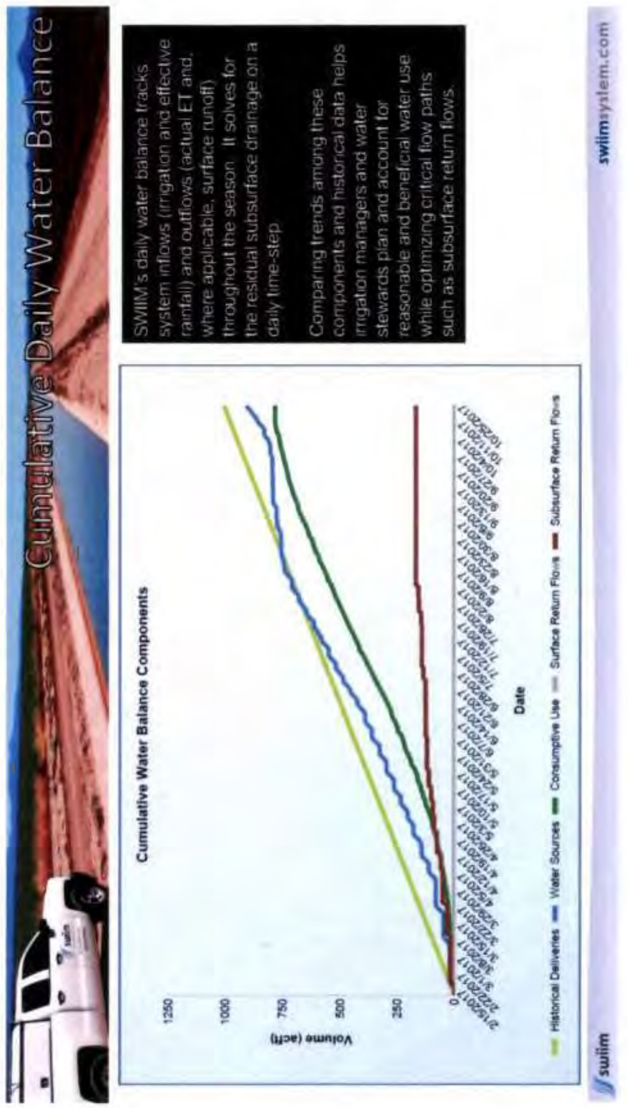

Daily Ledger Water Balance Approach
ET
P
A
V_B
ΔS
DP
i = 1,n where n is number of days of recharge
DP = deep percolation below the root zone
V_B = daily inflow (measured) = Q_B *t
ΔS = volumetric change in soil moisture storage (assumed zero over water balance period)
ET = evapotranspiration (from weather station data calibrated with regular remote sensing)
P = precipitation (measured)
A = average surface water area
d_w = average depth of water
For each day, i: $DP_i * A_i = V_{Bi} + (Pi - ETi) * Ai \pm \Delta S \pm \Delta d_w * Ai$
swiim
swiimsystem.com

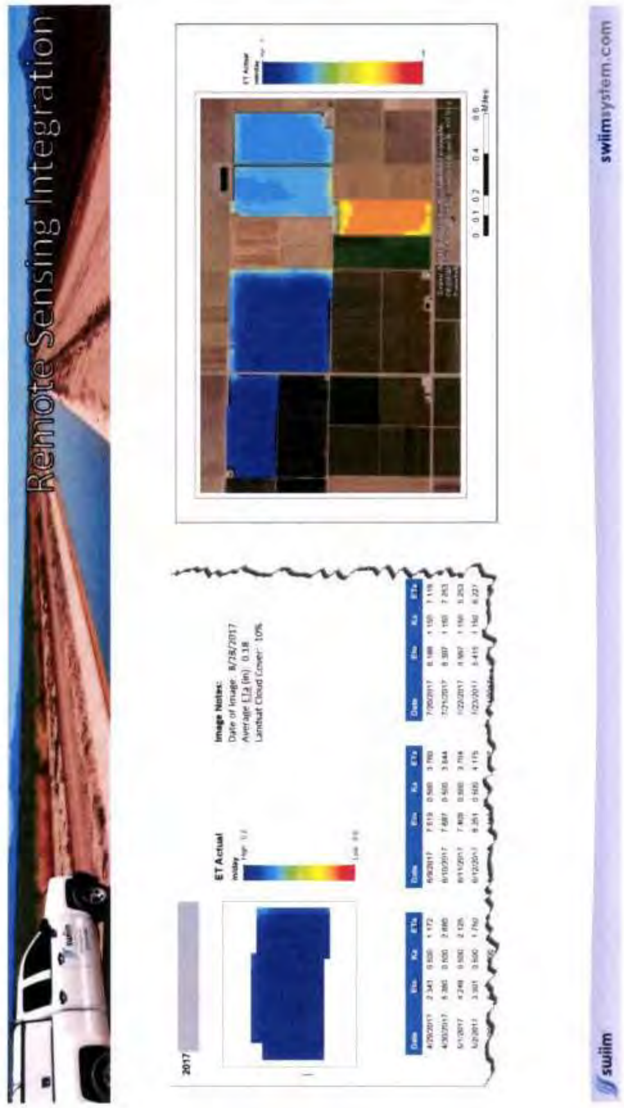

SWIIM SYSTEM
Monitoring and Reporting
District Water Delivery
OR
Farm Reservoir
Pump and Filter
OR
Groundwater Irrigation Well
Crop Field
Water Delivery applied to Crop
Crop Consumptive Water Use-ET
Deep Percolation Return Flow
Cellular Uplink
Weather Stations SWIIM Installed or Network
Satellite Imagery or Aerial Imagery
SWIIM Cloud
Key
Data Path verified by SWIIM
Remote Telemetry maintained by SWIIM
Water Meter or Open Channel Flow Sensor
Water flow-Single or Multiple Sources
Essential information calculated by SWIIM
Data Logger/Cellular Modem Uplink
Weekly, Monthly or Annual Reports
SWIIM Web Portal Dashboard
Emergency alerts of system failure
swiim
swiimsystem.com

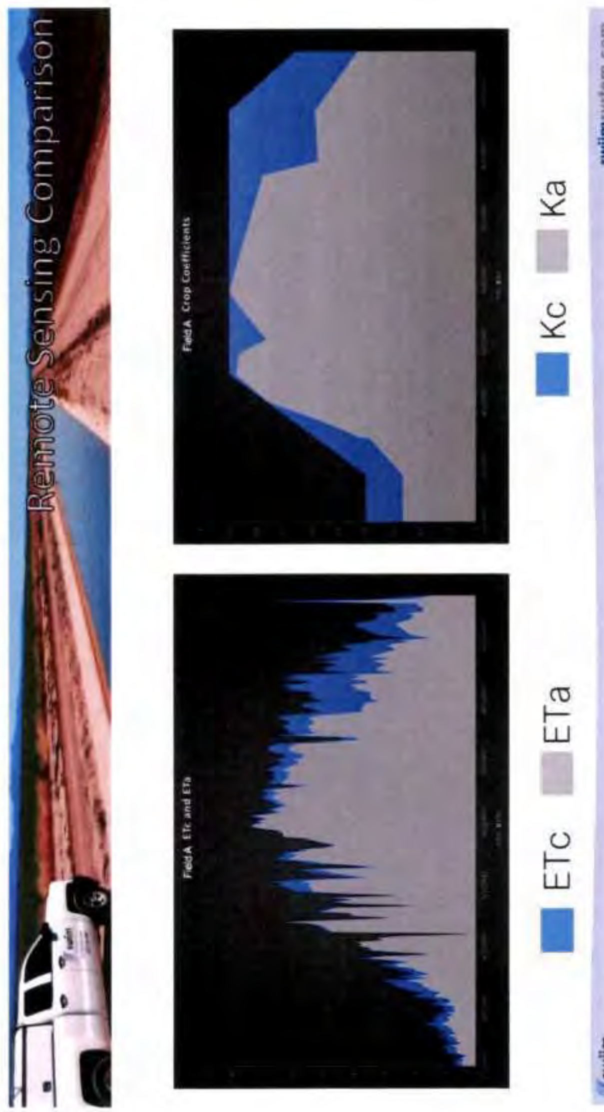

Equipment in the Field
Telemetry Interface for Equipment Configuration and Maintenance
SWIIM Weather Station
Monitoring

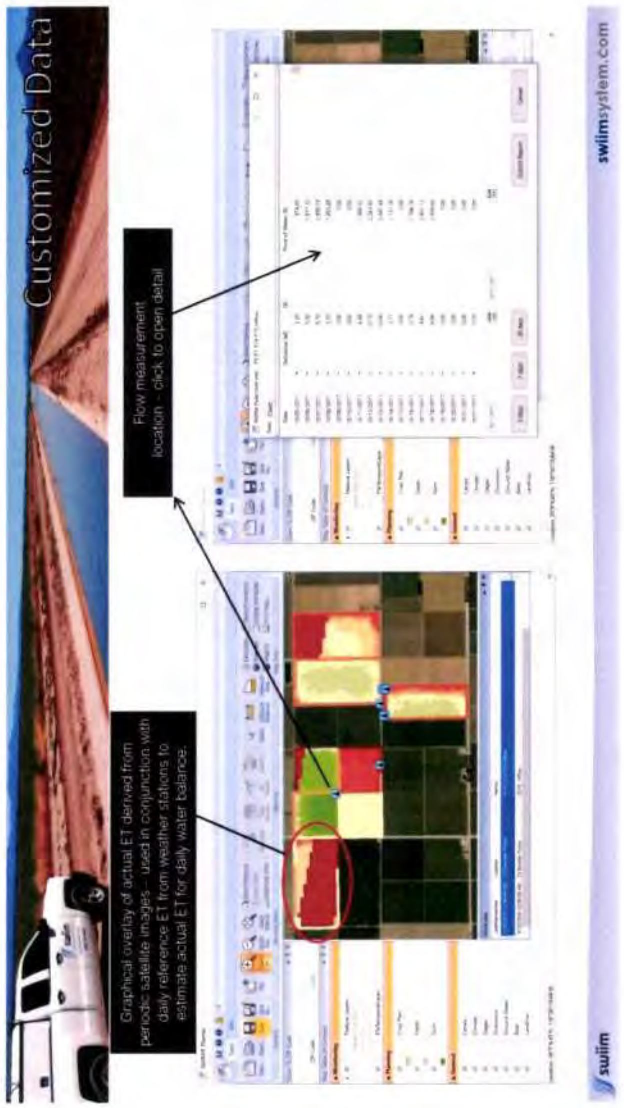

swiim®
SUSTAINABLE WATER & INNOVATIVE IRRIGATION MANAGEMENT®
Reports & Technical Data
swiim
swiimsystem.com

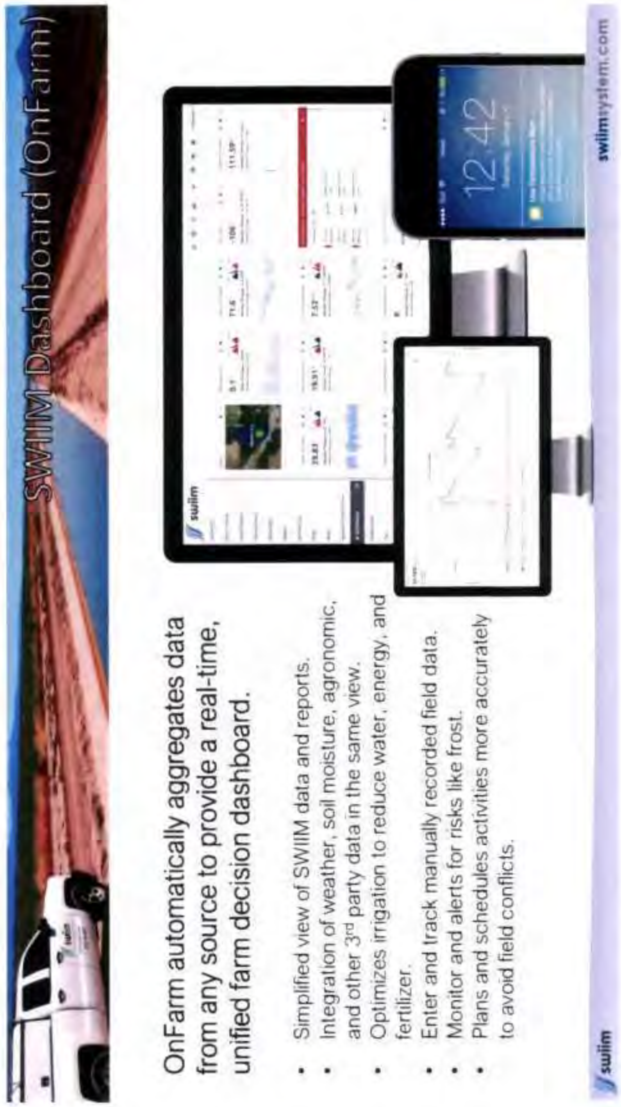

Delivery & Water Balance Reports
Deliveries
swiim
Water Balance Full Report
Farm Summary
Field Summary
Water Balance
Monthly Summary
Reporting Period Component
Depth (ft)
Volume (acft)
Value ($)
swiimsystem.com


Cumulative Daily Water Balance
Cumulative Water Balance Components
Volume (acft)
1250
1000
750
500
250
0
Date
Historical Deliveries
Water Sources
Consumptive Use
Surface Return Flows
Subsurface Return Flows
SWIIM's daily water balance tracks system inflows (irrigation and effective rainfall) and outflows (actual ET and, where applicable, surface runoff) throughout the season. It solves for the residual subsurface drainage on a daily time-step.
Comparing trends among these components and historical data helps irrigation managers and water stewards plan and account for reasonable and beneficial water use while optimizing critical flow paths such as subsurface return flows.
swiim
swiimsystem.com


Remote Sensing Integration
swiimsystem.com
swiim


Remote Sensing Comparison
FieldA ETc and ETa
FieldA Crop Coefficients
ETc
ETa
Kc
Ka
swiim
swiimsystem.com


Customized Data
Graphical overlay of actual ET derived from periodic satellite images - used in conjunction with daily reference ET from weather stations to estimate actual ET for daily water balance.
Flow measurement location - click to open detail
swiim
swiimsystem.com


SWIIM Dashboard (OnFarm)
OnFarm automatically aggregates data from any source to provide a real-time, unified farm decision dashboard.
• Simplified view of SWIIM data and reports.
• Integration of weather, soil moisture, agronomic, and other 3rd party data in the same view.
• Optimizes irrigation to reduce water, energy, and fertilizer.
• Enter and track manually recorded field data.
• Monitor and alerts for risks like frost.
• Plans and schedules activities more accurately to avoid field conflicts.
swiim
swiimsystem.com


You can't protect what you don't quantify
and you can't manage what you don't measure.
swiim
SUSTAINABLE WATER & INNOVATIVE IRRIGATION MANAGEMENT
ONFARM
GROW INFORMED
Thank you!
swiim
swiimsystem.com

McCROMETER

Error: 404 / error
URL: https://munchkin.marketo.net/munchkin.js

The Benefits of McCrometer Flow Meters for Irrigation and Agriculture

Agricultural and turf irrigators operate in difficult environments with extreme climates where water flow measurement can be the difference between profit or loss. Choosing the right irrigation flow meter doesn't need to be complicated. With 60+ years of experience in agricultural irrigation, McCrometer provides reliable and low maintenance flow meter solutions to meet this industry's tough requirements.

McCrometer flow meters offer **unbeatable value** in cost of installation and ownership, and set the standard for ease-of-use, reliability and economy. Our leading edge meters offer versatile water flow measurement that have been trusted by irrigators since 1955.

Watch the video below to learn more about McCrometer's Mc Mag^{3000}, battery operated mag meter with a 5 year Guaranteed Battery Life.

Request a quote or more information on products designed for Agriculture & Irrigation

How to Select the Right Irrigation Flow Meter

In any irrigation network, water meters are a critical tool for irrigators. With many different choices, choosing the ideal flow meter for your application is vital. Whether you're looking for greater control, easy installation, accuracy, billing solutions, consistent irrigation schedules or improved water quality, there are a number of solutions from which to choose.

To help eliminate the guesswork and get you operating quickly and efficiently, below is a list of mechanical or electromagnetic meters to help you learn more about which choice might be right for you.

Chat Live!

A Few of our Agriculture Irrigation Flow Meters .... Find out More ...

- **Mc Propeller:** Affordable, easy to install and operate, easy to service in the field, long-life components. The best-selling propeller meter in the U.S. Trusted by irrigators since 1955.
- **FlowConnect:** Built in remote meter reading for collecting and transmitting flow data from McCrometer's Mc® Propeller and Water Specialties propeller meters.
- **Dura Mag:** Battery powered flanged mag meter with a 5 year battery life eliminates the need for AC power and arrives pre-calibrated with an internal datalogger with 5 years of data storage, and telemetry-ready output options.
- **FS100 Flow Straightener:** Uses breakthrough flow straightening technology for highly accurate, reliable flow measurement with minimal upstream/downstream pipe runs requirements.

	Propeller Meter	Mag Meter	Telemetry Ready	Accuracy	Line Sizes	Easy to Install & Service	Custom Lengths / Flanges
DuraMag		✓	✓	±1%	4" - 12"		✓
FlowConnect			✓	N/A	N/A		
Flow Straightener	✓			±2%	6" - 12"	✓	
Mc Mag3000™		✓	✓	±2%	4" - 12"	✓	
Mc® Propeller	✓		✓	±2%	2" - 96"	✓	✓
Ultra Mag®		✓	✓	±0.5%	2" - 48"		✓
Water Specialties Propeller Meter™	✓		✓	±2%	2" - 72"	✓	✓

What Our Customers are Saying:

"My decision to specify McCrometer is based upon these four basic facts: they are ruggedly built, simple to install, easy to read, and above all have had consistent high quality for more than 20 years."

Chat Live!

4/26/2019 Water Flow Instruments for Agriculture and Turf | McCrometer

David R. Bower, Ewing Irrigation Products

Chat Live!

https://www.mccrometer.com/Agricultural-Turf 3/3

McCROMETER

Error: 404 / error
URL: https://munchkin.marketo.net/munchkin.js

Instruments: Connected Solutions

Connected Solutions

Today's water managers face several challenges when it comes to reading the data on their flow meters. Collecting the data can be time consuming, with delivery either inconsistent or irregular due to weather restrictions or meter inaccessibility. Manual reading can be inaccurately reported, and the infrequency of the data collection is often insufficient for planning. Add to that the expensive cost of labor, vehicles and fuel, it's no wonder they're demanding more. How many times have we heard "There must be a better way!"

Fortunately, there is. McCrometer's FlowConnect™ is a built-in solution for collecting and transmitting flow data from the Mc Propeller and Water Specialties meters. Its unique one-piece design eliminates the need for cables, pole mounting and other hardware typically required with traditional telemetry systems. FlowConnect's features include ExactRead™ Technology, a proprietary technology for exact match from meter to website, affordable and reliable remote meter reading with a streamlined design, timely and accessible data for water management decisions, pre-assembled on new meters for simplified installation and retrofits on existing meters in less than 30 minutes. With multiple register input and output options, modem options and power options, McCrometer, your trusted partner for flow meters, offers innovative built-in remote meter reading. Finally, this is a much better way of automatic meter reading.

McCrometer also offers Smart Output for use with their line of electromagnetic insertion and full bore flow meters. Smart Output™ is compatible with Sensus and Itron systems, which makes these mag meters plug and play into larger AMI and AMR systems. McCrometer has an electromagnetic flow solution for nearly every application - line sizes 4"-138": hot tappable insertion meters, full bore type, battery/solar or AC/DC powered. And now, their entire line of mag meters are AMI compatible, with Smart Output.

Chat Live!

FlowConnect

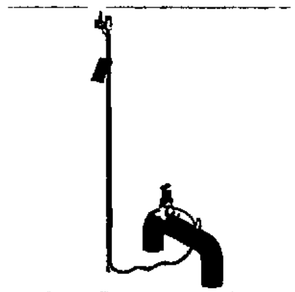
McCrometer CONNECT

Smart Output

Chat Live!

McCROMETER

McCrometer CONNECT



Series: MCCROMETER-CONNECT

» Gallery

Request a Quote

I confirm that I have reviewed and agree with McCrometer's privacy policy.

I also understand my privacy choices as they pertain to my personal data as provided in the McCrometer privacy policy under "Your Privacy Choices"

More Systems • More Sensors • More Solutions

Wireless Technology for Today's Growers

McCrometer CONNECT™ offers the most comprehensive choice in wireless remote monitoring for irrigation and crop management from the convenience of your computer, smart phone or tablet.

Complete turnkey solutions for growers and irrigators
Highest quality local service and support
Selection and Flexibility

With McCrometer CONNECT, you have the real-time, industrial-strength crop data and tools you need

Chat Live!

right at your fingertips. Make timely and effective irrigation and crop management decisions from wherever you are: In the field, on the road or in your office.

- 24/7 Connectivity
- Simple. Convenient. Affordable.

Chat Live!

4/26/2019 Smart Output | McCrometer USA - Overview

McCROMETER

Error: 404 / error
URL: https://munchkin.marketo.net/munchkin.js

Smart Output

» Gallery

Series: SMART OUTPUT

Request a Quote

I confirm that I have reviewed and agree with McCrometer's privacy policy.

I also understand my privacy choices as they pertain to my personal data as provided in the McCrometer privacy policy under "Your Privacy Choices"

Water engineers and technicians will find McCrometer has a versatile Smart Output mag meter solution that is Sensus or Itron system compatible for nearly every type of AMR and AMI application. These accurate, reliable and cost-effective mag meters are available for line sizes from 4 to 138 inches in hot tap insertior or full bore styles, which can be AC or DC powered, battery powered or solar. Smart Output gives water utility managers the flexibility they need to network the flow meters across their distribution systems with the AMI solution of their choice. Smart Output reduces costs, calls, travel, and labor, while it increases efficiency, ensuring your data is accurate.

Chat Live!

https://www.mccrometer.com/smart-output/product?id=52333948151 1/2

Smart Output mag meters from McCrometer are designed with a highly intelligent module in their transmitters that is similar to a communication protocol. This capability allows McCrometer mag meters to transmit data on a schedule or on demand, as well as receive diagnostic queries to ensure or update meter operation. There's no need for technicians to gather flow data manually or check meter status with McCrometer's Smart Output mag meters.

With advanced plug-and-play, real-time Smart Output communications, McCrometer's FPI Mag Flow Meter, SPI Mag Flow Meter and Ultra Mag Flow Meter provide highly effective solutions for automatic meter reading (AMR) and advanced meter infrastructure (AMI) in support of utility smart grids that help conserve valuable water resources, reduce expensive non-revenue water costs, and simplify daily operations and routine maintenance.

McCrometer's Smart Output technology is backed by the company's 60-plus years of solving flow measurement problems.

Letter O1

Commenter: Michele Staples, Jackson Tidus – A Law Corporation, on behalf of the Agricultural Alliance for Water and Resource Education (AAWARE)
Date: April 26, 2019

O1-1 The Groundwater Sustainability Agency (GSA) acknowledges the Agricultural Alliance for Water and Resource Education ("AAWARE") request to consider use of the SWIIM meter system to monitor groundwater production in the Subbasin, or McCrometer meters. SWIIM includes a comprehensive administration/management tool that verifies water use and related conservation against a specified baseline, along with the resulting newly projected crop production output. SWIIM is "hardware agnostic" and compatible with many commercially available equipment, including flow meters, gate meters, tail water sensors, climatic sensors, groundwater instrumentation and supporting infrastructure such as weirs, flumes, stilling wells, and similar technologies. This equipment is connected near real-time via telemetry to SWIIM to provide near-real-time water usage and consumption reports, along with "alarms" if a specific field is going outside the projected/approved water usage, alongside other pre-determined irregularities" (SWIIM 2019). SWIIM is a comprehensive metering and on-farm water accounting platform that requires detailed evaluation to verify compatibility with planned groundwater production reporting requirements.

The GSA will consider use of metering and monitoring systems/platforms in coordination with the non-de minimis pumpers in the Subbasin. The cost, technology, hardware integration, management platforms, and opportunities and constraints of multiple systems should be considered including but not limited to SWIIM meter system. Of particular interest is the reporting and data management capabilities of each system to document groundwater production for purposes of Groundwater Sustainability Plan (GSP) implementation. As the SWIIM meter system appears compatible with existing well meters, pressure transducers and weather stations in the Subbasin, the GSA could consider after the GSP is adopted a trial project potentially be conducted to confirm suitability of use, cellular access and document actual costs for system installation, ongoing use and compatibility with proposed GSA groundwater production metering requirements.

INTENTIONALLY LEFT BLANK

Comment Letter O2

Jackson Tidus
A LAW CORPORATION

Letter to Borrego Valley Groundwater Sustainability Agency

Re: AAWARE Comments on March 2019 Draft Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin and Baseline Pumping Allocations

May 20, 2019

Delivered via E-Mail and Overnight Delivery to:
County of San Diego Planning & Development Services
Attention: Mr. Jim Bennett

Submitted by:
Michele A. Staples, Esq.
Boyd L. Hill, Esq.

Irvine Office
2030 Main Street, 12th Floor
Irvine, California 92614
t 949 752.8585 f 949 752 0597

Westlake Village Office
2815 Townsgate Road, Suite 200
Westlake Village, California 91361
t 805.230.0023 f 805.230 0087

www.jacksontidus.law

TABLE OF CONTENTS

-i-

TABLE OF CONTENTS
(continued)

-ii-

Jackson Tidus
A LAW CORPORATION

May 20, 2019

Direct Dial 949 651 7409
Email mstaples@jacksontidus.law
Reply to Irvine Office
File No 7588-122439

VIA E-MAIL (PDS.LUEGGroundWater@sdcounty.ca.gov) & Overnight Delivery

County of San Diego Planning & Development Services
c/o Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

RE: AAWARE COMMENTS ON MARCH 2019 DRAFT GROUNDWATER SUSTAINABILITY PLAN FOR THE BORREGO VALLEY GROUNDWATER BASIN AND BASELINE PUMPING ALLOCATIONS

Dear Mr. Bennett:

I. INTRODUCTION AND SUMMARY.

The Agricultural Alliance for Water and Resource Education ("AAWARE") provides this comment letter to the Borrego Valley Groundwater Sustainability Agency ("GSA") to address AAWARE's concerns regarding the March 2019 draft Groundwater Sustainability Plan ("GSP") for the Borrego Valley Groundwater Basin ("Basin"). AAWARE's members comprise the majority of the agricultural property owners and groundwater users overlying the Basin AAWARE's members are dependent on the Basin for agricultural and domestic water uses on their properties

For many years, AAWARE's members have been working toward a solution to bring the Basin into balance, both individually and, more recently, as members of the Borrego Water Coalition ("Coalition") and the Advisory Committee to the GSA ("Advisory Committee"). AAWARE members have voluntarily reduced water consumption, willingly shared their production data with the Core Team in confidence, researched and proposed metering systems for approval by the GSA, and devoted countless hours to engage in various forums at which groundwater management alternatives have been discussed.

AAWARE seeks constructive dialog with the GSA in the hopes of reaching a workable solution to the GSP and its intended implementing programs that will facilitate beneficial use of the Basin, including agricultural use, together with sound management under the Sustainable Groundwater Management Act ("SGMA", Wat. Code, § 10720 et seq). Unfortunately, the 60-day public review period for the GSP was not further extended as necessary to allow the ongoing dialog to reach a satisfactory conclusion. Compounding the problem, the GSA withheld from public disclosure critical information upon which the GSP is based, hindering AAWARE's ability to provide relevant information during the Advisory Committee proceedings and during the public comment period on the GSP. For example, Dudek's "Update to the USGS Borrego Valley Hydrologic Model" and summary report dated December 2018 (GSP Appendix D1 ("Dudek Model Update")) were withheld from public disclosure until the draft GSP was

-1-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

published in March 2019 (See, Exhibit 1,[1] November 2, 2018 joint T2 Borrego/AAWARE letter, p. 1) The GSA is still withholding the Planning, Permitting and Ordinance Review Technical Report (referenced at GSP p. 4-38) and Working Draft Financing Plan (referenced at GSP pp. 5-9, 5-10).

Therefore, AAWARE and its individual members (who join in these comments) must now preserve their rights regarding the substantive and procedural deficiencies of the draft GSP and the process of its development that improperly marginalize, subordinate and prevent consideration of the AAWARE members' interests in the Basin, and violate their Constitutionally-protected substantive and procedural due process rights, water rights, and private property rights.

As a result of the Core Team's failure to adhere to SGMA's statutory and regulatory requirements and guidance provided by the Department of Water Resources ("DWR") (such as the use of best available science and compliance with fundamental principles of substantial evidence and due process), the draft GSP proposes excessive regulatory obligations and crushing financial burdens that would plainly eliminate private agricultural water use from the Basin. In enacting SGMA, the Legislature was clear that it did not seek to create a subordinate class of beneficial users regulated out of existence by SGMA. Instead, the Legislature mandated that beneficial users are to be full participants in the planning process, with the express intent to preserve beneficial uses through "sustainable", rather than draconian, management.

As discussed in greater depth below, the draft GSP:

1. Is being developed by a process that withholds relevant information relied upon in the GSP and prevents active involvement by affected agricultural water users, thereby preventing the GSA's consideration of the agricultural users' interests as required by SGMA. (Wat. Code, §§ 10723.2(a)(1), 10727.8(a).)
2. Fails to rely upon the best available science provided in the USGS report prepared in cooperation with the District entitled, "Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley" ("2015 USGS Model Report"-- https://pubs.usgs.gov/sir/2015/5150/sir20155150.pdf, excerpts cited to herein are attached hereto as Exhibit 2.)
3. Establishes arbitrary management zones without model testing the zones.
4. Adopts sustainability measures that are not supported by the evidence.
5. Calls for excessive and costly implementing programs that are economically infeasible and needlessly harm beneficial agricultural uses in the Basin.
6. Includes administrative and program development costs that far exceed what is contemplated by SGMA for a small basin with few pumpers, rendering GSP implementation economically infeasible.

[1] The Exhibits referenced in this letter have been uploaded to a share site and may be accessed at the following link: https://sharefile.jacksontidus.law/wl/?id=HClcpnHVFl2x6XJrcHnLpAySefoKnfDt

-2-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

In order to correct the draft GSP's procedural and substantive deficiencies, AAWARE asks the GSA to:

- Establish a collaborative technical process to be convened before GSP adoption to allow a meaningful opportunity for public review and dialog on matters that were not adequately developed through the Advisory Committee process;
- Convene technical meetings before GSP adoption among the water producers who will be subject to the GSP and their respective technical consultants in order to finalize their Baseline Pumping Allocations;
- Provide information explaining why the GSA decided to effectively reject the USGS's Scenario 6 sustainable pumping target of 7,824 AFY (Exhibit 2, 2015 USGS Model Report, p. 122 (Table 20)), including any data indicating a potential undesirable result at that pumping target;
- Produce at least one model run evaluating a pumping target of 7,100 AFY, which is the total average natural safe yield amount substantiated in both the 2015 USGS Model Report and Dudek Model Update;
- Provide for a permanent Technical Advisory Committee as part of the GSP governance process to be comprised of California licensed engineers, hydrogeologists and other licensed technical representatives from all stakeholders desiring to participate (see Exhibit 1, November 2, 2018, joint letter on behalf of T2 Borrego and AAWARE regarding Borrego Springs Groundwater Model and Proposal for Collaborative Technical Approach), and
- Amend and recirculate an updated draft GSP, and extend the comment period to allow for further review and comment by affected beneficial users.

II. **AAWARE COMMENTS ON THE DRAFT GROUNDWATER SUSTAINABILITY PLAN.**

A. **THE GSP FAILS TO RELY UPON THE BEST AVAILABLE SCIENCE AND INSTEAD JUSTIFIES THE GSA's PRE-DETERMINED SUSTAINABLE YIELD FOR THE BASIN AT 5,700 AFY.**

1. **The GSP Mischaracterizes and Wrongly Adopts the USGS Natural Surface Recharge Estimate as the Basin's Sustainable Yield.**

The 2015 USGS Model Report indicates that the available yield of the Basin in the pre-development condition is 7,074 afy. The 2015 USGS Model Report's "Scenario 6" evaluates a target pumping rate of 7,824 AFY (for 30 years commencing in 2030) and concludes that at 2060, recharge approximates discharge. (See, Exhibit 2, 2015 USGS Model Report pp. 4, 118 (Table 19), 122 (Table 20), Exhibit 3, May 16, 2019, Wagner & Bonsignore Letter Report, p. 2.) O2-1

Rather than adopt the sustainable yield of 7,824 AFY as set forth in the 2015 USGS Report Scenario 6, or even the available pre-development yield of 7,100 AFY set forth in the USGS Model Report, the GSP mischaracterizes the USGS Model Report and incorrectly adopts

-3-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

the USGS Model Report's natural *surface* recharge of 5,700 AFY as the Basin's "sustainable yield":

> At present, the total baseline pumping allocation (BPA) of 21,963 acre-feet per year (AFY) greatly exceeds the **Subbasin's estimated long-term sustainable yield of 5,700 AFY determined by the U.S. Geological Survey and confirmed in this GSP.** (GSP, p. ES-3 [emphasis added].)

As set forth above, **the USGS did not determine or estimate the long-term sustainable yield at 5,700 AFY**. Rather, the USGS estimated the long-term sustainable pumping rate at 7,824 AFY and only estimated the natural recharge to the Basin from **surface** water at 5,700 AFY. (Exhibit 2, 2015 USGS Model Report, pp. 2, 122 (Table 20), 129.) USGS estimated the total average natural recharge to the Basin to be approximately 7,100 AFY, comprised of 5,700 AFY surface recharge and 1,400 AFY underflow into the Basin. (See, Exhibit 2, 2015 USGS Model Report pp. 2, 129, See also, Dudek Model Update, p. 10; Exhibit 3, Wagner & Bonsignore Letter Report, p. 2, Exhibit 6, Thomas Harder Letter Report p. 7.)

The GSP's mischaracterization and adoption of USGS estimated natural surface recharge of 5,700 AFY as the "sustainable yield" **violates the statutory definition of sustainable yield as the maximum quantity of water** that can be sustainably used. (Wat. Code, § 10721(w).)

The evidence contained in the 2015 USGS Model Report shows that 5,700 AFY is **not the maximum quantity** of water that can be sustainably used. The USGS model runs for SGMA sustainability that take into natural subsurface recharge, irrigation return flows and other components of the Basin's developed state estimate the long-term sustainable yield at 7,824 AFY.

O2-1 Cont

The evidence contained in the GSP also shows that 5,700 AFY is not the maximum quantity of water that can be sustainably operated within the Basin. The GSP Basin setting discussion for safe yield estimate concedes that the water budget numbers set forth in the 2015 USGS Model Report are the correct numbers for what the GSP calls the "combined natural recharge" to the Basin:

> The average annual natural recharge of water reaching the saturated zone, which includes stream leakage and infiltrating water through the unsaturated zone, was 5,700 AFY for the full model simulation period from 1929 to 2010 (USGS 2015). In addition to natural recharge from stream leakage and infiltrating water (mostly from irrigation return flows), the Subbasin received underflow originating from the adjacent watersheds at an average annual rate of 1,400 AFY. **Therefore the combined average annual natural recharge to the BVGB is approximately 7,100 AFY.** (GSP, pp. 2-80 – 2-81 [emphasis added].)

-4-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

The GSP Basin setting discussion for water budget purposes provides a slightly lower number of 6,770 AFY for combined total inflow based on the Dudek Model Update that admittedly either overestimates pumping or underestimates recharge. (GSP, pp. 2-72, 2-73 (Table 2.2-9A), 2-79.) However, even at that lower water budget inflow number of 6,770 AFY, the GSP concedes that the "sustainable yield" of 5,700 AFY is not the maximum quantity of water that can be sustainably operated within the Basin. By arbitrarily picking the average annual natural surface recharge number as the sustainable yield, the GSP violates the SGMA regulations requiring the GSA to use water budget projections and safe yield estimates as the foundation for determination of sustainable yield (23 Cal. Code Regs., § 354.18(b)(7), (c)(3).)

The County's GSP contract with Dudek specifically tasked Dudek to "consider both surface and groundwater data and run predictive simulations to determine effects of recharge and extraction on levels and quality along with implementation measures to be detailed in the GSP." (See, Exhibit 4, excerpts of County Contract No. 555655, Agreement with Dudek, pp 21-22) The County/Dudek contract explains that the purpose of this task, among other things, is "to determine sustainable yield for the basin in its entirety that is acceptable to DWR".

Instead, Dudek ran only model scenarios evaluating the 5,700 AFY natural surface water recharge as the Basin-wide sustainable yield. (See, GSP, pp. 3-20, 3-21 ["All of the simulations are based on the target pumping rate of 5,700 AFY being achieved in year 20 of GSP implementation."], Exhibit 6, 2019 Thomas Harder Letter Report, p. 7, Exhibit 5, April 26, 2019, Transcript, p. 54:1-11 [Dudek ran one model scenario stepping down current pumping to 5,700 afy over 20 years].) The GSA model run for the "sustainable yield" of 5,700 AFY shows that operation of the Basin in that amount is well below the maximum quantity of water that can be operated without undesirable result (GSP, p. 3-20, Figure 3-3-2.) Establishing the GSP "sustainable yield" at 5,700 AFY would add between 35,000 and 70,000 acre-feet over a 35-year period (about 1,000 to 2,000 AFY) to storage instead of being sustainably used without undesirable result (GSP, Figure 3-3-2; See, Exhibit 6, 2019 Thomas Harder Letter Report, p. 4 [quantifying the amount of storage gain]; Exhibit 3, 2019 Wagner & Bonsignore Letter Report, p 2.)

AAWARE questions the GSA's approach in formulating a desired sustainable yield result and then rationalizing that conclusion after-the-fact However, that is what happened in this case. The Dudek Model Update selectively accepts only the information supporting the GSA's decision to limit pumping to the 5,700 AFY natural surface water recharge, and rejects or ignores the data, laws and guidance contradicting that decision. No mention is made of the USGS Scenario 6 target production level of 7,824 AFY or any undesirable result that would occur at that level. The predictable result is that the County Board of Supervisors and District Board of Directors (as the GSA decision maker in this case) and DWR (as the oversight agency) will receive a one-sided analysis of the Basin's sustainable yield. The GSP's self-serving analysis of sustainable yield is arbitrary and capricious, particularly where the GSA has at its disposal the 2015 USGS Borrego Valley Hydrologic Model that was developed in cooperation with the District over a 6-year period at significant expense for the express purpose of testing alternative management scenarios. (See, Exhibit 2, 2015 USGS Model Report, p. 1.)

O2-1 Cont.

-5-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

Contrary to the requirements of SGMA and the scope of work outlined in the County/Dudek GSP contract, the GSA failed to conduct model runs at any number between 5,700 AFY natural surface water recharge and the 2015 USGS Model Report's sustainable yield Scenario 6 model result of 7,824 AFY that the GSP ignores and effectively rejects. (See, 2015 USGS Model Report, p. 122 (Table 20, Scenario 6).) The GSA should provide at least a model run evaluating production at the combined average annual natural recharge amount of 7,100 AFY. (23 Cal. Code Regs., § 354.26(c) [requirement to consider multiple minimum thresholds to determine point at which undesirable result occurs], Exhibit 2, 2015 USGS Model Report, p. 129; Exhibit 3, Wagner & Bonsignore Letter Report, p. 2; Exhibit 6, Thomas Harder Letter Report, p. 7.) O2-1 Cont.

2. The GSP's Incorrect Adoption of Natural Surface Recharge as the "Sustainable Yield" Violates SGMA's Intent to Preserve Common Law Water Rights.

The GSA's adoption of the Basin's natural surface recharge of 5,700 AFY as the "sustainable yield" violates common law water rights as protected by the California Constitution (Art X, Sec. 2) to maximum reasonable and beneficial use of the Basin sustainable or safe yield, and thus violates both the California Constitution and SGMA (Wat. Code, §§ 10720.1(b), 10720.5(a), (b); Cal. Const., Art. X, Sec. 2, *California American Water v. City of Seaside* (2010) 183 Cal App 4th 471, 480-481 ["The solution must not, of course, unreasonably or adversely affect the existing legal rights and respective priorities of the parties."].) Most of the groundwater rights adjudications in California (if not all) use a definition of the basin yield that includes 3 components: O2-2

1. Natural yield, which is the amount of the total recharge including underflow that would exist under pre-development conditions In the Basin, this amount is about 7,100 AFY;
2. Developed yield, which is the amount of water that is developed from pumping the groundwater basin and includes changes in storage and reductions in basin outflow and evapotranspiration; and
3. Return flow from pumping.

(See, Exhibit 3, Wagner & Bonsignore Letter Report, p. 2) The GSA's arbitrary rejection of USGS Scenario 6 effectively takes usable water out of production by regulation, adversely affecting the AAWARE members' water rights and land use. By requiring water users to operate so significantly under the Basin's total average natural recharge (which is less than sustainable or safe yield under the Basin's developed condition), the GSP constitutes a major change in overlying parties' water rights, in violation of SGMA. (Wat. Code, §§ 10720.1(b), 10720.5(a), (b); *Peabody v. City of Vallejo* (1935) 2 Cal.2d 351, 376 [requiring water to be unused and flow to the bay in order to make insubstantial contribution to underground supply of land held to be a great waste for small benefit].)

3. The GSP's Incorrect Adoption of Natural Surface Recharge as the "Sustainable Yield" Violates SGMA's Requirement to Consider All Beneficial Uses and Users. O2-3

-6-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

SGMA requires that the GSP "consider the interests of all beneficial uses and users of groundwater," including holders of overlying rights. The requirement was amended last year to expressly require the GSA to consider the interests of farmers holding overlying groundwater water rights (Water Code section 10723 2(a)(1), as amended by Assembly Bill 321, effective January 1, 2018) The GSP falls to consider or even mention the interests of private overlying farmers or other private groundwater users in its explanation of why it sets the "sustainable yield" significantly below the Basin's combined average annual natural recharge of approximately 7,100 AFY: O2-3 Cont.

> Recharge in the basin is bimodal, with the majority of recharge occurring on decadal basis in a few very wet years. Most years have significantly less natural recharge than the average. Given that this bimodal pattern introduces a level of uncertainty regarding the actual amount of recharge that could occur over the next 20 years, the GSA has determined that a target pumping rate of 5,700 AFY by 2040 would be consistent with the GSP sustainability goal (discussed in Chapter 3). (GSP, p 2-81)

The "bimodal recharge" pattern is a function of desert environments. Multiple successive wet years will provide more than average recharge, and multiple successive dry years will provide less than average recharge. With no supplemental source of water, water users in the Basin (including overlying agriculture) will necessarily rely upon infrequent large recharge events to provide a steady source of banked supply during the more frequent dry seasons Over a long period of time, wet and dry cycles will produce an average recharge The USGS's full model simulation considered a 60-year period, 1929 to 2010. (See, Exhibit 2, 2015 USGS Model Report, p. 79.) The average annual natural recharge estimates from Appendix A of the Dudek Model Update are based on an 80-year period of record (7,040 AFY) and 65-year period of record (6,881 AFY), which are more than sufficient to account for hydrologic cycle variability. (See, Exhibit 6, 2019 Thomas Harder Letter Report, p. 4)

The GSP's statement about bimodal recharge fails to explain the undesirable result, if any, that would result from a pumping target based upon the 7,100 AFY combined average annual natural recharge or the 7,824 AFY USGS Scenario 6 pumping target. **By omitting a very significant amount of natural underflow into the Basin (1,400 AFY, which is 20% of the Basin's total 7,100 AFY average natural recharge), the GSP fails to rely on the best available information and science about the Basin's natural recharge in both the USGS model and the Dudek Model Update** (23 Cal. Code Regs., § 354.18(e)) The USGS's evaluation of sustainable yield (Scenario 6, which evaluates total production of 7,824 AFY), appropriately relies on the best available science, taking into account not only the natural surface recharge and underflow, but also return flows from irrigation. **The GSA ignores and effectively rejects USGS Scenario 6 without substantial evidence or explanation, arbitrarily reducing the sustainable yield and taking usable water out of production by regulation.**

-7-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

B. THE GSA FAILED TO ALLOW FULL PARTICIPATION BY PRIVATE WATER USERS INCLUDING AGRICULTURAL USERS AND FAILED TO CONSIDER THEIR INTERESTS IN PREPARING THE GSP.

1. The GSA Did Not Involve Beneficial Users in the Development of the GSP's Sustainability Measures.

SGMA requires that the GSA provide a written statement that commits to the manner in which interested parties may participate in the development and implementation of the GSP (Wat. Code, § 10727.8(a).) The GSA must follow the commitment set forth in that statement for involvement of beneficial users. (23 Cal. Code Regs, § 354.10.) Given the mandate that the GSA consider the interests of all beneficial users and uses of groundwater (including farmers) (Wat. Code, § 10723.2(a)(1)) and the legislative intent to preserve water rights in the development and implementation of the GSP (Wat. Code, §§ 10720.1(b), 10720.5(a), (b), this commitment is crucial.

Beneficial user input into the development of GSP sustainability measures is critical to the GSP process and to the protection of overlying water rights. (Wat. Code, §§ 10720.5, 10723.2, 10727.8(a); 23 Cal. Code Regs., §§ 354.10, 354.26(b)(3), 354.28(b)(4).) Contrary to the requirements of SGMA and the Advisory Committee Bylaws (GSP, Appendix BA, p. 1), development of the GSP was reduced to a top-down process where GSP proposals were developed by the Core Team and selectively reported to the Advisory Committee members and affected private water users In some cases, relevant information was withheld from the Advisory Committee and the affected water users (including AAWARE members), depriving them of a meaningful opportunity to evaluate potential impacts to their interests and provide input into the GSA's decisions such as the GSP management proposals (23 Cal. Code Regs., § 354.10.) Specifically, the GSA failed to comply with the process required to develop the GSP by: O2-4

- Witholding the Dudek Model Update until after publication of the draft GSP and failing to timely provide related information required for the Advisory Committee, the affected water users and their technical consultants' meaningful comment on the technical foundation of the GSP,
- Witholding key documents cited in GSP even after publication of the GSP under the "deliberative process privilege" exemption, including the Planning, Permitting and Ordinance Review Technical Report (referenced at GSP p. 4-38) and Working Draft Financing Plan (referenced at GSP pp. 5-9, 5-10);
- Relying on 2018 ENSI Report that miscalculates the Basin's combined annual natural recharge, and misrepresenting to the Advisory Committee and affected water users that the total yield is 5,700 AFY,
- Failing to post agenda materials, including but not limited to information about the proposed contents of the GSP, in advance of Advisory Committee meetings;
- Failing to respond to comment letters submitted by private water users during the Advisory Committee process;

-8-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

- Proposing management programs that target agricultural land and water use without input by the affected agricultural water users, and
- Proposing financing mechanisms that are not feasible and will have the effect of eliminating beneficial agricultural use.

In the months preceding publication of the draft GSP, the technical consultants advising the GSA repeatedly misinformed the Advisory Committee members, the public and the private water users' technical consultants that the average annual natural recharge of the Basin totals 5,700 AFY. The District's consultant, Environmental Navigation Services, Inc. ("ENSI"), incorrectly represented the total 65-year average natural recharge to the Basin to be 5,700 AFY per the 2015 USGS Report, comprised of 1,400 AFY groundwater inflow and 4,300 AFY surface water recharge. (See, Exhibit 17, September 2018 report entitled "Methodology to Examine Future Groundwater Overdraft in Terms of the Overall Hydrologic Water Balance Considering Recharge Variability and Parameter Uncertainty" ("2018 ENSI Report"), p 7.) To the contrary, the 2015 USGS Model Report estimated the total average natural recharge to the Basin at approximately 7,100 AFY, comprised of 1,400 AFY underflow into the Basin plus 5,700 AFY surface recharge (See, Exhibit 2, 2015 USGS Report p 2; GSP pp. 2-80 – 2-81; See also, Exhibit 3, Wagner & Bonsignore Letter Report, p. 2; Exhibit 6, Thomas Harder Letter Report p. 7.) **ENSI mistakenly *subtracted* the 1,400 AFY underflow from the 5,700 AFY surface recharge instead of *adding* the two together.** (Exhibit 17, 2018 ENSI Report, p. 7.) **As a result, the ENSI Report misrepresents the Basin's total average natural recharge to be 20% lower than the 2015 USGS Model Report.**

The misleading information on the Basin's average natural recharge was particularly impactful given that the purpose of ENSI's examination was to address concerns about potential impacts on the District's ability to produce drinking water and related increase in water production costs should the target pumping rate fail to achieve the SGMA-mandated sustainability goals. (Exhibit 17, 2018, ENSI Report, p. 1.) The 2018 ENSI Report further explains that "subsequent analyses are in process that will build from this Report to examine the effect of overdraft on BWD supply well production rates and water quality". (Exhibit 17, Cover letter to the District's General Manager.) The GSP relies on the incorrect 2018 ENSI Report for the Plan Area and Basin Setting and Sustainability Management Criteria (see GSP pp. 2-87, 3-48), and includes a subsequent ENSI study dated December 7, 2018, entitled "Water Quality Review and Assessment: BWD Water Supply Wells" that may have been one of the "subsequent analyses" that built upon the incorrect 2018 ENSI Report (see, GSP Appendix D2). **The Advisory Committee members and the public were incorrectly informed that the pumping levels in the 2015 USGS model's Scenario 6 would so far exceed the Basin's natural recharge that it would not meet SGMA's sustainability requirements. (See, for example, Exhibit 11, August 2018 Advisory Committee Minutes, p. 3; Exhibit 17, 2018, ENSI Report, p. 18.)**

The GSA relied in part on the incorrect ENSI analysis in picking the 5,700 AFY target pumping rate as the Basin's sustainable yield and effectively rejecting the USGS Scenario 6. (See, GSP pp. 2-87, 3-48, 3-49.) At the August 31, 2018, technical meeting among the technical consultants advising the GSA, AAWARE and T2 Borrego, the GSA incorrectly said that the Dudek Model Update was using the 2015 USGS model and assumptions and was only updating

O2-4 Cont

-9-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

the model to the period beyond 2010 However, the draft GSP published months later disclosed that, in setting the sustainable yield at 5,700 AFY, the Dudek Model Update excluded the 1,400 AFY average natural underflow recharge that had been included in the 2015 USGS Model inputs (See, Exhibit 2, 2015 USGS Model Report p. 118; GSP pp. 2-80 – 2-81; see also, Exhibit 3, Wagner & Bonsignore Letter Report, p. 2, Exhibit 6, Thomas Harder Letter Report p 7.) **The erroneous information was unable to be discovered by the affected water users and unable to be corrected during the Advisory Committee process because the GSA purposely withheld the Dudek Model Update from public review until the draft GSP was published.**

The August 2018 technical meeting was held at the request of AAWARE and T2 Borrego so that the GSA's engineering consultants could provide them with information needed for AAWARE and T2 Borrego to provide meaningful information for the Dudek Model Update, its inputs and the sustainability criteria At a subsequent Advisory Committee meeting, the GSA announced that what it provided at the technical meeting was merely information that could be found on the GSA website, and not the technical information that had been requested. (See, Exhibit 11, October 4, 2018, Advisory Committee Minutes, p. 2.)

The GSA also withheld the Dudek Model Update from public review until the draft GSP was published for public comment, claiming the "deliberative process" exemption from the Public Records Act Upon publication of the draft GSP, AAWARE and T2 Borrego scheduled two technical meetings for the technical consultants to discuss the model, data and model runs with the GSA during the public comment period. (See, Exhibit 12, March 22, 2019, email exchange to schedule technical meetings during GSP public comment period.) The information learned from the subsequent technical meetings and from the GSP is that the GSA had a predetermined result to use the USGS natural surface recharge number of 5,700 AFY as the "sustainable yield," and that the GSA only performed model runs at that 5,700 AFY number. No other forward projection runs were performed at higher pumping rates. (See, GSP pp. 3-20, 3-21 ["All of the simulations are based on the target pumping rate of 5,700 AFY being achieved in year 20 of GSP implementation."], 3-61 (Figure 3.3-2); Exhibit 3, 2019 Wagner & Bonsignore Letter Report, pp. 1-2; Exhibit 6, 2019 Thomas Harder Letter Report, p. 7) Because the GSA only studied its pre-determined result of a 5,700 AFY "sustainable yield", the Advisory Committee and the affected water users cannot evaluate the maximum pumping that can occur in the Basin without undesirable results, and neither can the County Board of Supervisors or District Board of Directors (in their role as the GSA decision maker) or Department of Water Resources (in its role as the oversight agency). The GSP process was not conducted in a manner to obtain any meaningful input from beneficial users as to sustainable yield components, in violation of SGMA requirements for beneficial user participation in the development of those sustainable yield components. (Wat Code, §§ 10723 2, 10727.8; 23 Cal. Code Regs. §§ 354.10, 354.26(b)(3), 354.28(b)(4).) O2-4 Cont.

Dudek told AAWARE's technical consultants that it was prevented from modeling other target pumping rates for the Basin due to budget and scoping constraints. (See, Exhibit 3, Wagner & Bonsignore Letter Report, pp 1-2.) However, as discussed above, the County/Dudek GSP contract tasked Dudek with running predictive simulations to determine sustainable yield for the Basin. **In order to comply with SGMA requirements to use the best available science and**

-10-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

information (23 Cal. Code Regs., § 354.18(e)), the GSP should provide at least one additional model run at the 7,100 AFY combined average annual natural yield.

Additionally, the Advisory Committee process was reduced to a top-down process with the Core Team developing GSP components and reporting only some of them to the Advisory Committee. A review of the agendas for the GSA reveal **only two items that came up for Advisory Committee Input, neither of which were GSA sustainability measures:** (1) metering of agricultural wells, and (2) allocation of base production rights. (See, Exhibit 7, November 27, 2017 Advisory Committee Agenda Excerpts.) As shown by the GSA website, the **GSP sustainability measures were rolled out to the Advisory Committee for review only at the very end of the Advisory Committee Process in October 2018, after the GSA's consultant had completed their model testing and developed the sustainability measures.** (See, Exhibit 8, website screenshot page 4, Exhibit 9, Advisory Committee Agenda Reports for GSP Rollout Oct. 2018, Nov. 2018 and Jan. 2019.) As discussed above, at that time, the Advisory Committee members were misinformed as to the Basin's natural recharge.

Additionally, the Advisory Committee agendas published in advance of the meetings did not contain attachments. The substance of the GSP text was not provided to the Advisory Committee members prior to the meetings, but instead Advisory Committee members were simply presented with a power point presentation on the spot at the meetings, with no opportunity to meaningfully review, consider and provide input into the GSP's contents. The power point presentations were not posted on the GSA's website until several days following the meeting, generally only in time for the subsequent meeting, thereby preventing timely and meaningful input by the affected water users into the GSP's development. (See, Exhibit 11, August 29 and October 3, 2019 letters to Jim Bennett and Geoff Poole.) O2-4 Cont.

After publication of the Draft GSP, information necessary for AAWARE's technical consultants to understand and comment on the Dudek Model Update during the 60-day public comment period was requested at the April 26, 2019 technical meeting. (See, Exhibit 5, April 26, 2019, Transcript, pp. 13:18-25, 25:23 – 26:3.) The GSA committed to provide the requested information at the May 10, 2019 technical meeting. (See, Exhibit 5, Transcript, p. 69:24 – 70:5.) However, the information was not provided at the May 10 meeting. The requested information was provided at the close of business on May 16, 2019, **just two business days before the close of the comment period on the draft GSP.** (See, Exhibit 16, May 16, 2019, Calibration Wells Correspondence and Documents.)

Additionally, the GSA continues to withhold information cited in the GSP upon which the proposed management programs are based, including the Planning, Permitting and Ordinance Review Technical Report (referenced at draft GSP p. 4-38) and the Working Draft Financing Plan (referenced at GSP pp. 5-9, 5-10) (See, Exhibit 10, March 29, 2019, email denying AAWARE's request for these documents.) Additionally, the GSP references Le Sar Development Consultants' work on matters including economic impacts (GSP p. 2-30), but there is no report included in the GSP.

-11-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

The GSA did not provide the Advisory Committee or beneficial users "balanced objective information" in a timely manner as necessary to assist in their understanding the Dudek Model "Update" to the USGS model, water budget or development of sustainability measures, did not involve or collaborate with the Advisory Committee in determining which sustainability measures to include in the GSP, and did not consult with the Advisory Committee or agricultural users targeted by the sustainability measures. **In fact, the GSA provided incorrect information about the Dudek Model Update and withheld Dudek's model report dated December 2018 from public disclosure until the GSP was published months later.**

The requested information should be provided to the public, and the public comment period should be reopened to allow a meaningful opportunity to review the information as necessary to comment on the Dudek Model Update.

Additionally, to avoid future dissemination of misinformation and ensure that the affected private water users receive relevant information about GSA matters potentially affecting their interests in a timely manner, AAWARE urges the GSA to establish a permanent Technical Advisory Committee process as part of the GSA's governance structure with authority to analyze and make recommendations on matters including specific yield, mountain front underflow and flux into the Basin across the Coyote Creek fault, and agricultural and recreational irrigation return flows; evaluating the feasibility of importing groundwater; advising on development of any Water Quality Optimization, Intra-Basin Water Transfers and General Plan Update proposed in the draft GSP; sustainable yield; scope of work and budget for technical work; rampdown; and any other matters to be approved by the GSA.

O2-4 Cont.

2. The Manner in Which the GSP Was Developed Violates the AAWARE Members' Constitutionally-Protected Substantive and Procedural Due Process Rights.

The GSA's failure to objectively evaluate sustainable yield scenarios violates the AAWARE members' Constitutionally-protected substantive and procedural due process rights by withholding from the Advisory Committee, County Board of Supervisors, District Board of Directors and DWR relevant information that is contrary to the GSA's arbitrary decision that the sustainable yield should be equal to the natural surface water recharge.

Further, the GSA's withholding relevant information cited to and relied upon in the GSP denies the AAWARE members a meaningful opportunity to evaluate the potential impacts to their interests from the GSP's incorrect determination of sustainable yield included in the draft GSP during the public comment period. These errors and omissions preclude the GSA from considering the agricultural water users' interests in violation of SGMA (Wat. Code, § 10723 2.)

C. THE BASIN SETTING CONTAINS IMPROPER ANALYSES CONTRARY TO BEST AVAILABLE DATA AND SCIENCE.

O2-5

-12-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

1. The Analysis of How Groundwater Sustainability Will Affect General Plans is Flawed and Improperly Favors Expanding Municipal Use Over Existing Agricultural Use.

SGMA requires that the GSP provide a description of the consideration given to general plans and an assessment of how the GSP may affect those plans. (Wat. Code, § 10727.2(g).) The GSP describes how the current General Plan allows for as many as 11,689 total housing units, which would equate to 5,844.5 AFY for just residential use. (GSP, p. 2-19) Thus, without any subdivision permitting, the residential water use alone would exceed the GSP's "sustainable yield" of 5,700 AFY. The GSP concludes that the existing General Plan land use designations and policies allow for growth and promote agricultural conservation in a manner that may be inconsistent with the sustainability criteria, pumping reduction program and agricultural land fallowing program described in Chapters 3 and 4. (GSP, p. 2-20.) Of course, the GSA needs to consider all beneficial users, and not favor any particular class of beneficial use. (Wat. Code, 10723.2.)

One of AAWARE's concerns is the statement in the GSP that "Supporting continued agricultural operations in Borrego Valley may be inconsistent with the goal of reducing groundwater demand". (GSP, p. 2-22, Table 2.1-6; See also p. 2-23.) The data presented in the GSP indicates that a significant reduction in agricultural water use is needed, and AAWARE's members are already undertaking measures to reduce their water production. However, there is no evidentiary support in the GSP for the conclusion that agricultural operations must be eliminated in order to achieve groundwater sustainability. In fact, the 2015 USGS study concluded that sustainability can be achieved with a 60% reduction in then-current agricultural pumping (13,162 AFY). (See, Exhibit 2, 2015 USGS Model Report, pp. 4, 122, Table 20 (Scenario 6).) (Using the USGS methodology, the required reduction would be slightly higher under the GSP totals of 15,729 AFY total agricultural Baseline Pumping Allocation, and 14,767 AFY total current agricultural production. (See, GSP p. 2-26, Table 2.1-7).) O2-6

Because the GSP cites to a "Planning, Permitting and Ordinance Review Technical Report" (referenced at draft GSP p. 4-38), AAWARE requested a copy of that document as necessary to evaluate and comment on the GSP's analysis of how the General Plan's agricultural policies and land use designations would be affected. However, the GSA denied AAWARE's request for a copy of the report. (See, Exhibit 10, March 29, 2019 [email denying AAWARE's request for the report].) **By withholding relevant information relied upon in the GSP about how it would affect the General Plan's agricultural policies and land use designations, the GSA has deprived AAWARE members of a meaningful opportunity to provide input on whether and how the purported General Plan inconsistencies and potential amendments could affect their interests. Additionally, the GSP's General Plan discussion evidences the GSA's intentions to disfavor agricultural uses in implementing the GSP. As a result, the County Board of Supervisors and District Board of Directors (in their role as the GSA) are unable to carry out their obligation to consider the interests of agricultural water users in violation of SGMA. (Wat. Code, § 10723.2.)**

-13-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

2. The Basin's Groundwater Quality Does Not Violate Sustainability Indicators, and the GSP's Extensive Groundwater Quality Monitoring Does Not Appear to be Warranted.

SGMA authorizes GSAs to adopt programs to avoid undesirable results, not to "optimize" water quality. SGMA only requires water quality monitoring as a component of a GSP "as applicable to the basin." (Wat. Code, § 10727 2(d)) SGMA indicates that water quality monitoring may only be necessary where groundwater quality degradation is created by extraction of groundwater or will affect the supply and beneficial uses of groundwater (Wat. Code, § 10727 2(d)(2); 23 Cal. Code Regs , § 354 16(d))

The GSP discussion on groundwater quality concludes: "In general, water quality has historically been good within BWD's wells with TDS at concentrations of less than 500 mg/L" (GSP, p. 2-62.) Wells with nitrate issues are located down gradient from Rams Hill and percolation ponds at the BWD water treatment plant (GSP, p. 2-63) There are no discernable trends of water quality degradation of any constituent. (GSP, p. 2-62 to 2-63) The primary concern is that decreased groundwater levels could induce flow of poor quality water (GSP, p. 2-63) That concern can be addressed more appropriately by minimum thresholds for groundwater levels already in place to address chronic lowering of groundwater levels. (23 Cal. Code Regs., § 354 28(d).)

Additionally, the GSP includes incorrect information about exceedances of nitrates The GSP incorrectly says that "historical exceedances of nitrate concentration have occurred in five wells in the vicinity of Henderson Canyon Road in the northern part of the valley, adjacent to areas of agricultural use"; that one District well in the northern area shows an increasing nitrate trend; and that four wells in the northern area had to be taken out of potable service due to elevated nitrate. (GSP, pp 2-57, 2-62, 3-12.) In response to AAWARE's question for additional information, the GSA responded that only one of the District's wells (ID4-4) is located in the northern management area and was drilled deeper to avoid nitrate. (See, Exhibit 10, March 29, 2019, email and Attachment A.) Additionally, the December 7, 2018 ENSI report entitled "Water Quality Review and Assessment: BWD Water Supply Wells" (GSP Appendix D2, p. 66) says that nitrate occurs in all of the active BWD wells at varying concentrations **well below the maximum contaminant level ("MCL") for nitrate**. The GSP should be corrected accordingly. O2-7

The data simply does not indicate a potential undesirable result supporting the expansive "Water Quality Optimization Program" as part of the GSP The GSA's $124,000 cost to develop the program elements (not including the implementation costs) should be reviewed through the Technical Advisory Committee process. Without a publicly-available itemization of the GSA's costs, program elements such as the new District well and pipeline referenced in the Water Quality Optimization Program (GSP p 4-32) give the appearance of being District transmission system upgrades inappropriately subsidized by private well owners who are not connected to the District's system.

-14-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

The GSP's Water Quality Optimization Program, its potential impacts on the interests of agricultural water users and its costs should be evaluated through the Advisory Committee and Technical Advisory Committee before the GSP is approved.

Also, in addition to noting agricultural amendments and septic systems as potential sources of nitrates in the Basin (GSP pp. 2-56, 2-57, 3-12), the GSP should discuss the District's sewage spreading ponds. (Wat. Code, § 10727.4.) Sewage collected by the District is treated at the Ram's Hill Waste Water Treatment Plant ("WWTP") and then spread to evaporation/percolation ponds. Sludge from the WWTP is discharged to on-site drying beds for stabilization and removed every four to five years for off-site disposal. (See, Exhibit 18 [excerpts from the District's website, October 2007 San Diego County Local Agency Formation Commission Borrego Valley Municipal Service Review & Sphere of Influence Update, and August 2017 Colorado River Basin Regional Board Water Quality Control Plan].) **The GSP's steps to fill data gaps (GSP p. 3-47) should objectively evaluate all potential sources of nitrates in the Basin, not focus on agricultural fertilizer application alone.** O2-7 Cont.

3. **The Dudek Model Update and Water Budget Calculations Are Not Based on Best Available Science and Ignore Information That Contradicts the Pre-Determined Result.**

The foundation of the basin setting is a description of groundwater conditions in the basin and a water budget that is based on the best available information and best available science. (23 Cal. Code Regs., § 354.16.) The Dudek Model Update begins with a description of water demand for the last ten years that outflows are 20,000 AFY and inflows are 5,000 AFY. That description is contradicted by the best available science and information set forth in the GSP, as follows:

- Groundwater inflow across the Coyote Creek fault was estimated to be as high as 3,200 AFY based on a scientific electrical resistivity study, but was dismissed because it was based on "limited data" and "inconsistent with the BVHM model assumption" of a no flow boundary. (GSP, p. 2-42) The GSP's stated reasoning for dismissing the scientifically demonstrated inflow and not accounting for any of it is not based in science: "The GSA does not consider this a critical data gap because historical groundwater levels and trends suggest the flux would be into the Subbasin rather than out of the Subbasin." (GSP, p. 2-42.) O2-8
- Despite actual testing of return flows from irrigation at 22% and golf course at 14% (GSP, p. 2-46), assumptions are made regarding efficiency and a dry saturated zone (despite years of continual watering) to reduce those amounts in the incorrect 2018 ENSI Report discussed above. (GSP, p. 2-75, and Exhibit 17.)
- A mere six year period was used to "validate" the Dudek Model Update. (GSP, p. 2-72.)
- The Dudek Model Update, using only six years of data, finds only 3,905 AFY of surface recharge to the Basin (GSP, p. 2-73), yet the water budget agrees with the 2015 USGS Report's surface recharge amount of 5,700 AFY rather than the Dudek Model Update amount. (GSP, p. 2-80.) The 2015 USGS Report, based on 70 years of data, is the best available scientific data to use.

-15-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

- The Dudek Model Update confirms natural underflow recharge to the Basin averages 1,400 AFY in addition to the 5,700 AFY surface recharge. (GSP, p. 2-76.) Yet, the GSP throughout claims that only 5,700 AFY is available for natural recharge and incorrectly calculates overdraft and loss in storage based solely on the 5,700 AFY amount. (GSP, pp ES-3, 2-34, 2-80, Tables 2.2-9A, 2.2-9B; See also, Exhibit 17, p. 7.) The GSP effectively ignores the underflow as part of the "sustainable yield" despite the science substantiating this information. (GSP, p. 2-61.)
- The Dudek Model Update results "underestimate hydraulic heads," which "may be the result of the model simulating too much pumping compared to actual usage, or underestimating storage values like specific yield for the upper aquifer, or underestimating the amount of recharge to the BVGB, or a combination of all three." (GSP, p 2-79.)

To summarize, the GSP fails to take into account demonstrated Coyote Creek inflow, demonstrated recharge from underflow and demonstrated irrigation return flows. The GSP uses a much different sustainable yield number than from the accepted scientific methods of the USGS Report, with the effect of overestimating overdraft, underestimating sustainable yield and underestimating groundwater in storage. This violates the SGMA requirements for water budgets. (23 Cal. Code Regs., §§ 354.18(b) [estimates based on direct measurements or data], (c)(3) [projected hydrology to utilize 50 years of historical information for estimating future hydrology].) O2-8 Cont

The Basin Setting also should include information about the significant amount of groundwater in storage in the Basin The District previously relied upon that storage as a basis for tempering drought water restrictions and cutbacks. (See, GSP Appendix D2, p 10; see also, District's report to State Water Resources Control Board at https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html#smallsupplier under January 5, 2016 State Water Resources Control Board Small Supplier Report Dataset, Row 131, Column Q [Basin contains at least a 50 year supply of groundwater in the uppermost of three aquifers])

D. **<u>THE SUSTAINABILITY MEASURES ARE NOT SUPPORTED BY DATA FROM THE BASIN SETTING AND DO NOT CONSIDER BENEFICIAL USES.</u>**

1. **<u>The Minimum Thresholds are Not Justified by Supporting Information in the Basin Setting and are Without Input and Consideration of Beneficial Interests and Property Owners.</u>** O2-9

Minimum thresholds must be based on supporting information in the basin setting and data and models and must consider the effect on beneficial users and property interests. (23 Cal. Code Regs., § 354.28(b)(1) & (4).)

-16-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

For the chronic lowering of groundwater sustainability indicator, the minimum threshold must be a groundwater level based on the historical rate of groundwater decline for projected water use and type. (23 Cal. Code Regs., § 354.28(c)(1).)

For the reduction of groundwater in storage sustainability indicator, the minimum threshold should be the total volume of water that can be withdrawn from the Basin without undesirable results, as supported by the sustainable yield of the Basin, but groundwater levels may be a proxy. (23 Cal. Code Regs., § 354.28(c)(2), (d))

For water quality sustainability indicator, the minimum threshold should be the degradation of water quality, but groundwater levels may be a proxy. (23 Cal. Code Regs., § 354.28(c)(4), (d).)

The GSP selects as the minimum thresholds for all three sustainability indicators "maintaining groundwater levels above saturated screen intervals for pre-existing municipal wells during an anticipated multi-year drought circumstance". (GSP, p. 3-17; GSP, p. 3-23 ["use of GWEs at the cross section of wells outlined in Table 3-4 and Table 3-5, are also appropriate minimum thresholds for the following sustainability indicators: groundwater storage, groundwater quality degradation, and depletion of interconnected surface waters"].) There is no explanation of how those well levels are based on the historical rate of groundwater decline for projected water use and type. (23 Cal. Code Regs., § 354.28(c)(1).) O2-9 Cont.

Those groundwater levels appear not to be based upon the point at which groundwater decline would halt, but instead are based upon the Dudek Model Update model run of the pre-determined "sustainable yield" of 5,700 AFY which, as previously explained, is not the maximum quantity in which the Basin can be operated given current inflows and operation of the Basin. (GSP, pp. 3-20, 3-21 ["All of the simulations are based on the target pumping rate of 5,700 AFY being achieved in year 20 of GSP implementation"].)

At least one additional model run should be provided to evaluate target pumping at the total natural recharge of 7,100 AFY to determine whether sustainable yield can be reached at or above that level, as indicated by the data in the 2015 USGS Report and Dudek Model Update. (23 Cal. Code Regs., § 354.26(c).) The groundwater levels chosen according to pre-determined "sustainable yield" were made without consideration of whether the overlying agricultural use can sustain the impact of reducing production well below the Basin's natural recharge. (Wat. Code, § 10723.2; 23 Cal. Code Regs., § 354.28(b)(4).)

2. <u>The GSP Reversed the SGMA Process of Determining Undesirable Results Based Upon Exceedances of Minimum Thresholds and Instead Pre-Determined the Undesirable Results to Back Into Minimum Thresholds Through Modeling of the Incorrect "Sustainable Yield".</u> O2-10

As minimum thresholds are developed for particular uses and locations, the exceedance of those minimum thresholds in a quantitative manner that causes significant and unreasonable effects in

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

the Basin (taking into account potential effects on beneficial users and property owners) is what should be determined as the unreasonable result. (23 Cal. Code Regs., § 354.26(b)(2)-(3).) O2-10 Cont.

The GSP carries out this process in reverse. It works backwards to establish what is the "sustainable yield" and then conducts model runs accordingly. (GSP, pp. 3-10 to 3-12.) There is no discussion in the GSP about how the undesirable results were obtained by a quantitative analysis of "minimum threshold exceedances (i.e., groundwater levels) that cause significant and unreasonable effects in the basin." (23 Cal. Code Regs., § 354.26(b)(2).)

3. **The GSP Mischaracterizes and Confuses the Sustainability Goal by Treating the Goal as Sustainable Yield; The GSP Mischaracterizes and Treats Natural Recharge of Surface Water as the "Sustainable Yield".**

The sustainability goal refers to the implementation measures targeted to ensure that the Basin is operated within its sustainable yield. (Wat. Code, § 10721(u).) "**SGMA does not incorporate sustainable yield estimates directly into sustainable management criteria. Basinwide pumping within the sustainable yield estimate is neither a measure of, nor proof of, sustainability.** Sustainability under SGMA is only demonstrated by avoiding undesirable results for the six sustainability indicators." (DWR, Draft Sustainable Management Criteria, p. 32 [emphasis added].) "The key to demonstrating a basin is meeting its sustainability goal is by avoiding undesirable results." (DWR, Draft Sustainable Management Criteria, p. 33 [emphasis added].) O2-11

In direct contradiction of the DWR guidance and SGMA definition for sustainability goal, the GSP adopts as one of its sustainability goals groundwater use within the sustainable yield. (GSP, p. 3-4.) As explained previously, the GSP errs in treating only natural surface water recharge (5,700 AFY) as the "sustainable yield" without any supporting evidence and despite conceding that the combined natural recharge (including underflow) is 7,100 AFY. **The GSP incorrectly establishes a sustainability goal at far less than the sustainable yield based on an incomplete natural recharge rate that neglects to include 1,400 AFY of underflow into the Basin.**

As discussed above, the GSP's sustainability goal with respect to groundwater quality exceeds the GSA's authority under SGMA by seeking to maintain or improve groundwater quality for transition to future municipal use (GSP, p. 3-4), rather than protect against groundwater quality degradation that impairs water supplies (Wat. Code, § 10721(x)(4)).

4. **The GSP Measurable Objectives Violate SGMA by Using Different Metrics From Those Used to Define the Minimum Thresholds and by Failing to Provide a Reasonable Margin of Operational Flexibility.** O2-12

SGMA requires that measurable objectives be based on quantitative value using the **same metrics and monitoring sites** as are used to define the minimum thresholds. (23 Cal. Code Regs., § 354.30(b).) The measurable objectives must provide a reasonable margin of operational

-18-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

flexibility under adverse conditions which take into account historical water budgets, seasonal and long-term trends and periods of drought commensurate with levels of uncertainty. (23 Cal. Code Regs., § 354.30(c).)

The GSP violates SGMA by creating a new measurable objective of production reductions that was not the metric used to define the minimum thresholds and does not use the monitoring sites that are used to measure the minimum thresholds. (GSP, pp. 3-31 to 3-34.) The GSP attempts to justify the different measurable objective by claiming that the linear reduction of production was the input for the Dudek Model Update, as if that linear input somehow defines sustainable yield or somehow displaces the metric of groundwater levels. (GSP, pp. 3-31 to 3-32.) O2-12 Cont.

Far from providing a reasonable margin of operational flexibility, by ratcheting down production to a level significantly below the Basin's natural recharge, the proposed production reductions of 74% of current production will needlessly impair the interests of water users. Production reductions should be triggered by failure to meet groundwater elevation measurable objectives, and unless the GSA demonstrates undesirable results would occur, should have the operational flexibility of the sustainable yield, which the 2015 USGS Report estimated at 7,824 AFY.

E. <u>THE GSP's PROJECTS AND MANAGEMENT ACTIONS EXCEED SGMA AUTHORITY TO ACHIEVE THE SUSTAINABILITY GOAL FOR THE BASIN.</u>

Project and management actions must achieve the sustainability goals for the Basin. (23 Cal. Code Regs., § 354.44(a).) The GSP must quantify the measurable objectives under the sustainability components that the projects and management actions are expected to meet. (23 Cal. Code Regs., § 354.44(b)(1).)

The GSP must describe the circumstances under which the projects and management actions must be implemented (i.e., the criteria that triggers implementation and termination of the projects and management actions). (23 Cal. Code Regs., § 354.44(b)(1)(A).)

If overdraft conditions exist, the GSP must describe management actions (and quantify the demand reduction they will achieve) to mitigate overdraft. (23 Cal. Code Regs., § 354.44(b)(2).) O2-13

Because the sustainability goal statement inappropriately uses "sustainable yield" as a sustainability goal, it creates additional confusion when evaluating whether projects and programs will achieve the sustainability measures. The sustainability goal must match the sustainability measures, which for all of the sustainability indicators are groundwater levels. Thus, in order to qualify as GSP projects or management actions, they must achieve quantifiable sustainability objectives. (23 Cal. Code Regs., § 354.44(b)(1).)
<u>Management Action No. 1—Water Trading Program.</u> The high cost of developing the Water Trading Program ($122,000 for "planning level development") is unreasonable in light of the fact that there are only a few dozen non-de minimis well owners in the Basin. **<u>To minimize costs, the Technical Advisory Committee process should be used to solicit bids from</u>**

-19-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

qualified engineering firms to act as a clearinghouse for willing buyers and sellers before GSP approval.

Management Action No. 2—Water Conservation Program. The GSP's Water Conservation Program would consist of separate components for the agricultural, municipal and recreation sectors. The primary element of the agricultural conservation program will be water audits to be performed by the GSA or third party contractors which may have the following components:

- Pre-audit analysis of historical water use, topography, climate data and land use;
- Analysis of distribution uniformity (amount of water supplied by irrigation system to each plant), crop density and crop types,
- Analysis of irrigation efficiency (amount of water used beneficially by crop compared to total water applied);
- Analysis of soil grain size and texture, agronomic soil suitability including salinity, drainage and water retention properties;
- Analysis of irrigation system water use efficiency, pressure and maintenance;
- Pesticide and fertilizer application and use;
- A report containing recommendations for improving efficiency and crop yield; and
- Follow up analysis of measures implemented actions/practices and savings obtained.

(GSP pp 4-11 – 4-12) The estimated agricultural water savings totals 365 AFY. (GSP p. 4-15) The estimated cost to develop the program is approximately $130,000. (GSP p 4-19) **The Agricultural Water Conservation Program should be evaluated through the Technical Advisory Committee process after water meters are installed and the level of agricultural water savings to date is evaluated. The program as described would be highly intrusive and must be voluntary.** O2-13 Cont.

Management Action No. 3—Pumping Reduction Program. The Pumping Reduction Program (GSP pp 4-20 – 4-24) would require each well owner to incrementally reduce Baseline Pumping Allocations to reach the estimated sustainable yield (currently, 5,700 AFY) by 2040. The GSA will consider the adoption of fees and penalties for violations of pumping allowance and/or reporting during the GSA implementation period. Meters would be installed within 90 days of GSP adoption. The area of irrigated land and crop types should also be directly tracked to monitor program effectiveness It would cost the GSA $82,000 to develop the Pumping Reduction Program. The Pumping Reduction Program would be implemented once CEQA review of the GSP is completed.

Again, the program amounts to over-regulation SGMA calls for water users to file an annual statement with the GSA setting forth the total extraction in acre-feet of groundwater during the previous water year (Wat. Code, § 10725.8(c).) Additionally, AAWARE members who do not already have meters proposed to install their own meters and to have the usage data remotely reported to the GSA. The agricultural well owners are awaiting the GSA's approval of alternative meter technologies and would like to install meters as soon as possible, in advance of GSP approval. (See, Exhibit 15)

-20-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

Also, as discussed above, because the Pumping Reduction Program relies upon an incorrect "sustainable yield" that is only the amount of the surface water recharge to the Basin, the program exceeds the GSA's authority under SGMA and interferes with overlying water rights to the sustainable yield. (Wat. Code, §§ 10720.1(b), 10720.5(a)-(b).)

Furthermore, the proposed Pumping Reduction Program describes no criteria that trigger its implementation and termination. (23 Cal. Code Regs., § 354.44(b)(1)(A).) The program must be tied to groundwater level targets, and pumping levels should be set without further reductions once groundwater levels are stabilized. **The Pumping Reduction Program should be developed through the Technical Advisory Committee process before the GSP is approved.**

Finally, while the GSA recognizes that the pumping reduction program is subject to review and approval under the California Environmental Quality Act ("CEQA," GSP, p. 4-20), the GSA prematurely commits to part of the program in advance of CEQA review, in violation of CEQA. (14 Cal. Code Regs., §§ 15004(b)(2)(B), 15352, *Save Tara v. City of West Hollywood* (2008) 45 Cal.4th 116, 130-131.)

Management Action No. 4—Voluntary Fallowing of Agricultural Land. The Voluntary Fallowing of Agricultural Land Program would facilitate the conversion of high water use irrigated agriculture to low water use open space, public land or other development on a voluntary basis. Factors that will be considered for the fallowing program include the current extent of agriculture land and water use, the intended land and water use after fallowing, and the potential environmental impacts associated with fallowing (airborne emissions through wind-blown dust, introduction or spread of invasive plant species, and changes to the landscape that could adversely affect visual quality) O2-13 Cont.

It will cost the GSA $103,000 to develop the fallowing program. Site stabilization is estimated at $1,000-5,000 per acre; passive restoration to habitat is estimated at $10,000-25,000 per acre, active restoration to habitat in a relatively short period of time is estimated at $25,000-50,000 per acre. (GSP pp. 4-24 – 4-29.)

The proposed voluntary fallowing program does not directly achieve groundwater level reduction, and its description does not quantify any measurable groundwater level objective under the sustainability components, therefore it does not qualify as a GSP project or management action. Voluntary fallowing in the statute means voluntary and not coerced to make privately owned land suitable for future uses (GSP, p. 4-26 [contemplated conversion of fallowed land to stormwater runoff infiltration project]). (Wat. Code, §§ 10726.2(c), 10720.1(b), 10720.5(a)(b).) A voluntary fallowing program under SGMA would require funding by the GSA as consideration for fallowing the land and covenanting to have it remain fallow, not a penalty in the form of costs to bring the land up to standards for future benefit of others.

Site stabilization for the purposes of avoiding blight associated with dead agricultural vegetation and to reduce potential air quality impacts from wind-blown dust is a County land use concern, not a function of the GSP. Site stabilization on private land should simply consist of destroying the crop on the fallowed portion (e.g., chipped or burned) and

-21-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

stabilizing the soil (e.g. mulched with the resulting tree crop clippings or ash). The GSA should not obligate private property owners to carry out habitat restoration without just compensation. Any further consideration of the Voluntary Fallowing of Agricultural Land should be conducted through the Technical Advisory Committee process.

Management Action No 5—Water Quality Optimization Program. As discussed above, the Water Quality Optimization Program has nothing to do with sustainability measures, but instead seeks to benefit future land uses by "optimizing" water quality, for example, by upgrading the District's transmission system with a new well and pipelines in the Northern Management Area (GSP, p 4-32) to the detriment of overlying agricultural water user interests. (Wat. Code, §§ 10720.1(b), 10720.5(a)(b), 10723 2.) **The GSP's Water Quality Optimization Program and its costs should be vetted through the Technical Advisory Committee, and its potential impacts on the interests of agricultural water users should be evaluated before the GSP is approved.**

Management Action No. 6—Intra-Subbasin Water Transfers Program. The GSP's Intra-Subbasin Water Transfers Program would convey sub-potable water pumped in one management area to another for sub-potable use. For example, groundwater pumped in the North Management Area, with potentially elevated nitrate levels from irrigation return flow, might be beneficially used to irrigate golf course turf in the Central or South Management Area If a sizeable area of land were fallowed in the North Management Area, there is the potential to use existing wells to supply water to the Central or South Management Area. It will cost the GSA $90,000 to develop this program. (GSP pp 4-34 – 4-38.)

The proposed Intra-Subbasin Water Transfers Program is another example of private water users subsidizing programs that benefit others. The cost of any such transfers should instead be borne by those benefitting from the transfer. As discussed above, there is no data evidencing elevated nitrate levels close to MCL: (See, December 7, 2018, ENSI report entitled "Water Quality Review and Assessment: BWD Water Supply Wells" [nitrate levels in all of the active District are **well below the MCL for nitrate**) **The GSP's proposed Intra-Subbasin Water Transfers Program could impair the interests of agricultural water users and should be evaluated through the Technical Advisory Committee process before GSP approval.** O2-13 Cont.

F. **THE ADMINISTRATIVE AND PROGRAM COSTS FAR EXCEED WHAT IS CONTEMPLATED BY SGMA FOR A SMALL BASIN WITH FEW PUMPERS AND INCLUDE COSTS THAT THE DISTRICT IS RESPONSIBLE FOR.**

The GSP estimates 20-year implementation costs of $19.2 million, ***not including*** $652,000 estimated costs required to ***develop*** (not carry out) the management programs, plus unspecified amounts to pay the District for "internal management and administration" and to reimburse the District "for some of its GSA creation and GSP development related expenses". (GSP, p. 5-8) The letter from District Director Brecht indicates that the District will seek reimbursement of as much as $6 million (See, Exhibit 13, April 4, 2019 letter, p. 1, footnote 1.) **The GSP** O2-14

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

Implementation and estimated costs far exceed the ability of the few dozen Borrego Valley well owners to pay.

Of course, it was never the intent of SGMA that the responsibility to pay for public water service provider tasks would be reallocated to private pumpers who are not connected to the water system It is precisely for those reasons that SGMA expressly places the onus on the public agencies comprising the GSA to meet the costs, and where there are new GSP costs, to fund those costs through pumping assessments. (23 Cal. Code Regs., § 354.6(e).) Many of the District's SGMA-related costs that it seeks to have reimbursed (described in Director Brecht's letter, Exhibit 13) are not properly recoverable under SGMA. (Wat Code, §§ 10730, 10730 2.) A 2015 memorandum from the District's legal counsel allocates many of those same costs to the District and the County (See, Exhibit 14, Borrego Water District Board Package October 20, 2015, pp 5-8)

The GSP management and administration costs are similarly duplicative of existing District management costs There is no explanation as to why the District would need to hire two additional full-time engineers when it already has engineering staff. The scope of work required for additional technical staff required to administer the GSP should be developed through the Technical Advisory Committee process to provide input into cost-saving measures. For example, SGMA calls for private well owners to self-report their production to the GSA, so there is no need for the GSA to incur the cost of reading private meters or inspecting private property to confirm acreages and crop types planted. GSA monitoring of groundwater production can be done remotely (see, Exhibit 15, April 26, 2019, Letter to Borrego Valley GSA regarding SWIIM meter systems), and water quality testing and reporting is already undertaken by the District. O2-14 Cont.

SGMA authorizes the GSA to enter into private agreements with private water users to implement the GSP. The Projects and Management Actions shown in Table 5-4 can be met through private agreements with water users.

The infeasibility of the GSP costs is evident when compared with the decision by the GSA members to reject as economically infeasible a $3.4 million water importation project that would bring substantial amounts of supplemental water to the Basin, compared with the $20+ million cost of GSA implementation that would be spread among a few dozen well owners.

The infeasibility of the cost is compounded by the GSP's proposed funding structure (GSP p. 5-10) that would impose:

- Monthly fixed charge based on well meter size (i.e., specific "meter fee" based on meter pipe diameter 0-2 inches, 2-4 inches, 4-6 inches, 6-8 inches, and more than 8 inches), regardless of water usage, and
- Variable pumping fees based on the volume of groundwater extracted (expected to be up to $50/AF on the initial Baseline Production Allocation) to cover just administrative costs during the first 10 years, not including additional potential fees required for specific projects and management actions to implement the GSP Because of the steep reduction

-23-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

> in groundwater pumping required to achieve sustainability, the per acre-foot fee will necessarily increase just as sharply to pay the $20+ million cost.

There is a serious risk that, unless the GSA's costs are checked, the GSP's fixed well meter charges and variable pumping fees will result in the elimination of agricultural land and water use due to inability to pay the needlessly inflated costs.

The method of allocating the GSP costs also was not vetted through the Advisory Committee process and is patently unreasonable for such a small number of water users. In an effort to evaluate the proposal and its potential impacts on beneficial users, AAWARE asked the GSA for a copy of the draft Financing Plan. The GSA rejected AAWARE's request based on the "deliberative process" exemption of the Public Records Act. (See, Exhibit 10, March 29, 2019 email rejecting AAWARE's request.) The GSA's withholding of relevant information prevents a meaningful opportunity for affected private well owners to comment on the GSP's financing plan proposal and evidences the GSA's failure to include AAWARE members and other private water users as part of the deliberative process in violation of SGMA. O2-14 Cont

Before approving the GSP, it is incumbent upon the GSA to disclose: (1) costs for tasks already covered by the District as the water service provider, and (2) costs beyond the authority of the District and GSA to have reimbursed under SGMA; to deduct these costs from the total; and to coordinate with water users to identify cost-saving measures for the remaining implementing actions. As the 2018 ENSI Report explains, the District is primarily concerned with its ability to produce drinking water and related increase in its water production costs. (Exhibit 17, 2018 ENSI Report, p. 1.) Therefore, the County's active and objective oversight of the administration and program costs is required.

AAWARE asks the GSA to convene the Technical Advisory Committee to provide information on how the funding program affects their interests and recommendations for cost-saving measures to reduce the exorbitant GSP implementation costs.

III. AAWARE COMMENTS ON BASELINE PUMPING ALLOCATIONS.

Certain individual AAWARE members have confidentially submitted groundwater production information pertaining to their individual properties under separate cover letters. Further adjustments and corrections to their respective Baseline Pumping Allocations should be made in accordance with the information submitted by individual AAWARE members. Additionally, all confidential information reported by private water producers must be kept confidential and not disclosed without the well owner's written consent. (Gov Code, § 6254; Wat. Code, § 10730.8(b) [personal information submitted under SGMA has the same protection from public disclosure as utility customers, including name, address, telephone number and usage data].) O2-15

The GSA's Baseline Pumping Allocations are not based on the best available data. According to GSP Appendix F, the GSA calculated agricultural Baseline Pumping Allocations using an Annual Water Use Factor equation. (Appendix F, p F-3) AAWARE questions the components of the equation. For example, the equation includes a plant factor determined by the Water Use

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

Classification of Landscape Species IV methodology which, as its name discloses, is geared toward *landscape* trees rather than commercial agricultural crop-producing trees. (GSP Appendix F, p. F-2, Table F-1.)

Certain AAWARE members with meters have submitted their metered groundwater production data to the GSA in confidence. The metered data provides local water duty information for mixed citrus and for lemon crops. The GSA is using similar maximum annual metered groundwater production data to calculate Baseline Production Allocations for municipal and recreational producers. Direct measurement of groundwater production with flow meters is highly accurate and the preferred method under SGMA. (Wat Code, § 10725.8(a); DWR Water Budget BMP, p. 35.) Furthermore, the California Constitution (Article X, § 2), California legislative water policy (Wat. Code, § 100 5), and SGMA (Wat. Code, §§ 10720.1(b), 10720.5(a)) all require that local uses and production practices, among other factors, be taken into account in considering the water use by the AAWARE members and other water users.

Certain other AAWARE members without meters have separately submitted additional groundwater production information for their individual operations to the GSA in confidence. **A more accurate measure of maximum annual water production by AAWARE members can be obtained by using water meter readings for AAWARE members who have meters, and by using local crop irrigation information discussed in data provided to the GSA for AAWARE members who do not have meters.**

In some cases, the maximum irrigated agricultural acreage estimated by the GSA as part of the Baseline Production Allocation does not correspond with the actual irrigated crop acreage reported to the GSA by AAWARE members. The GSA's error may be the result of its use of aerial imagery only from the years 2010, 2012 and 2014, excluding two years of the GSA's five-year baseline pumping period of 2010-2015. O2-15 Cont.

Also, the GSA's Baseline Production Allocation calculations do not account for beneficial uses of water by AAWARE members besides irrigation use, such as domestic use, frost protection or supplemental irrigation required due to low soil moisture retention.

Unless a particular Baseline Pumping Allocation is agreed to in writing, each AAWARE member reserves the right to contest its respective Baseline Pumping Allocation. AAWARE respectfully asks the GSA to convene technical meetings among the water producers who will be subject to the GSP and their respective technical consultants to finalize the calculation of the water producers' Baseline Pumping Allocations. This is an important first step toward cooperative basin management, particularly where the GSA's information and proposals differ so significantly from the 2015 USGS model report (The GSP calls for a mandatory 74% reduction in groundwater pumping based on an incorrectly calculated sustainable yield of 5,700 AFY, while the 2015 USGS report concluded that sustainability can be achieved with a 60% reduction in then-current agricultural pumping (13,162 AFY), and 50% reduction in municipal (1,006 AFY) and recreational (4,113 AFY) pumping to achieve sustainability at total production of 7,824 AFY) (See, GSP p 4-20, Section 4 4 1, 2015 USGS Report pp. 4 and 122, Table 20 (Scenario 6).) AAWARE also supports the proposal made

-25-

County of San Diego Planning & Development Services
c/o Jim Bennett
May 20, 2019

previously by T2 Borrego LLC, for facilitated efforts to mediate the Baseline Pumping Allocation question using a qualified facilitator. O2-15 Cont.

AAWARE urges the GSA to reopen the comment period on the GSP as necessary to continue constructive dialog to resolve the concerns addressed in this letter and reach a workable solution to the GSP.

Sincerely,

Michele A. Staples

Michele A. Staples

MAS/BLH dt
Enclosures (see attached Exhibit List)

cc Jim Seley, AAWARE*
Geoff Poole, Borrego Water District*
Matthew Zimmerman, Department of Water Resources*
Boyd L. Hill, Esq., for AAWARE*

*via email only

-26-

EXHIBIT LIST

"Hard copies" of Exhibits delivered with original letter. Electronic copies of Exhibits posted at:
https //sharefile jacksontidus law/wl/?id=H2lcpnHVFl2x6XJrcHnLpAySefoKnfDt

1. 11/02/18 Joint T2 Borrego/AAWARE Letter to Jim Bennett re Borrego Springs Groundwater Model and Proposal
2. Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego, California
3. 5/16/19 Wagner & Bonsignore Letter Report
4. Dudek GSP Scope of Work excerpts
5. 4/26/19 Transcript of Technical Meeting
6. 5/17/19 Thomas Harder & Co. Letter Report
7. 11/27/17 Advisory Committee Agenda Excerpts
8. GSA website screen shot
9. Advisory Committee Agenda Reports for GSP Rollout Oct 2018, Nov 2018 and Jan 2019
10. 3/29/19 Email providing some requested technical documents and withholding disclosure of others
11. August and October 2018 Advisory Committee Minutes re technical meeting process
12 3/22/19 Email exchange to schedule technical meetings during GSP public comment period
13 4/4/19 BWD Director Brecht Letter re GSP Costs
14 9/24/15 Downey Brand Memorandum to Borrego Water District Board of Directors re Procedure for Imposition of Regulatory Fees Under SGMA
15. 4/26/19 Letter to Borrego Valley GSA
16. 5/16/19 Calibration Wells Correspondence and Documents
17 9/12/18 ENSI Report
18 Excerpts re septic systems and District sewage ponds

-27-

Letter O2

Commenter: Michele Staples, Jackson Tidus – A Law Corporation, on behalf of the Agricultural Alliance for Water and Resource Education (AAWARE)
Date: May 20, 2019

The Groundwater Sustainability Agency (GSA) recognizes the Agricultural Alliance for Water and Resource Education (AAWARE) sustained participation towards sound groundwater management of the Subbasin and looks forward to constructively working with AAWARE's members to achieve a path toward long-term sustainability of the Subbasin.

O2-1 The U.S. Geological Survey (USGS) specifically states that in Scenario 6, which evaluates target pumping rate of 7,824 acre-feet per year (AFY) cited in the comment, "agricultural, recreational, and municipal pumping continue at rates greater than recharge, drawdown and storage losses continue in the areas where this pumping occurs" and that "in the long run, groundwater levels would continue to decline" (USGS 2015 at page 124).[4] This means that the target pumping rate of 7,824 AFY presented in Scenario 6 is greater than the sustainable yield of the basin, and does not meet the sustainability requirements set forth under the Sustainable Groundwater Management Act (SGMA).

The initial sustainable yield estimate used in the Draft Groundwater Sustainability Plan (GSP) of 5,700 AFY was based on the U.S. Geological Survey (USGS) *pre-development scenario* that estimated natural inflows to the boundary of the Borrego Valley Hydrologic Model (BVHM) for the period 1945 through 2010. The *pre-development scenario* was used as the initial sustainable yield estimate recognizing the adaptive management approach of SGMA and iterative process of updating the sustainable yield estimate at each 5-year check-in period during GSP implementation. Additionally, the USGS referenced approximately 1,400 AFY that enters the basin as underflow from adjacent basins but did not clarify the outflow components used in the pre-development scenario. Since calculations of sustainable yield must include both inflow and outflow components, a water budget from the GSP modeling update is presented to confirm the validity of using 5,700 AFY as the initial sustainable yield. A discussion of historical water budget and sustainable yield is provided below.

[4] It is noted that both the USGS and the model update prepared for the GSP repeat the historical climate for evaluation of future climate scenarios. This assumption presents a "what if" scenario that may not represent actual future conditions in the Subbasin.

The USGS' Groundwater Model is based on an overall long-term water budget consisting of all inflows and outflows that contribute to developing the sustainable yield. Overall, the average annual water budget can be expressed in terms of three inflow values and three outflow values summarized in Table O2-1. It should be noted that several non-substantive edits were made in the Draft GSP and the USGS Model Report to ensure consistent terminology and definitions for each water budget component.

Table O2-1
Summarized Historical Water Budget

Water Budget Components (Units in Acre-Feet per Year)	Original USGS Model (1945-2010)	Model Update (1945-2016)	Most Recent 20 Years (1997-2016)	Most Recent 10 Years (2007-2016)
Inflows				
Stream Recharge	4,028	3,905	2,749	1,865
Unsaturated Zone Recharge[a]	1,486	1,497	1,635	1,505
Underflow (Inflow from Adjacent Basins)	1,367	1,367	1,367	1,367
Total Average Annual Inflows	**6,881**	**6,770**	**5,751**	**4,737**
Outflows				
Pumping	10,128	10,597	16,466	16,856
Evapotranspiration[b]	3,032	2,815	759	498
Underflow (Flow out of Southern End)	522	522	520	523
Total Average Annual Outflow	**13,682**	**13,934**	**17,745**	**17,877**
Average Annual Deficit				
Change in Storage	**-6,801**	**-7,164**	**-11,994**	**-13,140**

Source: USGS 2015, GSP Appendix D1
Notes: USGS = U.S. Geological Survey.
[a] Consists of flow from the unsaturated zone into groundwater. Includes direct precipitation recharge (negligible), leakage from some streams within the model domain, and irrigation return flows (Distributed Recharge).
[b] Consumptive use of water calculated by the Farm Process Package for all land use type; primarily represents evapotranspiration

The inflow and outflow terms listed in Table O2-1 are defined as follows:

- *Stream Recharge* is the primary source of groundwater recharge. It comes from surface water that flows into the valley from adjacent watersheds and infiltrates within stream channels.

- *Unsaturated Zone Recharge* is water that infiltrates through soils within the valley and is primarily associated with irrigation return flows. Rainfall within the valley does little to contribute to groundwater recharge.
- *Underflow* is groundwater that enters or leaves the valley aquifer system as subsurface flow at the edges of the groundwater model.
- *Evapotranspiration* refers to water losses from non-irrigated plants. Evapotranspiration has decreased over time because groundwater levels declined many decades ago to a level no longer supporting a viable Honey Mesquite bosque habitat. For instance, evapotranspiration decreased from an average of 3,032 AFY for the period 1945 to 2010 to 498 AFY for the most recent 10-year period (Table O2-1). The 498 AFY includes evapotranspiration from both native and non-native vegetation in the Subbasin, most of which is currently comprised of non-native tamarisk that were traditionally used as wind breaks throughout the Subbasin. Based on GSA mapping, there is estimated to be 211 acres on non-native Tamarisk in the Subbasin, which is thought to use between 359 and 1,361 AFY. Appendix D4 of the GSP has been revised to include this information.

The USGS water budget developed using the BVHM for the years 1945 through 2010 and updated by Dudek for the years 2011 through 2016 indicated that the average total inflow, which includes groundwater subsurface inflow (specified flows), stream leakage, and unsaturated zone recharge (UZF recharge), is 6,900 AFY (rounded) for the period 1945 to 2010 and 6,800 AFY (rounded) for the period 1945 to 2016 (Table O2-1).

The twenty-year and ten-year averages for the most recent periods are 5,800 AF (rounded) and 4,700 AFY (rounded), respectively. These recent periods were comprised mostly of a drier climatic period compared to the longer scenarios beginning in 1945 that included both wet and dry periods. Future recharge from the unsaturated zone is likely to be less than historical estimates because of diminishing irrigation return flows due to pumping rampdown over the GSP implementation period and/or the potential effects of climate change on recharge within the basin.

Historical inflows from 1945 to 2016 were compared to recent (past 10 years) groundwater outflows from the BHVM model update to estimate the initial sustainable yield of the basin. Average inflows from the entire run of the model update provide a reasonable estimate of potential basin inflows because they capture a wide variety of climatic conditions. Outflows from the most recent 10 years were considered to be more representative of potential basin outflows than the entire historical model period because the loss of native phreatophytes has decreased outflow from evapotranspiration in the basin. Using these assumptions, the surplus of inflows over outflows in the basin is estimated to be approximately 5,750 AF (rounded; Table O2-2).

Table O2-2
Estimated Surplus of Inflows Over Outflows

Water Budget Components (Units in Acre-feet per Year)	Acre-feet/Year
Inflows (Model Update 1945-2016)	
Stream Recharge	3,905
Unsaturated Zone Recharge	1,497
Underflow (Inflow from Adjacent Basins)	1,367
Total Inflows	**6,770**
Outflows Besides Pumping (Most Recent 10 Years, 2007-2016)	
Evapotranspiration	498
Underflow (Flow out of Southern End)	523
Total Outflows	**1,021**
Surplus of Inflows over Outflows	**5,749**

Source: USGS 2015, Dudek 2018, Dudek 2019

The text on page 2-81 of the Draft GSP is incorrect as the total inflow components of the BVHM is not additive to the total. As such, the GSP has been corrected to fix this error and clarify the difference between the estimate of natural inflow under the *pre-development scenario* and the estimate of inflows under the *developed scenario*. It should be emphasized that the historical estimates of recharge do not take into account diminishing irrigation return flows that will occur as result of pumping rampdown over the GSP implementation period or potential effects of climate change.

O2-2 The GSA notes your assertion that the proposed adoption of the Subbasin's planning level estimate of sustainable yield violates common law water rights. Your comment calls for a legal conclusion to which the GSA is not required to respond.

O2-3 The GSA notes your assertion that the GSP fails to consider or even mention private overlying farmers or other private groundwater users in evaluating the sustainable yield of the Subbasin. Your comment calls for a legal conclusion to which the GSA is not required to respond. For responses to comments regarding sustainable yield, please refer to response to Comment O2-1.

O2-4 The GSA notes your dissatisfaction with the GSP preparation process and assertion that the GSA failed to allow full participation to consider all interests in preparing the GSP. For responses to comments regarding sustainable yield, please refer to response to Comment O2-1.

The remainder of the comment apart from the sustainable yield does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O2-5 The GSA notes your assertion that the manner in which GSP was developed violates your members' constitutionally protected substantive and procedural due rights process and that the Basin Setting contains improper analyses contrary to best available science. Your comment calls for a legal conclusion to which the GSA is not required to respond.

O2-6 The GSA understands your concern that the analysis of how groundwater sustainability will affect the General Plan is flawed and improperly favors expanding municipal use over existing agricultural use. The GSP merely points out that the current General Plan allows for potentially more development at current water use factors than what may be available given supply constraints under sustainability. Historical and current market conditions suggest that new development is unlikely to achieve the growth rate required to substantially expand municipal use in the near-term. Additionally, the GSP points out that the *current* agricultural water use in the Subbasin may not be compatible with the goal of reducing groundwater demand. This statement is not meant to suggest a bias toward favoring expanding development over *current* agricultural water use. GSP Table 2.1-6 has been clarified to indicate that "Supporting continued agricultural operations *at current groundwater extraction rates* may be inconsistent with the goal of reducing groundwater demand." For the comments pertaining to sustainable yield, please see response to Comment O2-1.

O2-7 The GSA notes your assertion that the GSPs extensive water quality monitoring does not appear to be warranted. The GSP states, "historical exceedances of nitrate concentration have occurred in five wells in the vicinity of Henderson Canyon Road in the northern part of the valley, adjacent to areas of agricultural use (USGS 2015)." Table O2-3 lists the five wells and results for which historical nitrate concentrations are reported to exceed the drinking water standard of 10 mg/L as nitrogen (as N); (45 mg/L as NO_3).

Table O2-3
Historical Nitrate Exceedances in the Vicinity of Henderson Canyon Road

No Wells	State Well ID	Sample Date	Latitude[a]	Longitude[a]	Analyte	Result (mg/L)[b]
1	010S006E15D004S	01/04/2012	33°18'34.88"	116°20'59.25"	Dissolved nitrate	37.3 as N
2	010S006E21A001S	08/03/1955	33°18'01.30"	116°21'03.65"	Dissolved nitrate	155
3	010S006E21B001S	04/08/1952	33°18'00"[c]	116°21'10.1"[c]	Dissolved nitrate	29
	010S006E21B001S	01/01/1953	33°18'00"[c]	116°21'10.1"[c]	Dissolved nitrate	90
	010S006E21B001S	4/12/1955	33°18'00"[c]	116°21'10.1"[c]	Dissolved nitrate	66
	010S006E21B001S	05/26/1963	33°18'00"[c]	116°21'10.1"[c]	Dissolved nitrate	87
4	10S0006E21B002S	9/29/1954	33°17'52"[c]	116°21'16.1"[c]	Dissolved nitrate	10
	10S0006E21B002S	10/3/1956	33°17'52"[c]	116°21'16.1"[c]	Dissolved nitrate	44
	10S0006E21B002S	12/31/1975	33°17'52"[c]	116°21'16.1"[c]	Dissolved nitrate	240
	10S0006E21B002S	Date redacted	33°17'52"[c]	116°21'16.1"[c]	Dissolved nitrate	99.2
5	010S006E17J001S	04/28/1952	33°18'16"[c]	116°22'00"[c]	Dissolved nitrate	26[c]

Notes:
[a] Latitude and Longitude NAD83 unless noted otherwise.
[b] Result reported as nitrate as NO_3 unless otherwise noted.
[b] Latitude and Longitude NAD 27
[c] This result appears to be reported as nitrate as NO_3, which would be below the drinking water standard of 45 mg/L as NO_3 (10 mg/L as N). Additional historical water quality data has not been located for this well to verify the exceedance repotted in the USGS study (USGS 2015).
Source. USGS 2015 (Figure 26 on page 66)

The District wells that show statistically increasing nitrate concentrations are wells ID4-11 near the boundary of the Central Management Area (CMA) and North Management Area (NMA), ID4-18 in the NMA, and ID1-8 in the South Management Area (SMA).[5] It is noted that the current concentration in all of these wells is below one-half the drinking water standard for nitrate; however, these wells should be monitored regularly to track nitrate concentrations and trend. The wells that have been taken out of service due to elevated nitrates include Improvement District (ID) Four (4) wells 1 and 4 (original well ID4-4 later re-drilled and screened deeper), Borrego Springs Water Company Well No. 1 (located at the BWD office),

[5] Includes historical water quality data though Fall 2018 and statistical analysis performed using the Mann-Kendall test at significance level of 0.05 or confidence level of 95%.

the Roadrunner Mobile Home Park and Santiago Estates wells. Section 2.2.2.4 of the Draft GSP has been revised to clarify the location of wells taken out of service and the current concentration of wells (at less than one-half the MCL) exhibiting increasing nitrate concentrations.

The GSA notes your concern that the water quality data do not indicate a potential undesirable result supporting the expansive Water Quality Optimization Program as part of the GSP. The GSA also notes your concern that it should objectively evaluate all potential sources of nitrate in the Basin, not just on agricultural fertilizer application alone. The GSA informs you that the District is currently conducting a study of the treated effluent from the Rams Hill Waste Water Treatment Facility to evaluate its impact on groundwater. The goal of the study is to determine the fate and transport of nitrogen and total dissolved solids originating from the discharge of the water treatment facility to the evaporation/percolation ponds, as per the recent amendment of the Waste Discharge Requirements of the California Regional Water Quality Control Board Colorado River Basin Region Plan (R7-2019-0015). The new District well, under construction as of June 2019, is funded by the District and grant funding obtained under Proposition 1. This new well is not being subsidized by private well owners. The GSA notes your position that the Water Quality Optimization Program, its potential impacts on the interests of agricultural water users and its costs should be evaluated through the Advisory Committee and Technical Advisory Committee before the GSP is approved. The GSA emphasizes that cost to develop the Water Quality Optimization Program is a planning level estimate and that program design and development would occur through a stakeholder process, if required.

O2-8 The GSA notes your assertion that "The Dudek model update and water budget calculations are not based on best available science and ignore information that contradicts the pre-determined result." The model update was never intended to be a reworking and recalibration of the USGS numerical model. As such, it was infeasible to try to add additional inflows to the model, as any additional inflows would cause the model to be uncalibrated and a costly and time-consuming recalibration of the model would have to take place with little to no data available to calibrate added inflows (i.e., limited duration of additional years of observed groundwater level data, limited additional production data and no additional physical data to constrain subsurface inflows/outflows at the model boundary).

The six year period for the model update was based on available data at the time of the model update. The original USGS model was run through the year 2010, and the model update was completed in Summer 2017, meaning that the only data available to update the model was for years 2011 through 2016. The USGS chose not to use a validation period during their initial model run, so the six year validation period was the only period available at the time the update was completed. It should be noted that the model update includes all of the calibrated USGS model, it just appends data from the years 2011 through 2016 to the calibrated USGS model.

The number 3,905 AFY as presented on page 2-73 of the GSP represents only stream leakage in the model, and is not the equivalent of the 5,700 AFY presented in the USGS report. Stream leakage in the initial USGS model run was 3,995 AFY, which is consistent with the average from the model update. As the model update concludes with the drought period of 2011 through 2016, the average stream leakage for the period 1945 through 2016 is slightly lower than the original stream leakage for the period from 1945 through 2010. Again, as noted above, the original period of the USGS model (1945 through 2010) was included in all calculations of average flows for the model update (which includes the years 1945 through 2016).

As another point of clarification, both the original USGS model and the model update start in the year 1929. However, the period from 1929 through 1944 is considered to be a "spin-up" period for the model, and the data for these years is considered less reliable. Therefore, in all calculations made by the USGS in their original report and by Dudek in the model update, data from 1929 through 1944 is excluded.

The 1,400 AFY of underflow from adjacent basins is a number that the USGS calculated as part of model calibration. There are no physical measurements in the area of this inflow to confirm or verify this number. The model update did not attempt to change this number, as this would have changed model conditions such that the model would have become uncalibrated. The model update was not an attempt to recalibrate the USGS model, but rather to update the model with data that had become available since the model was published to extent the period of the model run.

The Basin Setting Section indicates that, "The aquifer holds a large amount of groundwater in storage, estimated to be approximately 1.6-million acre-feet of usable groundwater. However, this amount of remaining storage says nothing about its cost of extraction or potability or available use for irrigation purposes. Section 2.2.2.2 Estimate of Groundwater in storage provides additional information regarding the significant groundwater in storage.

O2-9 The GSA notes your assertion that the minimum thresholds are not justified by supporting information in the Basin Setting and are without input and consideration of beneficial interests and property owners. The GSA points out that the minimum thresholds for chronic lowering of groundwater levels shall be *supported by* historical trends, water year type, projected water use in the basin, and potential effects on other sustainability indicators.

The development of the minimum thresholds for chronic lowering of groundwater levels included review of the hydrogeologic conceptual model, climate, current and historical groundwater conditions including groundwater level trends and groundwater quality, land subsidence data, groundwater-surface water connections and the water budget. The chronic lowering of groundwater levels minimum threshold explicitly takes into account historical loss of groundwater in storage and corresponding decline in groundwater levels.

Development of the minimum threshold includes projected water use in the Subbasin based on annual rampdown in pumping each year from the current estimated pumping to achieve the sustainable pumping target by 2040. The BVHM simulated groundwater levels uses the assumptions that historical climate repeats and projected water use under annual rampdown were implemented to assist with the development of the interim milestones, measurable objective and compared to the chronic lowering of groundwater levels minimum threshold to provide for operational flexibility.

The chronic lowering of groundwater levels minimum threshold takes into account the potential for highly variable future recharge based on the historical record. Rather than simply apply DWR climate change factors to projected groundwater levels based on the above scenario, the GSA developed a minimum threshold based on the potential for a dry climatic period during GSP implementation. As such, the minimum threshold is developed based on the 20th percentile Monte Carlo uncertainty analysis performed to evaluate the effect of time-varying recharge. Under this scenario based on the historical variability in recharge, 80% of the time conditions will be wetter, and 20% of the time conditions will be drier. Development of the chronic lowering of groundwater levels minimum threshold using the Monte Carlo uncertainty analysis provides greater operational flexibility to the Subbasin.

O2-10 The GSA notes your comment that the Draft GSP reversed the SGMA process of determining undesirable results based upon exceedances of minimum thresholds and instead pre-determined the undesirable results to back into minimum thresholds through modeling of the sustainable yield. The GSA emphasizes that as a critically overdrafted basin, the sustainability goal for groundwater in storage is to "halt the overdraft condition in the Subbasin by bringing the groundwater demand in line with sustainable yield by 2040." Similarly, the sustainability goal for chronic lowering of groundwater levels is, "for groundwater levels to stabilize or improve and to ensure groundwater is maintained at adequate levels for key municipal wells" (Draft GSP page ES-4). That is, it is *significant and unreasonable* for continued chronic lowering of groundwater levels and corresponding reduction of groundwater in storage beyond 2040. Thus, absent undesirable results to the other relevant sustainability indicators, such as water quality, or direct impacts to beneficial users of groundwater absent mitigation, the planning level estimate of sustainable yield may be used to guide development of sustainable management criteria.

O2-11 The GSA notes your assertion that the Draft GSP mischaracterizes and confuses the sustainability goal by treating the goal as sustainable yield; the Draft GSP mischaracterizes and treats natural recharge of surface water as the "sustainable yield. SGMA and the DWR, Draft Sustainable Management Criteria indicate that a GSA may decide what significant and unreasonable conditions are and translate them into quantitative undesirable results.

The sustainability goal for groundwater in storage is to "halt the overdraft condition in the Subbasin by bringing the groundwater demand in line with sustainable yield by 2040." Similarly, the sustainability goal for chronic lowering of groundwater levels is, "for groundwater levels to stabilize or improve and to ensure groundwater is maintained at adequate levels for key municipal wells" (Draft GSP page ES-4). The GSA completed extensive analysis of sustainability indicators and determined that based on best available data, continued extraction of groundwater does not directly affect three of the sustainability indicators: seawater intrusion, land subsidence, and depletions of interconnected surface water.

Additionally, limited data suggests some deterioration of water quality as a result of extraction of groundwater (e.g., increasing arsenic concentration noted in one well in the South Management Area [SMA]); however, available data suggest that existing regulatory standards are sufficiently protective of municipal, domestic, and agricultural (including golf course irrigation) beneficial uses. As such, the primary sustainability indicators that apply to the Subbasin are chronic lowering of groundwater levels and reduction of groundwater in storage. Significant and unreasonable undesirable results for these sustainability indicators could include dry wells, loss in well production yield, and depletion of supply to meet beneficial uses. All of these undesirable results have historically occurred in the Subbasin, which has necessitated fallowing, drilling deeper wells and shifting the location of groundwater extraction to meet water demands. Groundwater level declines indicating a significant and unreasonable depletion of supply, if continued over the SGMA planning and implementation horizon, can occur in several ways in the Subbasin. Depletions leading to a complete dewatering of the Subbasin's upper aquifer in the Central Management Area (CMA) would be considered significant and unreasonable because beneficial users rely on this aquifer for water supply.

Groundwater level declines would be significant and unreasonable if they are sufficient in magnitude to lower the rate of production of pre-existing groundwater extraction wells below that needed to meet the minimum required to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. To the extent lowering groundwater levels impact de-minimis pumpers, significant and unreasonable impacts to those pumpers could be avoided. For example, alternative means of obtaining water for de-minimis and domestic pumpers who can no longer pump may include connection to the municipal water system (i.e., BWD), groundwater well maintenance or rehabilitation (e.g., well pump lowering), or for some beneficial users, well redevelopment or deepening. However, use of these alternative means of supply, by themselves, do not necessarily offset undesirable results for lowering groundwater levels in the context of the Subbasin as a whole (as opposed to individual uses or users), because the ultimate source of supply remains groundwater pumped from the Subbasin, even if from another location.

Undertaking an evaluation for one particular use or user depends on the overlying beneficial use(s), the location within the basin, and the characteristics of the well(s) currently in use. Should a groundwater level decline cause the production rate of pre-existing groundwater wells to be insufficient for the applicable beneficial use, an undesirable result may be avoided for that particular user through the alternative means. Certain beneficial users have greater flexibility and financial capacity to address lowering groundwater levels than others. For example, the BWD, as the municipal water system, has the ability to manage production from multiple extraction wells across its service area, normally distributes the cost for well maintenance and development to its pool of customers, and can obtain grants for such work, if available. In contrast, domestic and de-minimis users can have geographic and financial constraints that may make well redevelopment and/or new well construction infeasible.

Given the considerations previously outlined, domestic well users who are not in close proximity to existing BWD water service lines have the greatest sensitivity to and are consequently the most likely to experience the adverse effects of continued declining groundwater levels. Because many of the domestic groundwater users not connected to BWD rely on continued access to the upper aquifer or upper portions of the middle aquifer, an important objective in this GSP is that access to the upper aquifer or upper middle aquifer be maintained, as much is practicable, in areas with de minimis and other domestic wells not currently served by municipal supply.

Overall, there are 77 domestic wells in DWR's well completion report database. The difference between the average well depth and the average groundwater level is less than 50 feet in seven township and range sections, representing 20 domestic wells, which indicates a high likelihood that some may lack access to adequate water in existing wells. With groundwater levels expected to continue to decline early in the GSP implementation period, domestic users are currently experiencing undesirable results, which will be alleviated by 2040. The majority of the wells in this situation are close to the BWD water distribution system. The undesirable results of chronic lowering of groundwater levels is expected to continue to occur absent management action to counteract the current trend, until the Subbasin water budget is brought into balance.

BWD has had to abandon and re-drill wells in the past and expects to continue to do so within the GSP's implementation timeframe to continue to provide adequate groundwater access. For example, BWD Well ID1-10 is being replaced and relocated in 2019 due to declining groundwater levels and production rate loss. The exact number of agricultural and domestic wells that have been abandoned and re-drilled deeper and/or relocated due to production rate loss from declining groundwater levels is not known. However, anecdotal information and field observations have confirmed that inactive wells exist throughout the Plan Area. In addition to thresholds for BWD key indicator wells, the GSA has set thresholds for key indicator wells throughout the Subbasin which are intended to be protective of beneficial uses and users of groundwater.

O2-12 The GSA notes your assertion that the Draft GSP measurable objectives violate SGMA by using different metrics from those used to define the minimum thresholds and by failing to provide a reasonable margin of operational flexibility. The USGS specifically states that in Scenario 6, which evaluates target pumping rate of 7,824 AFY cited in the comment, "agricultural, recreational, and municipal pumping continue at rates greater than recharge, drawdown and storage losses continue in the areas where this pumping occurs" and that "in the long run, groundwater levels would continue to decline" (USGS 2015 at page 124). Additionally the comment fails to recognize the GSPs adaptive management strategies including 5-year outlook for proposed pumping reductions and annual review of the pumping allowance in terms of achieving sustainability goals.

O2-13 The GSA notes your comment that the Draft GSP's Projects and Management Actions exceed SGMA authority to achieve the sustainability goal for the basin and your assertion that the sustainability goal statement inappropriately uses "sustainable yield" as a sustainability goal. The primary sustainability indicators that apply to the Subbasin are chronic lowering of groundwater levels and reduction of groundwater in storage that are inextricably linked to balancing the inflows and outflows into the Subbasin over the long-term or the "sustainable yield." The cost of developing a Water Trading Program is an estimate and actual costs could be less considering multiple available water trading accounting options. The GSA further acknowledges your concern regarding the cost, potential overregulation, and/or implementation of the water trading program, water conservation program, pumping reduction program, voluntary fallowing of agricultural land, water quality optimization program, and intra-subbasin water transfers program. The GSA will take these comments into consideration when projects and management actions are developed after GSP adoption in coordination with the Subbasin stakeholders.

O2-14 The GSA notes your comment that the administrative and program costs far exceed what is contemplated by SGMA for a small basin with few pumpers and include costs that the District is responsible for. The GSA will take this comment into consideration when considering imposing fees to fund GSP implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O2-15 The GSA notes your comments on the Baseline Pumping Allocation and acknowledges receipt of additional comments by pumpers in the Subbasin. The GSA developed Baseline Pumping Allocations based on the best available science and data and has provided each pumper letters with final baseline pumping allocations. For responses to comments regarding sustainable yield, please refer to response to Comment O2-1.

INTENTIONALLY LEFT BLANK

Comment Letter O3

O'Melveny

O'Melveny & Myers LLP
400 South Hope Street
18th Floor
Los Angeles, CA 90071-2899

T +1 213 430 6000
F: +1 213 430 6407
omm.com

May 21, 2019

Russell McGlothlin
D: +1 213 430 8163
rmcglothlin@omm.com

VIA EMAIL: PDS LUEGGROUNDWATER@SDCOUNTY.CA.GOV

Jim Bennet
County of San Diego Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Re: T2 Borrego, LLC's Comments Regarding the Draft Groundwater Sustainability Plan for the Borrego Springs Subbasin

Dear Jim:

This letter presents comments on the draft groundwater sustainability plan for the Borrego Springs Subbasin ("Subbasin") on behalf of T2 Borrego LLC and T2 Holding LLC (collectively, "T2 Borrego"). T2 Borrego owns the Rams Hill Golf Club and the surrounding residential development ("Rams Hill"), which wholly overlies the Subbasin. Rams Hill is comprised of approximately 3,200 acres including an award-winning golf course designed by legendary architect Tom Fazio.[1] The golf club employs approximately 38 full time employees and an additional 40 or more seasonal employees annually. The club is open to the public and includes a clubhouse and restaurants. There are 326 existing homes within the development, which are owned by others, and the development has land use entitlements for 1,244 additional residential dwelling units, various resort amenities, and an additional golf course Entitlements also provided for the public dedication of sites for a water recycling plant, health clinic, and fire station. At its reopening in 2014, Rams Hill acquired and fallowed sufficient agricultural uses to offset water pumped for the golf course, upgraded the irrigation system, landscaped with native plants, and has since added a 1MW solar array to provide a renewable energy source to support its operation.

Representatives of T2 Borrego have attended numerous meetings and conference calls over the course of several years in support of efforts to achieve compliance with the Sustainable Groundwater Management Act ("SGMA") and to resolve groundwater challenges within the Subbasin. T2 Borrego remains optimistic that a compromise can be reached to implement

[1] Bradley S. Klein, *Golfweek* Senior Writer, opined that "Our course-ratings panel has taken a shine to Rams Hill. It already sits at No. 34 on *Golfweek's* Best Resort Courses list in the U.S., and trails only Pebble Beach Golf Links and Spyglass Hill among resort courses in California."

O'Melveny

sustainable management of the Subbasin in a consensus-based fashion. To that effect, there are several aspects of the GSP that will need to be addressed by the groundwater sustainability agency ("GSA"), as discussed herein.

Overarching Comments

1. Sustainable-Yield and Rampdown

As you are aware, the hydrologeologic experts representing T2 Borrego (Aquilogic, Inc.) and AAWARE (Wagner & Bonsignore, CCE) have reviewed the technical work performed by the GSA's consultant, Dudek, in support of the Sustainability Criteria set forth in Chapter 3. They are concerned that Dudek's estimate of the Subbasin's sustainable yield (5,700 acre-feet per year) is inaccurate and too conservative because Dudek failed to consider substantial data gaps or revise the earlier USGS model despite USGS's explicit acknowledgment of such data gaps and recommendations for refinements, and because the 5,700 AFY estimate does not include significant contributions to the replenishment of the Subbasin.[2] (See comment letter from Aquilogic, Inc. attached hereto as Exhibit A). We are concerned that the sustainable yield estimate is inaccurately low, and thus the projected requisite long-term rampdown in BPA is too great.

However, T2 Borrego would support adopting the 5,700 AFY safe-yield estimate as a starting point for the GSP if the GSP also established a collaborative process to assess and resolve the technical uncertainties over time. As we have discussed, we recommend the formation of a technical advisory committee ("TAC") to foster such adaptive management. The TAC should include diverse technical representation from interested stakeholders, which should be charged with addressing the proposed task list set forth in the attached letter from Aquilogic, Inc. With such a process, the stakeholders could put aside their disagreements over the adequacy of the present technical findings, commence with rampdown to set the valley on a path to groundwater sustainability, improve technical understandings of the Subbasin over time in a collaborative manner, and recalibrate safe-yield estimates and rampdown projections, if appropriate, as better technical information is obtained. O3-1

To avoid a contest at this stage concerning the safe-yield estimate and attendant rampdown, the GSP should be modified to expressly provide for the creation of the TAC and to set forth the recommended initial work plan for technical undertakings during the first five years of the GSP's operation.

2. BPA

Unless a comprise is reached concerning the Baseline Pumping Allocation ("BPA") established for each pumper within the Subbasin and the other material provisions for Subbasin O3-2

[2] "The 5,700 AFY safe-yield estimate failed to include an annual average of 1,400 AFY of underflow from adjacent watersheds, which the GSP acknowledges is replenishing the Subbasin, but not included within the 5,700 AFY safe-yield estimate." (GSP p. 2-81)

2

O'Melveny

management, T2 Borrego objects to: (i) the quantity of BPA proposed to be granted to Rams Hill, specifically; and (ii) the method applied to calculate BPA throughout the Subbasin, generally. These objections are based on legal, factual, and equitable grounds.

By letters to the County of San Diego, care of Jim Bennett, dated August 13, 2018, October 18, 2018, and February 8, 2019, we explained that the BPA proposed to be allocated to Rams Hill was inappropriately understated because of the GSA's failure to consider numerous factors including significant weather differences between Rams Hill and the weather station data used by the GSA to calculate evapotranspiration (ETo at Rams Hill is approximately 31% higher than at CIMIS Station 207), salt leaching requirements, historical demand, assumption of HOA irrigated acreage, voluntary conservation, and disparate and unjustified differences in the crop factors used to calculate evapotranspiration between agricultural crops and turf. Please refer to these letters for additional details concerning T2 Borrego's objections concerning the BPA calculation for Rams Hill, which are attached hereto as Exhibit B.

T2 Borrego further objects to the method applied throughout the Subbasin to determine BPA in that the methodology is inconsistent with common law water right priorities for several reasons. First, the GSP allocates BPA to the BWD based on its highest historical use of groundwater during the five-year base period from January 1, 2010 through January 1, 2015. There are multiple infirmities with the BWD allocation. These include: (i) BWD is an appropriator, which under the common law, is junior in priority to overlying landowners unless prescriptive rights have been proven, which have not been proven in the Subbasin;[3] (ii) if prescriptive rights were proven, the amount of prescriptive right that may be established by the BWD would be limited by the overlying rights retained by landowners as a result of "self-help" pumping;[4] (iii) the maximum prescriptive right that could be established by the BWD would be the maximum <u>continuous</u> quantity of extraction during the prescriptive base period (i.e., the <u>lowest</u> annual pumping during any of the five years during the prescriptive period, <u>not the highest</u>);[5] (iv) the GSP does not include a recordation of the BWD's pumping in each of the years within the five-year prescriptive period (it should), and (v) during the prescriptive period, the BWD was delivering a large quantity of groundwater to Rams Hill for golf course irrigation, which demand is now the responsibility of Rams Hill and must now be satisfied exclusively from T2 Borrego's Rams Hill BPA (the BWD should not receive BPA as a result of these deliveries).

Second, the BPA allocated among landowners also does not follow the common law. Allocations among overlyers are not exclusively determined based upon historical use, highest or otherwise, but rather are based upon various considerations oriented toward reasonableness and equity.[6] The GSP's approach of simply calculating each landowner's five-year, maximum

O3-2 Cont.

[3] *City of Barstow v. Mojave Water Agency* (2000) 23 Cal. 4th 1224, 1241.
[4] *See City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 279.
[5] *Id* at 291; *California Water Service Co. v. Edward Sidebotham & Son* (1964) 224 Cal.App.2d 715, 726 (prescriptive rights must be established in relation to the highest <u>*continuous annual production*</u> of water from the basin during a period of five successive years)
[6] *See Tehachapi-Cummings County Water District v. Armstrong* (1975) 49 Cal.App.3d 99249 Cal.App 3d at 1001-1002; see also *Prather v. Hoberg* (1944) 24 Cal.2d 549, 560 (discussing

3

O'Melveny

historical use, while refusing to consider reasonable and equitable factors, like those raised in the aforementioned letters submitted to you from T2 Borrego, fundamentally conflicts with these common law principles.

Finally, the GSP does not disclose the BPA proposed to be allocated to individual users. Instead, it just lists the gross BPA allocated among six categories of users (agriculture, municipal, water credits, domestic users, and de minimis users) at Table 2.1-7. The lack of disclosure of individual BPA renders it impossible for any individual user to determine whether the BPA granted to others is fair or accurate (even assuming arguendo that the five-year maximum pumping approach was appropriate). This concern is further amplified by the fact that half of the GSA is constituted by the BWD, which is a competitive water user and recipient of BPA. Thus, as a matter of equity and transparency, a chart of each user's BPA, including the type of use and magnitude of use (e.g., quantity of irrigated acres) should be included in the GSP.

In addition to the legal infirmities respecting the methods used to calculate BPA, the GSA has not afforded adequate stakeholder input concerning the BPA calculation method. While there was some discussion at the Advisory Committee concerning the base period to be used and whether to apply an average or highest annual use during the base period, the GSA refused to consider other methodologies, such as conformance to common law water right priorities. Instead, the method for calculating BPA was chosen by the GSA, largely without informed stakeholder input or pumper consensus. This decision therefore failed to conform to SGMA's requirement that the GSA consider the interests of all beneficial users of groundwater, including holders of overlying groundwater rights.[7] O3-2 Cont.

Notwithstanding T2 Borrego's concerns regarding the calculation of BPA, T2 Borrego may be willing to accept the proposed BPA calculation methodology and the individual grants of BPA if a comprehensive agreement can be reached concerning a complete management plan for the Subbasin. We anticipate that such agreement would take the form of a stipulated judgment, of which a modified version of the GSP would be attached or otherwise incorporated therein. However, in the event a comprehensive agreement among the stakeholders cannot be reached, T2 Borrego raises these concerns to avoid any premise that T2 Borrego has waived these objections.

3. Conversion of Water Credits to BPA

In addition to the BPA calculation concerns noted in the preceding section, T2 Borrego joins other holders of water credits in urging the GSA to modify the GSP to explicitly provide for (a) the conversion of water credits to BPA using the same consumptive use factors applied to O3-3

division of supply among riparian rights (analogous to overlying rights), citing Wiel on Water Rights (3d ed.) p. 820, § 751").

[7] Water Code § 10723.2; see also Senate Bill 1168, § 1(b)(4) (declaring the legislature's intent in adopting SGMA "[t]o respect overlying and other proprietary rights to groundwater").

4

O'Melveny

calculate BPA for agricultural acreage during the baseline period, and (b) the issuance of BPA to water credit holders at the same time that BPAs are issued for all pumpers in the Basin.

Although the Sustainable Groundwater Management Act provides that it is not intended to alter groundwater rights, nor is an allocation issued pursuant to a GSP to be deemed a determination of water rights,[8] the proposed management actions concerning BPA (i.e., Pumping Reduction Program) (PMA No. 3 in the GSP) and the Water Trading Program (PMA No. 1 in the GSP) will effectively determine and control all opportunities afforded by a water right. This includes the amount of groundwater that may be pumped, the cost of pumping, how and when groundwater rights may be transferred, etc Thus, to remain equitable, lawful, and immune from successful legal challenge, BPA *must* be granted to water credit holders on the same terms (consumptive use factors) established to set BPA for existing irrigators and issued at the same time as all BPAs. Doing so will treat all similar pumpers equally and will avoid disadvantaging land owners who voluntarily reduced water usage early in an effort to help the Basin.

Conversion of water credits to BPA will also streamline management of the Basin by applying a single "currency" of water rights. For example, the BWD could develop a policy that requires a dedication to the BWD of BPA in exchange for extension of service for new developments (or an equivalent payment in lieu of BPA dedication). This would thereby avoid applying two BWD programs--one for water credit holders and one for BPA holders--that may result in disparate and unfair treatment of those pumpers that voluntarily worked with the BWD to advance water management in comparison to those that have not.[9] Without such conversion, other pumpers who are granted BPA would be afforded greater water use opportunities and advantages, including opportunities to accrue carryover, lease of allocation, and transfer and use of allocation to support groundwater production on different parcels, as compared to similarly-situated pumpers that were granted water credits. Such disparate treatment would render the BPAs and Pumping Reduction Program ripe for legal challenge pursuant to a groundwater basin adjudication[10] or other litigation.

This concern can be readily remedied by modifying the GSP to provide for the conversion of water credits to BPA for all water credit holders pursuant to the same consumptive use factors set forth in Appendix F, the elimination of the existing water credits program, and the issuance of such BPA when all BPAs are issued. The GSP could explain that the BWD would soon develop a new dedication program for extension of new water service based exclusively on BPA.

O3-3 Cont.

---

[8] See Water Code sections 10720 5(b)), 10726.4(a)(2), and 10726.8(b).
[9] The BPA calculation methodology set forth in Appendix F would result in a grant of more BPA per acre than has been granted in water credits for the same crop grown with the same method of irrigation and during the same time period. Thus, to deny a conversion of water credits to BPA at the same consumptive use factors would result in disparate treatment unless the BWD were to maintain two dedication programs with different dedication ratios respective of BPA and water credits, which would be unnecessarily complex.
[10] See Code of Civil Procedure sections 830 et seq.

5

O'Melveny

Water credits are not presently included in the total calculation of BPA. (Table 2.1.7, f n. f) Thus, when water credits are converted to BPA applying the same consumptive use factors applied to calculate BPA for agricultural acreage during the baseline period, the total BPA will increase by roughly 2,124 AFY (based on a conversion quantification presented by the County) to a total BPA of approximately 24,087 AFY. This would therefore increase the projected rampdown, based on a safe yield estimate of 5,700 AFY, from the present estimate of 74 percent (see GSP, page ES-4) to about 76.4 percent. If BPA remains as calculated in Table 2.1-7 (e g., pursuant to a comprehensive agreement - see discussion above), the total BPA and the projected rampdown will need to be updated where stated throughout the GSP. O3-3 Cont.

Pursuant to such changes to the GSP and a new BWD dedication program, we agree that the water credits-to-BPA conversion satisfies all obligations of the BWD pursuant to the water credits program such that the BWD would not bear any potential liability for breach of contract, or otherwise, relating to the water credits program.

Specific Comments

The specific comments set forth below are organized in relation to each section of the GSP. Unless otherwise noted, underlined text is requested to be added and strike-through text is to be deleted.

1. Title of GSP

The GSP is titled "Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin." The GSP, however, is only a plan for the Borrego Springs Subbasin of the broader Borrego Valley Groundwater Basin. SGMA defines the basin, for which a GSP is to be prepared, as "a groundwater basin or subbasin identified in Bulletin 118..." The area for which the GSA has elected to undertake GSA responsibilities is only the Subbasin (DWR, Bulletin 118 Basin No. 7.024.01), and accordingly, the title of the GSP should be revised to the "Groundwater Sustainability Plan for the Borrego Springs Groundwater Basin." O3-4

2. Executive Summary

A. The GSP provides at page ES-2 and ES-3 that "[i]n the Subbasin, the most critical aspect of water quality is ensuring that available supplies at municipal well sites are and remain in compliance with drinking water standards. Groundwater quality provided by BWD water supply wells is currently good and meets California drinking water maximum contaminant levels without treatment. Arsenic concentrations were increasing in multiple BWD water supply wells until 2014, but have since decreased." O3-5

The SGMA regulations do provide that in setting minimum thresholds for degraded water quality, the GSA shall consider local, state, and federal water quality standards. However, the GSP should also acknowledge that in balancing beneficial uses and interests in the Subbasin, some future impairment of water quality may occur and that treatment or other mediation may be required, particularly in relation to naturally occurring contaminants within the Subbasin.

6

O'Melveny

B. At page ES-3 edit the following paragraph as follows: "Total dissolved solids and sulfate are presently the only water quality constituents that show increasing concentrations with simultaneous declines in groundwater levels. Overall, the long standing overdraft has resulted in changes of water quality in the Subbasin over time. High salinity, poor quality connate water is thought to occur in deeper formational materials in select areas of the aquifer as well as shallow groundwater in the vicinity of the Borrego Sink in the southern portion of the Subbasin. The BWD does not operate wells in the vicinity of the Borrego Sink. The GSA monitors water quality from a groundwater quality network consisting of 30 wells." O3-6

C. At page ES-4 edit the following statement as follows: "The primary management tool to eliminate the overdraft is to require aggressive pumping cut-backs to a level that does not exceed the Subbasin's estimated sustainable yield of 5,700 AFY before 2040." This edit will render the statement consistent with the text on page ES-5, which states "That [baseline pumping] allocation [under PMA No. 3] will be reduced incrementally as necessary over the GSP implementation period such that the total extraction from the Subbasin will be *equal to* the estimated sustainable yield (5,700 AFY) by 2040." (emphasis added) O3-7

3. Chapter 2

A. At page 2-4, the text states that there are 2,624 acres of irrigated agriculture and 600 acres of fallowed acreage. The text also suggests that the SANGIS 2017 calculation incorporates these 600 fallowed acres within the total agriculture figure of 2,624 acres. However, Table 2 1.3 states that there was 3,474 acres of agricultural land as of 2015. It appears that either the text or table is incorrect, or if not, this apparent discrepancy should be clarified O3-8

B. At page 2-15, the text states that "[t]he County is also currently conducting compliance and enforcement evaluations related to the credits issued by the BWD program. At a later date, existing water credits associated with the WCP may be converted to a Baseline Pumping Allocation using the groundwater consumptive use factors developed by the GSA, as further discussed in Section 4 4, Pumping Reduction Program."

We are unsure what is meant by the County is "conducting compliance and enforcement evaluations related to the credits issued by the BWD program," and request that this statement be clarified. Also, as discussed above, the WCP should be converted to BPA based on the same BPA calculation formula as other agriculture at the time the GSP is adopted and the BPA granted in lieu of water credits at the same time as other BPA is granted. The GSP should clarify that this will occur. Table 2.1.7 and its footnotes on pages 2-26 through 2-17 should likewise be amended consistent with the conversion of water credits to BPA. O3-9

C At page 2-8, edit the following text as follows: "[O]ther than agriculture, recreation, and tourism, there is no major industry or source of high-quality employment O3-10

7

O'Melveny

within the Plan Area likely due to its remote location." While the drafters may be lumping recreation into tourism, that is unclear from the language here and the context provided otherwise in this report. The recreation sector employs more people than the agriculture sector and is a significant employer in Borrego Springs. Rams Hill alone employs approximately 80 full-time equivalent employees on a year-round or seasonal basis. O3-10 Cont.

D. Table 2.2 – 1 lists CIMIS Station 207 as active only until 2015. Our understanding is that CIMIS station 207 is still in use. Please clarify. O3-11

E. At Table 2.2 – 4 and elsewhere in the GSP, change references to ID1-1 and ID1-2 to RH-1 and RH-2, respectively, to avoid confusion because these wells were sold to Rams Hill in 2014 and are no longer owned or operated by the BWD. Also, on page 2-58 there is an inappropriate concern raised by the statement: "Wells exhibiting an increasing trend [in TDS] include BWD ID1-1 and ID1-8 in the SMA." BWD does not own or operate ID1-1 and it is not a municipal supply well for which higher TDS would compromise municipal water supplies. A similar clarification is needed for the statement on page 2-59, which states: "The only well exhibiting an increasing trend [in arsenic] is BWD Well ID1-2 in the SMA." BWD does not own or operate ID1-2 and it is not a municipal supply well for which higher arsenic would compromise municipal water supplies. O3-12

F. At page 2-63, the reference to the Rams Hill/BWD Long-Term Cooperation Agreement should be deleted because it has since been amended, and it is outside the scope of the GSP to discuss private agreements between the BWD and developers. Further, the GSP will require groundwater quality monitoring throughout the basin so this information is not helpful or insightful to readers. O3-13

4. Chapter 3

T2 Borrego's comments respective of Chapter 3 are set forth in the technical comment letter from Aquilogic, Inc. attached hereto as Exhibit A. O3-14

5. Chapter 4

A. At page 4-4, the GSP states: "The water trade review process by the GSA is intended to be structured to prevent unintended consequences, such as hoarding, collusion, or speculation. For example, to prevent hoarding, the GSA could cap the number of 'water shares' held by an individual at a maximum percentage of total shares." T2 Borrego is highly concerned with such restrictions on water transfers and the review process, and it particularly objects to the notion of limiting transfers on the basis of hoarding or speculation. A cap on the amount of allocation that may be transferred does not further any principle of sustainable groundwater management set forth in SGMA and could prevent legitimate water planning for significant and economically beneficial projects, like Rams Hill. Such limitations could also chill the benefits that may be achieved from the transfer program including the reallocation of limited water supplies from lower to higher valued uses and incentives for water users to conserve water in O3-15

8

O'Melveny

support of transfers. Our concerns are further amplified by the fact that half of the GSA is constituted by the BWD, which is a competitive water user, and thus there is potential for restrictions to be placed on the transfer program under a veiled intent to benefit the BWD at the expense of other water users in the Subbasin. Indeed, the only appropriate restrictions on the transfer program are those necessary to avoid adverse impacts to hydrogeologic conditions in the Subbasin that would cause or exacerbate undesirable results. The text on page 4-4 should be revised accordingly and should also explicitly provide for engagement by private pumpers in the development of the program and an opportunity for robust public review and comment on the proposed program before adoption by the GSA. O3-15 Cont

B. At page 4-6, the GSP states that "an area of origin pumping requirement (i.e., North Management Area) may be required for trades. PMA No. 6 – Intra-Subbasin Transfers is being evaluated to address and optimize the distribution of pumping in the Subbasin as a result of implementation of the PMAs." Consistent with the comment immediately above, this text should be revised to explain that any restrictions on transfers will be designed for the sole purpose of avoiding adverse impacts to hydrogeologic conditions that would cause or exacerbate undesirable results. O3-16

C. With respect to the Water Conservation Program (PMA No. 2), T2 Borrego notes that if a robust water trading program is implemented (PMA No. 1), private holders of BPA will be incentivized to conserve and to make investments in conservation to either preserve their economic enterprise supported by the BPA (which will become increasingly more difficult as rampdown occurs), avoid the costs of purchasing BPA from others, or render BPA available for transfer as either permanent sale or lease in exchange for payment. In other words, the market economics inherent in the transfer program will cause private users to make conservation efforts that are economically justified. The text describing PMA No. 2 should recognize this natural economic principle The elaborate scope and costs of the management action are also not justified for the same reason (the market will appropriately incentivize conservation) and because conservation measures internal to BWD customers should be funded by BWD (with grant funding if available), not other groundwater users. O3-17

D. With respect to the Pumping Reduction Program (PMA No. 3), T2 Borrego urges the GSA to modify the underlying accounting principles and terminology used. Rather than providing that each pumper will possess a "share" of the estimated sustainable yield (page 4-19), the program should be founded in BPA and an annual authorized "Pumping Percentage," that being the percent of each party's BPA that is authorized to be extracted in any particular year. Through this approach, the "currency" that controls pumping and that is transferable is BPA, which in any particular year authorizes a given quantity of production. That quantity will be driven by the Pumping Percentage then in effect, and the Pumping Percentage may be adjusted up or down as necessary consistent with improved understandings of the Subbasin, progress in meeting sustainability goals, and other aspects of adaptive management. By contrast, the establishment of a "share" of the estimated sustainable yield in addition to BPA would be O3-18

9

O'Melveny

an unnecessary and confusing additional denomination of pumping right which will result in increased costs for basin management in the future. O3-18 Cont.

E. With respect to the Voluntary Fallowing of Agricultural Land (PMA No. 4), T2 Borrego notes that the fallowing program does not further any principle of sustainable groundwater management set forth in SGMA. T2 Borrego also requests specific clarification of the fallowing requirement and scope of authority that it intended to be vested in the GSA. The text on page 4-25 suggests that the GSA may require different degrees (and expense) of fallowing based on intended post-fallowing land use For example, the text states that "there could be differing levels of site stabilization or restoration needed or required *based on the land use intended post- fallowing*... A passive restoration approach *may be applied* if the goal is for the property to eventually return to native habitat, and active restoration *may be applied* for relatively near-term restoration to native habitat with *the goal of providing open space, parks, or public trails*." (emphasis added)

All similarly-situated land owners must be treated the same, and different levels of fallowing or site stabilization for properties with the same historical use are inappropriate, as this would favor certain properties or property-owners above others, which is inequitable. Fallowing standards must be consistent and equally applied to all properties There is no circumstance where it would be appropriate to *require* some fallowing participants to engage in significant and expensive active restoration to establish open space, parks, or public trails where others are not required to achieve such result. Stated differently, the fallowing program should not be used by the GSA to achieve desired end land uses at the expense of, and without the consensual agreement of and compensation to, the landowner. Rather, the fallowing program should be designed to avoid significant adverse environmental impacts (e.g , significant and unreasonable fugitive dust and visual blight) in a manner that is as inexpensive and unobtrusive as possible. Additionally, the GSA should recognize that some of its desired goals are already regulated, for example by the County's well destruction policy. Anything further may be unlawful (particularly if there is disparate treatment of similarly situated landowners); counter to the policy of using a water transfer market to achieve groundwater sustainability in the valley in a manner that is least economically disruptive; and would increase costs to all pumpers in the Subbasin through costs incurred defending legal challenges . The text at pages 4-25, 4-28, and elsewhere should be modified accordingly. O3-19

F. Clarification is also needed concerning the scope of costs, and responsibility for payment of costs, related to the fallowing program. At page 4-28, the text states that "[p]otential sources of funding for the Voluntary Fallowing of Agriculture Program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.7, Funding Sources." The following paragraph states that the ongoing program costs "are related to the conformance inspections, economic value of fallowed land, the cost for site stabilization, and restoration. Additionally, wells that will no longer be used will have costs to be properly destroyed." O3-20

10

O'Melveny

The only program costs that are appropriate to be borne by the GSA (i.e., funded by groundwater users at large) are the cost of developing the standards and ensuring compliance with the standards. There is no legitimate purpose for the GSA to fund economic valuations of fallowed land, or the costs of site stabilization, restoration, or well destruction. These costs should be borne exclusively by the owner of the land and seller of BPA made available on the basis of agricultural fallowing. The text at page 4-28 should be modified accordingly. O3-20 Cont

G. At page 4-29, concerning Water Quality Optimization, the opening paragraph of this section should be revised as follows: "For irrigation wells, water quality should generally be suitable for agriculture <u>and recreation</u> uses." O3-21

H. At page 4-30 please clarify that the BWD is not currently required to treat water from any of its wells as follows: "In general, the groundwater quality in the Subbasin is good and meets California drinking water maximum contaminant levels without the need for treatment <u>and the BWD is not currently required to treat water from any of its wells</u>." O3-22

I. At page 4-31, the text should be clarified to explain that mitigation actions may not be the responsibility of the GSA (i.e., pumpers at large) to fund. If treatment (direct or indirect) is required, the costs of such treatment should be borne by the impacted party unless the degraded water quality is a direct result of Subbasin management decisions made with the intention to mitigate a water quality effect from such management decision. As the GSP acknowledges, much of the potential water quality concerns in the Subbasin are naturally occurring. Like in other areas of the state, the cost of making use of water with such naturally occurring contaminants must be borne by the individual user. O3-23

J. At p. 4-35, the GSP explains that the wells in different management areas have different end uses. Given that recreation is a significant pumper in the CMA (for example, Borrego Springs Resort is located in the CMA), the language should be modified to state, "...whereas wells in the Central Management Area (CMA) primarily serve <u>recreational and</u> municipal uses..." O3-24

6. <u>Chapter 5</u>

A. T2 Borrego is alarmed by the high costs of implementing the GSP that are projected in Chapter 5. There is insufficient information disclosed in support of these high projections. Although the scope of the tasks listed in Table 5-1 as Operating and Monitoring Costs are generally described in Section 5.1.1.1, there is no information presented regarding how the figures in Table 5-1 were generated (e.g., hours required, percentage of full time employee, consultant budget estimates etc.) The GSP should set forth such detailed information and estimates. Similarly, Section 5.1.2. 2 does not provide any detail regarding (i) the scope of work that would be required for two full time employees, (ii) why $120,000 per full time employee per year is an accurate estimate, (iii) how the line items in Table 5-2 for Management, Administration, and Other Costs O3-25

11

O'Melveny

were generated, and (iv) if any of these estimated costs would also include later work once the PMAs are developed and in place. The GSP should set forth such detailed information and estimates. O3-25 Cont.

B. The same is true for Table 5-3 (GSP 5-Year Update Costs) and Table 5-4 (Projects and Management Actions Development Costs). Each line item is just a figure set forth without any further discussion or support. The GSP should set forth such detailed information and estimates. O3-26

C. It is also not clear why there is additional, but uncalculated, costs for "internal management and administration" by BWD projected (page 5-9) when the GSA is intending to hire two full time employees. The roles and responsibilities between the GSA's full time employees and the BWD's internal management and administration should be calculated and the expense estimated. O3-27

D. Beyond the costs of GSP implementation ($19.2 million for the 20-year period and the $652,000 of Projects and Management Actions Development Costs), the GSP states at page 5-9 that the BWD intends to request reimbursement for GSA creation and GSP development related expenses. Water Code section 10730 authorizes the imposition of regulatory fees for GSP development and Water Code Section 10730 2 authorizes the adoption of an extraction fee for plan implementation. However, it is not clear that a plan implementation extraction fee, adopted pursuant to section 10730.2, may be used to retroactively reimburse a single member of a GSA for previously-incurred expenses. Further, before any reimbursement is made, there would need to be a detailed accounting and review by all stakeholders to determine the legitimacy and fairness of the requested reimbursement (e.g , to determine that the BWD is not seeking reimbursement for expenses that they would have been incurred regardless of GSP development or expenses that are oriented toward the protection of the BWD's interests and favor rather than basin-wide benefit). Additionally, the GSP acknowledges that grants from DWR have funded the majority of the GSP costs to date. Thus, an accounting and review process is also necessary to ensure that the BWD does not request reimbursement for a cost already funded/reimbursed through grant funding Presently, there is absolutely no detail concerning the expenses for which the BWD intends to request reimbursement. The GSP should provide that a detailed accounting and review process will be afforded before any reimbursement is made. O3-28

E. The GSP provides at pages 5-9 through 5-10 that the GSA intends to apply extraction charges, including monthly fixed charges and variable pumping fees, as well as assessment/parcel taxes and grants, to fund GSP implementation. As the GSP recognizes, Propositions 218 and 26 apply to these fees and assessments. Proposition 218 (Article XIII D) provides at section 6, subdivision (b) that the amount of a property-related fee charged to any individual parcel cannot exceed the proportional cost of providing service to that parcel. The GSP should expressly provide that the amount of extraction charge borne by any particular pumper shall be proportional to the cost of providing the GSP benefits respective of the individual pumper. This is particularly important in light of the GSA's intent to apply monthly fixed charges by well meter size, O3-29

12

O'Melveny

which may run afoul of Proposition 218's proportionality requirement. Additionally, since well meters were sized by private pumpers before the potentiality of GSP extraction fees, a monthly fixed meter charge is an inappropriate and arbitrary way to charge GSP fees as there is not a clear nexus between fees and benefits. The suggestion of a monthly fee has also not been vetted publicly before release of the draft GSP. T2 Borrego requests that the GSP be modified to either remove reference to fixed meter charges, or modified to include an explanation of the relationship and nexus between fees and benefits, along with a process that involves the pumpers in development of necessary fees. O3-29 Cont.

F. With respect to the costs of groundwater level monitoring discussed at page 5-4, the costs for field monitoring of groundwater levels may be reduced by automated reporting of water levels from transducers through telemetrically delivered readings The GSP should provide that the potential for such cost savings will be evaluated O3-30

Thank you for the opportunity to comment on the draft GSP.

Sincerely,

Russell McGlothlin

Enclosures:
Exhibit A: Comment Letter from Aquilogic, Inc.
Exhibit B: Letters to County of San Diego re Rams Hill BPA

13

EXHIBIT A

aquilogic, Inc.
environment • water • strategy

245 Fischer Avenue, Suite D-2
Costa Mesa, CA 92626
Tel +1 714 770 8040
Web www aquilogic com

May 21, 2019

Mr Jim Bennett
County of San Diego Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123

sent via email to:
PDS LUEGGroundWater@sdcounty.ca gov

Subject. Draft Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin, Dated March 2019

Dear Mr Bennett

This letter provides technical comments pertaining to the above referenced Draft Groundwater Sustainability Plan (GSP), which is prepared on behalf of T2 Borrego LLC and T2 Holding LLC (collectively, T2 Borrego), owners of the Rams Hill Golf Club, by aquilogic, Inc. (aquilogic) To facilitate the County of San Diego's (County) review and response, we have divided these comments into two categories: General Comments and Specific Comments Comments provided herein apply to the Draft GSP at large (i e., text, figures, tables, and appendices) Without these requested changes we believe the GSP is deficient and inaccurate

General Comments

1 Technical Advisory Committee: Over the past year, we have appreciated the opportunity to work with your consultant, Dudek, and other technical consultants to stakeholders in the Borrego Springs Groundwater Subbasin (Subbasin) to support the development of a GSP consistent with the requirements of by the Sustainable Groundwater Management Act (SGMA). In particular, the technical meetings requested by T2 Borrego and other stakeholders have facilitated a better understanding of groundwater conditions in the Subbasin, and how groundwater sustainability could be achieved in the future. To that end, we recommend that a Technical Advisory Committee (TAC) be established in the GSP and convened to move forward as a Project Management Action (PMA) The GSP would establish that the TAC would meet regularly to assist and advise the Groundwater Sustainability Agency (GSA), County, or other future responsible agency, on technical issues related to the sustainable management of groundwater resources of Subbasin. The TAC would address technical issues in all three currently identified individual management areas (North [NMA], Central [CMA], and South [SMA]) The responsibilities of the TAC would include, but not be limited to, the following: O3-14a

- Use best available science and engineering, considering all relevant data, in its technical deliberations and recommendations,

1

aquilogic re Comments to Draft GSP for the Borrego Valley Groundwater Subbasin, dated March 2019

- Assess and update the water budget and sustainable yield for the Subbasin at least every five (5) years during the first 20-year GSP implementation period,
- Evaluate the potential for Undesirable Results, as defined SGMA, and whether they are significant and unreasonable,
- Analyze whether the minimum thresholds and measurable objectives can be met and are sufficient to prevent Undesirable Results,
- Assess and recommend any additional actions to avoid Undesirable Results,
- Evaluate the effectiveness of management actions and projects defined in the final GSP and, where necessary, make recommendations to revise or supplement the actions and/or projects.

We request that you make this update to the GSP in order to ensure participation and review by technical experts to the stakeholders Please also note that this letter includes additional items for review by the TAC in later comments

O3-14a Cont.

2 Low Sustainable Yield As you are aware, the hydrogeologic experts representing T2 Borrego (aquilogic) and AAWARE (Wagner & Bonsignore and Tom Harder Company et al) have previously provided technical concerns to the GSA's consultant (Dudek) related to the accuracy of the key hydrogeologic components utilized in the GSP as it pertains to the USGS numerical groundwater model. Chief among these is the preliminary estimate of 5,700 AFY for the sustainable yield (SY) for the Subbasin Estimates of baseline SY prepared independently by ourselves and separately by Wagner & Bonsignore, are on the order of 7,100 AFY, or approximately 20% higher than the current conservative figure of 5,700 AFY being used for planning by the GSA during the initial 5-year reassessment period This artificial and arbitrarily low value for SY appears to be the result of Dudek and the GSA inexplicably omitting 1,400 AFY of subsurface inflow from adjacent mountain fronts and watersheds Indeed, Dudek states in the GSP that, "*The average annual natural recharge of water reaching the saturated zone, which includes stream leakage and infiltrating water through the unsaturated zone, was 5,700 AFY for the full model simulation period from 1929 to 2010 (USGS, 2015). In addition to natural recharge from stream leakage and infiltrating water (mostly from irrigation return flows), the Subbasin received underflow originating from adjacent watersheds at an average annual rate of 1,400 AFY Therefore, the combined average annual natural recharge to the BVGB is approximately 7,100AFY .*" (Chapter 2, section 2 2.3 6, page 2 80) Based on these facts, we are concerned that the current estimate of SY is inaccurately low, and thus the projected requisite long term demand reduction (pumping) rampdown is also unnecessarily conservative (i e. too high) We therefore request that the preliminary SY be corrected to 7,100 AFY and that the proposed rampdown percentages and schedule be revised accordingly, along with all other related information and data presented in the GSP

O3-14b

2

aquilogic

re Comments to Draft GSP for the Borrego Valley Groundwater Subbasin, dated March 2019

3. USGS Model Inaccuracies The USGS recognized the inherent inaccuracy and uncertainty in their numerical groundwater model which was used by the GSA as the hydrogeologic foundation for the Subbasin and by Dudek to prepare the Borrego Valley Hydrogeologic Model (BVHM) At the September 2018 technical meeting with aquilogic and Wagner & Bonsignore, Dudek characterized current USGS model uncertainty at approximately 20% On page 115 of the attached United States Geological Survey (USGS) Scientific Investigation Report 2015 5150 (USGS 2015 [Exhibit A]), the USGS experts state, *"In summary, some potential components that could improve the accuracy and reduce uncertainty of the simulation could include, but are not limited to the following*
   - Improved temporal estimates of land use,
   - Improved estimation and application of crop and irrigation properties,
   - Improved mapping of density, temporal distribution, and areal extent of natural vegetation, particularly phreatophytes,
   - Improved estimates of ungauged steam inflows through linkage to a daily precipitation-runoff model that simulates routed stream flow,
   - Improved estimates of hydraulic properties through field tests,
   - Improved texture estimates at depth,
   - Improved simulation of multi aquifer wells to account for well pumping capacities,
   - Improved simulation of wet year winter runoff within the FMP, and
   - Inclusion of antecedent soil moisture in the FMP".

   The nine items listed above by the USGS for improved model accuracy track closely with the data gaps we have recommended for closure during the first 5 year reassessment period and must be identified in the GSP and reevaluated immediately (These specific items are detailed in Specific Comments # 2 and 3, below) These important data gaps must be closed or the model will continue to perpetuate inaccurate simulations, which has significant management impacts for property owners and pumpers in the Borrego Springs Valley We are therefore requesting the GSP be revised to list and acknowledge the nine USGS items and that there is inherent inaccuracy and uncertainty in the current USGS model that will be redressed during the first 5-year reassessment period O3-14c

4 USGS Model Preliminary Given the inherent inaccuracy and uncertainty in the current USGS numerical flow model that was utilized as the foundation for the hydrogeologic findings and recommendations in the GSP, it is especially important to clarify in the GSP text that the model is preliminary and that findings and conclusions derived by Dudek from use of the incomplete model, such as the value for SY, are also preliminary and subject to change. We therefore request that Chapter 2 and Chapter 3 be clarified by the addition of introductory text to each Chapter that expressly states that the numerical model, and by extension the information pertaining to the occurrence and condition of groundwater in the Subbasin, is preliminary and will be revised as new data becomes available For example, references to the BVHM in Chapter 2 and elsewhere in the GSP should be revised to expressly state the O3-14d

3

data is preliminary and subject to refinement, and that the BVHM and USGS model will be revisited and updated at a minimum every 5 years These same corrections for clarity in the GSP text should also be made as needed in Chapter 3, especially in all those sections (for example section 3 3.2 6) that discuss the proposed Minimum Thresholds (MTs) and Measurable Objectives (MOs) related to groundwater elevations in wells It is important to make these changes now so it is evident to all stakeholders that the data is preliminary and is subject to reexamination and change. O3-14d Cont

5. Majority of Groundwater is for Non potable Use. State law requires that water delivered to customers for potable use must meet certain standards The text in Section 2 2 4 of the GSP currently compares raw ground water quality to treated (potable) water standards, without explicitly explaining that a majority of the groundwater in the Subbasin is used for recreational and agricultural irrigation (i e , non potable use) that does not have to meet potable standards Please further clarify that groundwater provided by the Borrego Water District (BWD) for municipal use must, and currently does, meet Title 22 Drinking Water Standards in order to be served to the public, as required by the State Water Resources Control Board's (SWRCB) Division of Drinking Water (DDW) In addition, please clarify that meeting established safe concentrations for the constituents of concern (COCs) in drinking water is the responsibility of the BWD, and that treatment of groundwater is a standard procedure for a majority of municipal drinking water systems in the State, and therefore it is not appropriate for funding by the GSA Hydrogeologic data from all the Subbasin management areas (NMA, CMA, and SMA) are needed to fully characterize groundwater conditions and potential implications, if any, for sustainable management of the Subbasin in the future Water from lower layers of the aquifer is not necessarily poorer quality water than that from higher layers of the aquifer, and the GSP needs to clearly state this and remove contradictory conclusions based on preliminary information Additionally, the text in this section (2 2.2 4) needs to be updated to match data provided in Table 2 2 6 on p 2 63, the majority of which shows no trend in constitutes of concern many of which are naturally occurring O3-14e

6 Water Quality Is Good Section 2 2 4 of the GSP shows that water quality is good, even without treatment, but the text in this section doesn't match the tables presented Out of the 15 entries in Table 2 2 6, 11 wells are identified as having no trend, and only five are identified as showing a "trend" Of these five, two are noted as having a decreasing trend Most notably one entry in the NMA for Nitrate that is currently listed as "increasing" appears to be actually decreasing (or no trend) based on the data presented in the table In the SMA, sulfate and TDS are listed as increasing, but both constituents are below their respective MCLs Based on this data the paragraph below the table which discusses potential future water quality impacts seems highly speculative without additional data. Indeed in the next following paragraph titled "Data Gaps" the GSP states that, "*The lateral* O3-14f

distribution of the wells in the monitoring network that measure groundwater quality is limited and does not extend to the outer portions of each management area" The subject paragraph goes on to state there are deficiencies in monitoring data in the SMA and elsewhere in the Subbasin primarily caused by high variability in the data and concludes with this statement." *Based on the inconsistent analytical suites between wells and monitoring periods, this variability represents a significant data gap."* Given the uncertainty related to data availability and data quality we request that the GSP remove speculative statements about poor or decreasing water quality and increasing trends of constituents of concern until representative data has been collected and analyzed Additionally, we request that the subject table be corrected as noted O3-14f Cont

7. Well Ownership There are places in the text, for example page 2 59, that erroneously credit ownership of T2 BORREGO-owned wells ID1 1 and ID1-2 to ownership by the BWD Please correct all such references. Further, any implication that water quality from these wells affects drinking water is also incorrect and requires revision O3-14g

Specific Comments

1 Section 2 2, page 2 35, Table 2 2 1, CIMIS Station 207 is listed as "Active" in this table, but the "Period of Record" is presented as 2008-2015 Please check the status of the Period of Record in the subject table (i e , 2008-present?) and revise, as needed O3-14h

2 Section 2 2 3 4, page 2-80 states, *"As **future funding allows** (emphasis added), the GSA intends to conduct aquifer tests at wells screened **only in the upper aquifer and only in the middle aquifer*** (emphasis added) *to obtain site specific estimates of hydraulic conductivity and specific yield for each aquifer unit. This information **may be** (emphasis added) used to enhance the calibration of the model to these hydraulic properties and our understanding of storage in the BVGB (Subbasin)"* This work, along with the items listed in #3 below and the nine items recommended by the USGS to further reduce the inaccuracies in the numerical model, should be done immediately and be prioritized for funding and collection during the first 5 year reassessment period The data should be incorporated in the existing numerical groundwater model The attached United States Geological Survey (USGS) Scientific Investigation Report 2015 5150 states, *"Specific yield typically is orders of magnitude larger than specific storage and is volumetrically the dominant storage parameter in the valley"* (USGS, 2015, p 86) As such, it is one of the most sensitive components of the current Subbasin numerical model and critical to a more representative water budget. We request that all qualifiers in the GSP pertaining to the timing, and collection of these data be removed. Data from all three aquifer layers and management areas (NMA, CMA, and SMA), not just the upper and middle, are needed to close these important data gaps and obtain a complete picture of the Subbasin's hydrology and a more useful and accurate numerical O3-14i

groundwater model We therefore request that the GSP's current text be revised accordingly and these additional tasks completed. O3-14i Cont.

3. In addition to collection of representative specific yield estimates for use in the numerical groundwater model for the three aquifer layers identified in the Subbasin, we also recommend that the text in Section 2.2.3 4 be modified to identify and prioritize the subject hydrologic data for funding and collection during the first 5-year reassessment period as follows, which should be reviewed by the TAC.
   - Specific yield estimates for the three aquifer layers identified in the existing USGS model;
   - Collection of data and more detailed analysis of mountain front underflow in the Subbasin at large;
   - Collection of additional depth related water quality data, for improved Mann Kendall Trend analysis;
   - Water optimization measures for further study;
   - Agricultural and recreational return flows;
   - Completion of a detailed feasibility and cost/benefit analysis for intra-management area water transfers, O3-14j
   - Based on the new data, an analysis of projected changes in groundwater storage over time when 2030 climate change predictions are included, and
   - Any other matters approved by the pumpers, including but not limited to, items required to comply with SGMA, meet the objectives of the County General Plan Update, and matters listed in Section 5 of the Rampdown Provisions

   These data and improvements are all necessary to reduce current inherent inaccuracies and data gaps in the USGS numerical model in order to help refine the hydrogeologic components used to estimate the Subbasin water budget and its various components. These components include, but are not limited to, the SY for the Subbasin, the GSP Minimum Thresholds (MTs) and Measurable Objectives (MOs) related to groundwater, and by extension, the proposed rampdown schedule over the long-term In the most recent technical meeting [on May 10, 2019], all experts, including Dudek, concurred with the importance of conducting this additional analysis and evaluation during the first five-year assessment period The GSP should be modified to include this language

4. Section 3.3 1 4, Table 3-6 on page 3 24 identifies the proposed rampdown schedule and percentages for demand reduction (i e , pumping reduction) in the Subbasin for each of the 5 year reassessment periods though 2040 Yet, in Section 4 4, PROJECTS AND MANAGEMENT ACTION NO 3 – PUMPING REDUCTION PROGRAM, there is no mention of the rampdown percentages provided in Table 3-6 We request that the text in Section 4 4 be revised to incorporate this important information pertaining to the proposed rampdown schedule and percentages utilizing a SY of 7,100AFY Further, we request clarification to the O3-14k

aquilogic

re Comments to Draft GSP for the Borrego Valley Groundwater Subbasin, dated March 2019

GSP text that to the extent that in the future if the SY or other Subbasin hydrogeologic components are revised consistent with the TAC analysis, the rampdown percentages and schedule will be revised accordingly O3-14k Cont.

5. Please clarify if the groundwater well level MTs described in Tables 3 4 and 3 5, pages 3-19 and 3 22 are based on data derived from the BVHM, and are therefore preliminary and subject to change Please also add text to state that the identified "key wells" could be added or replaced for the purpose of MT compliance monitoring by the TAC as new data becomes available The GSP appears to be using the top of the well screen interval as the MT for groundwater levels Several BWD wells on the subject table have an "N/A" entered in the column titled "Minimum Threshold/Top of Well Screen (feet bgs)", yet in the adjacent column the well screen intervals are actually listed Please clarify and revise the MT column and the column titled "Existing Minimum Threshold Exceedance "as needed. These changes are necessary based on previously expressed concerns about the inaccuracy of the Subbasin SY (which is the basis of MTs and MOs for rampdown and sustainability over the GSP implementation period), all of which has significant impacts on pumpers and must be based on the best available science. O3-14l

6 In Chapter 3, Table 3-4, page 3-19, please add a column titled "Surface Elevation" and provide the relevant topographic surface data for each well on the table O3-14m

7 In Chapter 3, Table 3 5, page 3-22, please remake this table to resemble Table 3-4 (i e all the same columns and data), including surface elevation. Without this information it is difficult to understand the proposed preliminary MTs for the individual management areas Further supporting data is needed to verify the appropriateness of the proposed MTs for the various individual management areas and the SMA in particular O3-14n

8 Chapter 5, PLAN IMPLEMENTATION, Revise as needed, Tables 5 1 through 5-5 to reflect the inclusion and funding (costs) for conducting the collection and analysis of the data described in this comment letter during the first 5 year reassessment period Please clearly identify which tasks are related to the initial and later 5 year reassessment periods, and which tasks are ongoing annually (e.g., is model updated annually or on a 5 year reassessment schedule) We request that the groundwater numerical model be updated a minimum of every 5 years O3-14o

9 Chapter 5, page 5-4, with respect to the costs of groundwater elevation monitoring, the costs for field monitoring of groundwater levels may be reduced by automated reporting of levels from transducers through telemetrically delivered readings The GSP should provide that the potential for such savings will be evaluated O3-14p

7

aquilogic

re. Comments to Draft GSP for the Borrego Valley Groundwater Subbasin, dated March 2019

The T2 Borrego team appreciates the opportunity to provide these comments to the Draft GSP. We also look forward to working cooperatively with all the key stakeholders and agencies to adaptively manage groundwater in the Subbasin to achieve sustainability of this vital resource. We respectfully request that the above-listed corrections and text revisions be made before the GSP is finalized and that the identified data gaps are addressed either immediately or by the TAC during the first 5-year reassessment period. Please do not hesitate to contact the undersigned should you have any questions regarding the comments provided herein.

Regards
aquilogic, Inc.

TL Watson

Thomas Watson, PG
Principal Geologist
tom.watson@aquilogic.com

Enclosure: USGS Scientific Investigation Report 2015-5150

cc: Cathy Milkey, Rams Hill Golf Course
Shannon Smith, Rams Hill Golf Course
Russ McGlothlin, O'Melveny & Meyers
Anthony Brown, aquilogic, Inc.

8

Letter O3

Commenter: Russel McGlothlin, O'Melveny & Myers LLC, on behalf of T2 Borrego LLC and T2 Holding LLC (T2 Borrego, or Rams Hill)
Date: May 21, 2019

O3-1 The Groundwater Sustainability Agency (GSA) welcomes the T2 Borrego LLC's comments on the Draft Groundwater Sustainability Plan (GSP) and sustained participation in development of the GSP. The GSA notes your concern that the sustainable yield estimate is "inaccurate and too conservative" and " thus the projected requisite long-term rampdown in BPA [Baseline Pumping Allocation] is too great." The GSA also notes that T2 could support adopting the 5,700 AFY planning level sustainable yield estimate if a technical advisory committee is formed to foster adaptive management to assess and resolve technical uncertainties. The GSA will take this comment into consideration as it develops governance for implementation of the GSP.

O3-2 The GSA acknowledges your objection to the quantity of BPA proposed to be granted to Rams Hill and method used to determine BPA throughout the Subbasin. The commenter is referred to the Master Response on the BPA. The GSA also acknowledges your willingness to accept the BPA through an agreement in the form of a stipulated judgment.

O3-3 The GSA acknowledges your request to include conversion of water credits to BPA using the same methodology used to calculate BPA for agricultural acreage during the baseline period and issuance of BPA to water credit holders at the same time as BPAs are issued for all pumpers in the Basin. The GSA also acknowledges that the total BPA and the projected rampdown would need to be updated should water credits be converted to BPA.

O3-4 The GSA will change the title of the GSP to the "Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin."

O3-5 The GSP states,

> Degraded water quality is significant and unreasonable if the magnitude of degradation at pre-existing groundwater wells precludes the use of groundwater for existing beneficial use(s), including through migration of contaminant plumes that impair water supplies, where alternative means of treating or otherwise obtaining sufficient alternative groundwater resources are not

technically or financially feasible. At a minimum, for municipal and domestic wells, water quality must meet potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. The Basin Plan has not established numerical objectives for groundwater quality in the Plan Area but recognizes that in most cases irrigation return flows return to the aquifer with an increase in mineral concentrations such as TDS and nitrate (Colorado River RWQCB 2017). The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater and irrigation/fertilizer use best management practices (Draft GSP Section 3.2.5; page 3-13).

O3-6 The GSA has made an edit to page ES-3 of the Draft GSP to state, "[t]he BWD does not operate wells in the vicinity of the Borrego Sink."

O3-7 The GSA has made an edit to page ES-4 of the Draft GSP.

O3-8 The GSA has verified the estimate of irrigated acreage and fallowed land stated at page 2-4 and Table 2.1.3 as being correct. The acreage provided in Table 2.1-3 is for 2015 and from San Diego Association of Governments' (SANDAG's) database, whereas the acreage determined by the GSA's own mapping is for 2018, as stated in the Draft GSP. The 2018 estimate of 2,624 acres should be considered the most accurate estimate for current conditions.

O3-9 The GSA has made the requested edit to page 2-15 of the Draft GSP. Again, the GSA, recognizes your request to convert water credits to BPA.

O3-10 The GSA has made the requested edit to page 2-8 of the Draft GSP. The GSA also acknowledges that the recreation sector provides employment in the community.

O3-11 The CIMIS Station remains active. The GSP has been revised to indicate as such.

O3-12 References in the GSP to ID1-1 and ID1-2 have been changed to reference new well names. While these wells are non-potable wells and not subject to drinking water standards, increasing trends for water quality constituents are important to track Subbasin-wide. The GSA will consider adding a clarifying statement that the wells are non-potable and the current concentrations do not limit beneficial use for irrigation.

O3-13 The GSA has edited the GSP to remove reference to the Rams Hill/BWD Long-Term Cooperation Agreement.

O3-14a The GSA notes your recommendation that a Technical Advisory Committee be established in the GSP and convened to move forward as a Project Management Action and meet regularly to assist and advise the GSA on technical issues related to the sustainable management of groundwater resources of Subbasin.

O3-14b The GSA acknowledges your comment pertaining to the preliminary estimate of sustainable yield. The commenter is referred to the Master Response on sustainable yield and to response on Comment O2-1.

O3-14c The GSA notes your comment pertaining to model uncertainty. The GSA clarifies that Dudek represented informally the uncertainty with the sustainable yield estimate may be around +/-20% 5,700 AFY but did not formally document uncertainty of the USGS model by this comment. The GSA acknowledges the USGS's summary of ways to reduce uncertainty in the model. In fact, the GSA presented model uncertainty to the public at the October 26, 2017, Advisory Committee Meeting and discusses model uncertainty in Draft GSP Section 2.2.3.4, Discussion of Model Validation, Uncertainties, and Recommendations for Improvement. The GSA acknowledges the nine items you list from the USGS report and will consider prioritization of the items that could improve the accuracy and reduce uncertainty of the model.

O3-14d The GSA acknowledges your comment that the Draft GSP should be clarified to indicate that the model is preliminary and that findings and conclusions derived from the model, such as the value for specific yield, are also preliminary and subject to change. The GSA also notes your request that Chapter 2 and Chapter 3 be clarified by the addition of introductory text to each Chapter that expressly states that the numerical model, and by extension the information pertaining to the occurrence and condition of groundwater in the Subbasin, is preliminary and will be revised as new data becomes available. You request to expressly state the data is preliminary and subject to refinement, and that the BVHM will be revisited and updated at a minimum every 5 years. You ask for these same corrections for clarity in the GSP text should also be made as needed in Chapter 3, especially in all those sections (for example Section 3.3.2.6) that discuss the proposed Minimum Thresholds (MTs) and Measurable Objectives (MOs) related to groundwater elevations in wells. The GSA has reviewed your request and incorporated changes to the text where appropriate.

O3-14e The GSA acknowledges your comment that the Draft GSP does not explicitly explain that a majority of the groundwater in the Subbasin is used for recreational and agricultural irrigation (i.e., non-potable use) that does not have to meet potable standards in the text of Section [2.2.4] of the Draft GSP. The GSA points out this specific comment is addressed in the minimum threshold for degraded water quality. The GSA notes that

> Degraded water quality in the Subbasin, as discussed in Section 3.2.4, Degraded Water Quality – Undesirable Results, is significant and unreasonable if it is sufficient in magnitude to affect use of preexisting groundwater wells such that the water quality precludes the use of groundwater to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. For municipal and domestic wells, this means water quality that meets potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture [and recreational] use. As indicated in the Basin Plan, irrigation return flows and septic recharge returns to the aquifer with an increase in mineral concentrations such as TDS and nitrate. (Draft GSP page 3-29)

The GSA has added a sentence to further clarify that most groundwater pumped in the Subbasin is used for non-potable purposes.

We also note your comment requesting clarification that, ". . . meeting established safe concentrations for the constituents of concern (COCs) in drinking water is the responsibility of the BWD, and that treatment of groundwater is a standard procedure for a majority of municipal drinking water systems in the State, and therefore it is not appropriate for funding by the GSA." The GSA notes your comment that "Water from lower layers of the aquifer is not necessarily poorer quality water than that from higher layers of the aquifer, and the GSP needs to clearly state this and remove contradictory conclusions based on preliminary information." You also indicate that the text in Section 2.2.2.4 Groundwater Quality needs to be updated to match Table 2.2-6, Management Area Background Water Quality. The GSA reviewed the text and clarified as necessary the analysis used to provide the narrative in the text.

O3-14f The GSA notes your requested revisions to clarify trends of constituents of concern and revisions to Table 2.2-6. The GSA also notes your request to remove speculative statements about poor or decreasing water quality and increasing trends of constituents of concern until representative data has been collected and analyzed.

O3-14g The GSA notes your comment regarding well ownership of Rams Hill wells and implications toward water quality. The GSA has corrected references to ownership of Well ID1-1 (RH-1) and ID1-2 (RH-2). While the GSA acknowledges that these wells are currently used for irrigation and that they are not required to meet potable water quality standards, increasing trends in wells do have potential implications to beneficial use for surrounding users such as for District wells or domestic wells.

O3-14h The CIMIS Station remains active. The period of record in Table 2.2-1 has been revised to indicate as such.

O3-14i The GSA notes your comment pertaining to prioritizing filling data gaps to incorporate in to the BVHM. Specifically you request aquifer testing of the upper, middle and lower aquifers, and the nine items recommended by the USGS to further reduce the potential inaccuracies in the numerical model, should be done immediately and be prioritized for funding and collection during the first 5-year reassessment period.

O3-14j The GSA notes your request that that the text in Section 2.2.3.4 be modified to identify and prioritize the subject hydrologic data for funding and collection during the first 5-year reassessment period, including: (1) specific yield estimates for the three aquifer layers identified in the existing USGS model; (2) collection of data and more detailed analysis of mountain front underflow in the Subbasin at large; (3) collection of additional depth-related water quality data, for improved Mann-Kendall Trend analysis; (4) water optimization measures for further study; (5) agricultural and recreational return flows; (6) completion of a detailed feasibility and cost/benefit analysis for intra-management area water transfers; (7) based on the new data, an analysis of projected changes in groundwater storage over time when 2030 climate change predictions are included; and (8) Any other matters approved by the pumpers, including but not limited to; items required to comply with SGMA, meet the objectives of the County General Plan Update, and matters listed in Section 5 of the Rampdown Provisions.

The GSA notes that you consider these data and improvements are all necessary to reduce current inherent inaccuracies and data gaps in the USGS numerical model in order to help refine the hydrogeologic components used to estimate the Subbasin water budget and its various components. These components include, but are not limited to, the specific yield for the Subbasin, the GSP MTs and MOs related to groundwater, and by extension, the proposed rampdown schedule over the long-term. The GSA also notes that you request the GSP to be modified to include language to emphasize that this additional analysis should be conducted during the first 5-year period.

O3-14k The GSA acknowledges that you request that the text in Section 4.4 be revised to incorporate this important information pertaining to the proposed rampdown schedule and percentages utilizing a revised specific yield. In addition, the GSA notes your requested revision to the GSP text that to the extent that in the future if the specific yield or other Subbasin hydrogeologic components are revised, that the rampdown percentages and schedule will be revised accordingly.

O3-14l The GSA notes your comment to clarify if the groundwater well level minimum thresholds described in Tables 3-4 and 3-5 are based on data derived from the BVHM, and are therefore preliminary and subject to change. In addition, we note your suggestion to add text to state that the identified "key wells" could be added or replaced for the purpose of minimum threshold compliance monitoring as new data becomes available.

O3-14m The GSA notes your suggestion to add a column titled "Surface Elevation" to Table 3-4.

O3-14n The GSA notes your request to remake Table 3-5 to resemble Table 3-4 (i.e., all the same columns and data), including surface elevation. In addition, you indicate that further supporting data is needed to verify the appropriateness of the proposed minimum thresholds for the various individual management areas and the South Management Area (SMA) in particular but do not provide any information to what further supporting data is required.

O3-14o The GSA acknowledges your request to revise Tables 5-1 through 5-5 to reflect the inclusion and funding (costs) for conducting the collection and analysis of the data described in your comment letter during the first 5-year reassessment period. In addition, you request to clearly identify which tasks are related to the initial and later 5-year reassessment periods, and which tasks are ongoing annually. Finally, you request that the groundwater numerical model be updated a minimum of every 5 years.

O3-14p The GSA notes your recommendation to reduce costs by use of water levels from pressure transducers and telemetry systems. The GSA plans to evaluate use and cost of such equipment and technology.

O3-15 The GSA acknowledges your concern regarding structure of the water trading program and specifically a theoretical cap of the number of shares that an individual could own. The GSA will take this comment into consideration as the water trading program is developed in coordination with the Subbasin stakeholders.

O3-16 The GSA acknowledges your comment regarding potential transfer of BPA and generally concurs that restrictions on transfer would likely be based on the premise of avoiding adverse impacts to hydrogeologic conditions that would cause or exacerbate undesirable results. Page 4-6 of the GSP has been edited to add this clarification.

O3-17 The GSA acknowledges your comment regarding market economics and its potential effect of incentivizing conservation. The Draft GSP clearly indicates that the scope of the Water Conservation Program is (PMA No. 2) is dependent upon the availability of funding provided by potential sources including state grant programs (Draft GSP page 4-19). The Water Conservation Program would be developed in concert with input from each of the water sectors (Agriculture, Municipal, and Recreation) and evaluate the costs and benefits of potential conservation measures. The GSA also notes your position that conservation measures internal to the BWD customers should be funded by the BWD. Conservation grant funding will be sought, and would be of benefit to all beneficial users of groundwater in the Subbasin.

O3-18 The GSP has been revised to clarify that the Pumping Reduction Program is planned to be based on BPA and use this consistent terminology.

O3-19 The Voluntary Fallowing of Agriculture Land (PMA No. 4) would require additional evaluation under the California Environmental Quality Act (CEQA) to determine actual fallowing standards. Previous fallowing under the water credits program included minimum fallowing requirements to address visual blight and fugitive dust. The GSA has revised the text on pages 4-25 and 4-28 to clarify that a uniform minimum fallowing standard would be established for all properties. Enhanced restoration would be for potential added value projects such as for direct mitigation projects (one project currently in the planning phase in the Subbasin), and mitigation banks.

O3-20 The GSA notes your request for clarification regarding the funding of the Voluntary Fallowing of Agriculture Land (PMA No. 4). The Draft GSP outlines an approach to developing the program including potential funding sources. The program would be developed in coordination with the Subbasin stakeholders. The GSA notes your position that the only costs that are appropriate to be borne by the GSA (i.e., funded by groundwater users at large) are the cost of developing the standards and ensuring compliance with the standards.

O3-21 The GSP has been revised to note that for irrigation wells water quality should be suitable for agriculture and recreation use.

O3-22 The GSA has revised the GSP page 4-30 with the suggested edit to further clarify that the BWD is not currently required to treat water from any of its wells.

O3-23 The GSA acknowledges your comment that mitigation actions may not be the responsibility of the GSA to fund unless the degraded water quality is a direct result of Subbasin management decisions.

O3-24 The GSP has been revised to indicate that the Central Management Area (CMA) primarily serves municipal and recreational uses.

O3-25 The GSA acknowledges that you are alarmed by the high costs of implementing the GSP, and that GSP should set forth detailed information and estimates regarding how costs were developed. The GSA will take this comment into consideration when considering imposing fees to fund GSP implementation.

O3-26 The GSA acknowledges your comment that Table 5-3, GSP 5-Year Update Costs and Table 5-4 Projects and Management Actions Development Costs should include detailed information and estimates.

O3-27 The GSA acknowledges your comment that the roles and responsibilities between the GSA's full time employees and the BWD's internal management and administration should be calculated and the expense estimated.

O3-28 The GSA acknowledges your comment regarding BWD reimbursement of GSA creation and GSP development related expenses and request for detailed accounting. The GSA concurs that prior to any charges being considered for reimbursement to the BWD, a detailed accounting process for verification purposes would be required.

O3-29 The GSA acknowledges your comment that the GSP should expressly provide the amount of extraction charge borne by any particular pumper shall be proportional to the cost of providing GSP benefits respective of the individual pumper. The GSA notes that the application of fees has yet to be determined.

O3-30 The GSA notes your recommendation to reduce costs by use of water levels from pressure transducers and telemetry systems. The GSA plans to evaluate use and cost of such equipment and technology.

Comment Letter O4

Tubb Canyon Desert Conservancy

May 21, 2019

County of San Diego
Planning & Development Services
C/O Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Re. Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

I am writing to suggest that Groundwater Dependent Ecosystems (GDE's) be designated Beneficial Users of Water with a specified allocation in the Groundwater Sustainability Plan (GSP) that is being developed by the Groundwater Sustainability Agency.

In the draft GSP, GDE's have been excluded from consideration as a Beneficial User of water by a logic that defies credulity: GDE's existed in the Borrego Springs Sub-basin prior to 2015 but were <u>all</u> destroyed prior to 2015 and therefore are not required to be considered in the GSP And those plant assemblages that were once GDE's and that survived the 2015 "SGMA cut-off" are not really groundwater dependent, but rather *now* derive their water from surface water. The fact of the matter is that natural processes are never as cut and dry as this argument suggests O4-1

Even if the above argument were the case for some of the GDE's in the basin, it is certainly not the case for all of them. In particular, it is not the case for the GDE that exists in Tubb Canyon. While it is true that the water table no longer comes to the surface as it did until 20 years ago, the palms and ironwood trees (Olneya tesota) derive their water from the only source that has ever been available to them—the aquifer. The grouping of the ironwood trees from Tubb Canyon toward Borrego Sink (which is clearly visible from Montezuma Grade) attests to the fact that these trees are sustained by the underground recharge river that is a critical part of the Borrego Valley Groundwater Basin.

I urge the GSA to revise the GSP to include GDE's a Beneficial Users of Water with a specific allocation of water, just like all other identified Beneficial Users

Sincerely yours,

J. David Garmon, MD
President, TCDC

Tubb Canyon Desert Conservancy
8899 University Center Lane #170, San Diego, CA 92122 • 858 535.9121 • contact.tcdc@tubbcanyondesertconservancy.org
www.TubbCanyonDesertConservancy.Org

INTENTIONALLY LEFT BLANK

Comment Letter O4

Tubb Canyon Desert Conservancy

May 21, 2019

County of San Diego
Planning & Development Services
C/O Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Re- Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

I am writing to suggest that Groundwater Dependent Ecosystems (GDE's) be designated Beneficial Users of Water with a specified allocation in the Groundwater Sustainability Plan (GSP) that is being developed by the Groundwater Sustainability Agency.

In the draft GSP, GDE's have been excluded from consideration as a Beneficial User of water by a logic that defies credulity GDE's existed in the Borrego Springs Sub-basin prior to 2015 but were all destroyed prior to 2015 and therefore are not required to be considered in the GSP. And those plant assemblages that were once GDE's and that survived the 2015 "SGMA cut-off" are not really groundwater dependent, but rather *now* derive their water from surface water. The fact of the matter is that natural processes are never as cut and dry as this argument suggests. O4-1

Even if the above argument were the case for some of the GDE's in the basin, it is certainly not the case for all of them. In particular, it is not the case for the GDE that exists in Tubb Canyon. While it is true that the water table no longer comes to the surface as it did until 20 years ago, the palms and ironwood trees (Olneya tesota) derive their water from the only source that has ever been available to them—the aquifer. The grouping of the ironwood trees from Tubb Canyon toward Borrego Sink (which is clearly visible from Montezuma Grade) attests to the fact that these trees are sustained by the underground recharge river that is a critical part of the Borrego Valley Groundwater Basin

I urge the GSA to revise the GSP to include GDE's a Beneficial Users of Water with a specific allocation of water, just like all other identified Beneficial Users.

Sincerely yours,

J David Garmon, MD
President, TCDC

Tubb Canyon Desert Conservancy
8899 University Center Lane #170, San Diego, CA 92122 • 858 535 9121 • contact.tcdc@tubbcanyondesertconservancy org
www TubbCanyonDesertConservancy Org

INTENTIONALLY LEFT BLANK

Letter O4

Commenter: J. David Garmon, MD, President, Tubb Canyon Desert Conservancy
Date: May 21, 2019

O4-1 The GSA notes your comment suggesting that groundwater dependent ecosystems (GDEs) be designated beneficial users of water with specified allocation in the GSP. The GSA notes that you disagree with the conclusion that GDEs have become disconnected from the underlying aquifer. As evidence you point to the GDEs that exist in Tubb Canyon such as the palms and ironwood trees that derive their water from the only source that has ever been available to them—the aquifer. You point to the grouping of ironwood trees from Tubb Canyon toward the Borrego Sink as attesting to the fact that these trees are sustained by the underground recharge that is a critical part of groundwater basin.

The GSA directs you to Appendix D4 of the GSP that provides evaluation of potential GDEs. In particular, Section 1.2.7 of Appendix D4 discusses the Tubb Canyon watershed.

> Tubb Canyon is comprised of four subwatersheds referred to as Tubb Canyon, and Tubb Canyon Road North, Middle and South subwatersheds. The total Tubb Canyon watershed area is 3,095 acres. The maximum elevation of the watershed is 4,520 feet amsl [above mean sea level] and the minimum elevation (i.e., outlet) is about 920 feet amsl. Tubb Canyon watershed discharges through a narrow canyon to the Subbasin where it broadens into an alluvial fan (Figure 9). Three springs are mapped in the watershed and include Big Spring, Middle Spring and Tubb Canyon Spring (ABDSP 2017).

In the vicinity of Big Spring, seepwillow, catclaw, and mesquite have been identified (San Diego Reader 2010). The satellite color-infrared photography indicates green, healthy vegetation as the color red (high reflection of near-infrared wavelengths). In a desert environment, the green healthy vegetation could represent a potential GDE. A narrow band of habitat appears in the Tubb Canyon Creek channel primarily associated with the mapped springs. A band of vegetation is mapped by the NCCAG dataset where Tubb Canyon opens into the Subbasin near Dry and Culp Canyons." Where Tubb Canyon enters the valley it joins with several canyons, including Culp Canyon to form an alluvial fan. The NCCAG dataset maps vegetation on the alluvial fan that you indicate is composed of palms and ironwood trees. These potential GDEs are edge cases mapped in areas confined to the outer fringes of the Subbasin boundary; their geographic confinement to the mountain front indicates that the vegetation communities are supported by surface water flows originating outside the Subbasin and not sustained by the regional groundwater table. Figure 21, Contributing Watersheds Hydrogeologic Conceptual Model, in Appendix D4 of the GSP displays how streams flow from outside the Subbasin transitions to disconnected streams that are not connected to the regional groundwater table by a fully saturated aquifer. These ephemeral streams lose water through a thick unsaturated zone. As such, pumping from wells screened in the regional groundwater table do not effect water available to these potential fringe GDEs. As such, a specified allocation was not assigned to these GDEs.

The commenter is referred to the GSA's master response on GDEs for further information.

Comment Letter O5

The Nature Conservancy
Protecting nature. Preserving life.

CALIFORNIA WATER | GROUNDWATER

555 Capitol Mall, Suite 1290
Sacramento, California 95814
[916] 449-2850

nature.org
GroundwaterResourceHub org

21 May 2019

Jim Bennett
County of San Diego Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Submitted via email. PDS LUEGGroundwater@sdcounty.ca.gov

Re: Concerns Regarding Draft Groundwater Sustainability Plan for the Borrego Valley

Dear Mr. Jim Bennett,

The Nature Conservancy (TNC) appreciates the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Borrego Valley Basin being prepared under the Sustainable Groundwater Management Act (SGMA). We have significant concerns regarding the treatment of environmental beneficial users in the Draft GSP and submit this letter as a guidance to address the deficiencies prior to submission to the State

TNC as a Stakeholder Representative for the Environment

TNC is a global, nonprofit organization dedicated to conserving the lands and waters on which all life depends We seek to achieve our mission through science-based planning and implementation of conservation strategies. For decades, we have dedicated resources to establishing diverse partnerships and developing foundational science products for achieving positive outcomes for people and nature in California. TNC was part of a stakeholder group formed by the Water Foundation in early 2014 to develop recommendations for groundwater reform and actively worked to shape and pass SGMA.

O5-1

Our reason for engaging is simple: California's freshwater biodiversity is highly imperiled. We have lost more than 90 percent of our native wetland and river habitats, leading to precipitous declines in native plants and the populations of animals that call these places home. These natural resources are intricately connected to California's economy providing direct benefits through industries such as fisheries, timber and hunting, as well as indirect benefits such as clean water supplies. SGMA must be successful for us to achieve a sustainable future, in which people and nature can thrive within Borrego Valley Basin and California.

We believe that the success of SGMA depends on bringing the best available science to the table, engaging all stakeholders in robust dialog, providing strong incentives for beneficial outcomes and rigorous enforcement by the State of California.

Given our mission, we are particularly concerned about the inclusion of nature, as required, in GSPs. The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs.

These tools and resources are available online at GroundwaterResourceHub.org. The Nature Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Addressing Nature's Water Needs in GSPs

SGMA requires that all beneficial uses and users, including environmental users of groundwater, be considered in the development and implementation of GSPs (Water Code § 10723.2).

The GSP Regulations include specific requirements to identify and consider groundwater dependent ecosystems [23 CCR §354.16(g)] when determining whether groundwater conditions are having potential effects on beneficial uses and users. GSAs must also assess whether sustainable management criteria may cause adverse impacts to beneficial uses, which include environmental uses, such as plants and animals. The Nature Conservancy has identified each part of the GSP where consideration of beneficial uses and users are required. That list is available here: https://groundwaterresourcehub.org/importance-of-gdes/provisions-related-to-groundwater-dependent-ecosystems-in-the-groundwater-s. Please ensure that environmental beneficial users are addressed accordingly throughout the GSP. Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decision, and using data collected through monitoring to revise decisions in the future. Over time, GSPs should improve as data gaps are reduced and uncertainties addressed.

To help ensure that GSPs adequately address nature as required under SGMA, The Nature Conservancy has prepared a checklist (**Attachment A**) for GSAs and their consultants to use. The Nature Conservancy believes the following elements are foundational for 2020 GSP submittals. For detailed guidance on how to address the checklist items, please also see our publication, *GDEs under SGMA. Guidance for Preparing GSPs*[1].

1. Environmental Representation

SGMA requires that groundwater sustainability agencies (GSAs) consider the interests of all beneficial uses and users of groundwater. To meet this requirement, we recommend actively engaging environmental stakeholders by including environmental representation on the GSA board, technical advisory group, and/or working groups. This could include local staff from state and federal resource agencies, nonprofit organizations and other environmental interests. By engaging these stakeholders, GSAs will benefit from access to additional data and resources, as well as a more robust and inclusive GSP.

2. Basin GDE and ISW Maps

SGMA requires that groundwater dependent ecosystems (GDEs) and interconnected surface waters (ISWs) be identified in the GSP. We recommend using the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) provided online[2] by the Department of Water Resources (DWR) as a starting point for the GDE map. The NC Dataset was developed through a collaboration between DWR, the Department of Fish and Wildlife and TNC.

O5-1
Cont.

[1] GDEs under SGMA Guidance for Preparing GSPs is available at: https://groundwaterresourcehub.org/public/uploads/pdfs/GWR_Hub_GDE_Guidance_Doc_2-1-18.pdf

[2] The Department of Water Resources' Natural Communities Commonly Associated with Groundwater dataset is available at https://gis.water.ca.gov/app/NCDatasetViewer/

3. Potential Effects on Environmental Beneficial Users
SGMA requires that potential effects on GDEs and environmental surface water users be described when defining undesirable results. In addition to identifying GDEs in the basin, The Nature Conservancy recommends identifying beneficial users of surface water, which include environmental users. This is a critical step, as it is impossible to define "significant and unreasonable adverse impacts" without knowing *what* is being impacted. For your convenience, we've provided a list of freshwater species within the boundary of the Borrego Valley groundwater basin in **Attachment C**. Our hope is that this information will help your GSA better evaluate the impacts of groundwater management on environmental beneficial users of surface water. We recommend that after identifying which freshwater species exist in your basin, especially federal and state listed species, that you contact staff at the Department of Fish and Wildlife (DFW), United States Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Services (NMFS) to obtain their input on the groundwater and surface water needs of the organisms on the GSA's freshwater species list. Because effects to plants and animals are difficult and sometimes impossible to reverse, we recommend erring on the side of caution to preserve sufficient groundwater conditions to sustain GDEs and ISWs.

4. Biological and Hydrological Monitoring
If sufficient hydrological and biological data in and around GDEs is not available in time for the 2020/2022 plan, data gaps should be identified along with actions to reconcile the gaps in the monitoring network.

The Nature Conservancy has thoroughly reviewed the Borrego Valley Groundwater Basin Draft GSP, and considers it to be inadequate under SGMA for the following main reasons: O5-1 Cont.

1. Environmental beneficial uses and users are not adequately identified and considered
2. The Draft GSP permits groundwater conditions to worsen in this Critically Overdrafted Basin (beyond the 2015 SGMA benchmark date) over the 20-year SGMA timeline.

Our specific comments related to the Borrego Valley Groundwater Basin Draft GSP are provided in detail in **Attachment B** and are in reference to the numbered items in **Attachment A**. **Attachment C** provides a list of the freshwater species located in the Borrego Valley Basin. **Attachment D** describes six best practices that GSAs and their consultants can apply when using local groundwater data to confirm a connection to groundwater for DWR's Natural Communities Commonly Associated with Groundwater Dataset[1]. **Attachment E** provides an overview of a new, free online tool that allows GSAs to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data.

Thank you for fully considering our comments as you finalize your GSP.

Best Regards,

Sandi Matsumoto
Associate Director, California Water Program
The Nature Conservancy

TNC Comments
Borrego Valley Basin Draft GSP

Page 3 of 27

The Nature Conservancy

Attachment A

Considering Nature under SGMA: A Checklist

The Nature Conservancy is neither dispensing legal advice nor warranting any outcome that could result from the use of this checklist. Following this checklist does not guarantee approval of a GSP or compliance with SGMA, both of which will be determined by DWR and the State Water Resources Control Board.

GSP Plan Element*		GDE Inclusion in GSPs: Identification and Consideration Elements		Check Box
Admin Info	2.1.5 Notice & Communication 23 CCR §354.10	**Description of the types of environmental beneficial uses of groundwater that exist within GDEs and a description of how environmental stakeholders were engaged throughout the development of the GSP.**		1
Basin Setting	2.2.1 Hydrogeologic Conceptual Model 23 CCR §354.14	**Basin Bottom Boundary:** Is the bottom of the basin defined as at least as deep as the deepest groundwater extractions?		2
		Principal aquifers and aquitards: Are shallow aquifers adequately described, so that interconnections with surface water and vertical groundwater gradients with other aquifers can be characterized?		3
	2.2.2 Current & Historical Groundwater Conditions 23 CCR §354.16	**Interconnected surface waters:**		4
		Interconnected surface water maps for the basin with gaining and losing reaches defined (included as a figure in GSP & submitted as a shapefile on SGMA portal)		5
		Estimates of current and historical surface water depletions for interconnected surface waters quantified and described by reach, season, and water year type		6
		Basin GDE map included (as figure in text & submitted as a shapefile on SGMA Portal).		7
		If NC Dataset was used	Basin GDE map denotes which polygons were kept, removed, and added from NC Dataset (Worksheet 1, can be attached in GSP section 6.0)	8
			The basin's GDE shapefile, which is submitted via the SGMA Portal, includes two new fields in its attribute table denoting: 1) which polygons were kept/removed/added, and 2) the change reason (e.g., why polygons were removed).	9
			GDEs polygons are consolidated into larger units and named for easier identification throughout GSP	10
		If NC Dataset was *not* used	Description of why NC dataset was not used, and how an alternative dataset and/or mapping approach used is best available information	11
		Description of GDEs included:		12
		Historical and current groundwater conditions described in each GDE unit.		13
		Ecological condition described in each GDE unit.		14

TNC Comments
Borrego Valley Basin Draft GSP

Page 4 of 27

O5-2

The Nature Conservancy

		Each GDE unit has been characterized as having high, moderate, or low ecological value.		15
		Inventory of species, habitats, and protected lands for each GDE unit with ecological importance (Worksheet 2, can be attached in GSP section 6.0).		16
	2.2.3 Water Budget *23 CCR §354.18*	Groundwater inputs and outputs (e.g., evapotranspiration) of native vegetation and managed wetlands are included in the basin's historical and current water budget		17
		Potential impacts to groundwater conditions due to land use changes, climate change, and population growth to GDEs and aquatic ecosystems are considered in the projected water budget.		18
Sustainable Management Criteria	**3.1 Sustainability Goal** *23 CCR §354.24*	**Environmental stakeholders/representatives were consulted.**		19
		Sustainability goal mentions GDEs or species and habitats that are of particular concern or interest.		20
		Sustainability goal mentions whether the intention is to address pre-SGMA impacts, maintain or improve conditions within GDEs or species and habitats that are of particular concern or interest		21
	3.2 Measurable Objectives *23 CCR §354.30*	**Description of how GDEs were considered and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the environment.**		22
	3.3 Minimum Thresholds *23 CCR §354.28*	**Description of how GDEs and environmental uses of surface water were considered when setting minimum thresholds for relevant sustainability indicators:**		23
		Will adverse impacts to GDEs and/or aquatic ecosystems dependent on interconnected surface waters (beneficial user of surface water) be avoided with the selected minimum thresholds?		24
		Are there any differences between the selected minimum threshold and state, federal, or local standards relevant to the species or habitats residing in GDEs or aquatic ecosystems dependent on interconnected surface waters?		25
	3.4 Undesirable Results *23 CCR §354.26*	**For GDEs, hydrological data are compiled and synthesized for each GDE unit:**		26
		If hydrological data *are available* within/nearby the GDE	Hydrological datasets are plotted and provided for each GDE unit (Worksheet 3, can be attached in GSP Section 6.0)	27
			Baseline period in the hydrologic data is defined	28
			GDE unit is classified as having high, moderate, or low susceptibility to changes in groundwater	29
			Cause-and-effect relationships between groundwater changes and GDEs are explored	30
		If hydrological data *are not available* within/nearby the GDE	Data gaps/insufficiencies are described.	31
			Plans to reconcile data gaps in the monitoring network are stated	32
		For GDEs, biological data are compiled and synthesized for each GDE unit:		33
		Biological datasets are plotted and provided for each GDE unit.		34
		Data gaps/insufficiencies are described.		35

O5-2
Cont.

The Nature Conservancy

		Plans to reconcile data gaps in the monitoring network are stated	36
		Description of potential effects on GDEs, land uses and property interests:	37
		Cause-and-effect relationships between GDE and groundwater conditions are described	38
		Impacts to GDEs that are considered to be "significant and unreasonable" are described	39
		Known hydrological thresholds or triggers (e.g., instream flow criteria, groundwater depths, water quality parameters) for relevant species or ecological communities are reported.	40
		Land uses include and consider recreational uses (e.g., fishing/hunting, hiking, boating)	41
		Property interests include and consider privately and publicly protected conservation lands and opens spaces, including wildlife refuges, parks, and natural preserves	42
Sustainable Management Criteria	**3.5 Monitoring Network** *23 CCR §354.34*	Description of whether hydrological data are spatially and temporally sufficient to monitor groundwater conditions for each GDE unit.	43
		Description of how hydrological data gaps and insufficiencies will be reconciled in the monitoring network.	44
		Description of how impacts to GDEs and environmental surface water users, as detected by biological responses, will be monitored and which monitoring methods will be used in conjunction with hydrologic data to evaluate cause-and-effect relationships with groundwater conditions	45
Projects & Mgmt Actions	**4.0 Projects & Mgmt Actions to Achieve Sustainability Goal** *23 CCR §354.44*	Description of how GDEs will benefit from relevant project or management actions.	46
		Description of how projects and management actions will be evaluated to assess whether adverse impacts to the GDE will be mitigated or prevented	47

* In reference to DWR's GSP annotated outline guidance document, available at:
https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD_GSP_Outline_Final_2016_12_23.pdf

TNC Comments
Borrego Valley Basin Draft GSP

Page 6 of 27

O5-2
Cont.

Attachment B

TNC Evaluation of the
Borrego Valley Groundwater Basin Draft Groundwater Sustainability Plan

The Nature Conservancy has thoroughly reviewed the Borrego Valley Groundwater Basin Draft GSP, and considers it to be inadequate under SGMA. The deficiencies of the GSP are described in here, along with recommendations on how to reconcile them.

2.1.4 Beneficial Uses and Users of Groundwater (p. 2-26)

[Checklist item #1]: Please identify environmental users of groundwater, such as groundwater dependent ecosystems and other species that depend on interconnected surface water that exist in Borrego Valley Basin, and describe how representatives of these beneficial uses were included in the planning process. If Borrego Valley is asserting that no environmental beneficial users exist, please provide scientific rationale and data to support this claim. Based on science The Nature Conservancy has assembled on the basin, there is a strong case to be made that environmental beneficial users are very likely to exist and the GSP must therefore provide sufficient evidence to rebut this science, which includes starting with the following resources: O5-3

- Natural Communities Commonly Associated with Groundwater dataset (NC Dataset) - https://gis.water.ca.gov/app/NCDatasetViewer/
- The list of freshwater species located in the Borrego Valley Groundwater Basin in **Attachment C** of this letter. Please take particular note of the species with protected status

Please also identify lands that are protected as open space preserves, habitat reserves, wildlife refuges, etc. or other lands protected in perpetuity and supported by groundwater or interconnected surface waters should be identified and acknowledged

2.2.2.6 Groundwater-Surface Water Connections (pp. 2-65 thru 2-68)
[Checklist Items #4-6]:

- Please rename the Groundwater-Surface Water Connections section as the "Identification of interconnected surface water systems" to be consistent with DWR's GSP annotated Outline Guidance Document[3]. O5-4
- On Figure 2.2-17, please add depth-to-groundwater data (derived from contoured groundwater elevation data and ground surface elevation from digital elevation model data; See Best Practice #5 in **Appendix D** of this letter for more specifications) near surface water systems in the Basin
- The regulations [23 CCR §351(o)] define interconnected surface waters (ISW) as "surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted". "At any point" has both a spatial and temporal component. Even short durations of interconnections of groundwater and surface water can be O5-5

[3] DWR's Annotated Outline Guidance Document
https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/GD_GSP_Outline_Final_2016_12_23.pdf

crucial for surface water flow and supporting environmental users of groundwater and surface water. Thus, only considering perennial portions of streams as ISWs does not meet the SGMA definition. **Please identify interconnected surface waters in the Basin by relying on groundwater elevation and stream gauge data, specifying any data gaps that exist so that they can be resolved in the monitoring network.** O5-5 Cont

2.2.2.6 Groundwater-Surface Water Connections - Groundwater Dependent Ecosystems (pp. 2-68 thru 2-72)
[Checklist Items #7-16]:

- Groundwater Dependent Ecosystems (GDEs) are not only relevant under the Groundwater-Surface Water Connections section, especially in arid environments like the Borrego Valley Basin where GDEs can exist in the absence of ISW. Please create a new subsection (e g , 2.2.2.7) for the identification of groundwater dependent ecosystems to be consistent with DWR's GSP annotated Outline Guidance Document[3]
- While historical groundwater level declines in the Borrego Valley have inevitably led to pre-SGMA adverse impacts to groundwater dependent ecosystems, please separate the identification of GDEs from the consideration of GDEs We recommend identifying GDEs (mapping) and describing groundwater conditions in the basin setting section of the GSP (e.g., 2 2 2.7) and evaluating potential adverse impacts due to groundwater levels in the Sustainable Management Criteria section where undesirable results are described (e.g., significant and adverse impacts to beneficial users of groundwater) **Please identify (map) GDEs in the basin that are supported by groundwater, even groundwater from a perched aquifer. Management actions and decisions regarding the prevention of post-2015 adverse impacts are a separate issue and should be addressed when defining undesirable results in the basin.** O5-6
- SGMA defines GDEs as "ecological communities and species that depend on *groundwater emerging from aquifers or on groundwater occurring near the ground surface*". **We recommend that depth to groundwater contour maps are used to verify whether a connection to groundwater exists for polygons in the NC Dataset, instead of relying on watershed boundaries (especially for the polygons located on the fringe of the basin). Please refer to Appendix D of this letter for best practices for using groundwater data to verify a connection to groundwater.**
- Please add a map that clearly indicates which NCCAG polygons were kept or removed, as well as specify the rationale for removing each polygon (e.g., groundwater levels too deep). It was hard to follow Appendix D4 of the draft GSP and know which polygons are being identified as GDEs in the Borrego Valley Basin.

GDE Unit 1 – Coyote Creek

- **Please provide information on the depth to groundwater, particularly in the NCCAG mapped areas that do not coincide with perennial surface flows.** O5-7

GDE Unit 3 – Mesquite Bosque

- Scientific literature does not support the removal of Mesquite Bosque in Borrego Sink. It appears that Mequite Bosque was not considered a GDE because it was assumed O5-8

TNC Comments
Borrego Valley Basin Draft GSP
Page 8 of 28

that the ecosystem has become disconnected from groundwater and is in decline. This finding was based on: 1) Estimated evapotranspiration for this area modeled by the USGS in a MODFLOW modeling study that was assumed to be zero; 2) surviving mesquite derive their water from soil moisture and perched groundwater; and 3) the rooting depth for *Prosopis glandulosa* was assumed to be 15.33 feet (Table 13 of the USGS (2015) modelling study, which does not have any references associated with it) and considerably lower than current groundwater levels (~55 feet). However, none of these assumptions were substantiated through field observations. According to TNC's global rooting depth database[4], the max rooting depth for *Prosopis glandulosa* can be as high as 66 feet. And, depending on the subsurface soils and thickness of the capillary fringe, groundwater at depths >66 feet could still be supporting the remaining Mesquite. Similarly, it is known that *P. glandulosa* can have taproots, in the absence of available subsurface water, up to 190 feet according to the United States Forest Service[5] These reported rooting depth observations for Honey Mesquite are beyond the 55 feet bgs groundwater levels observed in MW-5B, meaning that groundwater is likely still supporting this vegetation at greater depths than originally presented in this GSP. **Unless there is field evidence that demonstrates otherwise, it should be assumed that the remaining mesquite is groundwater-dependent and mapped as GDEs until further data and information can confirm otherwise. In addition, the sustainability criteria should be set to avoid adverse impacts to this species through further (post-SGMA) degradation. At a minimum this should be considered a data gap and the ecosystem needs to be further evaluated.** O5-8 Cont

<u>3.1.1 Standard for Establishing the Sustainability Goal (p.3-1)</u>
[Checklist Items #19-21]:

- According to 23 CCR §354.22, the sustainability goal must "culminate in the absence of undesirable results within 20 years of the applicable statutory deadline." As the GSP is written now, the sustainable management criteria fail to address adverse impacts to beneficial uses in the basin, and permit groundwater conditions in the basin to worsen over the 20 years of GSP implementation **Please redefine your sustainability goal so that it complies with the intent of SGMA.** O5-9

<u>3.2.1. Chronic Lowering of Groundwater Levels – Undesirable Results (p. 3-7)</u>
[Checklist Items #26-42]:
While impacts to GDEs have been broadly described in Appendix D4 of the Draft GSP, **please provide more specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs.** The definition of 'significant and unreasonable' is a qualitative statement that is used to describe when undesirable results would occur in the basin, such that a minimum threshold can be quantified. Potential effects on all beneficial users of groundwater in the basin need to be taken into consideration According to the California Constitution Article X, §2, water resources in California must be "put to beneficial use to the fullest extent of which they are capable". **Please identify appropriate biological indicators that can be used to monitor potential impacts to environmental beneficial users due to groundwater** O5-10

[4] TNC's Global Rooting Depth Database is available at <u>https://groundwaterresourcehub.org/gde-tools/gde-rooting-depths-database-for-gdes/</u>
[5] U S Forest Service <u>https://www.fs.fed.us/database/feis/plants/tree/progla/all.html</u>

conditions. Refer to Appendix E of this letter for an overview of a free, new online tool for monitoring the health of GDEs over time. O5-10 Cont.

3.2.6 Depletions of Interconnected Surface Water – Undesirable Results (p.3-14)
[Checklist Items #26-42]:

- **Please provide scientific evidence that supports the following statement on p 3-15: "The honey mesquite [in the Borrego Sink] experienced prolonged adverse impacts including desiccation, inability to regenerate and habitat loss well prior to 2015".** While adverse impacts (e g., extent of honey mesquite habitat) has been declining for years prior to SGMA, it is unclear of what the current ecological status of the remaining portions. O5-11
- There is insufficient evidence to conclude that current groundwater levels are no longer supporting the honey mesquite. The Mesquite polygons in the NC dataset were mapped from 1996, however, 35 years of Landsat imagery[6] (Figure 1) show a slight upward trend in vegetation growth (indicated by Normalized Vegetation Difference Index (NDVI)) and leaf moisture (indicated by Normalized Vegetation Moisture Index (NDMI)), with fluctuations over wet and dry years during this time period. Scientific studies[7,8,9] have found that gradual increases in depth to groundwater within a GDE with historically shallow groundwater levels tends to result in an altered species composition due to the migration of more opportunistic invasive species that have deeper rooting systems and are better adapted to deeper groundwater conditions. **Please conduct field verification to determine whether the polygons in this area are still Mesquite or if the invasive Tamarix (e.g., *Tamarix ramosissima*) is prevalent.** If either are present, it is still very likely that groundwater is currently supporting these phreatophytes. However, the presence of Tamarix and the lack of Mesquite would likely suggest that pre-SGMA adverse impacts are underway, confirming previous observations. If this is the case, conservation efforts (removal of *Tamarix spp.*) could provide water supply benefits for the Borrego springs area and the Mesquite vegetation. Visit TNC's Groundwater Resource Hub for a case study on how the invasive *Arundo donax* is being removed in Ventura County to improve groundwater supply and enhance habitat[10]. O5-12

[6] TNC's GDE Pulse is described in **Attachment E** of this letter and the web viewer is available at https://gde.codefornature.org/#/map
[7] Keddy, P.A., and A.A. Reznicek. 1986 Great Lakes vegetation dynamics. The role of fluctuating water levels and buried seeds. *Journal of Great Lakes Research* 12 25 – 36. DOI 10 1016/S0380-1330(86)71697-3
[8] Moore, D R.J , and P.A. Keddy 1988 Effects of a water-depth gradient on the germination of lakeshore plants. *Canadian Journal of Botany* 66. 548–552. DOI 10 1139/b88-078.
[9] Sommer, B , and R. Froend 2014 Phreatophytic vegetation responses to groundwater depth in a drying mediterranean-type landscape *Journal of Vegetation Science* 25 1045–1055 DOI 10 1111/jvs 12178.
[10] Case Study available at: https://groundwaterresourcehub.org/public/uploads/pdfs/GWR_Hub_Ventura_Co_arundo_case_study.pdf

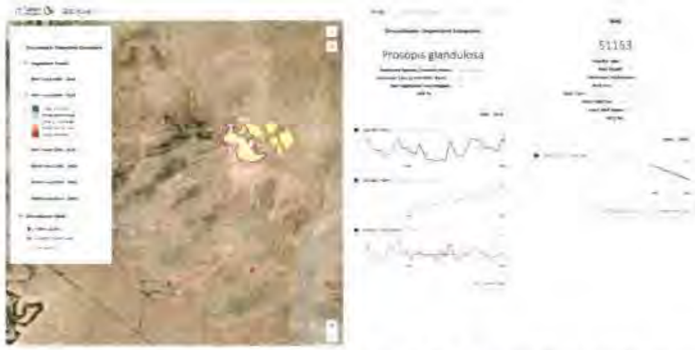


Figure 1. Landsat satellite data from GDE Pulse[3] of the Mesquite (*Prosopis glandulosa*) vegetation mapped within GDE Unit 3, and groundwater levels from nearby MW-5B.

- While the restoration of the honey mesquite GDE map may require groundwater levels to shallow by 30-40 feet to achieve its historic extent, **it is still possible to maintain groundwater levels such that no further adverse impacts occur post-SGMA so that remaining habitat is preserved.** SGMA also gives GSA's the authority to address pre-SGMA impacts by restoring some of the original historic extent of the honey mesquite, if the GSA's choses to do so. O5-13
- **Please describe whether there are any legally protected species that rely on the honey mesquite GDE habitat.** O5-14

3.3.1 Chronic Lowering of Groundwater Levels - Minimum Thresholds (p.3-17 thru 3-25) [Checklist items #22-25]:

- While maintaining groundwater levels above saturated screen intervals for pre-existing municipal wells during an anticipated multi-year drought circumstance is a suitable approach to establish minimum thresholds that protect some beneficial users of groundwater (i.e., municipal and domestic (*de-minimus*) users), it fails to prevent adverse impacts to GDEs and environmental beneficial users of surface water in interconnected surface waters. **Environmental beneficial users of groundwater are required to be considered when establishing measurable thresholds, measurable objectives, and interim milestones. Please include environmental beneficial users in section 3.3.1.4 of the GSP when describing how the minimum threshold impacts beneficial uses. Refer to Step 2 of *GDEs under SGMA: Guidance for Preparing GSPs*[1] for how this can be accomplished.** O5-15
- On page 3-20, the GSP describes that the measurable objectives, interim milestones, and minimum thresholds assume that the historical climate from 1960 through 2010 repeats itself for the 2020 through 2070 period. This has resulted in a linear reduction in pumping (outlined in Table 3-6) from current levels to a target of 5,700 AFY between O5-16

TNC Comments
Borrego Valley Basin Draft GSP

Page 11 of 28

2020 and 2070. The sustainable yield target of 5,700 AFY is inadequate for the following reasons:

- The target sustainable yield of 5,700 AFY does not take climate change into consideration, and establishing a target sustainable yield based on historical climate conditions fails to sustainably manage groundwater resources for current and future social, economic, and environmental benefits, thus deviating from the legal intent of SGMA. SGMA was passed at the height of California's historic drought, a period of time that was characterized by adverse impacts to domestic well owners (e.g., dry wells), GDEs (e.g., water stress impacts on growth, reproduction, and even mortality due to lack of groundwater), and surface water users (e g , lower streamflows). Critically overdrafted basins, such as the Borrego Valley Basin, are more likely to have disproportionately experienced these adverse impacts due to historical groundwater overdraft in the basin.
- As currently written in the GSP, a sustainable yield target of 5,700 AFT results in pumping restrictions that permit groundwater conditions to worsen by ~100,000 AF beyond 2015 conditions (see Figure 2 in this letter). This has resulted in the groundwater level measurable objectives and interim milestones in Table 3-7 to be deeper than they are in 2018. This is highly problematic, given that Borrego Valley has been characterized as a critical status basin nor does it adequately prevent adverse impacts to beneficial users in the basin.

O5-16 Cont.

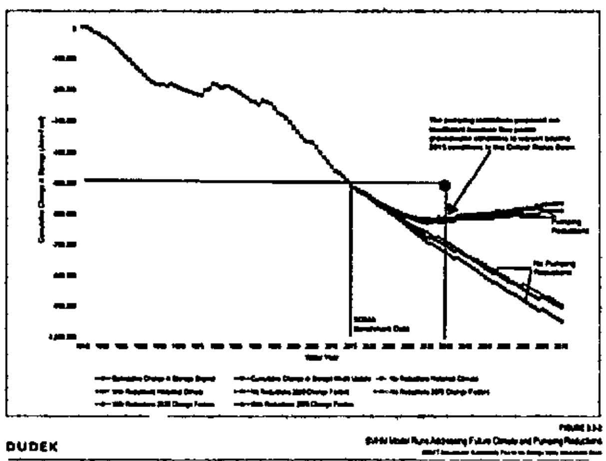


Figure 2. Figure 3.3-2 is annotated to demonstrate how the proposed pumping restrictions permit groundwater conditions to worsen post-2015 in the basin.

TNC Comments
Borrego Valley Basin Draft GSP

Page 12 of 28

- The minimum thresholds outlined in Table 3-5 (p.3-22) are inadequate for the following reasons.
    - The SGMA benchmark date is Jan 1, 2015 not 2018. Any adverse impacts that have been accrued in the current period (2015-2019) need to be corrected.
    - The scientific rationale behind the maximum allowable decline in groundwater levels through 2040 are not explained well. Also, the maximum allowable decline needs to be compared to the SGMA benchmark date, not the beginning of GSP implementation. **Please provide an explanation of how the maximum allowable decline in groundwater levels through 2040 will prevent adverse impacts to beneficial users of groundwater in the basin.**
    - As noted on p.3-21: "The GSA will adjust the rate of pumping reduction, revisit minimum thresholds, and/or evaluate additional PMAs if the minimum thresholds in Table 3-4 or Table 3-5 are exceeded or if the interim milestones in Table 3-7 are not being achieved." While adaptive management is certainly a foundational principle of SGMA, this statement fails to comply with SGMA by operating the basin with enough operational flexibility so that groundwater conditions are away from minimum thresholds **Please revise the minimum thresholds so that they prevent post-2015 adverse impacts to beneficial users of groundwater in the basin.** O5-17
- Please describe whether there are any legally protected species that exist in GDE or ISW areas in the basin and rely on groundwater **Please describe any differences between the selected minimum threshold and state, federal, or local standards relevant to the species or habitats residing in GDEs, as required [23 CCR §354.28 (b)(5)].** O5-18

3.4.1 Chronic Lowering of Groundwater Levels – Measurable Objectives (p. 3-32)
[Checklist Item #22]:

- The GSA should be managing the basin towards a measurable objective that is in a better state than Jan 1, 2015. As the measurable objectives are written now (in Table 3-7, page 3-33), the groundwater level goals for 2040 are actually deeper than 2018 observed levels. January 1, 2015 was at the height of California's historic drought, a period of time that was characterized by adverse impacts to domestic well owners (e.g., dry wells), GDEs (e.g., water stress impacts on growth, reproduction, and even mortality due to lack of groundwater), and surface water users (e g , lower streamflows). **The onus is on the GSAs to determine whether groundwater conditions (due to groundwater pumping) exacerbated impacts to these beneficial users. And if so, to recognize these impacts and establish thresholds and measurable objectives that can avoid adverse impacts to beneficial users caused by groundwater in all water year types.** O5-19

TNC Comments
Borrego Valley Basin Draft GSP

Page 13 of 28

3.4.6 Depletions of Interconnected Surface Water – Measurable Objectives (p.3-36)
[Checklist item #22]:

The honey mesquite bosque located in the vicinity of the Borrego Sink appear to be supported by current groundwater level (~55 feet), given the max rooting depths known for honey mesquite (see description above in section 2.2 2 6). In order to prevent adverse impacts post-SGMA, minimum thresholds around the SGMA benchmark date need to be established, at the very least. According to MW-5B, depth to groundwater ranged between ~50-56 feet over the past 10 years (2008-2018) (see Figure 1 in this letter). The average depth to groundwater measured at this well over this period (~53 feet), and would be a reasonable minimum threshold to consider for this honey mesquite GDE. SGMA empowers GSAs to address pre-SGMA impacts, and as demonstrated by TNC's Ventura County Case Study[10], conservation projects that remove invasive tamarisk could benefit groundwater conditions for the honey mesquite and the Borrego sink vicinity. **Please consider these suggestions when establishing sustainable management criteria.** O5-20

Chapter 3.5 Monitoring Network (pp. 2-68 through 2-72 and Appendix D)
[Checklist items 43-45]:

- The potential GDE Unit 3 - Borrego Sink (Mesquite Bosque) is one of the areas targeted for future monitoring. The well MW-5B is located about 1.2 miles northeast of the Borrego sink and is 480 feet deep. The well is a multi-completion well that includes MW-5B, screened from 45 to 155 feet, and MW-5A, screened from 200 to 340 feet. Similar groundwater levels were found and suggest potentially unconfined conditions in the Borrego Valley Subbasin. The following remark is made at page 2-71 in the GSP: "However, it is uncertain whether a good well seal was obtained during installation of the multi-completion monitoring well." Therefore, monitoring is suggested at a new well located near well MW5B that is screened from a depth of 45 ft bgs to 100 ft bgs focused on the shallower part of the aquifer. Monitoring in this new well would provide data for the groundwater levels screened in a region of interest to the GDE. O5-21

- Coyote Creek is one of the potential GDEs, Unit 1. This GDE is described as a losing stream reach based on limited visual observations in the creek. Additional streamflow measurements are needed to improve the understanding of streamflow contribution and stream leakage. Installation of recording streamflow gauges at the former USGS measuring locations is suggested instead of manual/visual measurements. This method would be more likely to monitor conditions that represent when the creek is losing or gaining as well as the infrequent and flashy flows from the watershed. O5-22

4.0 Projects and Management Actions
[Checklist items: 46 & 47]:

- For more case studies on how to incorporate environmental benefits into groundwater projects, please visit our website: https://groundwaterresourcehub.org/case-studies/recharge-case-studies/ O5-23

TNC Comments
Borrego Valley Basin Draft GSP

Page 14 of 28

Attachment C

Freshwater Species Located in the Borrego Valley Basin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result "depletion of interconnected surface waters", Attachment C provides a list of freshwater species located in the Borrego Valley Basin To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2 0 9 within the GSA's boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle The methods used to compile the California Freshwater Species Database can be found in Howard et al 2015[11]. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife's BIOS[12] as well as on The Nature Conservancy's science website[13].

Scientific Name	Common Name	Legal Protected Status		
		Federal	State	Other
BIRDS				
Actitis macularius	Spotted Sandpiper			
Aechmophorus occidentalis	Western Grebe			
Agelaius tricolor	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
Aix sponsa	Wood Duck			
Anas acuta	Northern Pintail			
Anas americana	American Wigeon			
Anas clypeata	Northern Shoveler			
Anas crecca	Green-winged Teal			
Anas cyanoptera	Cinnamon Teal			
Anas discors	Blue-winged Teal			
Anas platyrhynchos	Mallard			
Anas strepera	Gadwall			
Anser albifrons	Greater White-fronted Goose			
Ardea alba	Great Egret			
Ardea herodias	Great Blue Heron			
Aythya affinis	Lesser Scaup			
Aythya americana	Redhead		Special Concern	BSSC - Third priority
Aythya collaris	Ring-necked Duck			
Aythya valisineria	Canvasback		Special	

O5-24

[11] Howard, J K. et al 2015 Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California PLoSONE, 11(7) Available at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710
[12] California Department of Fish and Wildlife BIOS https://www.wildlife.ca.gov/data/BIOS
[13] Science for Conservation https://www.scienceforconservation.org/products/california-freshwater-species-database

Botaurus lentiginosus	American Bittern			
Bucephala albeola	Bufflehead			
Butorides virescens	Green Heron			
Calidris mauri	Western Sandpiper			
Calidris minutilla	Least Sandpiper			
Chen caerulescens	Snow Goose			
Chen rossii	Ross's Goose			
Chroicocephalus philadelphia	Bonaparte's Gull			
Cistothorus palustris palustris	Marsh Wren			
Egretta thula	Snowy Egret			
Empidonax traillii	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Empidonax traillii brewsteri	Willow Flycatcher	Bird of Conservation Concern	Endangered	
Fulica americana	American Coot			
Gallinago delicata	Wilson's Snipe			
Himantopus mexicanus	Black necked Stilt			
Icteria virens	Yellow breasted Chat		Special Concern	BSSC - Third priority
Limnodromus scolopaceus	Long billed Dowitcher			
Lophodytes cucullatus	Hooded Merganser			
Megaceryle alcyon	Belted Kingfisher			
Mergus serrator	Red breasted Merganser			
Nycticorax nycticorax	Black-crowned Night Heron			
Oreothlypis luciae	Lucy's Warbler		Special Concern	BSSC - Third priority
Oxyura jamaicensis	Ruddy Duck			
Pelecanus erythrorhynchos	American White Pelican		Special Concern	BSSC - First priority
Phalacrocorax auritus	Double-crested Cormorant			
Piranga rubra	Summer Tanager		Special Concern	BSSC - First priority
Plegadis chihi	White-faced Ibis		Watch list	
Podiceps nigricollis	Eared Grebe			
Podilymbus podiceps	Pied-billed Grebe			
Porzana carolina	Sora			
Rallus limicola	Virginia Rail			
Setophaga petechia	Yellow Warbler			BSSC Second priority

O5-24 Cont.

TNC Comments
Borrego Valley Basin Draft GSP

Page 16 of 28

Tachycineta bicolor	Tree Swallow			
Tringa melanoleuca	Greater Yellowlegs			
Tringa semipalmata	Willet			
Tringa solitaria	Solitary Sandpiper			
Vireo bellii	Bell's Vireo			
Vireo bellii arizonae	Arizona Bell's Vireo	Bird of Conservation Concern	Endangered	
Vireo bellii pusillus	Least Bell's Vireo	Endangered	Endangered	
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
Xanthocephalus xanthocephalus	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
FISH				
Cyprinodon macularius	Desert pupfish	Endangered	Endangered	Endangered - Moyle 2013
Cyprinodon macularius	Desert pupfish	Endangered	Endangered	Endangered - Moyle 2013
Cyprinodon macularius	Desert pupfish	Endangered	Endangered	Endangered - Moyle 2013
HERPS				
Actinemys marmorata marmorata	Western Pond Turtle		Special Concern	ARSSC
Anaxyrus boreas boreas	Boreal Toad			
Anaxyrus boreas halophilus	California Toad			ARSSC
Anaxyrus californicus	Arroyo Toad	Endangered	Special Concern	ARSSC
Anaxyrus punctatus	Red spotted Toad			
Pseudacris cadaverina	California Treefrog			ARSSC
Pseudacris regilla	Northern Pacific Chorus Frog			
Thamnophis hammondii hammondii	Two striped Gartersnake		Special Concern	ARSSC
Anaxyrus punctatus	Red spotted Toad			
Pseudacris cadaverina	California Treefrog			ARSSC
Thamnophis hammondii hammondii	Two-striped Gartersnake		Special Concern	ARSSC
INSECTS & OTHER INVERTS				
Abedus spp.	Abedus spp			
Anax junius	Common Green Darner			
Argia nahuana	Aztec Dancer			
Argia spp	Argia spp.			

O5-24 Cont.

TNC Comments
Borrego Valley Basin Draft GSP

Page 17 of 28

Argia vivida	Vivid Dancer			
Baetis adonis	A Mayfly			
Baetis spp	Baetis spp			
Belostomatidae fam	Belostomatidae fam			
Callibaetis spp	Callibaetis spp			
Chaetarthria pallida				Not on any status lists
Chironomidae fam	Chironomidae fam			
Coenagrionidae fam	Coenagrionidae fam			
Cricotopus spp	Cricotopus spp			
Cryptochironomus spp	Cryptochironomus spp			
Enallagma civile	Familiar Bluet			
Erpetogomphus compositus	White belted Ringtail			
Erpetogomphus spp	Erpetogomphus spp.			
Erythemis collocata	Western Pondhawk			
Eucorethra underwoodi				Not on any status lists
Eukiefferiella spp	Eukiefferiella spp			
Fallceon quilleri	A Mayfly			
Fallceon spp	Fallceon spp			
Gomphidae fam.	Gomphidae fam			
Helichus spp	Helichus spp			
Helicopsyche spp	Helicopsyche spp			
Hetaerina americana	American Rubyspot			
Heterelmis obesa				Not on any status lists
Heterotrissocladius spp	Heterotrissocladius spp			
Hydropsyche spp	Hydropsyche spp			
Hydropsychidae fam	Hydropsychidae fam			
Hydroptila spp.	Hydroptila spp			
Hydroptilidae fam.	Hydroptilidae fam.			
Laccobius spp	Laccobius spp			
Larsia spp	Larsia spp			
Lauterborniella spp	Lauterborniella spp.			
Lethocerus americanus				Not on any status lists
Libellula croceipennis	Neon Skimmer			
Libellula saturata	Flame Skimmer			
Libellulidae fam.	Libellulidae fam			

O5-24 Cont.

TNC Comments
Borrego Valley Basin Draft GSP

Page 18 of 28

Macrodiplax balteata	Marl Pennant			
Neropelopia spp	Neropelopia spp.			
Nilotanypus spp.	Nilotanypus spp.			
Ochrotrichia spp	Ochrotrichia spp			
Ophiogomphus spp	Ophiogomphus spp			
Orthemis ferruginea	Roseate Skimmer			
Pachydiplax longipennis	Blue Dasher			
Paltothemis lineatipes	Red Rock Skimmer			
Pantala flavescens	Wandering Glider			
Paracladopelma spp	Paracladopelma spp			
Parametriocnemus spp	Parametriocnemus spp			
Paratendipes spp	Paratendipes spp			
Paltodytes spp	Paltodytes spp			
Pentaneura spp	Pentaneura spp			
Perithemis intensa	Mexican Amberwing			
Phaenopsectra spp.	Phaenopsectra spp.			
Polypedilum spp.	Polypedilum spp.			
Postelichus spp.	Postelichus spp			
Pseudochironomus spp	Pseudochironomus spp			
Radotanypus spp	Radotanypus spp.			
Rhagovelia spp	Rhagovelia spp			
Rheotanytarsus spp	Rheotanytarsus spp			
Rhionaeschna multicolor	Blue-eyed Darner			
Sanfilippodytes spp.	Sanfilippodytes spp			
Simulium spp	Simulium spp.			
Sperchon spp	Sperchon spp			
Stictotarsus striatellus				Not on any status lists
Sympetrum corruptum	Variegated Meadowhawk			
Sympetrum spp	Sympetrum spp			
Tanytarsus spp	Tanytarsus spp.			
Tinodes spp	Tinodes spp.			
MAMMALS				
Castor canadensis	American Beaver			Not on any status lists
MOLLUSKS				
Physa spp	Physa spp			
PLANTS				

O5-24 Cont.

TNC Comments
Borrego Valley Basin Draft GSP

Page 19 of 28

Baccharis salicina				Not on any status lists
Castilleja minor minor	Alkali Indian-paintbrush			
Castilleja minor spiralis	Large-flower Annual Indian-paintbrush			
Datisca glomerata	Durango Root			
Juncus dubius	Mariposa Rush			
Juncus rugulosus	Wrinkled Rush			
Juncus xiphioides	Iris-leaf Rush			
Lythrum californicum	California Loosestrife			
Mimulus guttatus	Common Large Monkeyflower			
Phacelia distans	NA			
Platanus racemosa	California Sycamore			
Pluchea sericea	Arrow-weed			
Salix exigua exigua	Narrowleaf Willow			
Salix gooddingii	Goodding's Willow			
Salix laevigata	Polished Willow			
Schoenoplectus americanus	Three square Bulrush			
Typha domingensis	Southern Cattail			
Veronica anagallis-aquatica	NA			
Phacelia distans	NA			

O5-24 Cont

THC Comments
Borrego Valley Basin Draft GSP

Page 20 of 28

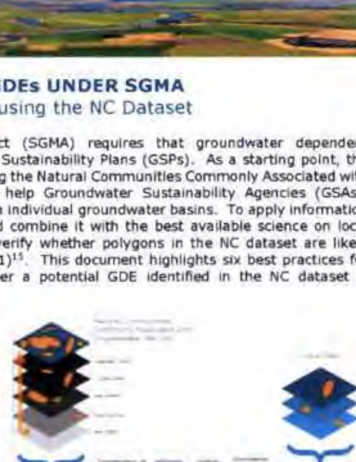
Attachment D

The Nature Conservancy
Protecting nature. Preserving life.

IDENTIFYING GDEs UNDER SGMA
Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online[14] to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)[15]. This document highlights six best practices for using local groundwater data to confirm whether a potential GDE identified in the NC dataset is supported to groundwater. O5-25

The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[16]. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset[17] on the Groundwater Resource Hub, a website dedicated to GDEs[18].



[14] NC Dataset Online Viewer is available at: https://gis.water.ca.gov/app/NCDatasetViewer/

[15] California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf

[16] For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf

[17] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/

[18] The Groundwater Resource Hub is available at: www.GroundwaterResourceHub.org

TNC Comments
Borrego Valley Basin Draft GSP

Page 21 of 28

BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2A) or multiple aquifers stacked on top of each other (Figure 2B). In unconfined aquifers (Figure 2A), using the depth to groundwater and the rooting depth of the vegetation is a reasonable method to determine groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2D). However, it is important to consider local conditions (soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2C). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2B) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and groundwater dependent ecosystems (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *If groundwater can be pumped from a well - it's an aquifer.*

O5-25 Cont.

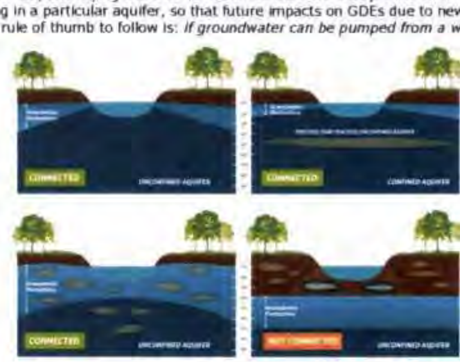


Figure 2. Confirming whether an ecosystem is connected to groundwater in a principal aquifer. Top: (Left) Depth to Groundwater in the aquifer under the ecosystem is an unconfined aquifer with depth to groundwater fluctuating seasonally and interannually within 30 feet from land surface. **(Right)** Depth to Groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. **Bottom: (Left)** Depth to groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. **(Right)** Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under surface water feature. These areas typically support species that do not require access to groundwater to survive.

BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)] Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g , depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets[19] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[20] could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[21] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document[4], one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (See Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3) Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however, if these groundwater conditions are prolonged adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet[4] are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[22]. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP <u>until</u> data gaps are reconciled in the monitoring network (See Best Practice #6).

O5-25 Cont.

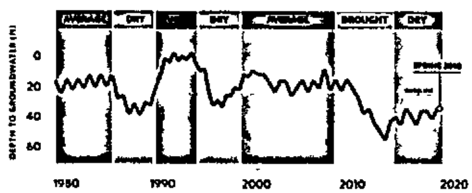


Figure 3. Example seasonality and interannual variability in depth to groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided

[19] DWR. 2016 Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016_12_23.pdf

[20] *Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin " [23 CCR §351(e)]*

[21] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs - link in footnote above)

[22] *SGMA Data Viewer* https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer

BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around NC polygons does not preclude the possibility that a connection to groundwater exists. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals[21], which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. **(Right)** Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. **Bottom: (Left)** An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. **(Right)** Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

O5-25 Cont.

[21] *For a list of environmental beneficial users of surface water by basin, visit:* https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/

Page 24 of 28

TNC Comments
Borrego Valley Basin Draft GSP

BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

O5-25 Cont.

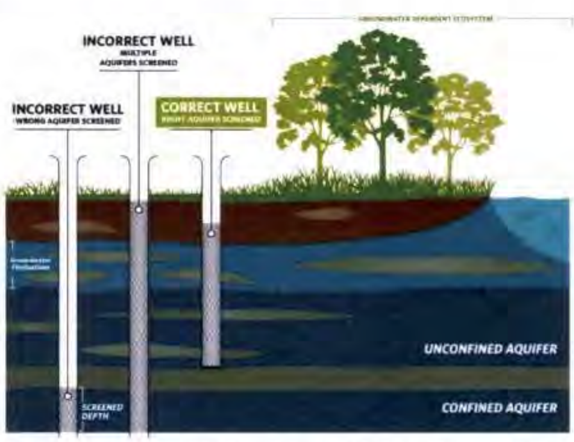


Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like streams and wetlands depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6 - left panel). A more accurate approach is to interpolate **groundwater elevations** at monitoring wells to get an estimate of groundwater elevation across the landscape. This layer can then be subtracted from the land surface elevation from a Digital Elevation Model (DEM)[24] to estimate depth to groundwater contours across the landscape (Figure 6 – right panel; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found. O5-25 Cont.

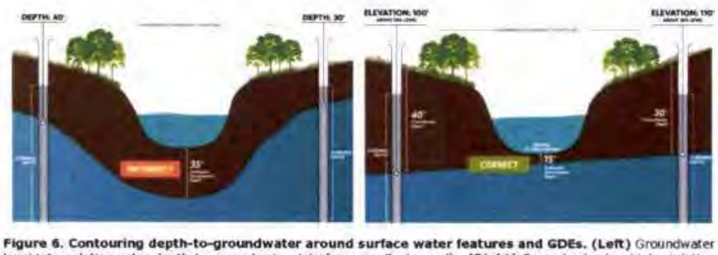


Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (Left) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. **(Right)** Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

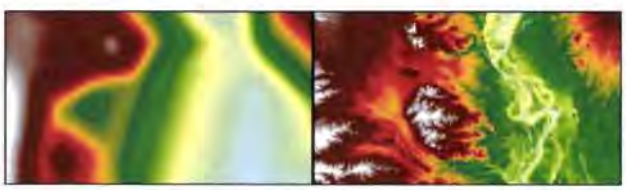


Figure 7. Depth to Groundwater Contours in Northern California. (Left) Contours were interpolated using depth to groundwater measurements determined at each well. **(Right)** Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth to groundwater contours. The image on the right shows a more accurate depth to groundwater estimate because it takes the local topography and elevation changes into account.

[24] USGS Digital Elevation Model data products are described at: https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services and can be downloaded at: https://viewer.nationalmap.gov/basic/

BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, **The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP <u>until</u> data gaps are reconciled in the monitoring network.** Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

O5-25 Cont.

KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on <u>groundwater emerging from aquifers</u> or on groundwater occurring <u>near the ground surface</u>. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to <u>wells, springs, or surface water systems</u>. *23 CCR §351(aa)*

ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (<u>www.groundwaterresourcehub.org</u>) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

Page 23 of 28

TNC Comments
Borrego Valley Basin Draft GSP

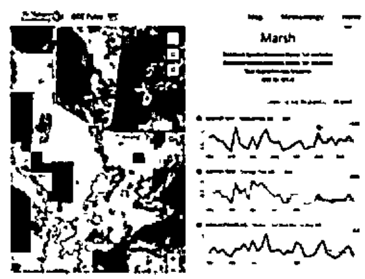
Attachment E

GDE Pulse

A new, free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data.

The Nature Conservancy
Protecting nature. Preserving life.

Visit
https://gde.codefornature.org/



Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA's Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset[25]. The following datasets are included: O5-26

Normalized Difference Vegetation Index (NDVI) is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

Normalized Difference Moisture Index (NDMI) is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

Annual Precipitation is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset[26]. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

Depth to Groundwater measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

---

[25] *The Natural Communities Commonly Associated with Groundwater Dataset is hosted on the California Department of Water Resources' website https://gis.water.ca.gov/app/NCDatasetViewer/#*

[26] The PRISM dataset is hosted on Oregon State University's website http://www.prism.oregonstate.edu/

Letter O5

Commenter: Sandi Matsumoto, Associate Director, California Water Program, The Nature Conservancy
Date: May 21, 2019

O5-1 This comment provides introductory information about The Nature Conservancy's role in advocating for land and water conservation, clarifying its interest in the implementation of SGMA and summarizes the tools and resources it has developed to assist GSAs in identifying and evaluating interconnected surface waters and groundwater dependent ecosystems (GDEs). Specific responses to issues raised are provided below (responses to Comment O5-3 through Comment O5-27).

O5-2 The GSA appreciates TNC's provision of its detailed checklist for considering nature. The GSP has adequately considered interconnected surface waters and GDEs in accordance with SGMA. Specific responses to issues raised are provided below (responses Comment O5-3 through Comment O5-27).

O5-3 Please see Master Response regarding GDEs. The technical appendix identifying and evaluating GDEs (GSP Appendix D4) has been updated with additional information to provide further evidence that there are no groundwater dependent ecosystems and other species that depend on interconnected surface water within the Borrego Subbasin. In addition, as requested, the GSP has identified lands protected open space preserves, habitat reserves, wildlife refuges, etc. by both state (ABDSP) and non-profit (Anza-Borrego Foundation), described in GSP Section 2.1.1 (see also Figure 2.1-4 and Table 2.1-2).

O5-4 The GSP has been revised to incorporate suggested revisions. Information on the depth to groundwater for the nearest wells to each GDE Unit shown in Figure 2.2-17 has been added.

O5-5 Interconnected surface waters (ISWs) are identified in GSP Chapter 2, Section 2.2.2.6, and shown in Figure 2.2-17. These features were identified through the U.S. Geological Survey's watershed boundary dataset and local mapping of perennial waters provided by Anza Borrego Desert State Park. The GSA's assessment does not rely solely on stream segments mapped as perennial, but is supported by data provided by ABDSP; review of historical stream flow data; manual stream flow measurements and field observation of Coyote Creek; and more generally, the Subbasin's conceptual hydrogeological model. The HCM, supported by geologic cross sections and groundwater levels recorded in monitoring wells, indicates that as soon as the basin boundary is crossed, perennial waters, where present, rapidly transition to disconnected streams. These areas are characterized by desert alluvial fan morphology, which consist of thick packages of coarse permeable sediment conducive to recharge. The commenter is referred to GSP Appendix D4, Section 2 and Section 5.1 for an in depth discussion.

Although groundwater monitoring and stream gauge sites are sparse around the margins of the Subbasin, the available data indicates the depth to water, even in locations close to the mountain front, is hundreds of feet below the ground surface, as discussed in GSP Section 2.2.2.7. The GSP has been revised to correct a typo which misidentified State Park Well No. 3 as the Horse Camp Well. This well has a depth to groundwater of 347.84 feet, as measured in Spring 2018. The Horse Camp Well (which has a groundwater depth of 287.69 feet) and State Park Well No. 3 are the best available data to indicate the depth to water beneath Coyote Creek and Borrego Palm Creek, respectively. Figure 2.2-17 has been amended to include these monitoring well locations, and elevation contours have been added to Figures 2.2-13A through 2.2-13C to show the difference between groundwater levels and the land surface.

The GSA recognizes that the hydraulic connection between surface water and groundwater does not need to be spatially coincident or permanent in nature for a surface water body to be defined as an ISW. As discussed in the GSP, the hydraulic connection to groundwater occurs from springs and the fractured rock aquifer that exists outside the Subbasin's boundaries. Surface water that originates from groundwater sources outside the Subbasin are rapidly lost to percolation, transpiration or evaporation. While they may be ISWs, their status as ISWs is not affected by pumping within the Subbasin or implementation of the GSP. The GSA has not identified a data gap associated with knowledge of ISWs because there is enough evidence to show that the Subbasin as a whole is a system whose surface waters are disconnected from the underlying groundwater system (i.e., losing streams) and is not hydraulically connected by a continuous saturated zone to the underlying aquifer.

O5-6 There are no NCCAG polygons that the GSA has evaluated as representing current GDEs. The Master Response on groundwater dependent ecosystems clarifies why the GSA has determined that there are no undesirable effects associated with GDEs. The GSP addresses GDEs in Section 2.2.2.7 and in Appendix D4. The GSP has been amended as follows in response to this question:

- Information on the depth to groundwater for the nearest wells to each GDE Unit shown in Figure 2.2-17 has been added.

- Elevation contours have been added to Figures 2.2-13A through 2.2-13C to show the difference between groundwater levels and the land surface.
- All edits described in the GDE Master Response.

O5-7 The GSP has provided all available data on groundwater elevation in monitoring wells through 2018. See prior responses on how the GSP has been amended to provide additional clarity on depth to groundwater.

O5-8 The commenter is referred to the master response on GDEs.

O5-9 The GSP does not identify NCCAG-mapped GDEs as an undesirable result under SGMA, and therefore does not include a sustainability goal specific to GDEs. The minimum thresholds, measurable objectives, and projects and management actions described in GSP Chapters 3 and 4 are designed to culminate in the absence of undesirable results by 2040.

O5-10 The commenter is referred to the master response on GDEs.

O5-11 See master response. Additional evidence is provided by using the TNC iGDE dataset, which shows changes in plant moisture over time are closely correlated with precipitation patterns, and not correlated with groundwater level trends. The GSA has amended Appendix D4 and Section 2.2.2.7 of the GSP to provide this additional evidence.

O5-12 The commenter is referred to the master response on GDEs. The GSA appreciates TNC's reference to Ventura County case studies.

O5-13 The commenter is referred to the master response on GDEs. The GSP concludes that impacts to groundwater dependent ecosystems are a pre-2015 impact and is not currently an undesirable result applicable to the Subbasin.

O5-14 The commenter is referred to the master response on GDEs. Because there is no significant nexus between the Honey Mesquite habitat and the regional groundwater table, an analysis of whether any legally protected species rely on the honey mesquite habitat is not required.

O5-15 The commenter is referred to the master responses on GDEs and the initial estimate of sustainable yield. The commenter is also referred to the GSAs response to Letter O2.

O5-16 The commenter is referred to the master responses on the initial estimate of sustainable yield. The sustainable yield is based on the USGS pre-development scenario in the

BVHM, and is confirmed through a water budget as presented in response to Letter O2. The GSP recognizes that the long-term average for natural recharge may not be reproduced in the future, especially over shorter time intervals, as evaluated through a Monte Carlo Simulation (MCS) uncertainty analysis, described in GSP Section 3.3.1.1. This analysis found that the uncertainty associated with climate variability is much greater than that associated with climate change.

O5-17 The commenter is referred to GSP Section 3.2, which defines what the GSA considers to be undesirable results for each of SGMA's sustainability indicators. The measurable objectives, interim milestones, and minimum thresholds established in the GSP are fixed standards that are not influenced by how groundwater conditions have changed between 2015 and 2019. The commenter assumes that any decline in the groundwater level or amount of groundwater in storage amounts to an adverse impact to beneficial users of groundwater. This is not the case, because the GSA has defined what would constitute an undesirable result in Section 3.2, and has determined that impacts to interconnected surface waters and GDEs occurred prior to 2015 and thus has not established sustainable management criteria for GDEs. Beneficial users consist of municipal, agricultural, recreational, and other uses (i.e., small water systems and non-potable irrigators), and do not include environmental uses. Operational flexibility is provided in the difference between interim milestones and minimum thresholds in key indicator wells, as described in GSP Section 3.4 and shown in Figure 3.4-1.

O5-18 The commenter is referred to response to Comment O5-14.

O5-19 The commenter is referred to response to Comment O5-17.

O5-20 The commenter is referred to the master response on GDEs.

O5-21 The commenter's suggestion is noted. The GSA will continue to use the existing groundwater level monitoring network to assess Subbasin conditions, and further develop the groundwater level network over the GSP's planning and implementation horizon, in accordance with adaptive management needs and as necessary to meet the GSP's sustainability goal.

O5-22 The commenter's suggestion is noted. The GSA will continue to use the BCM in future model updates, and incorporate new streamflow records that may become available within the watershed, in accordance with adaptive management needs and as necessary to meet the GSP's sustainability goal.

O5-23 The GSA appreciates the case studies linked by TNC. In response to this and other comments on the GSP, the GSA has modified some of its language to be more open ended with regard to multibenefit groundwater recharge projects. However, the GSA is not proposing specific groundwater recharge PMAs at this time because there are few existing barriers to recharge (i.e., hardened stream channels) within the Subbasin. The construction and maintenance costs and the regulatory constraints (i.e., FEMA floodplain considerations) that would be involved in building artificial/engineered recharge projects within the Subbasin are greatly disproportionate to the benefits of such a project. Though uncertain, the additional recharge provided by such projects would occur highly infrequently (i.e., high rainfall years when runoff is sufficient to reach the Borrego Sink), likely impossible to predict or forecast, and would add only incrementally to total recharge during major wet years. However, the GSA would encourage the construction of small scale recharge projects in conjunction with golf course renovation, or new development and/or redevelopment project, consistent with existing County stormwater regulations.

O5-24 The commenter is referred to the master response on GDEs. Because there is no significant nexus between interconnected surface waters and the regional groundwater table, the sustainable management criteria established to achieve the sustainability goal of the GSP will not impact the list of freshwaters species provided by TNC in its Attachment C.

O5-25 The GSA appreciates the guidance developed by TNC to identify and evaluate potential GDEs within groundwater basins. TNC is referred to GSP appendix D4 which implements many of the principles and practices discussed in the guidance. The commenter is referred to the master response on GDEs.

O5-26 The GSA appreciates the guidance developed by TNC to identify and evaluate potential GDEs within groundwater basins. TNC is referred to GSP Appendix D4 which implements many of the principles and practices discussed in the guidance. The commenter is referred to the master response on GDEs.

INTENTIONALLY LEFT BLANK

Comment Letter O6

Fostering the protection and appreciation SAN DIEGO AUDUBON SOCIETY *of birds, other wildlife and their habitats.*

May 17, 2019

Jim Bennett
County of San Diego Planning & Development
5510 Overland, Avenue, Suite 310
San Diego, CA 92123
Re Draft Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin
Dear Mr. Jim Bennett,

San Diego Audubon Society (SDAS) appreciates the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Borrego Valley Basin (Plan) being prepared under the Sustainable Groundwater Management Act (SGMA), as an environmental stakeholder in the basin SDAS is a non-profit organization with a mission to foster the protection and appreciation of birds, other wildlife, and their habitats, through education and study, and advocate for a cleaner, healthier environment The San Diego Audubon Society advocates on behalf of birds, other wildlife and their habitats O6-1

SDAS reviewed the Draft GSP for the Borrego Valley Basin to assess the treatment of groundwater dependent ecosystems and interconnected surface water systems as required by SGMA SDAS has an interest in sustainable groundwater management because many wildlife habitats and ecosystems rely on groundwater or interconnected surface water. This letter will outline concerns we have with three topics discussed in the GSP 1) Groundwater Dependent Ecosystems, 2) Beneficial Uses and Users of Groundwater, and 3) Depletions of Interconnected Surface Water Systems.

Groundwater Dependent Ecosystems

The SGMA requires that all beneficial users and uses of groundwater, including Groundwater Dependent Ecosystems (GDE), be considered in the GSP (CWC Section 10723 2) There are three GDE's described in the Plan Coyote Creek, Palm Canyon, and Mesquite Bosque Other GDE's mentioned are Hellhole Palms, Tubb Canyon, and Glorietta Canyon, though there is no analysis of their ecological condition, past or present and their hydrological relationship, to the Subbasin This appears to us to be a significant deficiency. Please revise the GSP to include this information for all of the relevant GDEs and include information on the likely impacts of the lack of ground water sustainability on key species in each of these GDEs O6-2

Beneficial Users and Uses of Groundwater

The Plan designates beneficial users for surface waters including freshwater habitat, wildlife habitat and preservation of rare, threatened or endangered species Under SGMA, depletions of surface waters interconnected with water in the Subbasin that have significant and adverse impacts on beneficial users of surface waters constitute an undesirable result (CWC Section 10721(x)(6)) There are brief and inadequate descriptions of all three GDE's in the Plan. Coyote Canyon and Palm Canyon list none of the species and/or current dependence on surface water feeding these regions. The descriptions for Mesquite Bosque concentrate on the Honey Mesquite Bosque and other native plants, but doesn't identity specific species Section 2.1 4 Beneficial Uses and Users of Groundwater (p 2-26) fails to O6-3 identify environmental users of groundwater, including groundwater dependent ecosystems and species that depend on interconnected surface waters The Least Bell's Vireo is an endangered species with critical habitat on Coyote Creek, and there are numerous other species who should be identified as beneficial users of groundwater Please perform an accounting of species and add Environmental Users to Table 2 1-7 (p 2-26) O6-3 Cont.

A USGS (2015) study noted that phreatophytes roots in the Borrego Sink was 15 3 feet though they have been known to reach 150 feet The historic groundwater table was within 10 feet of the surface at Mesquite Bosque, which was the site of 450 acres of honey mesquite and other native phreatophytes The Draft GSP describes the honey mesquite bosque as completely disconnected from groundwater as a result of pre-2015 impacts to the groundwater from pumping But there is no thorough description of the existing ecological conditions of the Mesquite Bosque and the claim that remaining vegetation does not rely on groundwater is based on a rooting depth estimate from one modeling study Additional research with field studies should be conducted to determine if the Mesquite Bosque is connected to and dependent on groundwater, including between 2015 and 2019 O6-4

Depletions of Interconnected Surface Water Systems

Section 3 2 6 (p 3-14) does not identify depletions of interconnected surface waters as an undesirable result because it describes impacts to interconnected surface waters as having occurred prior to 2015 The Draft GSP again describes the Mesquite Bosque as being disconnected from groundwater because of pre-2015 groundwater depletion, but there is insufficient scientific evidence to support this conclusion The current ecological conditions are not thoroughly described and no field studies are utilized to characterize the relationship between groundwater and the habitat Without further evidence the Mesquite Bosque should be considered a GDE and interconnected surface water and the sustainability criteria should be defined to avoid significant and unreasonable results to this site In addition, please provide data on any Federal or State endangered species that rely on the Mesquite Bosque habitat and measures that can be taken for protection O6-5

Because the Draft GSP allows additional declines in groundwater levels while pumping restrictions are phased in, it is critical that GDEs and interconnected surface water systems are accurately identified so that post-2015 impacts can be avoided Minimum thresholds should be set to prevent further impacts to interconnected surface water systems O6-6

Thank you for your consideration of San Diego Audubon Society's comments on the Draft Groundwater Sustainability Plan for the Borrego Valley Basin SDAS looks forward to seeing further improvements in the GSP and supports the long-term efforts towards sustainable groundwater management Please contact us at conservation@sandiegoaudubon.org or 858-723-7800 if there are further questions O6-7

Sincerely,

James A. Peugh

James A. Peugh
Conservation Chair
San Diego Audubon Society

Page 2

Letter O6

Commenter: James A. Peugh, Conservation Chair, San Diego Audubon Society
Date: May 17, 2019

O6-1 This comment provides introductory information about San Diego Audubon Society's role as an environmental stakeholder in advocating for the appreciation, conservation, and the education/study of birds and other wildlife. The San Diego Audubon Society's main concerns about the GSP involve groundwater dependent ecosystems (GDEs), the beneficial uses and users of groundwater, and interconnected surface waters. Specific responses to issues raised are provided below (responses to Comment O6-2 through Comment O6-7).

O6-2 The commenter is referred to GSP Appendix D4, which provides a complete identification and evaluation of the potential GDEs identified by The Nature Conservancy's NCCAG dataset. The commenter is also referred to the master response on Groundwater Dependent Ecosystems. The GSA has determined that potential GDEs mapped within the Subbasin are supported by surface water, perennial flow originating outside the boundaries of the Subbasin, and have no connection to the regional groundwater table within the Plan Area.

O6-3 The commenter is referred to GSP Section 2.2.2.6 and Appendix D4, which provides an adequate evaluation of interconnected surface waters. The GSP identifies the mapped streams within the Subbasin as *losing* streams, even where such streams are mapped as having perennial flow. If there is a groundwater connection to streams entering the Subbasin, such as Coyote Creek and Borrego Palm Creek, it is from the fractured rock aquifer (bedrock), which exists outside the Plan Area Boundaries, and which pumping within the Subbasin would have no appreciable influence. This concept is further supported by the fact that groundwater levels around the western and northern margins of the Subbasin are hundreds of feet lower than the ground surface. Since there is no hydrologic connection between the aquifer accessed by pumpers and surface water resources in the Plan Area, the GSP is not required to provide a detailed analysis of terrestrial and/or aquatic biological resources. The commenter is reminded that the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any of the PMAs in the GSP.

O6-4 The commenter is referred to the master response on Groundwater Dependent Ecosystems.

O6-5 The commenter is referred to the response to Letter O5 (The Nature Conservancy letter) and the master response on Groundwater Dependent Ecosystems.

O6-6 The commenter is referred to the response to Letter O5 (The Nature Conservancy letter) and the master response on Groundwater Dependent Ecosystems.

O6-7 Comment noted.

Comment Letter O7

From: Bri Fordem <bfordem@theabf org>
Sent: Tuesday, May 21, 2019 3:09 PM
To: LUEG, GroundWater, PDS
Subject: GSP Comment: Anza Borrego Foundation
Attachments: ABF GSPresponse.pdf

Please see attached comment letter.
Thank you for the opportunity to comment, we look forward to learning more in the future.

Bri

Bri Fordem
Executive Director
TheABF.org
760-767-0446 EXT 1001

ANZA BORREGO FOUNDATION

1

County of San Diego
Planning and Development Services
C/o Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Subject: Draft Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin (GSP)

Dear Mr. Bennett:

Thank you for the opportunity to comment on the draft GSP. Our appreciation goes out to the County, the Borrego Water District, the Core Team and the SGMA Advisory Committee for their efforts over the past many months to produce such an impressive document.

Anza-Borrego Foundation (ABF) was founded in 1967 to purchase inholdings from willing sellers within the vast Anza-Borrego Desert State Park" (Park) Since our founding we have added over 55,000 acres to the Park and over the years have funded a wide variety of education, research and resource management projects in the Park. The Park is approximately 1,000 square miles, surrounds the approximate 98 square mile Borrego Springs Subbasin, and supplies the majority of the natural groundwater recharge to the Subbasin (GSP Figure 2.2-1) O7-1

Our comments on the draft GSP are as follows.

1. The Park contributes over $40 million annually to the economy of Eastern San Diego County The community of Borrego Springs plays a critical role as the hospitality hub for the State Park. To protect this economic vitality, it is essential that the community and the more than 500,000 visitors which it attracts annually have access to an affordable supply of high-quality water for basic needs use in town and for recreation in the Park.

a Allocate a portion for municipal use to ensure an adequate and affordable water supply to support the community's growing role as the primary provider of goods and services to both residents and visitors. O7-2

b. Don't gamble with water quality. Avoid the threat of diminishing water quality and the necessity for expensive water treatment facilities by shortening the target year to reach sustainability by 2030.

2. It is essential that the plan include ample water for critical at-risk biological resources in the basin. The draft GSP dismisses the relationship of continued pumping on both Groundwater Dependent Ecosystems (the Mesquite Bosque) and historic surface stream flow reductions on major tributaries entering the basin (Coyote Creek and others) There is no solid scientific consensus regarding the viability, survivability and recoverability of these important elements of the desert ecosystem. The people of California have promised to protect this precious desert ecosystem in perpetuity. Therefore, significant efforts to reduce the impact on the valued resources of the Park should be a priority of a plan towards recovery and sustainability of the area. O7-3

3. ABF recommends the Groundwater Sustainability Agency ("GSA") adjust the current shares of the estimated sustainable yield by considering proportion of land ownership, historic beneficial use, and feasibility of further reductions of use.

a The draft GSP does not consider the proportion of land each pumper services in the Subbasin. It focuses only on prior use over a five year period. (GSP 3.3.2.1) According to the draft GSP, the Park covers 27% of the land subject to the GSP. (GSP Table 2.1-2.) The draft GSP also identifies that ABF owns an additional 5% that will be transferred to the Park. (GSP Table 2.1-2) The Park will have the responsibility of stewardship over 32% of the land that is subject to this GSP, but its water use consists of less than .07% of the total baseline pumping allocation Yet under the draft GSP, the Park is still responsible for reducing use by 74%. O7-4

b. Whereas the Park is responsible for a large portion of the land and minimal water use, the agriculture sector's responsibility and use are the opposite. According to the draft GSP, the agriculture sector comprises 4 2% of the Subbasin's 62,776 acre surface area and uses 70% of the pumped water. (GSP Table 2 1-1; GSP 2 1 1; and GSP 3.1.4.) Because recent usage data is the only method the GSA used to determine shares of the estimated sustainable yield, the agriculture sector is also being allocated around 71 7% of the total baseline pumping allocation. (GSP Table 2 1-7, and GSP Table 3-6)

c. By failing to give any consideration to the amount of land sustained by each pumper's use, the GSP assigns a significant burden to the Park that may be impossible to bare, resulting in shutting down the Park. The blanketed 74% reduction is an ineffective approach to reaching sustainability, particularly where the current use is known to be concentrated in agricultural areas and the agriculture sector will be maintaining its 70% of the water use

O7-4 Cont.

4. There are data gaps in the water quality monitoring particularly in the North Management Area. Wells now in the process of being secured for water quality monitoring will not yield usable initial data for years. The GSP should specify mandatory water quality monitoring of any major wells in the Subbasin. As water quality degrades and additional treatment is required, the cost for ratepayers, including ABDSP, will increase The GSP should identify Ratepayers as stakeholders in the development of a Water Trading Program. Pumped water is a public resource concern in Borrego Springs. O7-5

5 Fallowing of agricultural land must include the removal of invasive weed species. There are two highly invasive weed species that threaten native habitats, wildflowers, and native species in the Park: Egyptian knapweed (*Volutaria tubuliflora*) and Sahara mustard (*Brassica tournefortii*) Currently, there are fallowed agricultural fields that host these species. State Parks devotes staff time and resources to remove and control these species in the Coyote Canyon area of the Park. O7-6

6. While the Water Trading Program is referred to as an economic incentive that will lead to more water conservation (GSP 4.1), the Water Trading Program is not necessarily the key to water reduction O7-7

7. ABF supports the immediate implementation upon GSP approval of the mandatory metering program as detailed in Appendix E of the GSP. O7-8

We appreciate your considerations of these important needs as you revise the current draft GSP.

Brianna Fordem
Executive Director
Anza-Borrego Foundation

INTENTIONALLY LEFT BLANK

Letter O7

Commenter: Brianna Fordem, Executive Director, Anza-Borrego Foundation
Date: May 21, 2019

O7-1 This comment provides introductory information about the Anza Borrego Foundation (ABF), and its role as an environmental stakeholder that seeks to add acreage to ABDSP; and further education, research and resource management projects in the Park. Specific responses to issues raised are provided below (responses Comments O7-2 through Comment O7-8).

O7-2 The Groundwater Sustainability Agency (GSA) appreciates the critical role played by ABDSP and ABF in the region's economic vitality, tourism, and hospitality. With regard to the commenter's concern over an adequate and affordable water supply, the commenter is referred to the master response for the baseline pumping allocation and pumping reduction program. The commenter's request to shorten the target year to 2030 is noted. While the Groundwater Sustainability Plan (GSP) does not set specific a specific schedule for reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

O7-3 The commenter is referred to the master response for groundwater dependent ecosystems.

O7-4 The commenter is referred to the master response for the baseline pumping allocation and pumping reduction program. With regard to its concerns over whether the BPA and pumping reduction program leaves sufficient water to operated ABDSP, the commenter is referred to the GSA's response to Letter S2 (ABDSP letter).

O7-5 The GSP states,

> Degraded water quality is significant and unreasonable if the magnitude of degradation at pre-existing groundwater wells precludes the use of groundwater for existing beneficial use(s), including through migration of contaminant plumes that impair water supplies, where alternative means of treating or otherwise obtaining sufficient alternative groundwater resources are not technically or financially feasible. At a

> minimum, for municipal and domestic wells, water quality must meet potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. The Basin Plan has not established numerical objectives for groundwater quality in the Plan Area but recognizes that in most cases irrigation return flows return to the aquifer with an increase in mineral concentrations such as TDS and nitrate (Colorado River RWQCB 2017). The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater and irrigation/fertilizer use best management practices (Draft GSP Section 3.2.5; page 3-13).

The GSA will continue to use the existing water quality monitoring network to assess Subbasin conditions, and further develop the groundwater quality network over the GSP's planning and implementation horizon, in accordance with adaptive management needs and as necessary to meet the GSP's sustainability goal.

Furthermore, BWD monitors water quality regularly, and cannot legally deliver water quality that does not meet applicable standards, including potable drinking water standards specified in Title 22 of the CCR. The commenter makes the assumption that water quality will degrade and eventually require additional and/or expensive treatment. This is not necessarily the case. BWD drinking water wells are located away from areas in the GSP identified as having water quality issues such as the Borrego Sink, and would retain the flexibility to manage the location of its groundwater pumping so as to avoid having to plan and build additional and/or expensive treatment facilities or facility upgrades. The commenter is referred to sections of GSP Chapter 3 that describe undesirable results (Section 3.2.4), minimum thresholds (Section 3.3.4), and measurable objectives (Section 3.4.4) related to water quality.

O7-6 The GSA notes the commenter's request that future fallowing include removal of invasive weed species. The GSP includes Voluntary Fallowing of Agriculture Land (PMA No. 4). As indicated in the GSP, the GSA will prepare policy development and CEQA documentation after GSP adoption in advance of considering formal adoption and implementation of a voluntary fallowing program.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O7-7 Comment noted.

O7-8 Comment noted.

Comment Letter O8

CLEAN WATER ACTION

May 21, 2019

Jim Bennett, Water Resources Manager
Borrego Valley Groundwater Sustainability Agency
5510 Overland Avenue, Suite 310
San Diego, California 92123
Sent via electronic mail to PDS LUEGGroundwater@sdcounty ca.gov

Re: Comments on Draft Groundwater Sustainability Plan for Borrego Groundwater Basin

Dear Mr. Bennett,

On behalf of Clean Water Action, I am pleased to provide the following comments on the draft Borrego Groundwater Sustainability Plan. Our organization has been working on the implementation of the Sustainable Groundwater Management Act (SGMA) since its inception, and has an interest in its successful implementation throughout the state. We have been engaged in groundwater protection efforts since our program opened in California in 1990, and have specific expertise in drinking water and stakeholder engagement. As part of our interest in the successful implementation of SGMA, our organization has commented on SGMA activities at the state level and on several plans submitted in 2016 as alternatives to Groundwater Sustainability Plans. Our organization co-authored a report on stakeholder engagement in SGMA[1] and were able to participate remotely in 2 meetings of the Ad Hoc Stakeholder Outreach Committee for this Plan. O8-1

Our review of this draft is admittedly cursory; we did not review models or the data used to run them, nor did we comprehensively review undesirable results and management actions. However, we're indebted to the Local Government Commission for its more thorough review of the plans and have attached their memo to supplement our questions.

We also understand that this is a draft document and welcome the opportunity to request additional information and clarification Our questions are limited to governance and management actions, stakeholder engagement and drinking water.

[1] "*Collaborating for Success: Stakeholder Engagement for Sustainable Groundwater Management Act Implementation*" Community Water Center, Clean Water Fund and Union of Concerned Scientists, 2015

1444 Eye Street NW, Suite 400
Washington, DC 20005
Ph. 202 895 0420 | Fax: 202 895 0438

350 Frank Ogawa Plaza, Suite 200
Oakland, CA 94612
Ph: 415.369.9160 | Fax: 415.369.9180

www cleanwateraction org/ca

Notice and Communication (Appendices C, C1)

We appreciated the strong commitment to stakeholder outreach and engagement expressed by the members of the Ad Hoc committee on the calls in which we participated. It would be helpful if more information about those efforts were provided in this plan For instance, how successful were efforts to reach all classes of beneficial users? Where is more effort – or a different approach – needed? In this area, we are specifically interested in your success in reaching domestic well users. We have the same question about public engagement – how successful were your efforts to encourage the "active involvement" of the general public[2]?. Specifically, how successful were your outreach efforts to Spanish-speaking residents in the basin?

It would also be helpful if the plan could identify how input received was incorporated. Can you provide more specifics about how the plan was amended in response to public input? O8-2

We are also interested in how outreach and communications continue through the plan's implementation, as required in statute. Unfortunately, we found the communications plan in Appendix F-2 woefully lacking in detail and hope that that can be amended in the final plan. A few suggestions;

- While the MOU in Appendix B-4 clearly states that the Advisory Committee will provide input on plan implementation, the plan itself states that the terms of those committee members extends only through plan development and completion[3]. Can you please clarify the permanent nature of the AC in the final plan?
- What are the goals, strategies and tactics for stakeholder outreach and communications?
- At a minimum, a key goal of the plan should be to educate residents and beneficial users about the need to raise funds for plan implementation.

Table 5-2 identifies an annual budget (in 2020 dollars) of $6,000 for outreach What activities will be funded with this budget? Is it sufficient to accomplish your objectives? O8-3

[2] Water Code 10727.8 "The groundwater sustainability agency shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin prior to and during the development and implementation of the groundwater sustainability plan."
[3] Draft Plan, Page 1-4

2

Drinking Water

As we reviewed the information in the report, we were unable to identify clearly which wells were potentially compromised due to water quality issues or the lowering of the groundwater table. Specifically, which domestic wells will potentially be impacted by increasing groundwater contamination and lowering groundwater levels? How does the plan identify those impacts and when and how would mitigation efforts be triggered? Also, the plan seems to confuse mitigation with additional plan actions. Our interpretation is that mitigation requires the impacted party to be directly assisted. O8-4

We also recommend that the plan reference the Irrigated Lands Regulatory Program[4] While it has not yet been implemented in Borrego Valley, the State Board in 2018 adopted final amendments to the East San Joaquin River Program, with some parts of that revised order identified as precedential. Specifically, the State Board required that all domestic wells located on land covered by the Program be tested for nitrates and that all agricultural operations should develop and implement irrigation and nutrient management plans to limit their discharge of nitrates to groundwater. O8-5

Projects and Management Actions

We appreciate the breadth of actions being considered, but have some questions. First, how are these actions being prioritized? If the plan is to reach the Sustainability Goal by 2040 in a linear fashion, do all of these measures need to be implemented simultaneously? Can they be prioritized according to cost and perhaps public receptiveness? O8-6

Water trading is an action being considered in basins around the state, but to date, only Ventura County has implemented a market and it is still in pilot form. Yet this plan states definitively that this is something that it definitely will do. Is the timeline for implementing this plan too ambitious O8-7

We appreciate that the Water Conservation action provides explicit savings. In the final plan, it would be helpful to quantify expected conservation for each identified measures, along with costs for each. All conservation is not alike and it may be more appropriate to implement some measures over time. O8-8

We agree with the metering requirement for the pumping reduction program and look forward to proposals to ensure that any program to track metered water use is effectively enforced. O8-9

[4] https://www.waterboards.ca.gov/water_issues/programs/agriculture/

3

We agree that some agricultural fallowing will be necessary to meet the 2040 Sustainability Goal and measurable objectives. We hope that this effort will be informed by an analysis of the impact of fallowing on farm workers and how that impact might be mitigated. O8-9 Cont

Can you clarify the intent of the Water Quality Optimization Program? It seems as though this is looking at expensive options for treatment or intrabasin transfers in response to water quality degradation Instead, could you consider accelerating other efforts, such as pumping reduction? For instance, if your monitoring plan indicates that the middle and lower aquifers in the Northern Management do contain significant levels of arsenic, you may want to accelerate efforts to reach the sustainability goal in that area and protect the upper aquifer. For nitrate, working with the board to implement the Irrigated Lands Regulatory Program could help reduce excess nitrate being discharged to the vadose zone? In short a cost comparison looking at source protection efforts rather than the mitigation efforts in this program seems like an appropriate action. O8-10

Thank you for allowing us the opportunity to comment. Please feel free to contact me if you have any questions

Sincerely,

Jennifer Clary
Water Program Manager

DRAFT Summary Memorandum

Independent Review of the Borrego Valley GSP

Gaps and Opportunities

Presented by

Local Government Commission

to

Borrego Valley Endowment Fund
&
Borrego Valley Stewardship Council
&
Borrego Water District

Friday, May 17, 2019

1

I. IMPETUS FOR REVIEW

The Borrego Valley Endowment Fund (BVEF) retained the services of Local Government Commission (LGC), on behalf of the Borrego Valley Stewardship Council (BVSC), to conduct an independent review of the draft Groundwater Sustainability Plan (GSP) for the Borrego Valley Groundwater Basin, as released by the Borrego Valley Groundwater Sustainability Agency (BV GSA) on March 21, 2019.

According to Task I of the BVEF/LGC Contract, "LGC will review GSP documents produced to date, past meeting agendas and notes; and interview advisory committee members and other relevant stakeholders. LGC's review of the existing GSP development process will identify both gaps in the current status and opportunities to enhance the GSP so as to help BWD ensure regulatory compliance while also enhancing the positive impact of the GSP for the entire Borrego Springs community. LGC will produce a summary findings memo outlining identified gaps and opportunities, with special attention to the needs of severely disadvantaged community members and the long-term vision for Borrego Springs."

LGC entered into contract with BVEF on May 7, 2019. As such, LGC had 8 business days to review the draft GSP for gaps and opportunities, with the goal of informing the Borrego Valley Stewardship Council and other interested parties for their own public comment to the GSA. To maximize use of available time, LGC determined to focus our review of the draft GSP on the two most important sections: Chapter 2, Plan Area & Basin Setting; and Chapter 3, Sustainable Management Criteria. O8-11

This document, submitted to BVEF on Friday May 17, 2019, represents the Draft Deliverable, "Summary Memo of Gap Analysis and Recommendations." The Final Deliverable will be submitted at a later date, no later than 60 days following submittal of the Borrego Valley GSP to the California Department of Water Resources or by December 31, 2019, whichever occurs first. LGC has used 40 of the estimated 80 hours personnel time to complete this task. LGC will use any remaining funds allocated to this task for completion of the Final Summary Memo.

II. CONTEXT OF REVIEW

LGC has coordinated closely with members of the Borrego Valley Stewardship Council, Borrego Springs Community Sponsor Group, Borrego Valley GSA Advisory Committee and other interested parties in its review of the Draft GSP. The goal of our review is to support long-term goals of aligning the Final Borrego Subbasin GSP with the existing BVSC Geotourism Charter and integrated watershed master plan to be developed at a later date, with specific attention to ensuring robust and meaningful representation of

2

historically underrepresented Borrego community members whom potentially face disadvantages (i.e., "disadvantaged communities" and "severely disadvantaged communities" under SGMA).

The BVSC Geotourism Charter aims to promote, sustain and enhance the geographical character of Borrego Springs—its environment, culture, aesthetics, heritage, and the well-being of its residents and visitors. The following principles of the BVSC Charter aligned with the goals of the Sustainable Groundwater Management Act:

- Principle VI. Community Involvement
- Principle VIII. Protection and enhancement of destination appeal
- Principle IX. Land Use
- Principle X. Conservation of Resources
- Principle XI. Planning

The key concepts of the future integrated watershed master plan, as outlined in the April BVSC Workshop, include: [6 break-out groups]

- Planning within a Water Budget / Integrated Planning Framework
- Sustainable Distanation Management / Hospitality
- Sustainable Community Development Needs Assessment
- Cultural Landscape Survey
- Economic Innovation & Transition Zones
- GSP / CEQA Compliance & Community Plan Integration

In the context of these key principles, LGC reviewed the Draft Borrego Subbasin GSP on the following topics:

- Stakeholder Engagement
- Disadvantaged Communities
- Drinking Water Safety
- Climate Change
- Groundwater Dependent Ecosystems
- Land Use / Groundwater Recharge

A summary of our review on each of these topics is provided in the following section. Attached to this document are excel file evaluation tools with detailed analysis of the GSP for each topic.

III. SUMMARY FINDINGS OF GAPS AND OPPORTUNITIES

The Borrego Valley GSA is the first real form of collaborative local governance for the Borrego Springs community, which provides a significant opportunity for Borrego Springs to achieve its vision for a sustainable future. SGMA provides ample flexibility

O8-11 Cont.

3

for the GSP to include broad goals that will support land use and economic development shifts necessary to achieve this vision (without overstepping jurisdictional authority of San Diego County. Local Government Commission strongly urges the BVGSA and its stakeholders to use this opportunity to the greatest extent possible – to establish necessary land use, water management, and community governance policies that will accelerate achievement of a sustainable Borrego Springs.

IV. RECOMMENDATIONS TO THE BVSC & OTHER INTERESTED PARTIES

- LGC strongly encourages the Borrego Valley Stewardship Council, its members, and all other interested parties to submit public comment letters to the Borrego Subbasin GSA. This can easily be done using this document and the attached excel spreadsheets. LGC recommends the following protocol for creating comment letters:
  - Select between 1 and 3 key issues of most interest to each BVSC member / constituent group.
  - Structure your letter as follows:
    - i. Your constituency & interest in the GSP
    - ii. Commendations to the GSA for their hard work & dedication
    - iii. Recognition of the overarching goals of SGMA, as they relate to your topic of interest/concern
    - iv. Then, for each interest/concern
      1. [Code/Regulation citation] requires that [quoted text]...
      2. [section / page number of GSP] addresses / fulfills this requirement by...
      3. GSP fails to meet the requirement because...
      4. I/We urge the GSA to remedy this shortcoming / address this concern by... [recommendation; inverse of the concern]
    - v. Thank you for your consideration; please do not hesitate to contact me/us to further discuss our concerns/recommendations.
  - Populate the content of your letter by:
    - Copying summary language for each of your topics of concern from this memo
    - Pull the specific code or regulation reference (citation) and text (quoted) from the attached excel spreadsheets.
  - Letters should be submitted via email (preferred) or postal mail in accordance with the draft GSP public comment guidelines.
    - *Note*: more letters citing the same concerns and recommendations, sent from multiple individuals and/or organizations will have a greater impact than fewer letters with multiple parties "signing on"

O8-11 Cont.

4

to a single letter. However, following both models will be the most impactful.

- LGC strongly encourages BVSC, its members, and all other interested parties to request that the GSA include all work products and reports developed to date by ENSI, LeSar, Dudek, or other consultants should be included in the body of the GSP and considered for adoption, and not included solely as an attachment, appendix, addendum or support document to the GSP.
- LGC strongly encourages Borrego Valley Stewardship Council, its members, and all other interested parties to attend all upcoming public meetings regarding the GSP, and voice their concerns regarding these gaps in the current draft, as well as their recommendations, especially with regard to:
  - Proportional reductions across all sectors;
    - LGC strongly recommends no water use reductions for the municipal sector. Proportional reductions are completely inappropriate and unnecessary based on current and historic pumping levels. Municipal users account for a fraction of that pumped by agriculture, and half what is pumped by golf. Neither of these industries are sustainable in the valley at high percentages. The Community needs to transition to lower water-use industries that will support the long-term economic sustainability of the region.
  - Accelerated Pumping Reductions
    - LGC recommends front-loading water use reductions in order to preserve more water in the subbasin and safeguard against potential drought and unforeseen impacts. Using a fixed percentage of the Baseline Pumping Allocations to calculate yearly reductions, rather than a fixed volume of water, will preserve as much groundwater as reducing the cut-back period from 20 years to 15 years under the current methodology.
  - Groundwater Dependent Ecosystems
    - LGC strongly encourages the GSA to reconsider its evaluation of groundwater dependent ecosystems. Existing data and anecdotal evidence illustrates that groundwater dependent ecosystems within the subbasin, especially within the Anza Borrego Desert State Park, continue to experience undesirable results. The current draft GSP does not acknowledge these impacts, as the analysis referred to uses the false assumption that groundwater dependent ecosystems were irreparably harmed prior to the January 2015 baseline.
  - Stakeholder engagement, communication, and disadvantaged community considerations

O8-11 Cont.

5

- LGC finds the current Draft GSP's treatment of stakeholder engagement and DAC considerations to be woefully inadequate. We strongly urge the GSA to significantly enchance their stakeholder engagement efforts, especially to disadvantaged communities, and document this engagement within the GSP.
- Land use changes and groundwater recharge potential.
  - LGC encourages the GSA to more adequately evaluate land use changes and groundwater recharge potential as a project and management action for the sustainability goal. Land use zoning and decisions have a tremendous impact on groundwater quality and recharge potential. The GSA should work closely with the Community Sponsor Group and the County to update all land use planning documents to maximize recharge potential while also maximizing opportunity for economic development in Borrego Springs.
- LGC strongly encourages the Borrego Valley Stewardship Council, its members, and all other interested parties to organize in-person meetings with the GSA Advisory Committee to discuss these concerns and recommendations in detail.
- Draft Comment Letter

O8-11 Cont.

V. DETAILED REVIEW OF THE GSP BY CHAPTER

[redacted] Chapter 1: Introduction

[redacted].2 Sustainability Goal

The Sustainability Goal should be based on climate change impacts and future conditions, and should acknowledge that maximizing groundwater recharge will be a necessary component of achieving sustainability. The current draft GSP makes no reference to climate change impacts on achieving the sustainability goal; nor does it reference soil conditions, recharge rates, or land use change impacts on achieving that sustainability goal. In fact, the sustainability goal as stated in the draft GSP is not a goal at all – but simply a restatement of the intent of SGMA. It is extremely vague and not quantified in this section. This is completely inadequate and must be resolved.

O8-12

[redacted].3 1 Organization and Management Structure

The GSA should include personnel with a focus on climate change effects on groundwater conditions and recharge rates. There is no clear identification that any of the staff on the GSA "Core Team" or Advisory Committee (AC) have background or expertise in either soil science or considering the impacts of land use on groundwater conditions. However, the organizational structure does include broad representation

6

from relevant sectors. Personnel from the state park may be equipped to address climate change, but this is unclear. Similarly, the BVSC representative should uphold climate change concerns, but it is unclear whether they have the necessary expertise. The GSA should seek to ensure the Core Team and AC is populated with adequate expertise on both climate science, soil science, and hydrology. The GSP should be updated to include a thorough description of the requisite background of Core Team and AC members. O8-12 Cont.

[redacted].3.3 Implementation Costs

Estimated costs to implement the GSP, and the GSA's approach to meeting those costs should include costs related to climate change impacts and adaptation, as well as costs to implement groundwater recharge. The current draft GSP includes no reference to soil conditions, recharge, or land use impacts or changing conditions as a result of climate change, and how these changing conditions could affect GSP implementation costs. The GSP implementation cost estimate does include a 10% contingency, but this is drastically insufficient, given the lack of detail in the current projects and management actions and implementation budget. The GSP implementation cost estimates need to be re-evaluated in conjunction with more detail being provided to the projects and management actions.

Further, a thorough analysis of projected costs, and how the GSA will raise those funds, needs to be conducted to determine the potential impacts to vulnerable communities, and how to mitigate those impacts.

[redacted]Chapter 2, Plan Area & Basin Setting

[redacted]Plan Area

a) 2.1.1 Summary of Jurisdictional Areas and Other Features

<u>Disadvantaged Communities</u>

This section should include specific reference to disadvantaged communities. The current draft includes no specific reference to <u>where</u> most vulnerable community members (e.g., specific neighborhoods or population groups) within the subbasin are located.

This section should include locations and extent of communities dependent upon groundwater and noting where community wells are located near higher production wells, such as irrigation wells, that could potentially impact domestic well users' groundwater supply or quality. The current draft includes a map with density of wells per square mile, but does not include a map of the 52 "de minimis extractors," such as the 49 domestic wells in the subbasin and small water systems. Despite the requirement of SGMA not extending to de minimis users, the Borrego Subbasin GSP *should* include

7

these users, because the overall water budget for the entire basin is relatively small, thus "de minimis" users actually make up a recognizable percentage of total extractors.

This section should represent various portions of the basin dependent upon groundwater for beneficial uses, including communities dependent upon groundwater for domestic uses. While the draft plan does map existing land use designations and zoning, it does not include specific data by land use on groundwater dependent users; all of the Borrego community and all users are groundwater dependent. This should be explicitly stated and mapped.

b) *2.1.2 Water Resources Monitoring and Management Programs*

Monitoring & Regulatory Alignment

This section should note where monitoring programs are located and where there may be gaps in monitoring. Components of the monitoring plan should include: 1) if stakeholders have requested additional monitoring; 2) either when additional monitoring will be implemented or why the request will not be approved at this time; and 3) water-relevant climate, land use and recharge variables (such as land use, soil conditions, precipitation, temperature, and evapotranspiration).

The current draft GSP highlights BWD's existing tiered rate structure, but does not indicate how this relates to water affordability for lower income groups. The draft provides a clear description of plan area geographic bounds, contributing watersheds, and land use designations with size and percent land cover. However, monitoring only lists the groundwater elevation monitoring wells included in CASGEM. No reference is made to soil conditions, precipitation, temperature, or evapotranspiration. Demand Offset Mitigation Water Credits Policy is the only management program in the section that adequately describes how this will impact or aligns with the GSP. All other programs included should follow this model, and this level of detail. These components need to be incorporated into the monitoring plan. O8-12 Cont.

The current draft GSP references that the County Groundwater Ordinance will need to be evaluated and possibly revised to ensure consistency with GSP sustainability goals, but provides no guidance on what that would look like. There is also no information on metrics measured, past impacts, or anticipated future impacts.

The current draft GSP does a sufficient job explaining the impact of wells to the GSP, but still includes no metrics and no real information on how this information will be incorporated into the GSP.

This section raises a number of questions:

8

- How does BWD's Conservation Management Program (including tiered rates) determine water affordability for low-income communities?
- How does the Draft GSP integrate with the 2009 Anza-Borrego Desert IRWM Plan?
- How will the GSP integrate into the Region 7 Water Quality Control Plan for the Colorado River Basin?
- Why is there a discrepancy between BWD and the County's Water Credits Policy? As such, which water credits will be validated under the GSP's Baseline Pumping allocations?
- How many wells have been applied for vs. approved since passage of SB 252 and release of this plan?
- How will domestic wells and small water systems be protected from negative impacts of the baseline pumping allocation?

Each of these questions must be answered favorably for this section to adequately fulfil the requirements of the regulation.

The current draft of this section only describes the applicable laws and regulations present in the basin; it needs to be augmented to describe how monitoring of each of those programs will be incorporated into the GSP; how those existing programs will limit operational flexibility, and how the GSA will adapt to those limits. O8-12 Cont.

c) 2.1.3 Land Use Elements of Topic Categories of Applicable General Plans

This section of the plan should identify:

- disadvantaged and severely disadvantaged unincorporated communities;
- where water agency consolidations or service extensions are being considered;
- potential sources of contamination from current land use practices;
- expected land use changes due to climate change impacts or development and socio-economic conditions, that may affect water supply and water demands, as well as groundwater recharge rates;
- projected water demand as a result of climate change or population growth, and its impact on achieving the sustainability goal; and
- how climate, land use and soil conditions impact groundwater recharge, and the affect this may have on water supply and demands how the GSP addresses those effects.

This current draft of this section does a very good job of identifying all the policies that are relevant and in alignment with the GSP, but need to greater specificity on how the GSP will uphold or implement these various policies.

9

According to the San Diego County Groundwater Ordinance: "One of the purposes of the ordinance is to ensure that development is not approved in groundwater dependent areas of the County unless a project applicant can demonstrate that there are adequate supplies available to serve both existing and proposed uses." The existing Community Plan and General Plan land use policies are listed in the draft GSP, but the degree of integration is included only as a yes/no factor. This raises the questions,

1) How will the GSP affect the pre-existing San Diego County Groundwater Ordinance? and

2) How will this impact pumping allocations?

These questions should be answered in this section of the GSP, as well as providing detail on how the integration requirement is met, and identifying in which section of both the GSP and the General Plan (GP)/ Community Plan (CP) this is discussed.

This section also fails to answer the following questions, necessary for meeting the regulatory requirements:

- Do current well permitting practices protect vulnerable water supply sources, such as shallow wells (for all beneficial uses)?
- Are there documented instances of stakeholder concerns regarding current land use or well ordinances impacting other beneficial uses?
- Which current ordinances need to be amended in order for the basin to meet its sustainability goals? O8-12 Cont.
- Are the policies considered to implement the GSP actual policies that are currently in existence, or policies that would need to be established?

Each of these questions must be sufficiently answered for this section to adequately fulfil the requirements of the regulation.

Recharge

The San Diego County General Plan (GP) and Borrego Valley Community Plan (CP) include positive policies to protect the basin from continued overdraft and to minimize the impact of stormwater runoff (e g., Goal LU-8; COS-5.2), yet include no mention what so ever of recharge. The current draft GSP should be augmented to include this information, and future GP / CP updates should do the same.

The current draft GSP includes positive language regarding future GP and CP needing to consider the sustainability goals of the GSP. The draft language also does an excellent job acknowledging the misalignment between agricultural preservation goals in the General Plan and groundwater sustainability in the Borrego subbasin. However, additional detail needs to be provided on how that consideration and GP / CP updates will occur, as well as how the agricultural preservation and groundwater sustainability goals will be reconciled.

10

It is unclear whether GP Conservation and Open Space Element, Goal COS-4: Water Management, and/or COS-4.3 - "Maximize stormwater filtration and/or infiltration" will promote groundwater recharge, or if it only refers to stormwater mitigation where groundwater is not shallow. This policy should be clarified, and potentially reevaluated to maximize groundwater recharge potential.

The discussion in this section of estimated buildout and impacts on the GSP is inconsistent. The draft GSP states that Borrego could not meet the water needs if all allowable lots were built out, yet also states that implementation of existing land use will not affect sustainable management. The draft does, however, acknowledge that updated buildout estimates should be considered in conjunction with the GSP.

<u>Climate</u>

The GP includes a "climate change and land use" goal (LU-5) (e.g., "sustainability"), but there is absolutely no discussion of potential climate change impacts on development patterns in the plan area. This section of the GSP needs to address this gap in existing policy by identifying potential impacts of increasing drought and evapotranspiration rates potentially making agriculture unsuitable for the subbasin, and therefor potentially causing major change in land use patterns. Further, current policy nor the draft GSP includes no discussion what so ever of climate change impacts to water supply and demand, or how the GSP will address those affects. O8-12 Cont

d) *2.1.4 Beneficial Uses and Users*

This section of the plan should include a description of the beneficial uses and users of groundwater in the basin, including potential climate impacts to beneficial uses and users, the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties. This section should also identify whether groundwater recharge is a designated beneficial use in the appropriate Basin Plan (per Regional Water Quality Control Board), and discuss potential locations for groundwater recharge.

The current draft GSP states that the "beneficial uses" evaluated in this GSP are not strictly synonymous with those analyzed in the Basin Plan. It is of no benefit to the GSA or the community for the GSP "beneficial uses" to be different from the Basin Plan "Beneficial uses;" these should be consistent.

Groundwater recharge nor habitat preservation / restoration are currently not included as beneficial uses in the GSP, even though they are included in the Colorado River Basin Plan. Is this because there is no active recharge currently exists in the subbasin?

11

The GSA should: a) consider including groundwater recharge and habitat preservation/restoration (especially in the washes/creeks & the Anza Borrego Desert State Park) as a beneficial use in the GSP, and b) seek modification at the Regional Water Board to the existing Beneficial Use Designations to ensure consistency between the Basin Plan and the GSP.

The current draft GSP lists de minimus users as a beneficial user in this section, but then includes them with municipal users in the water budget. This is misleading and affects proper analysis. This section should be augmented to include a narrative description of issues affecting the supply and beneficial uses of groundwater. Additionally, the GSP should distinguish between domestic well owners and small water systems independent of the municipal water supply in the water budget.

e) 2.1.5 Notice and Communication

The notice and communication section is required to include the following:

- An explanation of the Agency's (GSAs) decision-making process.
- Identification of opportunities for public engagement and a discussion of how public input and response will be used.
- A description of how the Agency (GSA) encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.
- The method the Agency (GSA) shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

Essentially, this section does not include a ture communication strategy. Rather, this section merely describes how the GSA communicated with the public (essentially just fulfilling minimum brown act requirements).; no real communication strategy, just explaining how they met brown act violation; no explanation of decision-making, just how they engaged with the AC.

This section should also describe how climate change and related uncertainties, available adaptation strategies, groundwater recharge potential and available optimization strategies (including potential land use changes) are integrated into the GSA's communication strategy. The current draft GSP includes absolutely no mention of climate impacts, nor is there any mention of groundwater recharge opportunities.

The current draft GSP states that there is currently no program to actively replenish the aquifer, and that aquifer storage and recovery are not being considered as an option at this time because using imported water to recharge the basin was determined to be

O8-12 Cont.

12

economically infeasible. However, the GSP should consider other forms of managed aquifer recharge, such as stormwater capture and agricultural runoff management.

The communication section should adequately outline the types of outreach performed throughout the GSP process and how outreach will continue moving forward. The current draft GSP includes little mention of how diverse groups were engaged; nor does it include future plans to share progress with these groups. Disadvantaged Communities ("DAC") and Severely Disadvantaged Communities ("SDAC") are not mentioned even once in the Stakeholder Engagement Plan, despite the entire Borrego Subbasin being designated a SDAC.

GSP meetings should always be held at times and places that enable all stakeholders to participate in at least some of the meetings. All Borrego Subbasin GSA Advisory Committee Meetings were held during work hours, thus precluding many community members from attending.

Meetings, outreach, and education materials should always be translated into appropriate languages spoken in the community. Meetings should provide services such as meals and/or childcare to enable working families to attend. While the current draft GSP does refer to translated materials, these materials are not included in the stakeholder engagement plan, nor are translation services in general mentioned in the stakeholder engagement plan. O8-12 Cont.

Public comment should be taken during all meetings, and written comments should be accepted throughout the process. The current Draft GSP references targeted "SDAC engagement" via a Proposition 1 Stakeholder Engagement grant. Yet, outcomes from that engagement is not included in the draft GSP. This lack of information raises the following questions:

- What was the feedback from outreach to "Domestic water users" and "Disadvantaged and Severely Disadvantaged Communities?"
- How are these interests represented in the sustainability goals?
- How will they be included moving forward?

A list of all meetings, including times and locations, should be included in the communication section of the GSP. A sufficient number of meetings should be held to ensure stakeholders have adequate opportunities to learn about the GSP creation process and provide public comment. One public meeting, "Ad Hoc Committee on Severely Disadvantaged Community (SDAC) Involvement," occurred on 4/27/2018. Yet attendance is listed as "unknown." Meeting minutes and meeting agenda for this convening are not listed on the website. The two most public meetings ("Community Meetings" on 3/16/18 and 9/19/18) also lack meeting minutes and agendas on the GSA

13

website, despite the GSP referencing that these materials are on the website. for either of the 2 most public meetings.

The Notice and Communication section, as well as the Stakeholder Engagement Plan for the draft GSP is woefully lacking. This raises the following concerns: has there been adequate stakeholder surveying and mapping? How were stakeholders informed of the process? How are the interests of small businesses, the tourism industry, and residents represented in the GSP? What were the key messages shared?

To remedy these shortcomings, the GSA should:

- Provide responses to the questions above in the Notice and Communications section of the GSP;
- Identify the outreach plan moving forward through GSP implementation, especially in development and implementation of Projects and Management Actions;
- Describe how public comments and feedback are incorporated into the GSP;
- Provide more opportunities for public input (e g., more Community Meetings with agendas and minutes posted online) with special effort to ensure these meetings are accommodating of all community members;
- Determine how the stakeholder engagement plan will be evaluated and adapted moving forward, and share that methodology with all stakeholders.

The Borrego Subbasin GSA must augment its stakeholder engagement plan and communication section of the GSP to incorporate the following changes:

- Post meeting minutes and agendas from all community meetings;
- Identify specifically which/where vulnerable community groups are;
- Explain how vulnerable communities have been (and should be) engaged;
- Describe the major concerns of community members as identified by community members;
- Establish a process for incorporating public input into GSP revisions;
- Determine how the Stakeholder Engagement Plan will be evaluated and regularly updated.

f) 2.1.6 Additional GSP Elements

According to CWC Section 10727.4, the GSP must describe the "processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity." While the current draft GSP does indeed list the relevant land use planning documents, there is no description of the process followed, or that will continue to be used, for reviewing and coordinating

O8-12 Cont.

14

with other land use planning activities This section of the GSP must be augmented to fully meet the regulatory requirement.

This section of the GSP should describe how soil conditions and land use may further impact groundwater dependent ecosystems and how to mitigate such impacts. It should also consider an increase on water storage losses due to higher climate change temperatures. The current draft GSP includes no mention what so ever of potential impacts to groundwater dependent ecosystems, nor of water storage loss from higher temperatures; it merely mentions loss of storage in the context of potential intra-basin transfers. The GSP should be augmented to address these inadequacies.

[redacted]Basin Setting

a) 2 2 1 Hydrological Conceptual Model

Drinking Water

The Hydrological Conceptual Model (HCM) should specify which aquifers are the main source of water for drinking water purposes, as well as for DACs, households relying on private wells, small community water systems, and school districts. The current draft GSP identifies the upper aquifer as the main source of water in the subbasin historically. Yet, this section does not explicitly state whether it is also the shallow aquifer that serves as the main source of water for DACs, households relying on private wells, small community water systems, and school districts. This must be rectified by including more information on the upper aquifer as it pertains to community drinking water. O8-12 Cont.

For aquifers of interest for drinking water wells, the HCM should specify the overall water bearing characteristics of the aquifer (e.g., overall water quality, overall water production capacity, vertical and lateral extent, hydraulic conductivity, and storativity)

The HCM should specify how much recharge can be accomplished in different hydrogeologic environments/aquifers, and particularly provide a brief description of potential benefits and concerns of the potential recharge areas.

The HCM should be attentive to information provided for shallow aquifers and water quality concerns.

b) 2 2 2 Current and Historic Groundwater Conditions

Groundwater Elevation

The HCM should clearly state specific groundwater levels in relation to various land uses. In particular, the HCM should note where first-encountered groundwater is relatively deep; where groundwater users reliant upon shallower wells; and where users

15

may not have the resources to drill new, deeper wells. Special notice should be given to drinking water uses. The current draft GSP provides no information regarding dewatering of wells, rehabilitation costs, rehabilitation data, or any other information about the impacts to DACs. The GSP should, but does not currently include a map identifying the locations of all drinking water systems, DACs, and areas of critical lowering of GW levels. The GSP should use monitoring wells screened for a specific aquifer, not combining aquifers, so as to indicate whether, and if so where, dewatering of wells is occurring.

Groundwater Quality
This section of the plan should include a map of known groundwater conditions, including sensitive uses and users of groundwater that may be impacted or threatened to be impacted.

According to the GSP, "The lateral distribution of the wells in the monitoring network that measure groundwater quality is limited, and does not extend to the outer portions of each management area." The GSP also notes that "high salinity, poor-quality connate water is thought to occur in deeper formational materials in select areas of the aquifer as well as shallow groundwater in the vicinity of the Borrego Sink in the southern portion of the Plan Area." The GSA needs more monitoring data for "di minimus" domestic well users and small water systems, especially regarding the potential impacts to disadvantaged community members and cost projections for remediation. The GSP should also indicate which wells are being considered to be taken out of production or drilled deeper to mitigate water quality concerns. Increasing contamination trends are noted in the GSP, but there is little discussion of how these issues will be addressed under the sustainability goal and management actions.

Drinking Water
This section should also include information regarding contamination of wells, treatment costs, water quality data, or any other information regarding the impacts to disadvantaged communities. This should also include a map noting the locations of all drinking water systems, DACs, and areas of critical water quality contamination. The current draft of the GSP does not include this information. However, meeting minutes posted on the GSA website note that community members are concerned about elevated nitrate levels in some drinking water wells. This is referenced in the GSP, but not adequately.

c) 2 2 3 Water Budget Information

The water budget should include historical use of groundwater for all types of uses and users, in particular the uses of small drinking water systems, regardless of whether they will be subject to pumping restrictions. Future use for drinking water needs must utilize

O8-12 Cont.

data from sources such as county general plans and LAFCo documents (e g., population projections and water demand forecasts).

The historic groundwater use percentages in the Borrego Subbasin (i.e., 70% agriculture, 20% golf course, 10% municipal) is not sustainable. This section should include a description of how historical conditions have impacted the ability of BWD and the County of San Diego to manage the basin within sustainable yield. Further, including domestic/di minimus users with the overall municipal users water budget and municipal pumping reductions is both inappropriate and inaccurate. These uses must be separated and accounted for independently in the water budget.

Data used to develop the water budget is out dated and inaccurately represents the groundwater conditions in the subbasin. The GSP must use the most recent data, and exclude data sets producing a biased result. For example, the hydrological modeling projections currently used in the draft GSP include time periods extending far back in time, prior to when pumping began, and do not take into account shifts in the hydrologic regime which have occurred as a result of climate change. The water budget currently does not (and must) consider projected recharge reductions due to land fallowing and water conservation.

These inadequacies must be addressed in order for the water budget to accurately represent present groundwater conditions and support the sustainability goal. O8-12 Cont.

d) 2 2.4 Management Areas

The purpose of this section is to ensure that management areas are designed in a way to protect, rather than harm, particular uses and users of groundwater. Management areas should be designed to set stricter requirements near vulnerable drinking water sources. The current draft GSP provides no indication of where potentially vulnerable drinking water source are within the management areas. The GSP should include a map identifying the location of all drinking water systems, DACs, and areas of particular threat from lowering of groundwater levels.

Chapter 3: Sustainable Management Criteria

a) 3 1 Sustainability Goal

According to 23 CCR § 354.24, the GSP must include a sustainability goal using information from the basin setting to establish measures that will ensure sustainable yield, and describe a realistic path to achieving the goal over a 20-year period. The sustainability goal should also consider all beneficial uses and users susceptible to harm from changing groundwater conditions over the 20-year time frame.

17

The GSP's primary sustainability goal, and five sub-goals, are brief and overly broad. As previously stated, utilizing the BVHM modeling from 1945-2010 that cites groundwater conditions from a time period before major agricultural development began, does not accurately reflect the current hydrogeological make-up of the basis, nor does it consider future impacts from climate change. The GSP should use the most recent data and hydrogeologic modeling that includes potential impacts from climate change, and exclude data sets producing a biased result.

Of the five sub-goals, only two of them explicitly consider domestic well owners (chronic lowering of groundwater levels and water quality concerns), however, the goals aren't tied back to the basin setting, nor do they identify specific vulnerable areas or how these goals impacts the sustainable yield.

It is unclear whether the sustainability goal intends is to address pre-SGMA impacts, or maintain current conditions.

The sustainability goal explains how land use and groundwater recharge was considered towards achieving the sustainability goal within 20 years of Plan implementation

local determination of the sustainable management criteria (sustainability goal, undesirable results, minimum thresholds, and measurable objectives).

O8-12 Cont.

a) 3 2 Undesirable Results

The GSP only considers 3 of the 6 possible sustainability indicators: Only considering 3 of the 6 possible sustainability indicators:
1. Chronic Lowering of Groundwater Levels
2. Reduction of Groundwater Storage
3. Degraded Water Quality Makes sense to not consider seawater intrusion, but land subsidence & connected surface waters should be included!

Chronic Lowering of Groundwater Levels
The GSP accurately identifies di minimus users as one of the groups most vulnerable to lowering groundwater levels, and cites the technical, financial and geographic constraints these users face when compared to better resourced pumpers like BWD or larger agricultural users. While this is notable, it is unclear how outreach was conducted to help better understand the negative impacts different stakeholders are experiencing due to declining groundwater levels. Some alternative means of obtaining water for de-minimis and domestic pumpers who can no longer pump are mentioned in the plan, however these alternatives lack further discussion in the minimum thresholds, measurable objectives, or projects and management actions.

18

It's noted that the some di minimus wells may currently lack access to adequate water, and may be close to the BWD water distribution system, however the project management actions fail to discuss how consolidation is being considered for these di minimus users. The GSP includes figures (i.e. Figure 3.2-4) with average domestic well depths, however this map should include specific well data to better identify the most vulnerable areas.

The GSP also reports, "The exact number of agricultural and domestic wells that have been abandoned and re-drilled deeper and/or relocated due to production rate loss from declining groundwater levels is not known. However, anecdotal information and field observations have confirmed that inactive wells exist throughout the Plan Area" (Section 3.2.1, Page 3-10). Similar to well consolidation, the GSP fails to address the data gap of abandoned wells, and the steps being taken to follow up on anecdotal concerns.

The GSP fails to consider pre-SGMA impacts to groundwater levels, instead opting to set the highest bar as maintaining current conditions, or levels at a lower than current state.

Minimum Threshold for Chronic Lowering of Groundwater Levels:
The minimum threshold for chronic lowering of groundwater levels is based principally on the documented screen intervals of key municipal water wells and domestic/de-minimis wells located in the basin, however, not all of the de-minimus wells have accurate data to identify where at-risk wells may be located. The GSP should indicate how the GSA's intend to improve well monitoring data for di minimus users as part of the interim milestones. O8-12 Cont.

Measurable Objective for Chronic Lowering of Groundwater Levels:
The GSP proposes linear pumping cuts for agricultural, municipal, and recreational users, however there is no description of how different uses and users of groundwater were considered and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the most vulnerable uses of groundwater, namely di minimus users and small water systems. It is unclear how the margin of safety protects di minimus users. In addition, the outlined 5-year evaluation of the interim milestones and measurable objectives does not indicate how stakeholders will be engaged throughout these interim evaluations

Lowering of Groundwater Storage
Lowering groundwater levels are intrinsically linked with decreased groundwater storage, however the , and begins to address how the sustainability goals will impact the San Diego County General Plan and Borrego Spring Community Plan.

19

Degraded Water Quality
Must include how stakeholders will be engaged throughout these interim evaluations, specifically how to set MT's for growers in the region to meet ag needs.
Increased need for monitoring water quality in domestic wells. Indicate how the GSP will integrate with the RQCB 'Basin Plan' groundwater quality objectives.

Minimum Threshold/Measurable Objectives

The GSP fails to indicate how these will be determined or met.

b) 3 5 Monitoring Network

Data gap in 3.5.4.2 - Well screened in multiple aquifers
- Screen can be slots or other measure that allows water through and keeps solids out
- Water comes from the aquifer into the well
- When you're using a monitoring well that is screened in different aquifers, you're getting a combined result - not really seeing what the impacts on a given aquifer are
- Need to use monitoring wells screened for a specific aquifer, not combining aquifers

[redacted]Chapter 4: Projects and Management Actions

However it is unclear how the top priority PMA's (land fallowing and pumping reductions) will impact domestic/small water system users

Expected benefits and metrics for evaluation for each PMA do a poor job of mentioning how PMA's will impact groundwater-dependent vulnerable groups

PMA's were not put before stakeholders (see feedback in Section 4.0), therefore stakeholders are not aware of project goals, timelines, benefits, and risks

Prior to adoption, the GSA should hold public meetings to gather input on the PMA's via publicly available meetings (appropriate meeting times, translation and childcare services, etc.).

Notes: According to public meetings posted on the GSA website, there was no 'Community Meeting' held to discuss the projects and management actions - the most recent Advisory Committee meeting (Jan 2019) includes slides on the PMA's and how to provide input, however, minutes from the meeting aren't posted (incorrect minutes are posted from Aug 2018); AND as seen from the previous schedule of Adis Committee meetings, these meetings tend to take place beginning at 10:00 am during workdays

O8-12 Cont.

20

[redacted]Chapter 5: Plan Implementation

TBD

[redacted]Excel Review Templates (attached)

- [redacted]Stakeholder Engagement & DACs
- [redacted]Climate
- [redacted]Recharge

O8-12 Cont

21

INTENTIONALLY LEFT BLANK

Letter O8

Commenter: Jennifer Clary, Water Program Manager, Clean Water Action
Date: May 21, 2019

O8-1 The Groundwater Sustainability Agency (GSA) appreciates your comments on the Draft Groundwater Sustainability Plan (GSP) and participation in two referenced meetings.

O8-2 The GSA acknowledges your request to provide additional information in the GSP regarding how successful efforts to reach all classes of beneficial users, where is more effort – or a different approach – needed and specifically interested in your success in reaching domestic well users. We note your questions regarding the success of general public engagement and efforts to Spanish-speaking residents. Additionally, you ask to identify how input received was incorporated and to provide more specifics about how the plan was amended in response to public input. In response, the Borrego Water District (BWD) placed into the administrative record, the SDAC [Severely Disadvantaged Community] Impact/Vulnerability Analysis (Task 2 Report) prepared by Environmental Navigation Services Inc., dated April 15, 2019. The report was prepared to understand the implications that the implementation of Sustainable Groundwater Management Act (SGMA) will have on the SDAC population of Borrego Springs.

O8-3 The GSA acknowledges your comment that the communications plan is woefully lacking in detail and hope that that it can be amended in the final plan. Specifically, you request clarification on the role of the Advisory Committee in the final plan, and what are the goals, strategies and tactics for stakeholder outreach and communications. In addition, the GSA notes that the commenter believes the key goal of the plan should be to educate residents and beneficial users about the need to raise funds for plan implementation. Finally, the commenter asks whether the $6,000 for outreach identified in Table 5-2 is sufficient to accomplish GSA objectives. In response, as stated in the Memorandum of Understanding, the Advisory Committee was formed for Plan Development. The primary purpose of the GSA under SGMA is to develop a GSP to achieve long-term groundwater sustainability. SGMA requires and directs GSAs to involve stakeholders and interested parties in the process to regulate groundwater. The purpose of outreach activities as described in the GSP was to provide individual stakeholders and stakeholder organizations, and other interested parties an opportunity to be involved in the development and evaluation of the GSP. Lastly, the GSP includes an initial estimate of $6,000 for outreach activities, which will be evaluated during implementation of the GSP.

O8-4 The GSA acknowledges your comment regarding identifying which wells were potentially compromised due to water quality issues or the lowering of the groundwater table. Specifically, which domestic wells will potentially be impacted by increasing groundwater contamination and lowering groundwater levels? How does the plan identify those impacts and when and how would mitigation efforts be triggered? Also, the GSA notes your comment that the plan seems to confuse mitigation with additional plan actions and that your interpretation is that mitigation requires the impacted party to be directly assisted. The Draft GSP specifically discusses in Section 3.2.1 Chronic Lowering of Groundwater Levels – Undesirable Results that "Overall, there are 77 domestic wells in DWR's well completion report database.

As shown Figure 3.2-4, four of the township and range sections have water levels estimated to be below the bottom of the well in the section. Furthermore, the difference between the average well depth and the average groundwater level is less than 50 feet in seven township and range sections, representing 20 domestic wells, which indicates a high likelihood that some may lack access to adequate water in existing wells. With groundwater levels expected to continue to decline early in the GSP implementation period, domestic users are currently experiencing undesirable results, which will be alleviated by 2040.

The majority of the wells in this situation are close to the BWD water distribution system" (Draft GSP page 3-10).

Groundwater level declines would be significant and unreasonable if they are sufficient in magnitude to lower the rate of production of pre-existing groundwater extraction wells below that needed to meet the minimum required to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. To the extent lowering groundwater levels impact de-minimis pumpers, significant and unreasonable impacts to those pumpers could be avoided.

> For example, alternative means of obtaining water for de-minimis and domestic pumpers who can no longer pump may include connection to the municipal water system (i.e., BWD), groundwater well maintenance or rehabilitation (e.g., well pump lowering), or for some beneficial users, well redevelopment or deepening. However, use of these alternative means of supply, by themselves, do not

> necessarily offset undesirable results for lowering groundwater levels in the context of the Subbasin as a whole (as opposed to individual uses or users), because the ultimate source of supply remains groundwater pumped from the Subbasin, even if from another location (Draft GSP page 3-8).

Table 2.2-6 Management Area Background Water Quality indicates that in water quality in the Subbasin is good and generally meets regulatory standards for intended beneficial use. Available Subbasin-wide data does not suggest that domestic wells will be impaired by increasing groundwater contamination. That said, the GSA recognizes that there has historically been limited sampling of domestic wells in the Subbasin by public agencies. The County of San Diego Department of Environmental Health (DEH) Land and Water Quality Division, requires that all building permit applicants demonstrate that their private water well supply is potable prior to occupancy or change of use.

The DEH reviews the water testing results submitted by the owner or their certified laboratory to verify potable quality for domestic use. However, it remains the responsibility of the private well owner to maintain the ongoing health standards and safety of their water supply. At a minimum, testing for bacteria and nitrates is required by an owner or applicant to verify a potable water supply prior to County issuance of a building or septic system permit. If the water sample results do not meet health standards for drinking water, or if an applicant fails to submit water testing results from a private water well, building occupancy will not be granted by the County (County of San Diego 2019). By proactively monitoring groundwater levels and groundwater quality in the Subbasin, the GSA will be able to ascertain if undesirable results to domestic well owners will potentially result in impairment to beneficial use.

It is noted that private domestic wells require regular maintenance and typically have an average lifespan of 30 to 50 years with pump lifespans of 4 to 10 years. One well failing in the Subbasin does not necessarily indicate an impairment or an undesirable result. Well failure can be the result of several factors including but not limited to age, well casing material and depth, screen and filter pack clogging due to bio-fouling or mineral encrustation and poor well construction. If it is determined that declining groundwater levels or deteriorating water quality is the result of management actions taken by the GSA, then the GSA will evaluate potential impacts and options at that time.

O8-5 The GSA acknowledges your comment that the plan reference the Irrigated Lands Regulatory Program. The Irrigated Lands Regulatory Program is already described in Draft GSP Section 2.1.2 Water Resources Monitoring and Management Programs. We note your comment that East San Joaquin River Program required that all domestic wells be tested for nitrates and that all agricultural operations should develop and implement irrigation and nutrient management plans to limit their discharge of nitrates to groundwater.

O8-6 The GSA appreciates your comment regarding how the Projects and Management Actions will be prioritized if the GSP is to reach the sustainability goal by 2040. First and foremost, Projects and Management Actions that result in a reduction in water demand at the lowest cost may affect prioritization, taking into account the magnitude of required reduction to reach the sustainability goal. Not all of the Projects and Management Actions need to be implemented simultaneously and depending on results of additional study and monitoring, some Projects and Management Actions such as the Water Quality Optimization Program and/or the Intra-Subbasin Water Transfers may not be required to be implemented but have been included in the Draft GSP should future monitoring prove impairment of beneficial water use due to groundwater quality degradation or supply.

O8-7 The Water Trading Program is a proposed Project and Management Action and expected to be implemented; however it is unclear how the commenter concluded that the GSP states that "definitively that this is something that it definitely will do" as this text does not appear anywhere in the Draft GSP. The GSA notes your concern that the timeline for implementing [water trading] is too ambitious.

O8-8 The GSA notes the comment that water conservation action provides explicit savings and that in the Final GSP, it would be helpful to quantify expected conservation for each identified measures, along with costs for each. Detailed development of measures and of costs is part of the Water Conservation Program development and not part of GSP development. Preliminary measures and associated costs are provided in Draft GSP Section 4.3 Projects and Management action No. 2 – Water Conservation.

O8-9 The GSA acknowledges that the commenter agrees with the metering requirement for the pumping reduction program and looks forward to proposals to ensure that any program to track metered water use is effectively enforced. In addition, the GSA notes the commenter agrees that some agricultural fallowing will be necessary to meet the 2040 sustainability goal and measurable objectives. Also, the GSA acknowledges that the commenter hopes this effort will be informed by an analysis of the impact of fallowing on farm workers and how that impact might be mitigated.

O8-10 The GSA notes your request to clarify the intent of the Water Quality Optimization Program. In brief the Water Quality Optimization Program is a proposed mitigation measure should beneficial water use be harmed by impaired water quality in the future. The GSP emphasizes that available data do not suggest that existing water quality is impairing any beneficial uses. Should future monitoring prove impairment of beneficial water uses due to groundwater quality degradation the GSA would conduct analysis to determine the cause of the impairment and determine feasible mitigation options. This process is described in Section 4.6.1, Water Quality Optimization Program Description, of the Draft GSP.

O8-11 The GSA notes that the Borrego Valley Endowment Fund retained the Local Government Commission on behalf of the Borrego Valley Stewardship Council to conduct independent review of the Draft GSP. The GSA notes the comment to establish necessary land use, water management and community governance policies that will accelerate achievement of a sustainable Borrego Springs. The GSA notes the comment that all work products be included in the body of the GSP and not included solely as attachments or appendices. The GSA notes the comment regarding proportional reductions. The GSA notes the comment regarding accelerated pumping reductions. The GSA notes the assertion that existing data and anecdotal evidence illustrates that groundwater dependent ecosystems (GDEs) within the Subbasin, especially within the Anza-Borrego Desert State Park, continue to experience undesirable results. The GSA points out that your letter provides no data or anecdotal evidence to support this general conclusion regarding GDEs. The GSA acknowledges your comment regarding stakeholder engagement and DAC considerations being inadequate, and your request to strengthen outreach and document engagement in the GSP. The GSA notes your comment regarding land use changes and groundwater recharge potential. Specifically you request evaluation of land use zoning and evaluation of impacts on both water quality and recharge.

O8-12 The commenter is referred to the GSA's response to Letter O12.

INTENTIOALLY LEFT BLANK

Comment Letter O9

BORREGO VILLAGE ASSOCIATION
BORREGO SPRINGS CALIFORNIA

May 21, 2019

County of San Diego
Planning & Development Services
C/O Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Re Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr Bennett,

I am writing on behalf of the Borrego Village Association (BVA), a 501(c)(6) non-profit corporation, whose mission is to facilitate sustainable economic development of the Anza-Borrego Desert State Park and the unincorporated village of Borrego Springs Our mission is predicated on the premise that through sustainable economic development we will be able to grow our community sufficiently to be able to sustain healthy schools, a more robust healthcare delivery system, and healthy businesses that support our population

I am grateful to you and the other members of the Core Team who have worked tirelessly on our behalf to create the draft Groundwater Sustainability Plan We understand that while SGMA directly addresses hydrological issues, that it is the intent of SGMA to leave communities such as ours as healthy and economically vibrant In this regard, SGMA and the mission of the Borrego Village Association are well aligned O9-1

The purpose of this letter is to articulate our strong opposition to the concept of Proportional Reductions across all sectors of current water users, i e a 70-75% reduction from baseline allotments for Municipal Users as well as Agriculture and Recreation In our view, Proportional Reductions are completely inappropriate and unnecessary based on current and historic pumping levels Municipal Users account for a fraction of the water pumped by Agriculture and a half of what is pumped by Recreation Neither of these industries is sustainable, thus requiring the community to transition to lower water-use industries, e g tourism, that will support the long-term economic sustainability of the region

BORREGO VILLAGE ASSOCIATION P O BOX 1133 BORREGO SPRINGS CA 92004

We urge the GSA to remedy this shortcoming of the GSP by requiring no reduction in water allotment to Municipal Users beyond their Baseline Allotment of approximately 1700 acre feet per year Our calculations indicate it would be possible to modestly grow the population of our community if no additional reductions are mandated for Municipal Users in the GSP We believe modest growth of our population will be possible as a result of the economic development model now being implemented by the Borrego Village Association, and that such growth will lead to the healthy, vibrant community envisioned by SMGA.

Thank you for your consideration Please do not hesitate to contact me if I may provide you with additional information regarding the interface of the activities of the Borrego Village Association and the issue of Proportional Reductions

O9-1 Cont.

Sincerely yours,

J David Garmon, M D.
Acting President, BVA

JDG ms

BORREGO VILLAGE ASSOCIATION P.O. BOX 1133 BORREGO SPRINGS, CA 92004

Letter O9

Commenter: J. David Garmon, M.D., Acting President, Borrego Village Association
Date: May 21, 2019

O9-1: The Groundwater Sustainability Agency (GSA) acknowledges the commenter's opposition to proportional reductions and that Borrego Water District (BWD) would not be subject to reductions below 1,700 acre-feet per year.

While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter O10

From:	Nancy L Collins <NCollins@rwglaw com>
Sent:	Tuesday, May 21, 2019 3:04 PM
To:	LUEG, GroundWater, PDS
Subject:	Letter to County of San Diego
Attachments:	Letter to County of San Diego pdf

Attached please find a letter from James Markman regarding the above-referenced matter. The original is being sent via first-class mail.

Nancy

Nancy L. Collins
Legal Secretary

RICHARDS WATSON GERSHON
1 Civic Center Circle
P O Box 1059
Brea, CA 92822-1059
T: 714 990 0901 x602
F: 714 990 6230
E: ncollins@rwglaw com
W: rwglaw.com

Secretary to James L. Markman, Paula Gutierrez Baeza, Roy Clarke and Isra Shah

1

O10

RWG LAW

James L. Markman

T 714.990.0901
F 714.990.6230
E jmarkman@rwglaw.com

1 Civic Center Circle, PO Box 1059
Brea, California 92822-1059
rwglaw.com

VIA ELECTRONIC MAIL & U S. MAIL

County of San Diego
Planning & Development Services
c/o. Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, California 92123

Re Re: Comment of Borrego Springs Unified School District on Draft Sustainability Plan for the Borrego Springs Groundwater Basin

Dear Sirs:

The undersigned represents Borrego Springs Unified School District ("the District") concerning the SGMA process for the Borrego Springs Groundwater Basin. There is one specific comment which we hereby provide to you regarding the District's Baseline Pumping Allocation quantified by you in a letter to the District dated July 13, 2018. That comment is that in determining rampdown reductions in the District's Baseline Pumping Allocation related to water production serving the District's elementary school, you are required to recognize that the pumping right exercised by the District is a priority overlying right under California law, but also is protected against prescription by California Civil Code section 1007. Therefore, unlike other overlying rights, such as agricultural production rights and recreational (golf course) production rights, the District's overlying rights remain superior to the rights of any appropriator and, specifically superior to the rights of Borrego Water District. That factor of priority of pumping must be considered in developing a rampdown or pumping reduction program as part of the final Implementation Plan. O10-1

Orange County Los Angeles San Francisco Temecula Central Coast

RICHARDS WATSON GERSHON

Please respond or call at your convenience if you would like additional information about the District's input and suggestion stated in this letter.

Very truly yours,

James L. Markman

cc: Mark Stevens, Superintendent
Borrego Springs Unified School District

10000-0194\2300175v1.doc

RICHARDS WATSON GERSHON

INTENTIONALLY LEFT BLANK

Letter O10

Commenter: James L. Markman, Borrego Springs Unified School District
Date: May 21, 2019

O10-1: The commenter's claim is that the water rights of the School District are superior to other appropriators, which include the Borrego Water District. The letter further requests that this right be considered when developing a rampdown or reduction program. The comment does not address the adequacy of the Draft GSP and calls for a legal conclusion to which the Groundwater Sustainability Agency (GSA) is not required to respond. Therefore, no further response is required or necessary.

While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP and calls for a legal conclusion to which the GSA is not required to respond. Therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter O11

From: Martha Deichler <mdeichler@bsusd net>
Sent: Tuesday, May 21, 2019 3 27 PM
To: LUEG, GroundWater, PDS
Subject: Borrego Springs GSP

County of San Diego
Planning and Development Services
% Jim Bennett
5510 Overland Ave Suite 310
San Diego, CA 92123

May 17, 2019

Ref. Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Jim Bennett;

I have much respect for the time and process the County, Borrego Water Coalition, Borrego Water District, Advisory Council and other interested parties have put into the creation of the Groundwater Sustainability Plan. It has been a long, complicated and at times arduous journey requiring much patience and willingness to listen on everyone's part - especially yours Thank you for your time and your expertise on behalf of Borrego Springs

I am writing in reaction to the Draft GSP's lack of any reference to the results of the Environmental Navigation Services, Inc study of our SDAC (Severely Disadvantaged Community) I am referring specifically to the high cost of water for our local low-income residents as well as the potential loss of employment when golf courses and agriculture are reduced and/or eliminated These two aspects of our water situation could have drastic impacts on the economic viability of our community With loss of jobs, families will move out of Borrego in search of employment and the local infrastructure will suffer Specifically, schools will lose students, lose state funding, lay off teachers and become a skeleton of a school district with high school becoming an online program for a few O11-1

The loss of our labor force will impact the local economy as housekeepers, gardeners, dishwashers, laborers and other low skilled workers leave our valley in search of employment elsewhere The infrastructure of our village depends on these workers and their families, their leaving will have a definite negative impact. In addition, a town without children is truly not a livable place

Please consider the plight of our low income citizens as well as the plight of our town as you ponder next steps in our GSP

Sincerely,

Martha Deichler
School Community Liaison
Borrego Springs Unified School District

INTENTIONALLY LEFT BLANK

Letter O11

Commenter: Martha Deichler, School Community Liaison, Borrego Springs Unified School District
Date: May 17, 2019

O11-1 The Groundwater Sustainability Agency (GSA) appreciates comments from the Borrego Springs Unified School District. The commenter asserts that implementation of the Groundwater Sustainability Plan (GSP) will result in loss of employment and labor force, and result in substantial reduction of population leading to an absence of children. The commenter is referred to the response to Comment O12-5 regarding consideration of Severely Disadvantaged Communities (SDACs).

INTENTIONALLY LEFT BLANK

Comment Letter O12

Bennett, Jim

From:	David Garmon <jdgarmon@me.com>
Sent:	Tuesday, May 21, 2019 4 40 PM
To:	LUEG, GroundWater, PDS
Cc:	Diane Johnson
Subject:	Groundwater Sustainability Plan Borrego Valley Groundwater Basin
Attachments:	BVSC Comment Letter pdf

Dear Jim,

Please find attached below the comment letter from Diane Johnson, who is the Stewardship Council representative to the AC. Diane is traveling from Canada today and has asked me to submit this letter on her behalf.

Thank you,

David

Borrego Valley Stewardship Council

Borrego Springs, CA

May 21, 2019

County of San Diego
Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Re: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

Please accept this review of the draft Groundwater Sustainability Plan (GSP) from the Borrego Valley Stewardship Council. The Stewardship Council is an umbrella organization in Borrego Springs composed of businesses, non-profits, and governmental agencies. Please visit our website for a listing of our institutional signatories at http://www.borregovalleystewardshipcouncil.org/home.html.

O12-1

The Borrego Valley Stewardship Council is committed to the sustainable development and growth of the Borrego region in its entirety. As such, we have great interest in most aspects of the GSP as described below.

We are grateful for the diligent work you and your team have put into this process over the last two years, and we look forward to continuing to work with you and your team for the health and vitality of the Borrego Valley.

I. DETAILED REVIEW OF THE GSP BY CHAPTER

Chapter 1: Introduction

1.2 Sustainability Goal

The Sustainability Goal should be based on climate change impacts and future conditions, and should acknowledge that maximizing groundwater recharge will be a necessary component of achieving sustainability. The current draft GSP makes no reference to climate change impacts on achieving the sustainability goal; nor does it reference soil conditions, recharge rates, or land use change impacts on achieving that sustainability goal. In fact, the sustainability goal as stated in the draft GSP is not a goal at all – but simply a restatement of the intent of SGMA. It is extremely vague and not quantified in this section. This is completely inadequate and must be resolved. O12-2

1.3.1 Organization and Management Structure

The GSA should include personnel with a focus on climate change effects on groundwater conditions and recharge rates. There is no clear identification that any of the staff on the GSA "Core Team" or Advisory Committee (AC) have background or expertise in either soil science or considering the impacts of land use on groundwater conditions. However, the organizational structure does include broad representation from relevant sectors. Personnel from the state park may be equipped to address climate change, but this is unclear. Similarly, the BVSC representative should uphold climate change concerns, but it is unclear whether they have the necessary expertise. The GSA should seek to ensure the Core Team and AC is populated with adequate expertise on both climate science, soil science, and hydrology. The GSP should be updated to include a thorough description of the requisite background of Core Team and AC members. O12-3

1.3.3 Implementation Costs

Estimated costs to implement the GSP, and the GSA's approach to meeting those costs should include costs related to climate change impacts and adaptation, as well as costs to implement groundwater recharge. The current draft GSP includes no reference to soil conditions, recharge, or land use impacts or changing conditions as a result of climate change, and how these changing conditions could affect GSP implementation costs. The GSP implementation cost estimate does include a 10% contingency, but this is drastically insufficient, given the lack of detail in the current projects and management actions and implementation budget. The GSP implementation cost estimates need to be re-evaluated in conjunction with more detail being provided to the projects and management actions. O12-4

Further, a thorough analysis of projected costs, and how the GSA will raise those funds, needs to be conducted to determine the potential impacts to vulnerable communities, and how to mitigate those impacts. O12-4 Cont.

Chapter 2: Plan Area & Basin Setting

Plan Area

a) 2.1.1 Summary of Jurisdictional Areas and Other Features

Disadvantaged Communities
This section should include specific reference to disadvantaged communities. The current draft includes no specific reference to where most vulnerable community members (e.g., specific neighborhoods or population groups) within the subbasin are located.

This section should include locations and extent of communities dependent upon groundwater and noting where community wells are located near higher production wells, such as irrigation wells, that could potentially impact domestic well users' groundwater supply or quality. The current draft includes a map with density of wells per square mile, but does not include a map of the 52 "de minimis extractors," such as the 49 domestic wells in the subbasin and small water systems. Despite the requirement of SGMA not extending to de minimis users, the Borrego Subbasin GSP *should* include these users, because the overall water budget for the entire basin is relatively small, thus "de minimis" users actually make up a recognizable percentage of total extractors. O12-5

This section should represent various portions of the basin dependent upon groundwater for beneficial uses, including communities dependent upon groundwater for domestic uses. While the draft plan does map existing land use designations and zoning, it does not include specific data by land use on groundwater dependent users; all of the Borrego community and all users are groundwater dependent. This should be explicitly stated and mapped.

b) 2.1.2 Water Resources Monitoring and Management Programs

Monitoring & Regulatory Alignment
This section should note where monitoring programs are located and where there may be gaps in monitoring. Components of the monitoring plan should include: 1) if stakeholders have requested additional monitoring; 2) either when additional monitoring will be implemented or why the request will not be approved at this time; and 3) water-relevant climate, land use and recharge O12-6

variables (such as land use, soil conditions, precipitation, temperature, and evapotranspiration).

The current draft GSP highlights BWD's existing tiered rate structure, but does not indicate how this relates to water affordability for lower income groups. The draft provides a clear description of plan area geographic bounds, contributing watersheds, and land use designations with size and percent land cover. However, monitoring only lists the groundwater elevation monitoring wells included in CASGEM. No reference is made to soil conditions, precipitation, temperature, or evapotranspiration. Demand Offset Mitigation Water Credits Policy is the only management program in the section that adequately describes how this will impact or aligns with the GSP. All other programs included should follow this model, and this level of detail. These components need to be incorporated into the monitoring plan.

The current draft GSP references that the County Groundwater Ordinance will need to be evaluated and possibly revised to ensure consistency with GSP sustainability goals, but provides no guidance on what that would look like. There is also no information on metrics measured, past impacts, or anticipated future impacts.

O12-6 Cont.

The current draft GSP does a sufficient job explaining the impact of wells to the GSP, but still includes no metrics and no real information on how this information will be incorporated into the GSP.

This section raises a number of questions:

- How does BWD's Conservation Management Program (including tiered rates) determine water affordability for low-income communities?
- How does the Draft GSP integrate with the 2009 Anza-Borrego Desert IRWM Plan?
- How will the GSP integrate into the Region 7 Water Quality Control Plan for the Colorado River Basin?
- Why is there a discrepancy between BWD and the County's Water Credits Policy? As such, which water credits will be validated under the GSP's Baseline Pumping allocations?
- How many wells have been applied for vs. approved since passage of SB 252 and release of this plan?
- How will domestic wells and small water systems be protected from negative impacts of the baseline pumping allocation?

Each of these questions must be answered favorably for this section to adequately fulfill the requirements of the regulation.

The current draft of this section only describes the applicable laws and regulations present in the basin; it needs to be augmented to describe how monitoring of each of those programs will be incorporated into the GSP, how those existing programs will limit operational flexibility, and how the GSA will adapt to those limits. O12-6 Cont.

c) 2.1.3 Land Use Elements of Topic Categories of Applicable General Plans

This section of the plan should identify:

- disadvantaged and severely disadvantaged unincorporated communities;
- where water agency consolidations or service extensions are being considered;
- potential sources of contamination from current land use practices;
- expected land use changes due to climate change impacts or development and socio-economic conditions, that may affect water supply and water demands, as well as groundwater recharge rates;
- projected water demand as a result of climate change or population growth, and its impact on achieving the sustainability goal; and
- how climate, land use and soil conditions impact groundwater recharge, and the affect this may have on water supply and demands how the GSP addresses those effects. O12-7

This current draft of this section does a very good job of identifying all the policies that are relevant and in alignment with the GSP, but need to greater specificity on how the GSP will uphold or implement these various policies.

According to the San Diego County Groundwater Ordinance: "One of the purposes of the ordinance is to ensure that development is not approved in groundwater dependent areas of the County unless a project applicant can demonstrate that there are adequate supplies available to serve both existing and proposed uses." The existing Community Plan and General Plan land use policies are listed in the draft GSP, but the degree of integration is included only as a yes/no factor. This raises the questions,

1) How will the GSP affect the pre-existing San Diego County Groundwater Ordinance? and
2) How will this impact pumping allocations?

These questions should be answered in this section of the GSP, as well as providing detail on how the integration requirement is met, and identifying in which section of both the GSP and the General Plan (GP)/ Community Plan (CP) this is discussed.

This section also fails to answer the following questions, necessary for meeting the regulatory requirements:

- Do current well permitting practices protect vulnerable water supply sources, such as shallow wells (for all beneficial uses)?
- Are there documented instances of stakeholder concerns regarding current land use or well ordinances impacting other beneficial uses?
- Which current ordinances need to be amended in order for the basin to meet its sustainability goals?
- Are the policies considered to implement the GSP actual policies that are currently in existence, or policies that would need to be established?

Each of these questions must be sufficiently answered for this section to adequately fulfill the requirements of the regulation. O12-7 Cont.

Recharge

The San Diego County General Plan (GP) and Borrego Valley Community Plan (CP) include positive policies to protect the basin from continued overdraft and to minimize the impact of stormwater runoff (e.g., Goal LU-8; COS-5.2), yet include no mention what so ever of recharge. The current draft GSP should be augmented to include this information, and future GP / CP updates should do the same.

The current draft GSP includes positive language regarding future GP and CP needing to consider the sustainability goals of the GSP. The draft language also does an excellent job acknowledging the misalignment between agricultural preservation goals in the General Plan and groundwater sustainability in the Borrego subbasin. However, additional detail needs to be provided on how that consideration and GP / CP updates will occur, as well as how the agricultural preservation and groundwater sustainability goals will be reconciled. O12-8

It is unclear whether GP Conservation and Open Space Element, Goal COS-4: Water Management, and/or COS-4.3 - "Maximize stormwater filtration and/or infiltration" will promote groundwater recharge, or if it only refers to stormwater mitigation where groundwater is not shallow. This policy should be clarified, and potentially reevaluated to maximize groundwater recharge potential.

The discussion in this section of estimated buildout and impacts on the GSP is inconsistent. The draft GSP states that Borrego could not meet the water needs if all allowable lots were built out, yet also states that implementation of existing O12-9 land use will not affect sustainable management. The draft does, however, acknowledge that updated buildout estimates should be considered in conjunction with the GSP. O12-9

<u>Climate</u>
The GP includes a "climate change and land use" goal (LU-5) (e.g., "sustainability"), but there is absolutely no discussion of potential climate change impacts on development patterns in the plan area. This section of the GSP needs to address this gap in existing policy by identifying potential impacts of increasing drought and evapotranspiration rates potentially making agriculture unsuitable for the subbasin, and therefore potentially causing major change in land use patterns. Further, current policy nor the draft GSP includes no discussion what so ever of climate change impacts to water supply and demand, or how the GSP will address those affects. O12-10

d) 2.1.4 Beneficial Uses and Users

This section of the plan should include a description of the beneficial uses and users of groundwater in the basin, including potential climate impacts to beneficial uses and users, the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties. This section should also identify whether groundwater recharge is a designated beneficial use in the appropriate Basin Plan (per Regional Water Quality Control Board), and discuss potential locations for groundwater recharge.

The current draft GSP states that the "beneficial uses" evaluated in this GSP are not strictly synonymous with those analyzed in the Basin Plan. It is of no benefit to the GSA or the community for the GSP "beneficial uses" to be different from the Basin Plan "Beneficial uses;" these should be consistent. O12-11

Groundwater recharge nor habitat preservation / restoration are currently not included as beneficial uses in the GSP, even though they are included in the Colorado River Basin Plan. Is this because there is no active recharge currently exists in the subbasin?
The GSA should: a) consider including groundwater recharge and habitat preservation/restoration (especially in the washes/creeks & the Anza Borrego Desert State Park) as a beneficial use in the GSP, and b) seek modification at the Regional Water Board to the existing Beneficial Use Designations to ensure consistency between the Basin Plan and the GSP.

The current draft GSP lists de minimis users as a beneficial user in this section, but then includes them with municipal users in the water budget. This is misleading and affects proper analysis. This section should be augmented to include a narrative description of issues affecting the supply and beneficial uses of groundwater. Additionally, the GSP should distinguish between domestic well owners and small water systems independent of the municipal water supply in the water budget. O12-11 Cont.

e) 2.1.5 Notice and Communication

The notice and communication section is required to include the following:

- An explanation of the Agency's (GSAs) decision-making process.
- Identification of opportunities for public engagement and a discussion of how public input and response will be used.
- A description of how the Agency (GSA) encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.
- The method the Agency (GSA) shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

Essentially, this section does not include a true communication strategy. Rather, this section merely describes how the GSA communicated with the public (essentially just fulfilling minimum brown act requirements).; no real communication strategy, just explaining how they met brown act violation; no explanation of decision-making, just how they engaged with the AC. O12-12

This section should also describe how climate change and related uncertainties, available adaptation strategies, groundwater recharge potential and available optimization strategies (including potential land use changes) are integrated into the GSA's communication strategy. The current draft GSP includes absolutely no mention of climate impacts, nor is there any mention of groundwater recharge opportunities. O12-13

The current draft GSP states that there is currently no program to actively replenish the aquifer, and that aquifer storage and recovery are not being considered as an option at this time because using imported water to recharge the basin was determined to be economically infeasible. However, the GSP should consider other forms of managed aquifer recharge, such as stormwater capture and agricultural runoff management. O12-14

The communication section should adequately outline the types of outreach performed throughout the GSP process and how outreach will continue moving forward. The current draft GSP includes little mention of how diverse groups were engaged; nor does it include future plans to share progress with these groups. Disadvantaged Communities ("DAC") and Severely Disadvantaged Communities ("SDAC") are not mentioned even once in the Stakeholder Engagement Plan, despite the entire Borrego Subbasin being designated a SDAC.

GSP meetings should always be held at times and places that enable all stakeholders to participate in at least some of the meetings. All Borrego Subbasin GSA Advisory Committee Meetings were held during work hours, thus precluding many community members from attending.

Meetings, outreach, and education materials should always be translated into appropriate languages spoken in the community. Meetings should provide services such as meals and/or childcare to enable working families to attend. While the current draft GSP does refer to translated materials, these materials are not included in the stakeholder engagement plan, nor are translation services in general mentioned in the stakeholder engagement plan. O12-15

Public comment should be taken during all meetings, and written comments should be accepted throughout the process. The current Draft GSP references targeted "SDAC engagement" via a Proposition 1 Stakeholder Engagement grant. Yet, outcomes from that engagement is not included in the draft GSP. This lack of information raises the following questions:

- What was the feedback from outreach to "Domestic water users" and "Disadvantaged and Severely Disadvantaged Communities?"
- How are these interests represented in the sustainability goals?
- How will they be included moving forward?

A list of all meetings, including times and locations, should be included in the communication section of the GSP. A sufficient number of meetings should be held to ensure stakeholders have adequate opportunities to learn about the GSP creation process and provide public comment. One public meeting, "Ad Hoc Committee on Severely Disadvantaged Community (SDAC) Involvement," occurred on 4/27/2018. Yet attendance is listed as "unknown." Meeting minutes and meeting agenda for this convening are not listed on the website. The two most public meetings ("Community Meetings" on 3/16/18 and 9/19/18) also lack meeting minutes and agendas on the GSA website, despite the GSP referencing that these materials are on the website. for either of the 2 most public meetings. O12-16

The Notice and Communication section, as well as the Stakeholder Engagement Plan for the draft GSP is woefully lacking. This raises the following concerns: has there been adequate stakeholder surveying and mapping? How were stakeholders informed of the process? How are the interests of small businesses, the tourism industry, and residents represented in the GSP? What were the key messages shared?

To remedy these shortcomings, the GSA should:

- Provide responses to the questions above in the Notice and Communications section of the GSP;
- Identify the outreach plan moving forward through GSP implementation, especially in development and implementation of Projects and Management Actions;
- Describe how public comments and feedback are incorporated into the GSP;
- Provide more opportunities for public input (e.g., more Community Meetings with agendas and minutes posted online) with special effort to ensure these meetings are accommodating of all community members; O12-17
- Determine how the stakeholder engagement plan will be evaluated and adapted moving forward, and share that methodology with all stakeholders.

The Borrego Subbasin GSA must augment its stakeholder engagement plan and communication section of the GSP to incorporate the following changes:

- Post meeting minutes and agendas from <u>all</u> community meetings;
- Identify specifically which/where vulnerable community groups are;
- Explain how vulnerable communities have been (and should be) engaged;
- Describe the major concerns of community members as identified by community members;
- Establish a process for incorporating public input into GSP revisions;
- Determine how the Stakeholder Engagement Plan will be evaluated and regularly updated.

f) 2.1.6 Additional GSP Elements

According to CWC Section 10727.4, the GSP must describe the "processes to review land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity." O12-18
While the current draft GSP does indeed list the relevant land use planning documents, there is no description of the process followed, or that will continue to be used, for reviewing and coordinating with other land use planning activities.

This section of the GSP must be augmented to fully meet the regulatory requirement. O12-18

This section of the GSP should describe how soil conditions and land use may further impact groundwater dependent ecosystems and how to mitigate such impacts. It should also consider an increase on water storage losses due to higher climate change temperatures. The current draft GSP includes no mention what so ever of potential impacts to groundwater dependent ecosystems, nor of water storage loss from higher temperatures; it merely mentions loss of storage in the context of potential intra-basin transfers. The GSP should be augmented to address these inadequacies. O12-19

Basin Setting

g) 2.2.1 Hydrological Conceptual Model

Drinking Water

The Hydrological Conceptual Model (HCM) should specify which aquifers are the main source of water for drinking water purposes, as well as for DACs, households relying on private wells, small community water systems, and school districts. The current draft GSP identifies the upper aquifer as the main source of water in the subbasin historically. Yet, this section does not explicitly state whether it is also the shallow aquifer that serves as the main source of water for DACs, households relying on private wells, small community water systems, and school districts. This must be rectified by including more information on the upper aquifer as it pertains to community drinking water. O12-20

For aquifers of interest for drinking water wells, the HCM should specify the overall water bearing characteristics of the aquifer (e.g., overall water quality, overall water production capacity, vertical and lateral extent, hydraulic conductivity, and storativity).

The HCM should specify how much recharge can be accomplished in different hydrogeologic environments/aquifers, and particularly provide a brief description of potential benefits and concerns of the potential recharge areas.

The HCM should be attentive to information provided for shallow aquifers and water quality concerns.

h) 2.2.2 Current and Historic Groundwater Conditions

Groundwater Elevation O12-21

The HCM should clearly state specific groundwater levels in relation to various land uses. In particular, the HCM should note where first-encountered groundwater is relatively deep; where groundwater users reliant upon shallower wells; and where users may not have the resources to drill new, deeper wells. Special notice should be given to drinking water uses. The current draft GSP provides no information regarding dewatering of wells, rehabilitation costs, rehabilitation data, or any other information about the impacts to DACs. The GSP should, but does not currently include a map identifying the locations of all drinking water systems, DACs, and areas of critical lowering of GW levels. The GSP should use monitoring wells screened for a specific aquifer, not combining aquifers, so as to indicate whether, and if so where, dewatering of wells is occurring. O12-21 Cont.

Groundwater Quality

This section of the plan should include a map of known groundwater conditions, including sensitive uses and users of groundwater that may be impacted or threatened to be impacted.

According to the GSP, "The lateral distribution of the wells in the monitoring network that measure groundwater quality is limited, and does not extend to the outer portions of each management area." The GSP also notes that "high salinity, poor-quality connate water is thought to occur in deeper formational materials in select areas of the aquifer as well as shallow groundwater in the vicinity of the Borrego Sink in the southern portion of the Plan Area." The GSA needs more monitoring data for "de minimis" domestic well users and small water systems, especially regarding the potential impacts to disadvantaged community members and cost projections for remediation. The GSP should also indicate which wells are being considered to be taken out of production or drilled deeper to mitigate water quality concerns. Increasing contamination trends are noted in the GSP, but there is little discussion of how these issues will be addressed under the sustainability goal and management actions. O12-22

Drinking Water

This section should also include information regarding contamination of wells, treatment costs, water quality data, or any other information regarding the impacts to disadvantaged communities. This should also include a map noting the locations of all drinking water systems, DACs, and areas of critical water quality contamination. The current draft of the GSP does not include this information. However, meeting minutes posted on the GSA website note that community members are concerned about elevated nitrate levels in some drinking water wells. This is referenced in the GSP, but not adequately. O12-23 *i) 2.2.3 Water Budget Information*

The water budget should include historical use of groundwater for all types of uses and users, in particular the uses of small drinking water systems, regardless of whether they will be subject to pumping restrictions. Future use for drinking water needs must utilize data from sources such as county general plans and LAFCo documents (e.g., population projections and water demand forecasts).

The historic groundwater use percentages in the Borrego Subbasin (i.e., 70% agriculture, 20% golf course, 10% municipal) is not sustainable. This section should include a description of how historical conditions have impacted the ability of BWD and the County of San Diego to manage the basin within sustainable yield. Further, including domestic/de minimis users with the overall municipal users water budget and municipal pumping reductions is both inappropriate and inaccurate. These uses must be separated and accounted for independently in the water budget. O12-24

Data used to develop the water budget is out dated and inaccurately represents the groundwater conditions in the subbasin. The GSP must use the <u>most</u> recent data, and exclude data sets producing a biased result. For example, the hydrological modeling projections currently used in the draft GSP include time periods extending far back in time, prior to when pumping began, and do not take into account shifts in the hydrologic regime which have occurred as a result of climate change. The water budget currently does not (and <u>must</u>) consider projected recharge reductions due to land fallowing and water conservation.

These inadequacies must be addressed in order for the water budget to accurately represent present groundwater conditions and support the sustainability goal.

j) 2.2.4 Management Areas

The purpose of this section is to ensure that management areas are designed in a way to protect, rather than harm, particular uses and users of groundwater. Management areas should be designed to set stricter requirements near vulnerable drinking water sources. The current draft GSP provides no indication of where potentially vulnerable drinking water source are within the management areas. The GSP should include a map identifying the location of all drinking water systems, DACs, and areas of particular threat from lowering of groundwater levels. O12-25

Chapter 3: Sustainable Management Criteria

k) 3.1 Sustainability Goal

According to 23 CCR § 354.24, the GSP must include a sustainability goal using information from the basin setting to establish measures that will ensure sustainable yield, and describe a realistic path to achieving the goal over a 20-year period. The sustainability goal should also consider all beneficial uses and users susceptible to harm from changing groundwater conditions over the 20-year time frame.

The GSP's primary sustainability goal, and five sub-goals, are brief and overly broad. As previously stated, utilizing the BVHM modeling from 1945-2010 that cites groundwater conditions from a time period before major agricultural development began, does not accurately reflect the current hydrogeological make-up of the basis, nor does it consider future impacts from climate change. The GSP should use the most recent data and hydrogeologic modeling that includes potential impacts from climate change, and exclude data sets producing a biased result. O12-26

Of the five sub-goals, only two of them explicitly consider domestic well owners (chronic lowering of groundwater levels and water quality concerns), however, the goals aren't tied back to the basin setting, nor do they identify specific vulnerable areas or how these goals impacts the sustainable yield.

It is unclear whether the sustainability goal intends is to address pre-SGMA impacts, or maintain current conditions.

The sustainability goal explains how land use and groundwater recharge was considered towards achieving the sustainability goal within 20 years of Plan implementation

local determination of the sustainable management criteria (sustainability goal, undesirable results, minimum thresholds, and measurable objectives).

a) 3 2 Undesirable Results

The GSP only considers 3 of the 6 possible sustainability indicators: Only considering 3 of the 6 possible sustainability indicators: O12-27

1. Chronic Lowering of Groundwater Levels
2. Reduction of Groundwater Storage

3. Degraded Water Quality Makes sense to not consider seawater intrusion, but land subsidence & connected surface waters should be included! O12-27 Cont.

Chronic Lowering of Groundwater Levels
The GSP accurately identifies de minimis users as one of the groups most vulnerable to lowering groundwater levels, and cites the technical, financial and geographic constraints these users face when compared to better resourced pumpers like BWD or larger agricultural users. While this is notable, it is unclear how outreach was conducted to help better understand the negative impacts different stakeholders are experiencing due to declining groundwater levels. Some alternative means of obtaining water for de-minimis and domestic pumpers who can no longer pump are mentioned in the plan, however these alternatives lack further discussion in the minimum thresholds, measurable objectives, or projects and management actions.

It's noted that the some de minimis wells may currently lack access to adequate water, and may be close to the BWD water distribution system, however the project management actions fail to discuss how consolidation is being considered for these de minimis users. The GSP includes figures (i.e. Figure 3.2-4) with average domestic well depths, however this map should include specific well data to better identify the most vulnerable areas. O12-28

The GSP also reports, "The exact number of agricultural and domestic wells that have been abandoned and re-drilled deeper and/or relocated due to production rate loss from declining groundwater levels is not known. However, anecdotal information and field observations have confirmed that inactive wells exist throughout the Plan Area" (Section 3.2.1, Page 3-10). Similar to well consolidation, the GSP fails to address the data gap of abandoned wells, and the steps being taken to follow up on anecdotal concerns.

The GSP fails to consider pre-SGMA impacts to groundwater levels, instead opting to set the highest bar as maintaining current conditions, or levels at a lower than current state.

Minimum Threshold for Chronic Lowering of Groundwater Levels:
The minimum threshold for chronic lowering of groundwater levels is based principally on the documented screen intervals of key municipal water wells and domestic/de-minimis wells located in the basin, however, not all of the de-minimus wells have accurate data to identify where at-risk wells may be located. The GSP should indicate how the GSA's intend to improve well monitoring data for de minimis users as part of the interim milestones O12-29

Measurable Objective for Chronic Lowering of Groundwater Levels:
The GSP proposes linear pumping cuts for agricultural, municipal, and recreational users, however these is no description of how different uses and users of groundwater were considered and whether the measurable objectives and interim milestones will help achieve the sustainability goal as it pertains to the most vulnerable uses of groundwater, namely de minimis users and small water systems. It is unclear how the margin of safety protects de minimis users. In addition, the outlined 5-year evaluation of the interim milestones and measurable objectives does not indicate how stakeholders will be engaged throughout these interim evaluations O12-30

Lowering of Groundwater Storage
Lowering groundwater levels are intrinsically linked with decreased groundwater storage, however the , and begins to address how the sustainability goals will impact the San Diego County General Plan and Borrego Spring Community Plan. O12-31

Degraded Water Quality
Must include how stakeholders will be engaged throughout these interim evaluations, specifically how to set MTs for growers in the region to meet ag needs.
Increased need for monitoring water quality in domestic wells. Indicate how the GSP will integrate with the RQCB 'Basin Plan' groundwater quality objectives. O12-32

Minimum Threshold/Measurable Objectives

The GSP fails to indicate how these will be determined or met.

b) 3 5 Monitoring Network

Data gap in 3.5.4.2 - Well screened in multiple aquifers
- Screen can be slots or other measure that allows water through and keeps solids out
- Water comes from the aquifer into the well
- When you're using a monitoring well that is screened in different aquifers, you're getting a combined result - not really seeing what the impacts on a given aquifer are
- Need to use monitoring wells screened for a specific aquifer, not combining aquifers

O12-33

Chapter 4. Projects and Management Actions

However it is unclear how the top priority PMA's (land fallowing and pumping reductions) will impact domestic/small water system users O12-34

Expected benefits and metrics for evaluation for each PMA do a poor job of mentioning how PMA's will impact groundwater-dependent vulnerable groups

PMA's were not put before stakeholders (see feedback in Section 4.0), therefore stakeholders are not aware of project goals, timelines, benefits, and risks

Prior to adoption, the GSA should hold public meetings to gather input on the PMA's via publicly available meetings (appropriate meeting times, translation and childcare services, etc.).

Notes: According to public meetings posted on the GSA website, there was no 'Community Meeting' held to discuss the projects and management actions - the most recent Advisory Committee meeting (Jan 2019) includes slides on the PMA's and how to provide input, however, minutes from the meeting aren't posted (incorrect minutes are posted from Aug 2018); AND as seen from the previous schedule of Advisory Committee meetings, these meetings tend to take place beginning at 10:00 am during workdays. O12-35

Thank you very much for your consideration of our concerns regarding this draft of the GSP. Please do not hesitate to contact me with any questions regarding the Stewardship Council's interests/concerns.

Sincerely yours,

Diane Johnson

Diane Johnson
BVSC Representative to the GSP Advisory Council

Letter O12

Commenter: Diane Johnson, Advisory Committee Member, Borrego Valley Stewardship Council
Date: May 21, 2019

O12-1 The Groundwater Sustainability Agency (GSA) welcomes comments submitted on behalf of the Borrego Valley Stewardship Council and recognizes your participation on the Advisory Committee and your commitment to sustainable development and growth of the Borrego region.

O12-2 The GSA acknowledges your comment that the Sustainability Goal should be based on climate change impacts and future conditions, and should acknowledge that maximizing groundwater recharge will be a necessary component of achieving sustainability. With regard to groundwater recharge, the commenter is referred to the GSAs response to Letter I19. With regard to climate change, the commenter is referred to Groundwater Sustainability Plan (GSP) Section 3.3.1.1 and Section 3.4.1 for a discussion of how Department of Water Resources (DWR) climate change factors were considered and applied in the establishment of minimum thresholds and measurable objectives.

The comment also indicates that sustainability goal is not a goal at all but simply a restatement of the intent of Sustainable Groundwater Management Act (SGMA) and inadequate. The GSA notes this concern, and the commenter is referred to GSP Section 3.1, which adequately describes the GSAs sustainability goal in accordance with SGMA and DWR regulations. Furthermore, GSP pgs. 3-21 and 3-22 explains how climate change was considered in the development of sustainable management criteria.

O12-3 The GSA notes the comment that the GSA should include personnel with a focus on climate change effects on groundwater conditions and recharge rates. The commenter indicates that there is no clear identification that any of the staff on the GSA "Core Team" or Advisory Committee (AC) have background or expertise in either soil science or considering the impacts of land use on groundwater conditions. The commenter requests that the GSA ensure that the Core Team and AC be populated with personnel with adequate expertise on climate science, soil science, and hydrology, and that the GSP be updated to include a thorough description of the requisite background of Core Team and AC members. The commenter is referred to GSP Section 1.3 and Appendix E, which describes the organization and management structure of the GSA.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O12-4 The GSA acknowledges the comment that estimated costs to implement the GSP, and the GSA's approach to meeting those costs should include costs related to climate change impacts and adaptation, as well as costs to implement groundwater recharge. The commenter also indicates that the Draft GSP includes no reference to soil conditions, recharge, or land use impacts or changing conditions as a result of climate change, and how these changing conditions could affect GSP implementation costs. The commenter believes the GSP implementation cost estimates should be re-evaluated in conjunction with more detail being provided to the projects and management actions. The commenter requests an analysis of how the GSA will raise funds, and to determine potential impacts to vulnerable communities, and how to mitigate those impacts.

With regard to groundwater recharge, the commenter is referred to the GSAs response to Letter I19. With regard to climate change, the commenter is referred to GSP Section 3.3.1.1 and Section 3.4.1 for a discussion of how DWR climate change factors were considered and applied in the establishment of minimum thresholds and measurable objectives. The commenter is referred to GSP Chapter 5 for a description of GSP implementation, including costs. It should be noted that the specificity of cost estimates are commensurate with the level of detail of the Project and Management Actions (PMAs), and are subject to change. Finally, the commenter is reminded that the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any of the PMAs in the GSP.

O12-5 The commenter requests that the GSP be revised to indicate reference where the most vulnerable community members (e.g., specific neighborhoods or population groups) within the Subbasin are located. The commenter is referred to GSP Section 2.1.1 (Summary of Jurisdictional Areas and Other Features) for a description of the characteristics of the community including Severely Disadvantaged Community (SDAC) status. In addition, the commenter requests that the GSP include locations and extent of communities dependent upon groundwater, including where community wells are located near higher production wells, such as irrigation wells, that could potentially impact domestic well users' groundwater supply or quality. The commenter asserts that despite the requirement of SGMA not extending to de minimis users, the Borrego Subbasin GSP should include these users, because the overall water budget for the entire basin is relatively small, thus "de minimis" users actually make up a recognizable percentage of total extractors. In addition, the commenter indicates that should represent various portions of the basin dependent upon groundwater for beneficial uses, including communities dependent upon groundwater for domestic uses and include specific data by land use on groundwater dependent users. Lastly, the commenter indicates that all of the Borrego community and all users are groundwater and this should be explicitly stated and mapped.

The Draft GSP adequately describes SDAC concerns, including the location of municipal and domestic wells which serves the SDAC. The Draft GSP adequately describes the location of de-minimis well users, and establishes thresholds protective of those uses. GSP Chapter 3 includes Figure 3.2-4 which shows the approximate location of de-minimis users along with BWD's distribution systems. In addition, Chapter 3 addresses how the GSP establishes thresholds that are protective of de-minimis users (Section 3.2.1 and Section 3.3.1). SGMA does not require identification of SDACs at the level of detail requested by the commenter. The GSA has appropriately identified the SDAC at the general scale of the U.S. Census Designated Place (CDP) and tracts.

The GSA sought grant funding to prepare the GSP and identify vulnerabilities and potential impacts from the GSP process on SDAC-related issues (e.g., water supply, cost, and infrastructure concerns). The BWD placed into the administrative record the SDAC Impact/Vulnerability Analysis (Task 2 Report) prepared by Environmental Navigation Services Inc., dated April 15, 2019. Besides defraying costs for the community, the report was prepared to understand the implications that the implementation of SGMA will have on the SDAC population of Borrego Springs. The report describes specific vulnerabilities, including challenges associated with potential loss of seasonal jobs in the agricultural and recreational sectors, funding and access to public schools, and water rate impacts to the lowest income portion of the community. The 20-year SGMA compliance period does provide time for the community to adapt, and potentially using the BWD's tiered rate structure and the GSA's commitment to seeking state funding to support the SDAC as the primary potential mitigation strategies to address SDAC concerns. GSP Section 2.1.5 has been amended to briefly summarize the results of BWD's Impact/Vulnerability Analysis.

O12-6 The commenter indicates that GSP Section 2.1.2 should note where monitoring programs are located and where there may be gaps in monitoring. In addition, the commenter requests that components of the monitoring plan should include: (1) if stakeholders have requested additional monitoring; (2) either when additional monitoring will be implemented or why the request will not be approved at this time; and (3) water-relevant climate, land use, and recharge variables (e.g., land use, soil conditions, precipitation, temperature, evapotranspiration).

The GSA notes the comment that the Draft GSP highlights BWD's existing tiered rate structure, but does not indicate how this relates to water affordability for lower income groups. The commenter indicates that no reference is made for monitoring data specific to soil conditions, precipitation, temperature, or evapotranspiration. In addition, the commenter requests that all programs include the level of detail provided for the Demand Offset Mitigation Water Credits Policy and that these components [soil conditions, precipitation, temperature, or evapotranspiration] need to be incorporated into the monitoring plan.

The commenter states that the Draft GSP provides no guidance on how the County Groundwater Ordinance will need to be evaluated and possibly revised to ensure consistency with GSP sustainability goals. The GSA is unclear on the following comment: ". . . no information on metrics measured, past impacts, or anticipated future impacts." The commenter indicates the following six items need to be addressed and favorably answer to adequately fulfill the requirements of SGMA: (1) relationship of tiered rate to water affordability for low-income communities; (2) 2009 Anza-Borrego Desert IRWM Plan; (3) Region 7 Water Quality Control Plan; (4) BWD and the County's Water Credit Policy; (5) wells since passage of Senate Bill (SB) 252 and release of this plan; and (6) how will domestic wells and small water systems be protected from negative impacts of the baseline pumping allocation. Your comment suggests that describing applicable laws in the Draft GSP is not sufficient and that the GSP must to be augmented to describe how monitoring of each of those programs will be incorporated into the GSP, how those existing programs will limit operational flexibility, and how the GSA will adapt to those limits.

In response to this comment, the GSA has revised Section 2.1.2 to provide additional information on the relevance of the water resource management programs to implementation of the GSP as well as operational flexibility considerations. Adequate information on soil conditions, precipitation, temperature, and evapotranspiration is found in Chapter 2, and Chapter 3 incorporates climate change considerations into the development of sustainable management criteria. Otherwise, this comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O12-7 The GSA acknowledges your comments on Section 2.1.3 Land Use Considerations and your request to identify the following items: (1) disadvantaged and severely disadvantaged unincorporated communities; (2) where water agency consolidations or service extensions are being considered; (3) potential sources of contamination from current land use practices; (4) expected land use changes due to climate change impacts or development and socio-economic conditions, that may affect water supply and water demands, as well as groundwater recharge rate; (5) projected water demand as a result of climate change or population growth, and its impact on achieving the sustainability goal; and (6) how climate, land use and soil conditions impact groundwater recharge, and the affect this may have on water supply and demands how the GSP addresses those effects.

Your comment indicates that the Draft GSP needs specificity on how the GSP will uphold or implement various policies. In addition, you question how will the GSP affect the pre-existing San Diego County Groundwater Ordinance and how will this impact pumping allocations.

Additionally, you indicate that Section 2.1.3, Land Use Considerations, fails to answer the following items necessary for meeting SGMA requirements: (1) do current well permitting practices protect vulnerable water supply sources, such as shallow wells (for all beneficial uses); (2) are there documented instances of stakeholder concerns regarding current land use or well ordinances impacting other beneficial uses; (3) which current ordinances need to be amended in order for the basin to meet its sustainability goals; and (4) are the policies considered to implement the GSP actual policies that are currently in existence, or policies that would need to be established?

Adequate information on well permitting practices is found in GSP Section 2.1.2; adequate information on stakeholder concerns is found in GSP Section 2.1.5; and adequate information on current ordinances and policies and how they relate to GSP implementation is found in GSP Sections 2.1.2 and 2.1.3. As discussed in Chapter 2 (Section 2.1.3), population growth is expected to be minimal, as existing regulatory, environmental, and public service constraints severely limit the ability for Borrego Springs to grow. Water demand and supply is provided in GSP Section 2.2.3. In addition, the commenter is referred to previous responses O12-1 through O12-6 for responses to issues around climate change, land use and soil conditions.

O12-8 The GSA notes your comment that the San Diego County General Plan and Borrego Valley Community Plan include positive policies to protect the basin from continued overdraft and to minimize the impact of stormwater runoff (e.g., Goal LU-8; COS-5.2), yet include no mention what so ever of recharge. The GSA acknowledges your comment that Draft GSP should be augmented to include this information. In addition, you indicate that detail needs to be provided on how the misalignment between agricultural preservation goals in the General Plan with the goals of the GSP will be aligned in the update to the General Plan.

The GSA notes your comment that it is uncertain whether General Plan Conservation and Open Space Element, Goal COS-4: Water Management, and/or COS-4.3 - "Maximize stormwater filtration and/or infiltration" will promote groundwater recharge, or if it only refers to stormwater mitigation, and that this policy should be clarified and potentially reevaluated to maximize groundwater recharge potential.

As described in the GSP (Section 2.1.3), "At the next County General Plan update, land use policies will be brought in line with the sustainability goals of this GSP. This will be done by considering the sustainability goals and the projects and management actions of the GSP in the updated community plan and through revisions to the County's groundwater ordinance."

O12-9 The GSA notes your comment that you infer that the GSP states that Borrego Springs could not meet the water needs if all allowable lots were built out, yet also states that implementation of existing land use will not affect sustainable management. This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary. As discussed in Chapter 2 (Section 2.1.3), population growth is expected to be minimal, as existing regulatory, environmental, and public service constraints severely limit the ability for Borrego Springs to grow. As stated in the GSP (pg. 2-21): "Future general plan and community plan updates should consider the sustainability goals of this GSP. Updated buildout estimates should be considered in conjunction with the sustainability goals, projects, and management actions outlined in this GSP."

O12-10 The GSA notes your comment that there is absolutely no discussion of potential climate change impacts on development patterns in the plan area. In addition, you indicate that current policy nor the Draft GSP includes no discussion what so ever of climate change impacts to water supply and demand, or how the GSP will address those affects. The commenter is referred to previous responses to Comment O12-1 through Comment O12-7 regarding issues around climate change, land use, and soil conditions.

O12-11 GSP Section 2.1.4 includes adequate information on beneficial uses and users at an appropriate level of detail to comply with SGMA. Groundwater recharge is discussed in GSP Section 2.2.1.4 and specific areas conducive to recharge are shown in Figure 2.2-11; in addition, recharge sources are quantified in GSP Section

2.2.3. As discussed in GSP Section 2.1.6, there is no program to actively replenish the aquifer, and there are no conjunctive use and/or underground storage programs within the Plan Area. Natural recharge is not considered a beneficial use.

Finally, the GSA notes the commenter's opinion that de minimis users should be listed as a separate beneficial use in Section 2.1.4. This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O12-12 The commenter asserts that the GSP does not describe a true communication strategy. GSP Section 2.1.5 includes adequate information on notice and communication at an appropriate level of detail to comply with SGMA, and the commenter is referred to Appendix C which includes additional detail on the GSA's communication strategy. In addition, GSP Section 2.1.5 has been amended to briefly summarize the results of BWD's SDAC Impact/Vulnerability Analysis.

O12-13 The GSA notes the comment that Section 2.1.5 should describe how climate change and related uncertainties, including adaptation strategies, groundwater recharge potential, and other optimization strategies, are integrated into the GSA's communication strategy. The commenter is referred to previous responses to Comment O12-1 through Comment O12-11 for responses to issues around climate change, groundwater recharge, land use and soil conditions.

O12-14 The GSA acknowledges this comment on aquifer replenishment. The commenter is referred to previous responses to Comment O12-1 through Comment O12-11 for responses to issues around climate change, groundwater recharge, land use, and soil conditions.

O12-15 The GSA acknowledges the commenter's concern about the GSA's communication strategy. GSP Section 2.1.5 includes adequate information on notice and communication at an appropriate level of detail to comply with SGMA, and the commenter is referred to Appendix C which includes additional detail on the GSA's communication strategy. As stated therein,

> the GSA gathered valuable information [from the public, including the SDAC] about community concerns, which primarily related to rising water rates, economic impacts (e.g., job loss), land use changes, water use allocations, water quality, and long-term environmental impacts. This information was then incorporated into the development of this GSP, and considered in the evaluation of groundwater dependent ecosystem (GDE), development of projects

and management actions, seeking additional funding opportunities to minimize impacts on ratepayers, and land use implications.

In addition, GSP Section 2.1.5 has been amended to briefly summarize the results of BWD's SDAC Impact/Vulnerability Analysis, including mitigation strategies to address potential economic impacts of GSP implementation.

O12-16 Commenter points out attendance is not known for several meetings in Appendix C2 (List of Public Meetings), and indicates meeting minutes for several meetings are not posted on the website. The County website has archives of all GSA GSP advisory committee meetings and does not include meeting minutes that were hosted solely by the BWD.

O12-17 The GSA acknowledges the commenter's concern about the GSA's communication strategy. GSP Section 2.1.5 includes adequate information on notice and communication at an appropriate level of detail to comply with SGMA, and the commenter is referred to Appendix C which includes additional detail on the GSA's communication strategy. In addition, GSP Section 2.1.5 has been amended to briefly summarize the results of BWD's SDAC Impact/Vulnerability Analysis, including mitigation strategies to address potential economic impacts of GSP implementation.

O12-18 The GSA acknowledges the commenter's concern about the GSA's coordination of land use planning and SGMA compliance. It should be noted that the County—who is the only land use planning agency in the Subbasin—is also part of the GSA. Accordingly, no special inter-agency coordination is needed to ensure land use plans are updated to be consistent with the GSP. This isn't necessarily the case for other GSAs in the state. GSP Section 2.1.3 includes adequate information to comply with CWC Section 10727.4.

O12-19 The GSA acknowledges the commenter's claim that the GSP lacks information on soil conditions, land use impacts, groundwater dependent ecosystems, and climate change. The GSP includes adequate information on all these topics. The commenter is referred to previous responses to Comment O12-1 through Comment O12-11, and to the master response of groundwater dependent ecosystems.

O12-20 The GSA acknowledges the commenter's claim that the GSP lacks information on drinking water sources and water quality for SDACs, domestic well owners, small water systems and school districts. The source and quality of water is the same as described in the GSP for the whole Subbasin. The commenter is referred to Chapter 2 for complete information about aquifer properties, water quality, and water budget. Furthermore GSP Chapter 3 provides additional information relevant to private well owners, small water systems, and de minimis users, including figures of how much water remains in the upper aquifer (e.g., Figure 3.2-1).

O12-21 The GSA acknowledges the commenter's opinion that the GSP should go into detail on each users' wells, the depth to groundwater for each, and speculate as to users' needs, costs, and/or resources to rehabilitate or drill new wells. GSP Chapter 3 includes adequate information that describes undesirable results for all beneficial users of groundwater within the Subbasin, including de minimis users of groundwater. It is not within the scope of the GSP nor necessary to meet SGMA requirements to go into the level of detail requested by the commenter.

O12-22 The GSA acknowledges the commenter's concerns about groundwater quality. The GSP adequately describes groundwater quality problems, including specific areas of concern. This information is primarily found in GSP Section 2.2.2.4, but is succinctly summarized in Chapter 4, pg. 4-30, which states,

> naturally occurring poor water quality has been identified in specific areas: near the margins of the Subbasin where unconsolidated sediments are in contact with fractured bedrock; for select wells screened predominantly in the lower aquifer of the South Management Area that have concentrations of arsenic above the drinking water maximum contaminant level; and near the Borrego Sink where elevated sulfate and TDS [total dissolved solids] are likely associated with dissolution of evaporites from the dry lake.
>
> Historical groundwater quality impairment for nitrates is noted for select portions of the Subbasin predominantly in the upper aquifer of the North Management Area underlying the agricultural areas and near high density of septic point sources. The source of nitrates is likely associated with either fertilizer applications or septic return flows.

In addition, the GSP has been amended to clarify that BWD does not have wells in the Borrego Sink area, and utilizes wells that produce water meeting Title 22 requirements without further treatment.

O12-23 The GSA acknowledges the commenter's opinion that the GSP should go into detail on the water quality characteristics for SDAC users' wells, and speculate as to users' needs, costs, and/or resources to treat a presumed water quality issue. The GSP includes adequate information that addresses water quality concerns within the Subbasin. It is not within the scope of the GSP nor necessary to meet SGMA requirements to go into the level of detail requested by the commenter.

O12-24 The GSA acknowledges the commenter's objection to including domestic/de minimis users' water uses into the larger municipal beneficial use umbrella. The GSP includes adequate information on groundwater conditions in the Subbasin, including the water budget. The commenter is referred to the master responses for the baseline pumping allocation and on the initial estimate of sustainable yield.

O12-25 The GSA acknowledges the commenter's opinion that the GSP should define management areas based on vulnerable drinking water sources, and that a map of drinking water systems, DACs, and groundwater levels should be provided. As discussed in the GSP, management areas are defined through a combination of criteria, one of which includes the predominant uses of groundwater (i.e., agricultural, recreational, or municipal). The commenter is referred to Figure 2.1-2 for a map of BWD's water service area and identification of small water systems. The commenter is referred to Figure 3.2-4 for a map that approximates the location, depth, and available water for de minimis users, as well as their location relative to BWDs drinking water distribution system.

O12-26 The GSA acknowledges the commenter's opinion that the GSP's sustainability goal and sub-goals are too brief and overly broad.

O12-27 The GSA acknowledges the commenter's statement that the GSP considers only three of the six possible sustainability indicators. The GSP considers all six sustainability indicators but has determined that undesirable results for seawater intrusion, land subsidence, and interconnected surface waters are not presently occurring or likely to occur over SGMA's planning and implementation horizon. For this reason, the GSP does not establish sustainable management criteria for those three indicators, as discussed in GSP Section 3.2.

O12-28 The GSA acknowledges the commenter's concerns about how the GSP's sustainable management criteria for chronic lowering of groundwater levels is protective of domestic and de minimis well users. The minimum threshold justification (GSP Section 3.3.1.1) is equally applicable to domestic and de minimis well users as it is to municipal beneficial uses served by BWD. Specifically, it states that an undesirable result would occur if groundwater level declines "lower the rate of production of pre-existing groundwater wells below that necessary to meet the minimum required to support the overlying beneficial use(s), where alternative means of obtaining sufficient groundwater resources are not technically or financially feasible."

Furthermore, GSP Section 3.2.1 provides additional information about domestic and de-minimis wells: "an important objective in this GSP is that access to the upper aquifer or upper middle aquifer be maintained, as much is practicable, in areas with de minimis and other domestic wells not currently served by municipal supply (Figure 3.2-1 and Figure 3.2-2)." The GSA's groundwater level monitoring network is sufficient to detect whether significant groundwater depressions and/or accelerated rates of decline might affect domestic and/or deinimis well owners, and such information will be included in annual reports and 5-year GSP evaluations. However, it is neither within the scope of the GSP nor feasible at this time to identify conditions in each private/domestic de minimis well or predict whether or to what degree individual's well yields might be affected in the future. Regarding inactive wells, it should be noted that PMA No. 4 (Water Quality Optimization) (described in GSP Section 4.6.1) includes consideration for proactive abandonment of inactive wells to minimize migration pathways.

O12-29 The commenter is referred to response to Comment O12-28.

O12-30 The GSA acknowledges the commenter's inquiry on how the measurable objective and interim milestones protects domestic and/or de-minimis well owners. The commenter is referred to response to Comment O12-28.

O12-31 This comment appears to have been truncated, but is interpreted as asking how the sustainable management criteria for lowering of groundwater in storage will impact the San Diego General Plan and Borrego Springs Community Plan. As described in the GSP (Section 2.1.3), "At the next County General Plan update, land use policies will be brought in line with the sustainability goals of this GSP. This will be done by considering the sustainability goals and the projects and management actions of the GSP in the updated community plan and through revisions to the County's groundwater ordinance."

O12-32 This comment appears to be incomplete, but is interpreted as asking how the GSA intends on monitoring and evaluating the sustainable management criteria for groundwater quality. The commenter is referred to GSP Sections 3.3.4, 3.4.4, and 3.5.

O12-33 The GSA acknowledges the commenter's notes on minimum thresholds and measurable objectives. The GSP does not fail to indicate how minimum thresholds and measurable objectives will be met. The commenter is referred to Chapter 3 and

Chapter 4 of the GSP. The remainder of the comments do not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O12-34 The GSA acknowledges the commenter's statement that it is unclear how PMA's will impact domestic/small water system users. As de-minimis users are not subject to the pumping reduction program, implementation of PMAs are expected to result in improved groundwater conditions when compared to the impacts of doing nothing. For small water systems considered as non-de minimis users, the commenter is referred to the master response on the baseline pumping allocation and pumping reduction program.

O12-35 The GSA acknowledges the commenter's assertion that PMA's were not put before stakeholders. The commenter is referred to GSP Appendix C2, which includes a list of public meetings. Public meetings that reviewed PMAs in full, or aspects of PMAs, occurred on May 31, 2018; August 30, 2018; November 29, 2018; and January 31, 2019. Both AC and community meetings are open to the general public.

Comment Letter O13

From: Diane E.P. Johnson <depjohnson@aol com>
Sent: Tuesday, May 21, 2019 5:01 PM
To: LUEG, GroundWater, PDS
Subject: Stewardship Council comments on BVGSP

Borrego Valley
Stewardship Council

May 21, 2019

County of San Diego

Planning & Development Services

C/O: Jim Bennett

5510 Overland Avenue, Suite 310

San Diego, CA 92123

Re: Groundwater Sustainability Plan

Borrego Valley Groundwater Basin

Borrego Springs Sub-basin

Dear Mr. Bennett,

1

The Borrego Valley Stewardship Council (BVSC) submits the following comments in reviewing the Draft Groundwater Sustainability Plan.

I. Introduction

The Borrego Valley Stewardship Council is a convening entity, guided by the Borrego Valley Geotourism Charter, that regularly brings together a collection of civic and community organizations, government officials, agency staff, academic institutions, and interested citizens to address major issues of concern impacting the Anza-Borrego Desert State Park, the Valley, and residents. The Council was formed in 2014 in cooperation with the National Geographic Society's Geotourism Program and the University of California, Irvine Steele/Burnand Anza-Borrego Desert Research Center. Signatories include Anza-Borrego Desert State Park–California State Parks; Borrego Water District; Borrego Springs Unified School District; Borrego Art Institute, Anza-Borrego Foundation, Anza-Borrego Desert Natural History Association; Borrego Modern; Borrego Springs Chamber of Commerce & Visitors Bureau; Borrego Village Association; Tubb Canyon Desert Conservancy; Borrego Outfitters; Borrego Springs Homeowners Association; de Anza Country Club; La Casa del Zorro; and The Springs at Borrego RV Resort. These organizations comprise virtually all the major NGOs and businesses in town. (http://www.borregovalleystewardshipcouncil.org/home.html)

The BVSC wishes to thank you, and the BVGSA Core Team and Dudek for tremendous efforts in producing such a substantial Draft GSP. A remarkably wide breadth of skills and types of work were required. As the Stewardship Council representative to the GSA Advisory Committee, I attended many meetings and witnessed the dedicated, on-going efforts put forth. O13-1

II. Background of intent: SGMA and related water law

SGMA has opened a new era in California water law, with its emphasis on *local* solutions to *local* groundwater basins. The DWR website on SGMA and Groundwater Sustainability Agencies states, "The Sustainable Groundwater Management Act (SGMA) established a new structure for managing California's groundwater resources at the local level by local agencies." (https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainable-Agencies)

The San Diego County SGMA website states, "The intent of the law is to strengthen local groundwater management of basins most critical to the state's water needs with an understanding that groundwater is most effectively managed at the local level. SGMA requires basins to be sustainably managed by local public agencies (e.g., counties, cities, and water agencies) who become groundwater sustainability agencies, or GSAs. The primary purpose of the GSAs is to develop *and implement* [italics added] a Groundwater Sustainability Plan (GSP) to achieve long-term groundwater sustainability." https://www.sandiegocounty.gov/pds/SGMA.html

It is important to note that, just as the Bill of Rights is predicated on the existence of the U.S Constitution, SGMA was written in the context of the long-established and regularly updated and reaffirmed California Water Plan. The Plan underlies all state water legislation and programs, emphasizing four societal goals in addition to the traditional hydrologic goals of state water law:

"Update 2018 organizes the intended outcomes that have been expressed by the water community around four broad categories of public benefits, or "societal values."

2

- **Public Health and Safety** — All Californians are protected from health and safety threats and emergencies.

  Comment: This includes guaranteed access to safe drinking water, as expressed in the Human Right to Water Act, AB 685, ch. 524, 2012 Cal. Stat. 91 (Codified at Cal. Water Code § 106.3 (West 2012). AB685 is "a comprehensive law guaranteeing the right to safe, affordable water without discrimination, prioritizing water for personal and domestic use and delineating the responsibilities of public officials at the state level. AB 685 specifically charges relevant California agencies with fulfillment of the law's mandate by considering the human right to water in policy, programming, and budgetary activities." https://www.law.berkeley.edu/files/Water_Report_2013_Interactive_FINAL(1) pdf]

- **Healthy Economy** — A strong, diverse economy provides satisfying ways of life and well-being, as well as opportunities for economic prosperity, for all Californians.

  Comment. The economy of Borrego Springs is totally dependent on its groundwater aquifer. Beneficial users in Borrego Springs include not only its 3500 residents (who pay over $300,000,000 to the County in property taxes each year), but also visitors – numbering in the hundreds of thousands annually – to the town and to the Anza-Borrego Desert State Park. If water becomes so unaffordable to municipal water users (residents and businesses) that the Borrego Water District cannot be sustained, then both residents and the Park – an important State resource – are irreparably damaged.

- **Ecosystem Vitality** — Ecological functions and processes that sustain ecosystems and fish and wildlife habitat are maintained and improved.
- **Opportunities for Enriching Experiences** — All Californians have opportunities for cultural, spiritual, recreational, and aesthetic experiences."

O13-1 Cont.

III. Stewardship Council comments on the Draft GSP

A. The underlying assumptions of the Draft GSP are more reflective of the long-time California tradition of conflating property rights with water rights, and regarding water as a privately-held resource free to its owners. Water is now recognized as a public common-pool resource, and the right to potable water is a basic human right in California Moreover, the Draft GSP breaks the tenet of local control Its hard line on across-the-board proportional reductions to pumping allocations comes not from any one sector of the local Borrego stakeholder ecosystem, but is instead being driven by Sacramento-based large agricultural interests funding attorneys to assist them in resisting change AS shown above, SGMA says that decisions should be derived locally, so as not to perpetuate the inequitable water interests that have made California the last state in the nation to adopt integrated watershed management planning. Borrego Springs should not be held hostage to the interests of state-level big agriculture. O13-2

B. Collaborative governance and transparency are also tenets in SGMA; the law makes clear that the relevant County is an important part of the local control it encourages. It's hard to see how, after accepting a special grant given to Borrego because it is an SDAC, the GSP can both ignore SDACs in its contents and its intentions The County, including its trong property-rights advocates, would be better served to be at the table than ceding control to the state Water Boards O13-3

3

C. The Stewardship Council would also like to reiterate its 2016 letter to the county in which it encouraged fully embracing the GSP process; particularly around inclusion, equity, and transparency. Including SDAC communities and Tribes/native Americans, equity in water allocation, land use and economic development. Transparency in water transfers and land use decisions is required O13-3 Cont.

Sincerely,

Diane E. Johnson

Letter O13

Commenter: Diane Johnson, Borrego Valley Stewardship Council
Date: May 21, 2019

O13-1: The Groundwater Sustainability Agency (GSA) acknowledges the commenter's assertion that Sustainable Groundwater Management Act (SGMA) was developed in the context of the long-established California Water Plan. It should be noted that the Groundwater Sustainability Plan (GSP) was developed in compliance with the SGMA of 2014 (California Water Code Section 10720–10737.8, et al.) and the Department of Water Resources (DWR) GSP Regulations (California Code of Regulations, Title 23, Section 350 et seq.). Appendix A of the GSP includes the Preparation Checklist for GSP Submittal, which identifies where in the GSP each of the statutory requirements of SGMA are addressed.

OS13-2: The commenter alleges the Draft GSP breaks the tenet of local control and is in objection to proportional reductions.

In response, the GSP does not set specific groundwater use reductions. The GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the basin pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

O13-3: The GSA acknowledges the commenter's assertion that the County should be at the table rather than the State Water Board. The GSA further recognizes the commenter's concern regarding ignoring the Severely Disadvantaged Community (SDAC). In response, the GSA sought grant funding to prepare the GSP and identify vulnerabilities and potential impacts from the GSP process on SDAC-related issues (e.g., water supply, cost, and infrastructure concerns). Besides defraying costs for the community, the work conducted for the grant will provide insight for Borrego Water District's (BWD's) future decision-making efforts, both of which are beneficial to the SDAC. The GSA intends to continue to pursue future grant opportunities for the benefit of the SDAC and the entire Borrego Springs community.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter O14

May 15, 2019

County of San Diego,
Attn Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Dear Jim

As you already know, Borrego Water District retained the services of Environmental Navigation Services, Inc. (ENSI) to provide a variety of studies related to the implementation of the Groundwater Sustainability Plan (GSP) for the Borrego Springs Subbasin (Basin) of the Borrego Valley Groundwater Basin and its possible impacts upon BWD infrastructure and the Borrego Springs Economy. All of the Reports have now been completed and BWD is submitting them to The County and become part of the public record for the comment period of this Basin's GSP. O14-1

Sincerely

Kathy Dice, President
Board of Directors

INTENTIONALLY LEFT BLANK

Letter O14

Commenter: Kathy Dice, President, Borrego Water District
Date: May 15, 2019

OS14-1: The Groundwater Sustainability Agency (GSA) has added the Environmental Navigation Services Inc. studies provided by Borrego Water District to the public record. The letter does not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter O15

P. O. Box 2714, Borrego Springs, CA 92004
Phone: 760-767-9919

BVEF
BORREGO VALLEY
ENDOWMENT FUND

May 21, 2019

County of San Diego
Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Re: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

Since its inception, the mission of the Borrego Valley Endowment Fund has been inextricably linked to the health and well being of the residents of the Borrego Valley. In fulfillment of its mission The Fund has supported efforts to improve healthcare delivery, to ensure sustainable water supply, and to promote clean air.

We are writing today regarding our concerns about clean air in the Borrego Valley. **We note that Section 5 of the Groundwater Sustainability Plan contains no costs associated with Air Quality Monitoring, which we believe is a significant deficit of this draft of the GSP.** O15-1

Attaining the goals of the GSP will necessitate the fallowing of thousands of acres of agricultural land, and fallowed agricultural lands have the potential to significantly and adversely impact the Air Quality of the Valley through increased air pollution. For the past three years The Fund, in partnership with the University of California, Irvine and the Borrego Water District, has supported Air Quality monitoring in the Borrego Valley, with particular attention to particles measuring 2.5 um and 10 um.

BVEF
BORREGO VALLEY ENDOWMENT FUND

May 21, 2019

Page 2

Air pollution poses a great environmental risk to health. Outdoor fine particulate matter (particulate matter with a diameter <2.5 μm) exposure is the fifth leading risk factor for death in the world, accounting for 4.2 million deaths and > 103 million disability-adjusted life years lost according to the Global Burden of Disease Report.

Air pollution can harm acutely, usually manifested by respiratory or cardiac symptoms; as well as chronically, potentially affecting every organ in the body. It can cause, complicate, or exacerbate many adverse health conditions. Tissue damage may result directly from pollutant toxicity because fine and ultrafine particles can gain access to organs, or indirectly through systemic inflammatory processes. Harmful effects occur on a continuum of dosage and even at levels below air quality standards previously considered to be safe.

The issue of Air Quality is of particular concern for the Borrego Valley given our demographic shift toward older age groups and the greater susceptibility to air pollution of those older groups.

Thus, we are writing to suggest that the costs associated with Air Quality monitoring be included in the GSP. We believe Air Quality monitoring will be an essential tool for compliance with the California Environmental Quality Act as the GSP is implemented and agricultural lands are fallowed. O15-1 Cont.

Thank you,

Bob Kelly
President, BVEF

Letter O15

Commenter: Bob Kelly, President, Borrego Valley Endowment Fund
Date: May 21, 2019

O15-1 The Groundwater Sustainability Agency (GSA) appreciates your comments on the Draft Groundwater Sustainability Plan (GSP) and commends your mission to support efforts to improve healthcare delivery, to ensure sustainable water supply, and to promote clean air. The GSA notes your comment that Section 5 of the Draft GSP contains no costs associated with air quality monitoring, which you believe is a significant deficit of the Draft GSP. The GSA also note your comment that attaining the goals of the GSP will necessitate the fallowing of thousands of acres of agricultural land, and fallowed agricultural lands have the potential to significantly and adversely impact the air quality of the Borrego Valley through increased air pollution. In addition, the GSA acknowledges your partnership with the University of California, Irvine (UCI), and the Borrego Water District (BWD) to support ongoing meteorology and particulate matter monitoring with particular attention to particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) and monitoring for particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$). The GSA acknowledges your request that the costs associated with air quality monitoring be included in the GSP.

The GSA notes that UCI implemented a research study to evaluate, model and attribute particulate matter air quality in Borrego Springs, California. The three year program evaluated current and historical air quality trends, developed and calibrated a particulate matter air quality model of the region and is in the process of attributing likely air quality sources of degradation (UCI 2017, 2018). Data for this research was provided from the installation and monitoring of five new weather stations in Borrego Springs by real-time continuous airborne particle nephelometers. Nephelometers measure the visual quality of local ambient air by measuring the scattering of light due to particles in continuous air samples. Nephelometers do not make direct measurements of mass but instead measure secondary properties of particles from which the mass must be inferred to compare to regulatory particulate matter requirements. Light scattering technologies must be calibrated against the Environmental Protection Agency (EPA's) Federal Reference Method. UCI's weather stations are primarily for scientific research and are not intended to meet regulatory mass-balance stations requirements used to determine compliance with federal EPA National Ambient Air Quality Standards or state ambient air quality standards. Additional information regarding particulate matter monitoring requirements is available from the California Air Recourses Board at: https://www.arb.ca.gov/aaqm/partic.htm.

The GSP includes Project and Management Action No. 4 – Voluntary Fallowing of Agricultural Land. As indicated in the GSP, the GSA will prepare policy development and the California Environmental Quality Act (CEQA) documentation after GSP adoption in advance of considering formal adoption and implementation of a voluntary fallowing program.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter C1

Borrego Springs Community Sponsor Group
Comments on the Draft Groundwater Sustainability Plan (GSP)
Borrego Valley Groundwater Basin

1. The Borrego Springs Community Sponsor Group (BSCSG) would prefer no reductions in water use for the municipal sector. Proportional reductions are a major concession to non-municipal sectors. BWD's Baseline Pumping Allocation (BPA) should remain at 2461 af/yr as proposed to the Advisory Committee or at the full 2700 or so af/yr that was the highest single year water use for the municipal sector in 2010, and not be reduced further in addition to the concession of proportional reductions. Proportional reductions are only acceptable as long as the amount of water used under Human Right to Water provisions of state law is not subject to reductions for municipal users under the GSP. If other sectors do not agree to sign the GSP, BWD should fully assert its interest and seek current water use and water for the future with no reductions C1-1

2. Water reductions should be front-loaded (using a fixed percentage of the Baseline Pumping Allocations to calculate yearly reductions rather than a fixed volume of water as is currently indicated in the GSP) so that higher reductions in water use occur early. This will save significantly more of the water in our aquifer than the current reduction method will, and safeguards against water quality and water management issues that will be too late to adequately address if they occur later in the reduction period after the aquifer has been dewatered more significantly. Changing methods for calculating mandatory water reductions saves as much aquifer water as shortening the reduction period to from 20 years to 15 years using the current method. C1-2

3. The Sponsor Group supports the mandatory metering program as detailed in Appendix E of the draft GSP and its immediate implementation upon GSP approval, and would like the GSP to describe that program, not as an "approach" in the section on the mandatory metering program, GSP p 3-36, second full paragraph, but rather as a requirement that is detailed in Appendix E, so that the mandatory requirements are emphasized in all parts of the GSP. Similarly, p. ES-5, PMA #3, last sentence, should affirmatively read that Mandatory water metering ."will" take place rather than "is proposed to take place following adoption of this GSP." C1-3

4. Water quality is an essential concern Better data must fill the data gaps for water quality in the North Management Area. New monitoring wells for water quality that are not quite yet in place, and additional wells now in the process of being C1-4

secured for water quality monitoring, won't yield usable initial data once installed for about three years (and then it will show the beginning of a likely trend). The Sponsor Group would like the GSP to explicitely specify that the governing body that implements the GSP has the authority to impose mandatory water quality monitoring of any major wells in the subbasin, including any agricultural wells, so that any needed comprehensive data is made available. C1-4 Cont. The GSP should also address who will pay for addressing water quality issues that arise in agricultural areas, including under a water trading program. C1-5

5. The GSP should list Ratepayers and the Sponsor Group as stakeholders in the discussions and crafting of a Water Trading Program because what happens to pumped water in Borrego Springs is a matter of public concern about a public resource, and also because of land use impacts of such a program. C1-6

6. There should be consideration in the GSP for our SDAC (Severely Disadvantaged Community) status: cost impacts that can affect water rates must be considered. C1-7

Borrego Springs Community Sponsor Group
Approved for Submission at the May 2, 2019 BSCSG Meeting

Rebecca Falk

Rebecca Falk, Chair, BSCSG

RTC.4 COMMUNITY GROUPS

Letter C1

Commenter: Rebecca Falk, Chair, Borrego Springs Community Sponsor Group
Date: Undated.

C1-1 The Groundwater Sustainability Agency (GSA) acknowledges the Borrego Springs Sponsor Group's opposition to any groundwater use reductions for the municipal sector. While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers or GSA adoption of an interim ramp down schedule are two possible scenarios where pumping reductions could start prior to CEQA review completion.

The portion of this comment regarding future groundwater reductions does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

The GSA acknowledges the Borrego Springs Sponsor Group's request for Borrego Water District (BWD) baseline pumping allocation to be increased to approximately 2,700 acre-feet per year or remain at 2,461 acre-feet per year. The GSP has been revised to reflect 2,731 acre-feet per year as the baseline pumping allocation for BWD. This has been revised up from 2,122 acre-feet per year to include water that was provided in 2010 by BWD to the Rams Hill Golf Course.

C1-2 The GSA acknowledges the Borrego Springs Sponsor Group's request to front load groundwater reductions. While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific ramp down schedule. The GSP also indicates an agreement among the pumpers or GSA adoption of an interim ramp down schedule are two possible scenarios where pumping reductions could start prior to CEQA review completion.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

C1-3 The comment suggests that the language within the body of the Draft GSP regarding Mandatory Water Metering should be strengthened to ensure that the provisions specified in Appendix E are in fact mandatory. Revisions have been made to page 3-39 to clarify that the details within Appendix E are mandatory requirements. Page ES-5 has also been clarified that mandatory metering "will" take place following adoption of the GSP.

C1-4 The GSA acknowledges the Borrego Springs Sponsor Group's request to explicitly state within the GSP specific authorities the governing body will have upon adoption of the GSP to impose mandatory water quality monitoring on any wells in the subbasin. The GSP indicates that the GSA continues to work with private landowners to expand the monitoring network.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

C1-5 When and if water quality becomes a concern that may require mitigation within any portion of the Subbasin, the GSA may consider implementing Project and Management Actions No. 4 – Water Quality Optimization and/or No. 5 – Intra-Subbasin Water Transfers Program. Funding sources for the Project and Management Actions (PMAs) will be considered by the GSA prior to implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

C1-6 The GSA acknowledges the Borrego Springs Sponsor Group's request to add the Sponsor Group and Ratepayers to the GSP as stakeholders for development of the Water Trading Program. The GSP outlines the anticipated development approach of the Water Trading Program by the GSA to identify stakeholders/participants and conduct interviews and meetings to receive input and identify concerns to be addressed in program development.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

C1-7 The GSA acknowledges the Severely Disadvantaged Community (SDAC) status of Borrego Springs. The GSA will take this comment into consideration when considering imposing fees to fund GSP implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter I1

From:	Janet Johnson <fishandwhistle65@gmail.com>
Sent:	Saturday, May 18, 2019 9 37 PM
To.	LUEG, GroundWater, PDS
Subject:	Proposed Borrego Valley Groundwater Sustainability Plan

Mr. Jim Bennett·

My husband and I have a home at the Borrego Air Ranch. I appreciate the efforts involved in creating a sustainable plan for water in the future of the Borrego Valley and certainly think it is an important issue to tackle. However, I would like to share our thoughts on the fairness of the proposed plan

First, it seems like those who use proportionally little of the water in the valley are being asked to decrease water usage by the same amount as the higher users who have had a bigger role in the progressive depletion of the aquifer. If the agricultural interests have used 70% of the water in the past, they should reduce their water usage by a higher percentage than residences which have had a much lighter role in decreasing the water table If golf courses have used 18% of the water in the past, they should also reduce their water usage more than residences, perhaps making a bigger use of grey water to maintain the course. Requiring a 75% water reduction across all segments of the community will do a great harm to the community and hurts those most who have not had the biggest role in depleting the aquifer.

Secondly, The Borrego Air Ranch has its own two wells, which have been drawn from a water table that has not been decreasing The BAR water levels have been stable for more than 50 years. Having the 75% water reduction over the next 20 years will not affect the rest of the Borrego Valley aquifer. The BAR residents are already very careful with their water in order to maintain this stability. Forced reduction in water usage would have a very negative effect on the air ranch community, would affect health and safety, and would of course decrease property values (as it would in other residential areas of Borrego.) I1-1

While applauding that there is a tentative plan, we would urge you to make the mandatory reduction for residents a lower percentage and if possible, to leave the Borrego Air Ranch out of the mandatory requirements. The Borrego Valley is a wonderful place with many exciting, progressive things going on We hope this unfair water reduction plan will not bring this to an end.

Sincerely,

Mary Janet Johnson

1

INTENTIONALLY LEFT BLANK

RTC.5 INDIVIDUALS

Letter I1

Commenter: Janet Johnson (Air Ranch Community Member)
Date: May 18, 2019

I1-1 The Groundwater Sustainability Agency (GSA) acknowledges your proposed approach of non-proportional cutbacks of water use for beneficial users of groundwater in the Borrego Springs Subbasin. It should be emphasized that, the GSP would not necessarily result in any reduction of physical water use by the Borrego Air Ranch. Rather the Air Ranch would be assigned a baseline pumping allocation (BPA) that would ramp down over the 20 year implementation period.

The BPA assigned to the Air Ranch is 12 acre-feet per year (AFY) based on previous estimates of water use for the Air Ranch by the U.S. Geological Surey (USGS 2015). No pumping data was provided by the Air Ranch to the GSA to document historical use. If the Air Ranch uses water in excess of their BPA in any given year, a water trading program, once implemented, would allow air ranch to acquire additional BPA from other users in the Subbasin. The GSP approach allows for continued use of groundwater by the Air Ranch for existing and planned future beneficial use.

As shown in GSP Figure 2.2-13F, the groundwater level contours in the vicinity of air ranch suggests that average groundwater levels have decreased by 1 to 1.5 feet over the past 8 years. The depth to water in a well on Air Ranch (SWID No. 011S007E30L001S) was measured in Fall 2016 to be 85.1 feet bgs and measured in Spring 2019 to be 88.5 feet bgs. Again, there is no forced physical reduction of Air Ranch water use. While the BPA ramps down over time, the Air Ranch can either implement conservation and acquire BPA once a water trading program is implemented to maintain existing beneficial water use or even increase water use provided sufficient BPA is obtained from users who have either fallowed land or reduced water use.

For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I2

From. Bill Carpenter <billbar7@gmail.com>
Sent: Friday, April 26, 2019 7.38 AM
To: LUEG, GroundWater, PDS
Cc: Bill Carpenter
Subject: Borrego Valley Groundwater Sustainability Plan (GSP)

County of San Diego Planning & Development Services
c/o: Jim Bennett
PDS.LUEGGroundWater@sdcounty.ca.gov
5510 Overland Ave Suite 310
San Diego CA 92123

Mr. Jim Bennet,

The Borrego Air Ranch is a residential airport community located in the southern management area of the Borrego Springs Subbasin The Air Ranch has been in existence since 1945, the subdivision map was created in 1948 There are currently 24 residential units in the community. It has been classified as 'Other' in the Groundwater Sustainability Plan (GSP). A Baseline Pumping Allocation (BPA) of 12 acre-feet per year has been assigned to the community. It appears the Air Ranch will be required to cut back its usage of water by 75% over the period covered by the Plan That would result in an allocation of 3 acre-feet per year to be shared by 24 residences or 0 125 acre-feet per residence per year. This would essentially result in the closing of the community and the Air Ranch Airport.

The Air Ranchers have always been good stewards of water usage. The Air Ranchers do not maintain any common property which requires water. There is minimal use of non-native vegetation and external watering has been kept to an absolute minimum at the individual residences. The community elected to be served by a single community owned and operated water system rather than drilling and maintaining individual wells. It should be noted that if the community had elected to source their water by individual wells, they would not be subject to any cutbacks under the GSP Their well usage would be well under 2 acre-feet per year per residence; they would be classified as de minimus users I2-1

The Air Ranchers have been assigned a BPA of 0.5 acre-feet per year per residence. Air Ranchers are able to live within the BPA. They will, however, not be able to survive cuts of 75% to the Air Ranch BPA. It will likely result in the elimination of a community with a long established tradition of living and working with a minimal usage of water in a desert community. The Air Ranchers wish to continue this tradition and should be exempted from cutbacks to their BPA. Such an exemption will have almost no impact on the goals of the Borrego Valley GSP. Cutting back the Air Ranch allocation from 12 to 3 acre-feet per year will have very little impact on achieving the Borrego Springs Subbasin goal of 5700 acre-feet per year of water usage but it would almost certainly result in the elimination of this unique community. The Air Ranch should be exempted from cutbacks to their assigned BPA.

Willard (Bill) Carpenter & family
Borrego Air Ranch (full time resident)

1

INTENTIONALLY LEFT BLANK

Letter I2

Commenter: Bill Carpenter (Air Ranch Community Member)
Date: April 26, 2019

I2-1 We appreciate your concern that the Air Ranch would be required to reduce water use from a baseline pumping allocation (BPA) of 12 acre-feet per year (AFY) that ramps down to approximately 3 AFY assuming a 75% reduction over a 20-year implementation period; however an actual physical reduction in water use is not required to be shared by the 24 residents of the Air Ranch. The Air Ranch can secure additional BPA via the water trading program, once implemented, from other users in the Subbasin to maintain water use or even increase water use.

It is noted that if residents of the Air Ranch had individual domestic wells that they would be considered de minimis users. It is also noted that the Air Ranch is a State Small Water System No. and similar to other retail water users such as the Borrego Water District (BWD) have not been assigned a per-dwelling allocation. Implementation of the Groundwater Sustainability Plan (GSP) requires participation and stewardship by all beneficial users of groundwater to ensure a sustainable future for Borrego Springs. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I3

From: Lee Grismer <lgrismer@lasierra.edu>
Sent: Monday, May 20, 2019 11 40 AM
To: LUEG, GroundWater, PDS

Dear Mr. Bennett,

I would like to add my voice to the growing concerns surrounding the Borrego Valley Groundwater Basin Sustainability Plan (GSP) Rather than contribute to the already well-articulated and logistically infallible arguments of my neighbors at the Borrego Air Ranch, I would like to address these issues from a completely different perspective. I am a professor of Biology and the Director of Research in the Biology Department of La Sierra University in Riverside and I have been a property owner at the Air Ranch since 1986. Although I applaud the conservation premise of the GSP, I believe it is short-sighted from an ecological perspective as those who drafted the plan were unaware of other activities that take place at the Air Ranch. We at the Air Ranch have always been a small, ecologically minded community and conscientious stewards of OUR water. My residence also serves as a non-profit research retreat and training centered for ecologist and their students from around the world. Myself and my son, Dr. Jesse Grismer—also a biologist—regularly host training and research workshops on various aspects of conservation—one of which involves water conservation To date, we have hosted professors and their students from all over the United States as well as from Cambodia, Vietnam, Malaysia, and México. These scientists take what they learn from the workshops and from the habitat surrounding the Air Ranch back to their home countries and incorporate these data into their classroom curricula and research labs. The point here being that the Borrego Air Ranch has a tangible international impact on conservation efforts in other countries Locally, I have students doing non-take recapture population studies on some of the species of reptiles that are Red-Listed by the International Union for Conservation of Nature (IUCN) that occur on the Air Ranch. Additionally, I have been using my residence at the Air Ranch as a base station to support my field research on the amphibians and reptiles of Anza-Borrego since 1986. Asking Air Ranch residents to cut their water usage by 75% would completely deconstruct the utility of my property as a base station, research retreat, and intermittent residence. I3-1

Mr. Bennett, ultimately the larger issue here I believe is the far-reaching impact the Air Ranch has on conservation overall—not just one of its subcategories of water management I sincerely hope that a broader, more agnostic view of international conservation and the realization of the role the Borrego Air Ranch bears on this issue will work its way into the decision-making process. If conservation is truly the end game here, then shutting down the Borrego Air Ranch would be analogous to trying to build a new build while simultaneously putting a moratorium on nails

I would be happy to meet with you any time at your convenience if you have any or concerns or issues you would like to discuss.

Sincerely,
L. Lee Grismer, Ph D
Professor of Biology and Director of Research
Department of Biology
La Sierra University

1

-

L Lee Grismer, Ph D.
Director of Research
Department of Biology
La Sierra University
4500 Riverwalk Parkway
Riverside, CA 92515-8247, USA
Tel 951-785-2345

"A risk free world is a very dull world, one from which we are apt to learn little of consequence." - Geerat Vermeij

"If people are good only because they fear punishment, and hope for reward, then we are a sorry lot indeed." - Albert Einstein

2

Letter I3

Commenter: Lee Grismer (Air Ranch Community Member)
Date: May 20, 2019

I3-1 The Groundwater Sustainability Agency (GSA) appreciates your information relating to population studies on some of the species of reptiles that are Red-Listed by the International Union for Conservation of Nature (IUCN) that occur on the Air Ranch. We hope that you can share some of your research with the GSA to determine whether areas in the vicinity of the Air Ranch or greater Subbasin are suitable for habitat conservation as part of developing Groundwater Sustainability Plan (GSP) projects and Management Actions. See above responses to comments concerning future water availability to the Air Ranch. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I4

From: John Geyer <John@jgeyerplumbing com>
Sent: Tuesday, May 21, 2019 8 01 AM
To: LUEG, GroundWater, PDS
Subject: Borrego Valley Groundwater Sustainability Plan Comments

County of San Diego Planning & Development Services
c/o: Jim Bennett

I am the owner of a vacant lot at the Borrego Air Ranch The lot was purchased 40 years ago with the plan to build when I retire The Borrego Valley Groundwater Sustainability Plan(GPS) would make my parcel unbuildable

The Air Ranch water table has been steady for the last 40 years and is not impacting the northern basin. Please exclude us from the GPS

Regards
John Geyer
619 820.8537

I4-1

1

INTENTIONALLY LEFT BLANK

Letter I4

Commenter: John Geyer (Air Ranch Community Members)
Date: May 21, 2019

I4-1 The Groundwater Sustainability Agency (GSA) appreciates your concern regarding the ability to develop your vacant subdivided parcel at the Air Ranch. As discussed in the master response on the Baseline Pumping Allocation and Pumping Reduction Program, water can be obtained via a water trading program, once implemented, to develop your property. Also, as described in response to Comment Letter I1, groundwater levels in the vicinity of the Air Ranch have declined over the last 10 years. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I5

From:	Enc Nessa <encnessa8@aol.com>
Sent·	Saturday, May 04, 2019 8.28 PM
To:	LUEG, GroundWater, PDS
Subject:	GSP Comment

I am a home owner at the Borrego Air Ranch (BAR) I have reviewed the proposed GSP and personally believe that it treats me and the other residents of the BAR unfairly The BAR has been a good steward of the water under our immediate area for over 60 years The residents have been educated in efficient use of household water, and in the efficient use of landscape irrigation The proposed GSP requires all non-de-minimis pumping sectors to make exactly the same percentage of reductions from their Base Allocation I object to the proposed GSP because the reduction is equally applied to all sectors despite facts that contradict GSP s shotgun approach logic.

The GSP's stated mandate is to bring the aquifer into sustainable equilibrium. That is exactly what the Borrego Air Ranch has done with the aquifer under our feet **It has been for years, and is in equilibrium today!!**

The Borrego Air Ranch has long history of conservative water use, which is demonstrated by the fact that our water levels are stable and have not gone down over the past 60 years The BAR should not be punished by being forced to make the same reductions as a other sector pumpers that have depleted the aquifer under their wells. It is the Borrego valley agriculture industry that has squandered the water under their feet over the past 60 years It is the Ag Sector that has drawn the water table down 126 feet in their area It is the Ag Sector who has placed the entire Borrego community at risk. It is the Ag Sector who should have to reduce their usage by whatever percentage required, or stop pumping until the aquifer in their area is in equilibrium To hold the BAR to the same reductions as Ag or other over users is not logical, it is not equitable, it is not fair The BAR should get a Medal of Merit for keeping our aquifer in sustainable equilibrium!!! I5-1

Thus, I as a resident, respectfully request that the Borrego Air Ranch be exempted from the proposed GSP

Respectfully submitted,

Eric Nessa

2727 Borrego Air Ranch Rd

Borrego Springs CA 92004

INTENTIONALLY LEFT BLANK

Letter I5

Commenter: Eric Nessa (Air Ranch Community Member)
Date: May 4, 2019

I5-1 We acknowledge your concern regarding the baseline pumping allocation (BPA) rampdown for the Air Ranch. The Groundwater Sustainability Plan (GSP) includes participation by all beneficial users of groundwater in the Subbasin to ensure stewardship of water resources. As described above, groundwater levels in the vicinity of the Air Ranch have been declining over the past several years. Stewardship requires continued metering, monitoring and management of the entire Subbasin. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I6

From: Carlsbad Raceway Office <carlsbadraceway@verizon.net>
Sent: Tuesday, May 21, 2019 11 06 AM
To: LUEG, GroundWater, PDS
Subject: Borrego Valley Groundwater Sustainability Plan (GSP)

Dear Mr. Bennett,

Our family owns two lots on the Air Ranch plus a residence I also own 5 acres on the north end of the Air Ranch and 5 hangars

In agreement with the other objection letters submitted from Borrego Air Ranch residents, including letters from my two sons, in my opinion the idea of limiting residential water that won't use as much in a year as one golf course does in a month is not only disagreeable but ridiculous We have owned property there since 1986 bought directly from Mr Fletcher and to this point had no interest in selling it. The proposed GSP will have severe Impact on property values Don't like much getting into politics but sometimes it's necessary I6-1

In closing I disagree and will do all I can to work against what you are trying to do to the Air Ranch.

Larry Grismer
Borrego Air Ranch

1

INTENTIONALLY LEFT BLANK

Letter I6

Commenter: Larry Grismer (Air Ranch Community Member)
Date: May 21, 2019

I6-1 The Groundwater Sustainability Plan (GSP) secures water resources for responsible and sustainable development of the Borrego Springs community. The GSP provides the framework for securing water via a water trading program, once implemented for your properties. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I7

May 4^{th}, 2019

To County of San Diego Planning & Development Services
c/o: Jim Bennett
PDS LUEGGroundWater@sdcounty ca gov
Subject, Comment to the Borrego Valley Groundwater Sustainability Plan (GSP)

Dear Mr Jim Bennett,

I am writing you in response to an opportunity to comment on the Borrego Valley Groundwater Sustainability Plan.

I believe the goal of any plan is to enhance awareness and take care of the environment while taking care of our responsibility to our water supply I bought my property at the Air Ranch back in the 70's My goal has always been to have a small retirement home which also houses my airplane Everyone at the ranch prides themselves on taking care of the environment and being very frugal with water consumption. We all want to be good stewards of our dessert and continue to live at The Borrego Air Ranch. The plan currently does not include our small community as a de minimis user given by the general reference to acreage in the GSP We respectively request that since we are a de minimis user, the acre feet definition not be the only way in addressing communities such as ours and language be added to allowing those who have a de minimis effect on the aquifer be included regardless if they meet the acre feet definition. I7-1

If this change to the plan does not occur, we will lose our community and retirement plan We can't imagine your organization wanting to eliminate our community Please hear our voice and make the critical change to the GSP

Respectfully submitted,

Linda Goodrich

INTENTIONALLY LEFT BLANK

Letter I7

Commenter: Linda Goodrich (Air Ranch Community Member)
Date: May 4, 2019

I7-1 De minimis is defined by Sustainable Groundwater Management Act (SGMA) as water use less than 2 acre-feet per year (AFY). The Air Ranch is estimated to currently use approximately 12 AFY and is not considered a de minimis user. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I8

From: Pat Hall <path@told com>
Sent: Sunday, Apnl 28, 2019 4 30 PM
To: LUEG, GroundWater, PDS
Subject: RE. Borrego Valley Groundwater Sustainability Plan
Attachments: Borrego Valley Water Basin pdf

County of San Diego Planning & Development Services

c/o: Jim Bennett

I am the owner of a home located at Borrego Air Ranch, 2756 Airstrip Borrego CA, 92004. The owner's association has had much discussion about the Borrego Valley Groundwater Sustainability Plan(GPS) and I would like to get my comments and thoughts on the record.

I8-1

There are several issues that are on all our minds however, there are two major ones I wish to address in this email. First is the fact that the Air Ranch water levels have remained stable for the entire time we have been monitoring them, which is more than half a century. The other issue is that we are already a very efficient community from a water conservation standpoint.

As to my first point regarding our stable water levels in our water wells, I will quote one of the knowledgeable resources on the valley's water issues, John Peterson, "Water levels don't lie". His comments maintain that the water levels in the Northern Borrego Basin are being impacted by over usage, which has resulted in dramatic overdraft and therefore the change in water well depths. However, if you look at all the facts, the Borrego Air Ranch, which you can see by the attached diagram, is located downstream from the Northern Borrego basin as well as the Borrego sink. Therefore, any change in our usage will not impact water levels upstream. This is evidenced by the fact that our water levels have remained stable while the Northern Borrego basin continues to be depleted. If there I8-2

1

was an interaction between the Borrego Air Ranch location and the community of Borrego Springs, logic would dictate that we would have seen some change in our water levels over the years It has been stated by a few who have studied this issue that the southern basin has either a different source or is so far removed from the northern basin that it would take hundreds of years for any draw down in the Southern Borrego basin to impact the Northern Borrego basin.

For the record the following is the complete quote from Mr. Peterson: "Water levels don't lie. It is comparable and equivalent to looking at your banking account, and seeing whether or not you've got more money coming out of your account than going in. That's an overdraft and the balance is going down," Peterson said. "We're pumping out a lot more water than is being naturally recharged." I8-2 Cont.

This condition is clearly not the case for the Borrego Air Ranch. Therefore, I request that you not include us in your GSP recovery plan. We are not part of the problem and therefore any change in our current usage will not impact the required solution.

As to my second point, we are already an efficient community when it comes to water usage. We don't have lush lawns or tree orchards. All the homes have very modest desert landscaping. Therefore, the only way we can cut back our usage further would be to significantly change our lifestyle and personal hygiene. By forcing a cutback to the level that has been suggested, the GPS will make our properties potentially uninhabitable, destroy our community as well as the value of our property. I8-3

If this plan, as we understand it, is implemented throughout the Borrego Springs area the community will sustain significant damage. A more reasoned approach would be to move the agriculture users to a location that can provide the water they need, and require the recreational users install gray water recycling systems that will allow continued watering of their golf courses. These two actions alone would prevent overdraft of the basin. I8-4

If you move forward with the plan to reduce the usage by all categories equally, this will not only destroy the future growth of Borrego Valley, It will most certainly negatively impact the current economic renewal that Borrego Springs is experiencing. I8-5

Best Regards,

V. PAT HALL

PATH@TOLD.com

DIRECT PHONE (818) 466-0222

DIRECT FAX (818) 466-0232

MOBILE (805) 402-2106

3

INTENTIONALLY LEFT BLANK

Letter I8

Commenter: Pat Hall (Air Ranch Community Member)
Date: April 28, 2019

I8-1 The Air Ranch provided no groundwater level, production or water quality data as requested on multiple occasions. As described in response to Comment I1-1, groundwater levels in the vicinity of the Air Ranch have been declining. For additional information on this response, the commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

I8-2 The Groundwater Sustainability Agency (GSA) acknowledges the conservation and stewardship efforts by the Air Ranch

I8-3 As explained in response I11-2, costs will be necessary to obtain additional water via the water trading program, once implemented.

INTENTIONALLY LEFT BLANK

Comment Letter I9

From: Mike Himmench <borrego it@att net>
Sent: Tuesday, May 21, 2019 12:28 PM
To: LUEG, GroundWater, PDS
Cc: Mike Himmench
Subject: Borrego Basin Groundwater Sustainability Plan - GSP

County of San Diego Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue Suite 310
San Diego, CA 92123

Mr Jim Bennett,

I would like to add my review and comments on the proposed Borrego Basin Groundwater Sustainability Plan - GSP

I am a full time, year round resident of the Borrego Valley at the Borrego Air Ranch. My family first visited Borrego Valley in the 1940's and has resided here for the past quarter century.

I attended most of the public planing sessions for the GSP As well as many of its predecessor, the borrego water coalition
This is our first real opportunity to comment on the GSP I don't believe all of the residents, property owners and tax payers were directly contacted via personal letter, phone call or notation on our property tax bills and informed of the plan and their potential impacts

The Borrego Air Ranch is a planned residential airpark community started in 1945 at about the time electric was first brought into Borrego It is one of the oldest residential airpark in the nation

One of the many considerations for moving across the country to the Air Ranch was the availability of water Water is supplied by our long-established-Borrego Air Ranch Mutual Water and Improvement Company Water is Life in the desert. Its' availability and the construction of water infrastructure to all properties in our long planed residential community is the difference between open desert land that is worth about $200 an acre and our land values of up to around $75,000 an acre I9-1
Attempts to reduce our already frugal water usage by 75% is would make the current and future homes on the ranch unlivable and uninhabitable. Resulting in a defacto regulatory taking

We also have some lots that do not currently have homes constructed on them, the owners have been working hard toward retirement and then building their dream home That will be impossible without the access to water they always believed was secure by purchasing in a planed community with its own private water system

In the published GSP, Appendix D2 Figures 2A and 2B the groundwater flows shown in the USGS Hydrogeology, Hydrologic Effects models - show our water source is separate from the parts of the valley that overdrafts the water in their areas Our groundwater flow runs to the north and west away from us, toward the Borrego sink area

Our water use has no effect on the other areas of Borrego Valley

There is no other source of water for the Air Ranch other than our wells We are outside the Borrego Water District, as such they provide no beneficial use or service to the Air Ranch

1

The Borrego Air Ranch property owners and it's Mutual Water Company have always been a good stewards of it's overlying and beneficial water rights since 1945. Our community water well levels haveatways had stable water levels

We will continue to be a good steward as there is no feasible alternatvesource of water

I would like consideration of a permanent exclusion to the Borrego Valley GSP in the Borrego Air Ranch and our mutual water company

1 We are outside the Borrego Water District service area, they can not and do not provide a beneficial use or service to us. They are unaccountable to the residents of the Air Ranch as we are not part of their voting district. They provide no representation for us.

2. The USGS hydrological models show we have no effect on the rest of the Borrego Valley Basin

Comments on the full plan

The expense of establishing and maintaining a new multi-million dollar agency in a small ecconmic disadvantaged community to monitor water levels and manage, study and adjust the plan and endlessly sustain it, is prohibitively expensive. Residents will be forced out and leave Borrego The new agency is unaccountable to all residents of Borrego

The ecconmic impacts have not been considered As residents leave costs and taxes on water will continuously and exponentially rise on individual residents Land and property values will fall, wiping out peoples life saving As the schools close, businesses fail Borrego will become a ghost town

Much of the residential use is already tailored to desert living, domestic water usage and evaporative coolers to withstand the desert heat. For most of us further reductions are impractical and impossible

Thank you for you consideraton and opportunity to comment.

I9-1 Cont.

Mike Himmerich
2765 Borrego Air Ranch
Borrego Springs, CA 92004

2

Letter I9

Commenter: Mike Himmerich (Air Ranch Community Member)
Date: May 21, 2019

I9-1 The commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

I9-2 The commenter is referred to response to Comment I1-1.

I9-3 Comment noted.

INTENTIONALLY LEFT BLANK

Comment Letter I10

From:	JeffGrismer@FlyingForFilm com
Sent:	Tuesday, May 21, 2019 5 03 PM
To:	LUEG, GroundWater, PDS
Subject:	Borrego Air Ranch GSP

Mr. Jim Bennett,

My family currently owns and has owned numerous properties at the Air Ranch since 1986 individually and as partners. I agree with the numerous other letters objecting to the Borrego Valley GSP and note that each one offers distinctly different and valid objections to the plan

While it might make me feel good to go on and on expressing my feelings, I'll skip the folderol of emotion and just make a couple points I haven't seen delineated in others' letters

A cursory look at the Air Ranch proves the extremely limited use of water for anything except that required for human existence and exemplifies the lack of productivity to cutting our tiny usage by 75%.

12 x 75 = 9 acre-feet per year saved of the 5700 acre-feet goal. That is 001578 of the goal, roughly one and a half tenths of one percent. .1578% in exchange for destruction the Valley's asset that has existed for 74 years and forcing the abandonment of 24 residences to become public liabilities. I10-1

Here's the two outcomes I foresee:

1. It is impossible for residents of the Air Ranch to survive in the extremes of the Borrego Dessert with a 75% water cut. Everyone will be forced to abandon their homes and relocate to survive. The Air Ranch, a once beautiful asset to the Valley, will become a haunt for vagrants, vandals and the lawless

2. I believe I've researched the pumping numbers accurately enough to generalize a second scenario. Current BPA for the Air Ranch is 12 acre-feet per year. To prevent the inevitable #1. scenario above, all 24 residents will be forced to drill individual wells, each having a BPA of 2 acre-feet per year. This plan thus may result in quadrupling the available usage and becomes counter productive to the GSP's stated goal.

Respectfully,

Jeff Grismer
President, Carlsbad Raceway Corp.

INTENTIONALLY LEFT BLANK

Letter I10

Commenter: Jeff Grismer (Air Ranch Community Member)
Date: May 21, 2019

I10-1 The Groundwater Sustainability Agency (GSA) appreciates that the Air Ranch represents a small percentage of Subbasin pumping. The GSA implemented the Sustainable Groundwater Management Act (SGMA) definition of de minimis users when determining required participation in the Plan. The GSA may consider requiring even de minimis user to also participate in the Plan in the future. To clarify on the Groundwater Sustainability Plan (GSP), the Air Ranch can acquire additional BPA to maintain or even potentially increase water use. The commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I11

From:	Bill Bancroft <billbancroft@patrol-one.com>
Sent:	Tuesday, April 30, 2019 8 40 AM
To:	LUEG, GroundWater, PDS
Cc:	Bill Carpenter
Subject:	GPS

County of San Diego Planning & Development Services
c/o: Jim Bennett

I am the owner of a home located at 2773 Borrego Air Ranch Rd., Borrego Springs, CA, 92004. Please allow me to add my comments to those of fellow Air Ranch owners in regard to the Borrego Valley Groundwater Sustainability Plan(GPS). I am the current Borrego Air Ranch Water Systems Manager. I've held this position for the past more than ten years.

During my tenure as Water Systems Manager I have measured the water table at our primary well on a weekly basis. The water table has, over that period of time remained at an average depth of 92 feet, never varying other than at brief intervals (30 minutes or less) when the pump is replenishing the storage tank.

I have monitored and documented individual household water consumption and overall system consumption in an effort to find and repair any leaks. I can state, unequivocally, individually and collectively residents have been excellent water stewards during my tenure as Water Systems Manager. Additionally, in my review of historical records, it's clear that current stewardship is reflective of the past performance of our residents. I11-1

My strong conclusions are.

- If included in the GSP the impact of the Borrego Air Ranch would be so demininus as to be unmeasurable
- However, impact of GSP, as currently planned, on the Borrego Air Ranch would be disastrous in terms of livability and property values

In short, we have "no dog in this fight" and respectfully ask to be excluded from the GSP.

Sincerely,

Bill Bancroft
Borrego Air Ranch
Water Systems Manager
Airport Manager
714.306.6600 (Cell, 24/7/365)

1

INTENTIONALLY LEFT BLANK

Letter I11

Commenter: Bill Bancroft (Air Ranch Community Member)
Date: April 30, 2019

I11-1 The Groundwater Sustainability Agency (GSA) appreciates information pertaining to documentation of groundwater levels at the Air Ranch. As described in Comment Letter I1, groundwater levels in the vicinity of the Air Ranch are demonstrated to be declining over the past several years.

I11-2 The commenter's assertion that the Groundwater Sustainability Plan (GSP), as currently planned, on the Borrego Air Ranch would be disastrous in terms of livability and property values is not supported. The GSP indicates an annual fee for GSP implementation of approximately $50 per acre-foot pumped to cover operations and monitoring costs, management, administration and other costs such as reserved. This cost does not include additional potential fees required to implement projects or management actions. Additionally, if the Air Ranch secures additional water via the water trading program, once implemented there would be cost involved with acquisition. The commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

Comment Letter I12

From: Steve & Debbie Riehle <sdriehle@gmail.com>
Sent: Thursday, May 02, 2019 11 17 AM
To: LUEG, GroundWater, PDS
Subject: Borrego Air Ranch: Groundwater Sustainability Plan (GSP)

Good Morning Mr Bennet,

My wife and I own a home located at the Borrego Air Ranch, 4211 Cessna Lane, Borrego Springs CA, 92004 The owner's association has had much discussion about the Borrego Valley Groundwater Sustainability Plan(GSP) and we would like to get our concerns on the record

There are several issues that are on all our minds however, there are two major ones we wish to address in this email First is the fact that the Air Ranch water levels have remained stable for the entire time we have been monitoring them, which is more than half a century. The other issue is that we are already a very efficient community from a water conservation standpoint I12-1

As to our first point regarding our stable water levels in our water wells, we will quote one of the knowledgeable resources on the valley's water issues, John Peterson, "Water levels don't lie". His comments maintain that the water levels in the Northern Borrego Basin are being impacted by over usage, which has resulted in dramatic overdraft and therefore the change in water well depths However, if you look at all the facts, the Borrego Air Ranch is located downstream from the Northern Borrego basin as well as the Borrego sink. Therefore, any change in our usage will not impact water levels upstream This is evidenced by the fact that our water levels have remained stable while the Northern Borrego basin continues to be depleted If there was an interaction between the Borrego Air Ranch location and the community of Borrego Springs, logic would dictate that we would have seen some change in our water levels over the years It has been stated by a few who have studied this issue that the southern basin has either a different source or is so far removed from the northern basin that it would take hundreds of years for any draw down in the Southern Borrego basin to impact the Northern Borrego basin. I12-2

As to our second point, we are already an efficient community when it comes to water usage We don't have lush lawns or tree orchards All the homes have very modest desert landscaping Therefore, the only way we can cut back our usage further would be to significantly change our lifestyle and personal hygiene By forcing a cutback to the level that has been suggested, the GSP will make our properties potentially uninhabitable, destroy our community as well as the value of our property I12-3

If this plan, as we understand it, is implemented throughout the Borrego Springs area the community will sustain significant damage A more reasoned approach would be to move the agriculture users to a location that can provide the water they need, and require the recreational users install gray water recycling systems that will allow continued watering of their golf courses These two actions alone would prevent overdraft of the basin I12-4

If you move forward with the plan to reduce the usage by all categories equally, this will not only destroy the future growth of Borrego Valley, it will most certainly negatively impact the current economic renewal that Borrego Springs is experiencing I12-5

Thank you for your attention to this most important matter

Steve and Debbie Riehle

1

INTENTIONALLY LEFT BLANK

Letter I12

Commenter: Steve and Debbie Riehle (Air Ranch Community Members)
Date: May 2, 2019

I12-1 The commenter is referred to response to Comment I1-1.

I12-2 The Groundwater Sustainability Agency (GSA) acknowledges your request that Air Ranch not be required to managed pursuant to Sustainable Groundwater Management Act (SGMA) due to its location. In response, Air Ranch is located within the South Management Area (SMA) of Department of Water Resources (DWR) defined Borrego Spring Subbasin and subject to the requirements of SGMA.

I12-3 The commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

I12-4 The fallowing of agricultural properties is described in Chapter 4 of the Groundwater Sustainability Plan (GSP). As discussed in GSP Section 2.2.3.8, recycled water use has been studied extensively and is not economical at this time. As documented in the Draft GSP, stormwater retention will be evaluated on a case-by case basis in conjunction with future development in the Subbasin.

I12-5 Securing a reliable and sustainable water supply for Borrego Springs will ensure availability for sustaining the community and future growth.

INTENTIONALLY LEFT BLANK

Comment Letter I13

To County of San Diego Planning & Development Services
c/o Jim Bennett

PDS LUEGGroundWater@sdcounty ca gov

Subject: Comment to the Borrego Valley Groundwater Sustainability Plan (GSP)

Dear Mr Jim Bennett,

We are owners of a house at the Borrego Air Ranch. We have two concerns The first is that we believe the definition of "*de minimis* user" is too narrow and should be revised. The Borrego Air Ranch should be designated as a *de minimis* user by a text change in the GSP allowing those who have a *de minimis effect* on the aquifer to be included regardless if they meet the acre feet definition

The dictionary definition of *de minimis* is "inconsequential, insignificant, trivial, of minor importance " The proposed GSP uses an acre foot usage definition for *de minimis* to identify those users who have an insignificant, as opposed to a significant, effect on the aquifer. The Borrego Air Ranch's water level has historically been very stable Therefore the effect of our use of water is *de minimis* and insignificant *in fact*, if not as defined by the acre foot test. Given the extraordinary inaccuracies likely in attempting to map out the details of how water flows underground in this great valley, it is overconfident and inaccurate to designate a small user that has had a stable well water level for half a century as non-*de minimus* and lump it in with the agricultural and recreational over drafters who have caused this dilemma. The Borrego Air Ranch is a small community that has not contributed to the overdraft and is not affected by it. We have stable water levels and we really have little effect on the rest of the aquifer and truly are "inconsequential, insignificant, trivial, of minor importance " I13-1

A text change could be made to the GSP that excludes any of the four small users that would otherwise be in the "Other" non-*de minimis* category from that category if that user has stable water levels Stable water levels proving this *de minimis effect* should be considered. The acre foot requirement of the *de minimis* category was created to *try to identify a de minimis effect* Stable water levels *show* a *de minimis* effect. A text change could allow a user with a demonstrably *de minimus effect* to be included in the *de minimus* category rather than be excluded by the overly broad acre feet definition. It would seem facts should win out over theory. The Borrego Air Ranch stands apart from the problem in both its stable water level and in physical distance from the overdraft areas.

The Borrego Air Ranch is one of only four users who use very little water and yet are defined as non-*de minimis*. The drafters did not want the four included with the big three categories because they called us "Other " It is evident the drafters of the GSP thought putting the Borrego Air Ranch into the same non-*de minimis* category as the agriculture and recreational industries whose excessive use has placed the entire Borrego community at risk is not logical, equitable or fair But with only an acre foot criteria for *de minimis* use they had tied their own hands But they probably didn't realize that *de minimis effect* could be shown another way than acre feet and probably would have welcomed the idea These comments give us an opportunity to correct that.

Our second concern is that reducing the usage to 24% across all users creates serious problems I13-2

Comment to the Borrego Valley Groundwater Sustainability Plan (GSP)
Terry and Pam Rhodes, May 4, 2019 Page 1 of 2

The proposed GSP reduction of everyone's water usage to 24% of their prior use *sounds* reasonable but it would result in massive damage to the domestic water usage community and an unrecognized benefit for the agriculture community Let me explain.

The GSP provides for an equal percentage reduction of use based on prior use The reduction *percentage* is equal but the *impact* greatly favors those who have drained the aquifer and destroys those who have not. Agricultural users of historically massive amounts of water would retain ¼ of their huge use and switch to other profitable uses of their still plentiful allocation Domestic users would retain ¼ of their minimal use and because it would be insufficient to support dwellings their properties would be abandoned and lost to tax sales

The proposed plan would allow the users of the most water who drained the aquifer to still use plenty of water for many useful purposes, including residential homes while the previously minimal users will have no options.

According to the University of Arizona Cooperative Extension mature citrus trees use about 60 inches [5 ft] of water per year That is 5 acre feet per acre of trees
https //extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1151.pdf
After the proposed reduction of 76% you have an allocation of 1.2 acre feet left which is enough to supply domestic water to 3 houses per acre. So as far as water supply available, the farmers can just build and sell up to 3 houses per acre on their hundreds of acres while current house owners will be unable to live here and abandon their houses Essentially current housing could be abandoned as new houses could appear in the agricultural sector The effect would be that the agricultural users who have massively drained the aquifer would be left with the right to most of the water once again and just change their business to building and selling houses, which may be more profitable anyway. It is entirely possible that under this GSP homeowners like those at the Borrego Air Ranch would have to abandon their current homes and buy new houses built by the farmers on their former grapefruit groves since they would still retain enough water allocation. Or the farmers could just switch to growing crops that need less water while the homeowners leave the valley. I13-2 Cont

We need to view the aquifer as a shared community resource and recognize that users of massive amounts of water should not be left very usable allocations while homeowners are left with insufficient water to survive here. When water is endangered domestic use should take priority over farming Possibly a base minimum but reasonable allocation for all current houses and building lots would be better and then any other reductions necessary could be made against any other properties

As the first community to have a GSP, Borrego Springs will be the template for GSP's for other communities If we do not replace unworkable notions of across the board reductions with a more realistic model allowing for adequate domestic allocations then the damage this GSP causes here will spread to many other communities as unforeseen consequences finally become apparent down the road as allocations are reduced to critical levels over 20 years We have to have the courage to get this one right no matter what I13-3

Respectfully submitted,

Terry and Pam Rhodes

Comment to the Borrego Valley Groundwater Sustainability Plan (GSP)
Terry and Pam Rhodes, May 4, 2019

Page 2 of 2

Letter I13

Commenter: Terry and Pam Rhodes (Air Ranch Community Members)
Date: May 4, 2019

I13-1 De minimis is not defined by the Groundwater Sustainability Plan (GSP). De minimis is defined by Sustainable Groundwater Management Act (SGMA). Under SGMA, the Air Ranch is defined as a non-de minimis user. The GSP uses the SGMA defined definition to determine users that are required to be included in the Plan.

I13-1 The commenter is referred to response to Comment I1-1.

I13-1 The baseline pumping allocation (BPA) is proposed to reduce by 75% over the GSP's 20-year implementation period, however this does not require a physical reduction by Air Ranch. Additional water can be purchased via the water trading program, once developed and implemented. The commenter is referred to the master response on the Baseline Pumping Allocation and Pumping Reduction Program.

INTENTIONALLY LEFT BLANK

(h) California Native American tribes.

(i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems

(j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency. I14-2 Cont.

The Borrego Water District has commissioned reports from Environmental Navigation Services, Inc (ENSI) that should be reviewed to help address SDAC interests in the Borrego Valley Basin GSP. The report for task 2, dated April 15, 2019, entitled "SDAC Impact/Vulnerability Analysis" and the report for task 3, dated May 13, 2019, entitled "Decision Management Analysis," have important analyses of the factors that will impact our community and will be needed for a consideration of our interests as an SDAC in the GSP. I14-3

We are a small town, with a few thousand residential and commercial meters to cover any costs that ratepayers must bear for the drafting and implementation of plans to bring our sole-source aquifer into sustainable use. We are likely to have to purchase water from other sectors for municipal needs going forward. The economics of the town will be altered as a result of groundwater management, and that will affect employment, schools, and plans for a viable economy. We will need to make sure that the Borrego Water District remains financially sound to maintain water delivery for the town despite that Borrego Springs is an economically severely disadvantaged community. All of these factors are challenged or put at risk by potential side effects of the plan or plans to reach sustainable water use. The Borrego Valley Basin Groundwater Sustainability Plan has to avoid killing the patient while curing the disease by making sure these risk factors are included and addressed. I14-4

Sincerely,

Rebecca Falk

Rebecca Falk

Falk Comment Letter, Draft GSP Borrego Valley Basin 2

INTENTIONALLY LEFT BLANK

Letter I14

Commenter: Rebecca Falk
Date: May 17, 2019

I14-1 The Groundwater Sustainability Agency (GSA) acknowledges the commenter's assertion that the Groundwater Sustainability Plan (GSP) fails to consider Severely Disadvantaged Community (SDAC) interests.

I14-2 The BWD placed into the administrative record the SDAC Impact/Vulnerability Analysis (Task 2 Report) prepared by Environmental Navigation Services Inc., dated April 15, 2019. Besides defraying costs for the community, the report was prepared to understand the implications that the implementation of Sustainable Groundwater Management Act (SGMA) will have on the SDAC population of Borrego Springs. The report describes specific vulnerabilities, including challenges associated with potential loss of seasonal jobs in the agricultural and recreational sectors, funding and access to public schools, and water rate impacts to the lowest income portion of the community. The 20-year SGMA compliance period does provide time for the community to adapt. The potential to use Borrego Water District's (BWD's) tiered rate structure and the GSA's commitment to seeking state funding to support the SDAC are the primary mitigation strategies to address SDAC concerns. GSP Section 2.1.5 has been amended to briefly summarize the results of BWD's Impact/Vulnerability Analysis. The commenter is also referred to response to Letter O12, which addresses how the GSP considers SDAC interests.

I14-3 The GSA acknowledges the commenter's remarks on employment, schools, and economic vitality.

INTENTIONALLY LEFT BLANK

Comment Letter I15

Comment on the Draft Groundwater Sustainability Plan (GSP)
Borrego Valley Groundwater Basin
May 20, 2019

Regarding Integration of a possible negotiated settlement/stipulated agreement among major pumpers and the GSP

Information is hard to come by as current negotiations between attorneys of major pumpers, including the Borrego Water District (BWD), are not transparent to the public, but it seems water rights and more are currently being negotiated.

I and other members of the public sincerely hope that this agreement, if it is reached, will not negate the GSP work done to date but we do not know if the substantive GSP provisions will still be upheld if such an agreement with the pumpers is reached. As an AC representative to the GSA developing the GSP for the basin, I also sincerely hope that there will be a public comment period on such a negotiated agreement before it is submitted to a court for affirmation Will the public have the option to comment on the provisions of such an agreement? Will there be any chance of a change as a result of public comments? Do we know what the process for decisions about this might be?

The intention of this comment letter is to point out that such private negotiations do not conform to the public participation aspects of SGMA, and that in such negotiations, the Borrego Water District is one pumper among others, instead of being acknowledged as the one pumper who represents thousands of residents and visitors, and who is responsible for delivering water that will make the town of Borrego Springs viable into the future One voice for the town of Borrego Springs is not sufficient. I15-1

The Draft GSP leaves virtually all of the controversial decisions to be made in a future time. When the stakeholder GSP Advisory Committee meetings were occurring, we were advised by the GSA, that is by representatives of San Diego County and the Borrego Water District, that there would be a fully transparent public process to determine the Projects and Management Actions that would govern the parts of the GSP that are mentioned there but were left to be determined in the future, like the water reduction program, fallowing program, and water trading program

Now we understand that key parts of these are being negotiated in private, along with water rights

The GSP can address this. Now that we know that stipulated agreement negotiations are likely going to determine many aspects of the programs mentioned in the draft GSP, as well as water rights, ***the GSP can protect its validity and the intent of SGMA by specifying that the process for drafting the Projects and Management Actions and any agreements that will determine the content of these programs must be conducted in a transparent way with public participation.***

There should be a representative of the town present at negotiations for a stipulated agreement, in addition to BWD, who isn't a representative of either the agriculture, golf or recreation sectors, because that voice for the well-being of the town wouldn't be restrained by the many responsibilities and matters BWD has to juggle in its many-faceted role.

Falk Comment Letter, Draft GSP Borrego Valley Basin, Negotiated Settlement and GSP 1

I request that the GSP include provisions to provide for the above italicized/bolded recommendations. We are all in new territory with the Borrego Valley GSP The future of the town is being decided in great part right now. Public participation and broad stakeholder involvement have to be part of that decision-making process. Isn't that the strong message the legislature sent by passing SGMA, despite any overly cautious legal interpretations that tend to weaken that intent? I15-1 Cont.

Sincerely,

Rebecca Falk

Rebecca Falk
P O Box 922
Borrego Springs, CA 92004

Letter I15

Commenter: Rebecca Falk
Date: May 20, 2019

I15-1 The commenter suggests language to be included in the Groundwater Sustainability Plan (GSP) to mandate public participation in development of projects and management actions, and that a representative of the community be present at stipulated agreement meetings. Although the stipulated agreement process is a separate process from GSP development, the Groundwater Sustainability Agency (GSA) recognizes the importance of public participation in developing the GSP and a potential stipulated agreement. In response, on July 9, 2019, the Borrego Water District (BWD) held a public meeting in which proposed stipulated agreement terms were made public.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I16

Comment on the Draft Groundwater Sustainability Plan (GSP)
Borrego Valley Groundwater Basin
May 20, 2019

I am concerned that the language in the body of the GSP for Mandatory Water Metering is weak (conditional, suggests rather than stipulates), even though the language in Appendix E, the Program itself, is strong (assertive of rules and mandates) Since this is the one action the farmers have agreed to as of this writing, and it is critically important, the language in the body of the GSP should be revised to mirror the strength of the language in Appendix E, to avoid giving the impression that all the Program's mandatory provisions aren't in fact mandatory. See draft GSP, pp. 3-39, 2nd paragraph, and E-S5, PMA #4, last sentence.

See for example (italics and bold mine):
(Executive Summary, ES-5, PMA #4, last sentence) "Mandatory water metering for all non-de-minimus groundwater extractors ***is proposed*** to take place following adoption of this GSP." *Why not, **will take place?***
(Monitoring Network, 3-39, 2nd full paragraph) First there is a strong sentence: "Upon Plan adoption all non-de-minimus groundwater extractors **will be required** to record monthly groundwater production and report to the GSA on an annual basis." But this sentence is followed by weak statements: "***It is expected*** that the property owner (or third party contractor acceptable to the GSA) ***would*** monitor/read the meter on a monthly basis." And: "A third-party contractor acceptable to the GSA ***would*** inspect and read the meter on a semi-annual basis to verify the accuracy of data including meter calibration. On behalf of the property owner, the third-party contractor ***would*** provide an annual statement. ..." The paragraph ends with another weak statement: "***The approach*** for well metering is detailed further in the Groundwater Extraction Metering Plan provided as Appendix E."
*Again, why not **will** instead of **would** in the above sentences? Why not **'The property owner ...will monitor/read'**, and why not **'The Groundwater Extraction Metering Plan (Appendix E) provides further details?***

Why not put Appendix E into the body of the GSP under Monitoring Network? I16-1

Sincerely,

Rebecca Falk

Rebecca Falk

INTENTIONALLY LEFT BLANK

Letter I16

Commenter: Rebecca Falk
Date: May 20, 2019

I16-1 The comments suggest that the language within the body of the Draft Groundwater Sustainability Plan (GSP) regarding Mandatory Water Metering should be strengthened to ensure it is clear that all the provisions specified in Appendix E are in fact mandatory. Revisions have been made to page 3-39 to clarify that the details within Appendix E are mandatory requirements. Page ES-5 has also been clarified that mandatory metering "will" take place following adoption of the GSP.

INTENTIONALLY LEFT BLANK

Comment Letter I17

To: Rebecca Falk; Crow, Leanne
Subject: RE: public comments GSP Borrego

From: Rebecca Falk <rebfalk7@gmail.com>
Sent: Thursday, April 25, 2019 8 44 AM
To: Bennett, Jim <Jim Bennett@sdcounty ca.gov>; Crow, Leanne <Leanne Crow@sdcounty ca gov>
Subject: public comments GSP Borrego

Jim and Leanne,

Here is my first comment, more to come:

<I am concerned that the language in the body of the GSP for Mandatory Water Metering is weak (conditional, suggests rather than stipulates), even though the language in Appendix E, the Program itself, is strong (assertive of rules and mandates) Since this is the one action the farmers have agreed to as of this writing, and it is critically important, I strongly feel the language in the body of the GSP should be revised to mirror the strength of the language in Appendix E, to avoid giving the impression that all the Program's mandatory provisions aren't in fact mandatory. See draft GSP, pp. 3-39, 2nd paragraph, and E-S5, PMA #4, last sentence. I17-1

Becky

INTENTIONALLY LEFT BLANK

Letter I17

Commenter: Rebecca Falk
Date: April 25, 2019

I17-1 The comments suggest that the language within the body of the Draft Groundwater Sustainability Plan (GSP) regarding Mandatory Water Metering should be strengthened to ensure it is clear that all the provisions specified in Appendix E are in fact mandatory. Revisions have been made to page 3-39 to clarify that the details within Appendix E are mandatory requirements. Page ES-5 has also been clarified that mandatory metering "will" take place following adoption of the GSP.

INTENTIONALLY LEFT BLANK

Comment Letter I18

From: DIANE JOHNSON <depjohnson@aol com>
Sent: Tuesday, May 21, 2019 2 58 PM
To: LUEG, GroundWater, PDS
Subject: Comment on Borrego Valley Draft GSP (1)
Attachments: Borrego GSP Comment Risk Brief.docx

Please see attached file If you prefer that I copy the file into its own email message, please let me know

Diane Johnson
Borrego Springs

1

21 May 2019

To: County of San Diego
Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

From: Diane E.P. Johnson, Borrego Springs

Re: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

I wish to submit the following Risk Brief as a Public Comment. As you are aware, but as others might not be, Lyle Brecht has been an active member of the Core Team of the Borrego Valley GSA, and the Borrego Water Coalition before that. His business and academic background give him a particular expertise in discerning both potential risks and potential ways to mitigate those risks. I am commending his careful and comprehensive risk analysis to you analysis to you because the hydrologically-oriented structure of SGMA and the GSP do not lend themselves to the kind of economic, and social, aspects of sustainability that Mr. Brecht discusses here. I imagine that this is because SGMA's authors did not hold a place like Borrego Springs in mind when they crafted the law.

As you are well aware, the Borrego basin and community are almost – or are in fact – unique in California in that we have and likely will never have access to water from a source other than our aquifer. We are very isolated geographically; our municipal water district is very small, with roughly 2000 customers, and the entire community is designated as an SDAC by DWR Yet the community has outsized importance in that it is the sole provider of hospitality services to visitors to Anza-Borrego Desert State Park, which attracts up to a million visitors (regional, American, and international) per year. I18-1

Clearly, our groundwater usage must be reduced to a sustainable level in order for the aquifer, the town, and the Park to survive. But it's also essential that the quality of our potable water remains high.

We cannot import cleaner water to dilute any well water that has become contaminated with pesticides (there are a few thousand acres of agricultural land here, and farming has gone on since the 1950s) or naturally occurring contaminants. Thus if water quality gets low enough, our small municipal water district would face building an extremely expensive water treatment plant, which would be ruinous and could in fact lead to the death of our community. And because we are the only community around to offer visitor services to the Anza-Borrego Desert State Park (the largest in California), that public resource/benefit would be heavily impacted as well.

Mr. Brecht backs up these points and raises many others as well in the following Risk Brief. We look forward to seeing these issues addressed in a revision of the Draft GSP.

FOR [illegible]
ONLY
by BWD Director Lyle Brecht

The present March 2019 draft Groundwater Sustainability Plan (GSP) for the Borrego Springs Subbasin (Subbasin) of the Borrego Valley Groundwater Basin is the result of thousands of hours of expert analysis. The GSP has cost approximately $6 million since 2010 (see attached) to arrive at a scientifically and legally defensible, carefully crafted approach to addressing the overdraft.[1] The draft GSP is a monumental step forward after so many years of neglect.[2]

I have a few technical concerns mostly related to the over reliance on adaptive management driven changes to the plan to potentially correct for starting assumptions, given such a short 20-year planning period.[3] These technical concerns primarily arise from the variability and frequency distribution of Subbasin physical recharge events over the US Geological Survey (USGS) numerical model calibration period (see attached) [4] Many of these technical concerns

18-2

[1] SGMA sets an arbitrary date of January 1, 2015 for *reimbursement* of GSP development-related expenses. However, what I am accounting for in the approximately $6M GSP actual development costs to date are the direct costs of the technical, legal, and administrative work necessary for developing the Subbasin GSP. For example, the draft GSP as it stands would not have been possible without the previous grant and BWD ratepayer funded studies by the USGS that provided a numerical model of the Subbasin that establishes a defensible sustainable yield; the US Bureau of Reclamation that establishes that running a pipeline to Borrego is economically infeasible; the USEPA that establishes that there are no economically available water sources from aquifers over the next hill, DWR's extensive data collection efforts; Dudek's various analytical work on issues of critical concern to the GSA such as Subbasin boundaries; Raftelis's estimates of potential financial costs to ratepayers from SGMA, Best Best & Krieger's legal work on the intersection of GSP requirements, CEQA and California water law; Downey Brand's legal work on water law and MOU development; the gracious contributions of time by citizens of Borrego with special expertise in hydrology, planning, field biology, fundraising, civic organization, and government relations, etc.

[2] About thirty-five years ago, a USGS study, funded by San Diego County, unequivocally established that the Subbasin was in severe overdraft. But, 35-years have gone by with no reduction of the annual overdraft. Between 1982 and 2010, the annual overdraft more than

FOR DISCUSSION PURPOSES ONLY

doubled and is now considered *critical* by DWR. The overdraft is economically expensive (water supply uncertainty is an impediment to growth). This expense for municipal ratepayers only increases with time as the overdraft continues.

[3] Assuming that *adaptive management measures* can correct for the entirely of systemic risk is not warranted. See Holly Doremus, Professor of Law, University of California, Berkeley, *Adaptive Management as an Information Problem* (2011). "Faced with the reality that adaptive management is not a panacea, policymakers may have to directly confront difficult questions about the relative costs of different sorts of errors and develop forthright approaches to making decisions in light of uncertainty."

[4] Due to the variability and frequency of natural recharge events based on the USGS 66-year calibration period, statistically it is highly unlikely that by altering a reduction schedule based on 5-years of new recharge data one can improve the odds of reaching a sustainable yield target by year 20. Instead, it is more likely one would decrease the probability of reaching the desired sustainable yield target.

Page 3 of 8 BORREGO RISK BRIEF DRAFT 1.6

are discussed and enumerated in the studies performed for the Subbasin Groundwater Sustainability Agency (GSA) under a California Department of Water Resources (DWR) Severely Disadvantaged Community (SDAC) Proposition 1 grant to the Borrego Water District (BWD) by Environmental Navigation Services, Inc (ENSI) [5]

However, my comments on the draft primarily are focused on risk.[6] My contention is that bringing the Subbasin into sustainable use by January 2040 is *path dependent*. That is, one could potentially bring the Subbasin into sustainable use by 2040, but do it in a manner that causes water rates to rise so high and so fast that some of the customers of BWD would not be able to afford to continue to live in Borrego [7] The problem with the loss of municipal customers is the potential for creating a vicious circle where loss of customers causes yet more increasing rates, given fixed costs that continue to drive even greater rate increases with less customers. This may seem far-fetched to some, but when I was consulting with the US Environmental Protection Agency, Office of Water, in Washington, DC, I saw firsthand that this has happened in other places. *Path dependency* matters.

I18-2 Cont.

Below are my comments that derive from this risk management perspective:

1. Insufficient Addressing of SDAC Considerations

   - Under GSP Regulations Section 355.4. "Criteria for Plan Evaluation by DWR." Whether the interests of the beneficial uses and users of groundwater in the basin, and the land uses and property interests potentially affected by the use of groundwater in the basin, have been considered;[8]

I18-3

[5] ENSI, *Methodology To Examine Future Groundwater Overdraft In Terms Of The Overall Hydrologic Water Balance Considering Recharge Variability And Parameter Uncertainty* (September 12, 2018); *Water Quality Review and Assessment: Borrego Water District (BWD) Water Supply Wells* (December 7, 2018). *Assessment Of Water Level Decline, Hydrogeologic Conditions, and Potential Overdraft Impacts For Active BWD Water Supply Wells* (January 7, 2019); *Comparison of Pumping Rate Reduction Schedules Under SGMA* (February 11, 2019). Decision Management Analysis (April 16, 2019).

[6] Risk in complex systems = sum (probability of an adverse event occurring X its attendant costs). Thus, low probability, high consequence events are not excluded from one's analysis. Risk in this context results in a dollar amount. Groundwater basins are a complex system. Linear analysis only approximates the physical reality of the system. See Stefan Thurner, Rudolf Hanel, and Peter Klimek, Introduction to the Theory of Complex Systems (Oxford, UK. Oxford University Press, 2018)

FOR DISCUSSION PURPOSES ONLY

[7] Based on the data, so carefully and thoughtfully presented in the draft GSP, bringing the Subbasin to sustainable use as quickly as economically feasible is necessary for future sustainable economic activity and development opportunity in the Borrego Valley.

[8] See draft GSP (March 2019), Appendix A: "DWR Preparation Checklist for GSP Submittal."

FOR DISCUSSION PURPOSES ONLY

From the draft GSP text, it is not clear that the interests of municipal customers of BWD in a SDAC have been adequately *considered* or *addressed*.[9] The projected approximately $20 million cost to implement the proposed GSP may drive water rates for municipal customers beyond affordability for some BWD SDAC customers;

For example, as an SDAC community, many of the BWD ratepayers are rate sensitive. Water rates are not infinitely elastic and undue risk that puts pressure on water rates can have a deleterious impact, not only on BWD's finances, but the economic viability of the Borrego community and its embedded property values served by municipal water service.[10] Future water rates, driven by SGMA implementation costs may become a primary factor in future economic development opportunities for Borrego Springs.[11]

I18-3 Cont.

2. Assumptions of Business-As-Usual for San Diego County Administrative Practices & Policies

Business as usual by the County may render the efforts of the GSA to bring the Subbasin into sustainable use no later than January 2040 with no undesirable results extremely unlikely.[12] The end result is that BWD ratepayers may experience a disproportionate amount of risk.[13]

I18-4

An important issue regarding risk is that without adequate management of this risk, it can become destructive of the BWD's credit. Give the capital intensity of BWD's business, BWD requires good credit in order to borrow for adequately maintaining its municipal water and ~~sewer system.~~[14] Loss of credit would put undue pressure on water rates

[9] See draft GSP (March 2019) pp. 36, 58, 203, 213, 315, 421-2, 588.

[10] It is uncertain that the District s SDAC customer base would be able to afford the resultant water rates. See Raftelis Financial Consultants, *Borrego Water District County Zoning and SGMA Impact Assessment* (November 17, 2016) and *Borrego Water District Water Rates Affordability Assessment* (October 4, 2017), LeSar Development Consultants, Borrego Springs Community Characteristics Report (1/30/2019) and ENSI, SDAC Impact/Vulnerability Analysis (Task 2) (April 15, 2019)

[11] Water rates are what they are to provide potable water to Borrego's homes & businesses. Under State law, the District is required to charge rates that produce revenues to cover its costs. So, the deeper issue is not rates, but *costs* to provide potable water Rates are a direct result of the District's *costs*. The District share of projected GSP implementation costs are likely to increase future water rates

[12] SGMA states that sustainability must be achieved within "20 years of implementation of the plan." (Water Code, § 10727(b)(1).

[13] "Managing risks [is] an act of the imagination…" See Michael Lewis, The Fifth Risk (New York: W. W. Norton & Company, 2018), Location 577.

[14] The current replacement cost of BWD's municipal water, sewer, and wastewater system is approximately $62.5 million.

FOR DISCUSSION PURPOSES ONLY

- *Land Use Decisions*: Full general plan buildout of existing approved zoning, given permitting constraints is presently presumed to add an additional 3,000 residential, 215 commercial, 108 public agency, 207 irrigation and 179 multiple unit EDU to the basin for a total of 6,811 EDUs. Applying the current residential water demand of 0.55 acre-feet per account would result in a future municipal water demand of 3,746 acre-feet per year, which is about 66% of the basin sustainable yield of 5,700 acre-feet per year. The estimated future municipal water demand of 3,746 acre-feet per year combined with the existing golf course water demand of 2,852 acre-feet per year is 6,598 acre-feet per year or 116% of the sustainable yield. This indicates that the municipal water demand at the already County-approved zoning buildout, assuming the current water use per EDU, combined with existing recreational water demand, will consume all available supply and that there would be limited to no available supply for agriculture.[15] This situation appears to be a result of the County's past policy to approve new development independent of the water supply availability to serve such new development.

- *Well Abandonment Enforcement*: San Diego County Code, Sections 67 401 through 67 424 provide the regulatory authority to abandon wells. In addition, Section 67.421 adopts standards from Department of Water Resources Bulletin 74-81 and 74-90 (i.e., California Well Standards) for the construction, repair, reconstruction, or destruction of wells Chapter 4, Wells Section 67.401 states: "It is the purpose of this Chapter to provide for the construction, repair and reconstruction of wells to the end that the ground water of this County will not be polluted or contaminated and that water obtained from such wells will be suitable for the purpose for which used and will not jeopardize the health, safety or welfare of the people of this County, and for the destruction of abandoned wells or wells found to be public nuisances to the end that such wells will not cause pollution or contamination of ground water or otherwise jeopardize the health, safety or welfare of the people of this County" (Amended by Ord. No. 10238 (N.S.), effective 1-4-13) Section. 67.402 defines Abandoned and Abandonment. The terms "abandoned" or "abandonment" shall apply to a well that has not been used for a period of 1 year, unless the owner declares in writing, to the director his intention to use the well again for supplying water or other associated purpose (such as a monitoring well or injection well) and receives approval of such declaration from the director. All such declarations shall be renewed annually and at such time be resubmitted to the director

I18-4 Cont.

FOR DISCUSSION PURPOSES
ONLY

[15] Dudek, *Theoretical Water Demand at Buildout of Present Unbuilt Lots Under County's Current Zoning in Borrego Springs* (October 4, 2016) and draft GSP (March 2019) Section 2.1.3 "Land Use Considerations" pp. 2-17-20.

FOR DISCUSSION PURPOSES ONLY

for approval (Dudek research). Presently, Dudek estimates approximately 50 improperly abandoned wells in the Subbasin at a cost of approximately $40,000/well to properly abandon (draft GSP estimate). Without adequate and timely enforcement of State and County well abandonment regulations, this approximate $2.0 million cost potentially jeopardizes adequate management of the Subbasin for no undesirable results.[16]

- *Ministerial Well Permitting* Under SGMA, assessment of well interference and impacts of new wells on pumping allowances will be required to adequately manage the Subbasin for no undesirable results.[17,18]
- *Land Restoration Sureties* Pre-SGMA land fallowing standards may not have had to meet California Environmental Quality Act (CEQA) requirements. It is anticipated that CEQA requirements will have to be met for all fallowing under the Groundwater Sustainability Plan and for any land that is fallowed in the Subbasin with public or private funds for water transfer purposes. Anticipated additional CEQA requirements beyond proper well abandonment include soil stabilization, Phase I Environmental Site

I18-4 Cont.

[16] Proper well abandonment enforcement may be a pre-requisite for sound Subbasin management. For example, in May 2000 in Walkerton, Ontario, a town of 5,000 people, a perfect storm of a broken water main, a sick animal, heavy rains, poor maintenance and repair practices, and operator error combined to introduce *E coli 0157:H7* into the public water supply sickening 2,300. Hundreds were hospitalized, and seven people died. The ultimate villain was an improperly maintained, barely used well. In other words, protecting groundwater quality is a big deal for the ongoing economic security of a community that is too often taken for granted. Lack of proper well abandonment enforcement may threaten the entire population of municipal ratepayers who represent approximately $300 million in assessed property value in the Borrego Valley.

[17] "The passage of SB 252 added Article 5, Wells in Critically Overdrafted Groundwater Basins, to chapter 10 of the California Water Code requiring collection of specific information for water wells proposed in critically overdrafted groundwater basins. To facilitate the collection of the required information, San Diego County Department of Environmental Health (DEH) has revised the Well Permit Application and created a Supplemental Well Application. The Supplemental Well Application is included in the Well Permit Application and must be submitted for wells proposed in the Borrego Springs Subbasin. Wells drilled by the BWD to provide water solely for the residents are exempt from this requirement. The provisions of SB 252 are effective until January 30, 2020." See draft GSP (March 2019, Section 2.1.2 "Water Resources Monitoring and Management Programs," p. 2-17

Page 10 of 8 BORREGO RISK BRIEF DRAFT 1 6

FOR DISCUSSION PURPOSES
ONLY

[18] Annual groundwater extractions exceeding the amount that a groundwater user is authorized to pump under regulations adopted by the GSA may be subject to fines or penalties under Water Code section 10732. The fine may be up to $500 per acre-foot extracted in excess of their authorized amount (Water Code §10732 (a)(1)), as well as potential additional fines under Water Code, 10732(a)(2).

FOR DISCUSSION PURPOSES
ONLY

Assessment (ESA), and removal of existing infrastructure.[19] Based on Dudek's analysis of land restoration costs, the County's sureties on existing land that was cleared for its approved solar farms may be only approximately 50% of the actual costs to properly return the land to acceptable condition once the economic useful life of these projects has run its course. Having an adequate surety for these projects is important since the experience nationally is that oftentimes once the project reaches its useful economic life, the project owner declares bankruptcy, leaving those land restoration costs to the public sector not covered by the original surety. I18-4 Cont.

3. Water Quality (WQ) Issues (See draft GSP (March 2019) Section 2.2.2.4 "Groundwater Quality, pp. 2-55-64)

- *The potential degradation of WQ due to the critical overdraft of the basin is the #1 risk factor for the District and its ratepayers.* This risk factor is due to the potential treatment and/or well abandonment/re-drilled/or replaced costs associated with degrading water quality from the *critical* overdraft.[20] The degradation of WQ in the basin is a low probability high consequence concern. These days, a new municipal well is an approximately $1.5 million cost. Already, the upper aquifer of the basin, where the highest water quality is found has largely been dewatered in the Central Management Area due to the overdraft. Thus, the majority of municipal pumping is now from municipal wells screened in the middle and lower aquifers;[21] I18-5
- *Historically (over the past 50-years), the most expensive WQ problem for municipal water supplies has been degraded WQ from septic tank effluent.* As many as 4 municipal wells have either been abandoned or had to be re-drilled or replaced due to nitrate contamination from septic tanks (ID4-1, ID4-4 (deepened), WC #1, Roadrunner).[22]

[19] "The GSA also has authority to 'provide for a program of voluntary fallowing of agricultural lands or validate an existing program" (CWC, Section 10726.2(c)) " See draft GSP (March 2019) Section 4.2.1 "Water Trading Program Description," p. 4-7. A passive restoration of disturbed land can take many years, and even decades, in a desert environment.

[20] Dudek, *Water Replacement and Treatment Cost Analysis for the Borrego Valley Groundwater Basin* (November 24, 2015).

[21] ENSI, *Water Quality Review and Assessment: Borrego Water District (BWD) Water Supply Wells*

FOR DISCUSSION PURPOSES
ONLY

(December 7, 2018).

[22] ENSI, *Water Quality Review and Assessment: Borrego Water District (BWD) Water Supply Wells* (December 7, 2018).

FOR DISCUSSION PURPOSES
ONLY

- *Historically, 2 municipal wells (ID-1 & ID1-2) have been abandoned due to naturally occurring contaminants that exceed Minimum Contaminant Levels (MCLs);*[23]

- *Historically, BWD presently knows of no municipal wells that have been adversely affected by pollution from return flows from agricultural pumping.* However, return flows from agricultural irrigation are highly polluted with salts and chemicals.[24] Return flow water is non-potable. This water would need to be treated before it was suitable for human consumption.[25] The precautionary principle suggests that the GSA should today plan for an uncertain future and make allowances for the potential treatment of historical return flows from agricultural irrigation.[26]

- *Presently, the District is closely watching water quality trends for one production well showing potential arsenic concentrations that may exceed MCLs for arsenic in the near future.* Thus, BWD is planning on replacing this well with a new production well in the near future,

- *Waiting to see if pollution of municipal supplies occurs sometime in the future is not the most prudent approach to managing the potential risks to public health.*[27]

I18-5 Cont.

[23] These wells, no longer useful for municipal use, were conveyed to the owners of the Rams Hill Golf Course for golf course irrigation use.

[24] A list of the toxic pesticides, herbicides and pesticides applied to land in the Borrego Valley is sourced from the California Pesticide Information Portal (CALPIP) hosted by the California Department of Pesticide Regulation. Site is as follows: http://calpip.cdpr.ca.gov/main.cfm.

[25] ENSI, *Assessment Of Water Level Decline, Hydrogeologic Conditions, and Potential Overdraft Impacts For Active BWD Water Supply Wells* (January 7, 2019)

[26] Testing for Emerging Contaminants of Concern (COCs) is expensive and may not be identified by traditional Mann-Kendall Trend Analysis until after-the-fact. Some chemicals such as 1,2,3 TCP toxic concentrations for drinking water are presently measured in parts per trillion (ppt). Large molecules (traditional with many pesticides) that sorb with soils do not typically make their way to the groundwater table. Many pesticide molecules can make their way into a drinking water supply from surface runoff into surface water bodies. Since the BWD does not rely on any surface water for its municipal drinking water supply, exposure to some COCs may be limited. However, the issue in Borrego is that we have approximately 50 improperly abandoned wells in the Basin, so an assumption that a large molecule toxin will not reach the water table may not be a good assumption.

[27] In April 2014, a decision to cut Flint, Michigan's water supply budget caused widespread lead poisoning of children in Flint, MI. Lead poisoning is an irreversible neurotoxin that interferes with the development of

the nervous system in children, causing permanent learning and behavioral disorders. Additionally 10 people have died from Legionnaires' disease amidst a surge in infections caused by water-borne bacteria. The costs for attempting to save $2 million/year is expected to reach $1 billion.

FOR DISCUSSION PURPOSES
ONLY

Page 16 of 8 BORREGO RISK BRIEF DRAFT I 6

FOR DISCUSSION PURPOSES ONLY

REFERENCES

Dudek 2015. Water Replacement and Treatment Cost Analysis for the Borrego Valley Groundwater Basin. December 11, 2015.

Dudek. 2016. Theoretical Water Demand at Buildout of Present Unbuilt Lots Under County's Current Zoning in Borrego Springs. October 4, 2016.

ENSI. 2018. RE: Methodology To Examine Future Groundwater Overdraft In Terms Of The Overall Hydrologic Water Balance Considering Recharge Variability And Parameter Uncertainty. Memorandum. Prepared for Borrego Water District. September 12, 2018.

ENSI. 2018. Water Quality Review and Assessment: Borrego Water District (BWD) Water Supply Wells. December 7, 2018.

ENSI. 2019. Assessment Of Water Level Decline, Hydrogeologic Conditions, and Potential Overdraft Impacts For Active BWD Water Supply Wells. January 7, 2019.

ENSI. 2019. Comparison of Pumping Rate Reduction Schedules Under SGMA. February 11, 2019.

ENSI. 2019. SDAC Impact/Vulnerability Analysis (Task 2). April 15, 2019.

ENSI, 2019. Decision Management Analysis. April 16, 2019.

LeSar Development Consultants. 2019. Borrego Springs Community Characteristics Report. January 30, 2019.

Raftelis Financial Consultants, 2016. Borrego Water District County Zoning and SGMA Impact Assessment. November 17, 2016.

Raftelis Financial Consultants. 2017. Borrego Water District Water Rates Affordability Assessment. October 4, 2017.

USBR. 2015. *Southeast California Regional Basin Study Summary Report.* September 2015.

. •

FOR DISCUSSION PURPOSES ONLY

USEPA. 2012. *Borrego Springs Pipeline Feasibility Study: Final Report.* U.S. EPA Region 9 - Tracking Number 10-430 Task H1. February 2012.

USGS. 2015. *Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California.* Scientific Investigations Report 2015–5150. Prepared by Claudia C. Faunt, et. al. DOI: 10.3133/sir20155150

FOR DISCUSSION PURPOSES ONLY

Page 19 of 8 BORREGO RISK BRIEF DRAFT 1.6

Letter I18

Commenter: Diane Johnson
Date: May 21, 2019

I18-1 The commenter includes a risk brief prepared by Lyle Brecht of the Borrego Water District and a request to revise the Groundwater Sustainability Plan (GSP) based on these comments. The commenter does not offer suggested edits to the GSP. Therefore, the comment does not address the adequacy of the Draft GSP, and no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I19

May 21, 2019

County of San DiegoMay 14, 2019
Planning & Development Services
C/O Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-

Re: Suggested changes to the Groundwater Sustainability Plan Draft for the Borrego Valley Groundwater Basin (SGMA Draft). Promote Bioretention Basins and Greywater Systems

Dear Mr. Bennett

I have several suggested changes and additions to the Groundwater Sustainability Plan Draft for the Borrego Valley Groundwater Basin (SGMA Draft)

The SGMA Draft states that "There are currently no managed stormwater recharge facilities in the Plan Area " Thus, recharge is limited to natural infiltration of stormwater, and to a lesser degree, return flows of applied irrigation water and septic recharge." (2 45) Additionally, poor water quality associated with irrigation return flow and septic recharge has percolated to the aquifer and has the potential to migrate laterally as a result of pumping (3.29) Septic systems have polluted several BWD wells and resulted in the need to drill expensive new wells.

"The source of nitrates is likely associated with either fertilizer applications or septic return flows " (4 30) "Home septic tanks, when used in high concentrations and built to poor or outdated standards" (2.46) and agriculture petrochemical fertilizers, herbicides and pesticides are contributors to groundwater quality degradation. I19-2

Since recharge is often polluted by septic and agriculture return flows, infiltration of stormwater in bioretention basins could dilute these toxic return flows. The use of existing natural and extensive man-made stormwater drainage channels could substantially reduce construction costs, increase the basin recharge, mitigate pollution from septic and agriculture return flows and the runoff to the Borrego Sink that could results in higher TDS levels.

Runoff in the Borrego Sink could also damage the middle and upper aquifers so stormwater should be captured and allowed to percolate into the aquifer before it I19-2 reaches the Sink. "The Borrego Sink, similar to dry lake beds that occur in the desert, is a location where water evaporates and minerals will accumulate and can form evaporite deposits Historically similar conditions occurred as sediments were deposited. Thus, the middle and upper aquifers have the potential to include evaporite deposits that can re-dissolve and lead to elevated concentrations of sulfates and carbonates that result in corresponding increase in TDS " ENSI: DRAFT 12/7/2018, page 9 I19-2 Cont

There is plenty of evidence that stormwater runoff exists and can be captured on a cost effective basis:

- There are years in which the frequency, intensity and/or duration of runoff events were sufficient to initiate substantial stream recharge (e g , water years 1967, 1977, 1979, and 1992)." (2.79)
- "The runoff into the Subbasin from the 24 entry points was as much as 44,000 AFY with an average annual rate of 3,600 AFY." (2.75)
- "Storm flows may occasionally be adequate in intensity and duration for recharge to be initiated through deep percolation of storm runoff " (2 66)
- The runoff that is not recaptured is lost to evaporation in the Borrego Sink or leaks out of the aquifer in the southern basin.
- "The contributory watersheds are approximately 400 square miles (mi2) and much larger in area than the approximately 98mi2 Subbasin as illustrated in Figure 1." (p. 532)
- "Stream and flood flows from the adjacent watersheds provide the bulk of the water that enters the Subbasin." (p. 532) I19-3
- There are existing infrastructure improvements (drainage channels) that can be utilized to increase runoff into bioretention basins and reduce construction costs. (See the attached Rams Hill example)

The Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area also encourages stormwater infiltration. It specifies the following

COS-4.3 Maximize stormwater filtration and/or infiltration in areas that are not subject to high groundwater by maximizing the natural drainage patterns and the retention of natural vegetation and other pervious surfaces.

COS-5 2 Require development to minimize the use of directly connected impervious surfaces and to retain stormwater runoff caused from the development footprint at or near the site of generation

Furthermore, Rick Alexander recently wrote a California Water Board Grant Application request for a Coyote Creek grant to research the capture groundwater in ponds. His requests should be expanded to include the Rams Hill, and de Anza areas I19-4

William J. Berkley, WJBerkley@Gmail.com 858-395-8709 2

Through Title XVI Reclamation Research Grant Program·

1 Stormwater Capture/Groundwater Infiltration Opportunity/Feasibility Study

Specifically, BU Rec is interested in funding a Research Grant to explore feasibility of groundwater capture in ponds during vernal, or storm events, from the Coyote Creek Watershed. Captured water would percolate into the aquifer providing recharge rather than running-off and evaporating as now occurs. Coordination/cooperation of planning with ABDSP would be a critical component of such a study. Taking advantage of potentially fallowed agricultural lands could provide opportunities for location of stormwater capture basins

3 Watershed Management Programs
The Cooperative Watershed Management Program (CWMP) provides funding to watershed groups to encourage diverse stakeholders to form local solutions to address their water management needs By providing this funding Reclamation promotes water reliability and cooperation between stakeholders to reduce conflict, facilitate solutions to complex water issues, and stretch limited water supplies. Funding is provided on a competitive basis for development of watershed groups and implementation of watershed management projects.

I19-4 Cont.

Therefore, the SGMA Draft Stormwater Capture and Infiltration sections should be rewritten with the emphasis on the positive rather than the negative. Grants and bond funding should be pursued and Incentives offered to homeowners and large property owners who have the ability to build bioretention basins

"There is an average of about 40 gallons per person per day available for graywater recycling and the average family can reduce their freshwater use by as much as 30% by using graywater for irrigation (SOW 2019)" (4.17). Those who capture filtered household greywater and collect stormwater from roofs, driveways and yards by contouring their property so the water flows into underground tanks, would also experience lower water bills and the satisfaction of helping the community.

I19-5

Although experts have made rough stormwater runoff estimates, accurate Borrego runoff data does not exist. Specifically, the annual precipitation data doesn't accurately indicate the amount of runoff and its potential recapture. The SGMA draft states "Winter and summer rain storms produce different amounts of runoff For example, in a year of unusually high precipitation from extended periods of winter drizzle, there may be high amounts of precipitation but very little runoff In other years, although the annual precipitation may be low, a single August storm could dumped a huge amount of rain in a few hours and create flooding This type of storm would produce a huge runoff that could be captured and allowed to percolate into the aquifer. Precipitation patterns in the Plan Area are influenced by two distinct sources. The first source is

I19-6

William J Berkley, WJBerkley@Gmail.com 858-395-8709 3

Pacific frontal systems that bring regional rain bands to Southern California, typically between October and April.

The second source is isolated and scattered thunderstorms that occur when moisture from the Gulf of California advects from south to north through the Plan Area. This phenomenon, commonly referred to as the "monsoon" season, is strongest in the summer months, but is not a regular or consistent occurrence. Occasionally, the decaying remnants of former tropical storms or hurricanes can pass through the area and in some years these further enhance the precipitation totals during the monsoon season. As a consequence of these disparate influences, the precipitation record is highly variable both seasonally and annually (Figure 2.2-3 and Figure 2.2-4). This makes defining the parameters of "wet" or "dry" years difficult **(e.g., one thunderstorm may drop half of the yearly total in an otherwise dry season)**." (2.36)

There are existing areas with extensive drainage systems that enhance their ability to capture stormwater at substantially lower construction costs (e.g. Viking Ranch and Rams Hill). Property owners could contribute the use of their land to Bioretention Projects and receive some form of compensation.

I19-6 Cont.

The Draft currently negatively states:

> "The infrequent occurrence of rainfall in the region results in extended periods of zero-recharge. Additionally, design criteria for capturing and infiltrating desert flood events, as well as removal and disposition of accumulated sediment from large storm events, is costly (USBR 2015). **Therefore, while this potential supplyside project requires additional analysis, the costs to construct this as a stand-alone project outweigh the benefits at this time.** Stormwater retention will be evaluated on a case-by case basis in conjunction with future development in the Subbasin."

William J. Berkley, WJBerkley@Gmail.com 858-395-8709 4

This section should be rewritten as follows:

There are a number of reasons bioretention basins should be built in Borrego.

1 Stormwater runoff that reaches the Borrego Sink doesn't recharge the aquifer, it is lost to evaporation.
2 "The Borrego Sink, similar to dry lake beds that occur in the desert, is a location where water evaporates and minerals will accumulate and can form evaporite deposits. Historically similar conditions occurred as sediments were deposited The middle and upper aquifers have the potential to include evaporite deposits that can re-dissolve and lead to elevated concentrations of sulfates and carbonates that result in corresponding increase in TDS " ENSI DRAFT 12/7/2018, page 9.
3 Bioretention basins would reduce flood damage.
4. Bioretention basins would support endangered ecosystems.
5. Experts lack accurate data on Borrego's rainfall intensity and duration, so their predictions are flawed
6. Experts lact accurate data on streamflows "The highest levels of uncertainty in the model were from agricultural pumping, specific yield, and streamflow entering the valley." (2.80) In the fall of 2017, there was a precipitation event in the Coyote Creek watershed that produced runoff in Coyote Creek; however, no stream flow measurements are available for this event. Dudek 10329 001 Feb. 2019. I19-7
7. Septic system and fertilizer pollution, that threatens water quality, can be diluted with the addition of natural recharge from bioretention basins.
8 The existing costly flood channel infrastructure, such as the extensive natural and man made drainage channels in the Rams Hill area, will reduce bioretention basin construction costs
9. There are government programs that encourage bioretention basins construction in areas such as the Viking Ranch.
10. "There is runoff into the Subbasin from 24 entry points with as much as 44,000 AFY (2.75) "
11. Since grants and bond financing for the capture and infiltration of stormwater are available, they should be aggressively pursued.
12. Incentives can be offered to encourage the construction of multiple bioretention basins

Therefore, bioretention basin construction costs may be quite reasonable and the benefits to Borrego's critical water problems substantial.

The draft should also be strengthened with these three provisions:

1. Prohibit the concentration of septic tanks that are threatening our water quality.
2. Wherever possible, eliminate home septic systems by connecting homes to the BWD sewer system.
3. All homes should be obligated to install greywater systems and capture stormwater from roofs, driveways, and direct flows from contoured land to bioretention basins and/or in underground tanks for landscape irrigation.

I19-8

Everyone agrees that Borrego needs every drop of water it can save whether it's through changing to drip irrigation and native landscaping, installing home and commercial greywater systems, initiating turf reduction programs, or constructing large and small bioretention basins.

For these reasons, the SGMA draft should encourage, not discourage, the capture of stormwater runoff in bioretention basins.

I19-9

Regards,

Bill Berkley
SGMA Advisory Committee representing Borrego recreation

The Rams Hill Drainage Channels:

In the Rams Hill area extensive existing drainage channels collect runoff from thousands of acres and direct it to a small central collection point at the bottom of the hill where a series of bioretention basins can be built. This system could save thousands of acre feet over a decade. Therefore, the cost to build a series of bioretention basins would be relatively small when weighed against the benefits and Borrego's critical water situation. I19-10

The world has been experiencing climate change, particularly in precipitation extremes that generate peak runoff flows which if captured and saved, would increase water supplies.

Rams Hill's 3,200 acres and the thousands of park acres drain into the extensive natural and manmade drainage systems that collect stormwater and funnels it down to a central location that's perfect for the construction of a number of cascading bioretention ponds. The water can then percolate into the aquifer or be pumped immediately into Rams Hill's lakes where it can then irrigate the course.

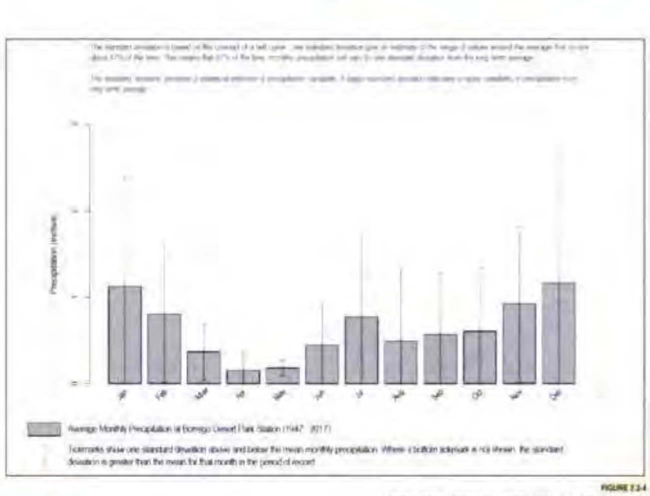
The entire 200 acre Rams Hill Golf Course is a bioretention basin that currently captures water from hillsides, roads, parking lots, and roofs so that it can percolate into the aquifer. Some of the stormwater flows into the golf course lakes and is reused for irrigation which eliminates the need to pump water from the aquifer.

This picture of the sixth hole at Rams Hill was taken in February 2019. It demonstrates that the golf course is a large bioretention basin that has captured hundreds of acre feet of stormwater runoff that has recharged the aquifer over the years.

This picture shows the existing rock lined channels (east of Borrego Springs Road and near the BWD Reclamation Plant) that direct stormwater to the Sink. If the 4 acres between the rock lined channel walls were excavated to an average depth of 10 feet, they could capture 40 acre feet from one storm. While these storms may be infrequent, climate change may result in more storm events in the future.

Why miss an opportunity to capture stormwater before it is lost to evaporation in the Borrego Sink?

I19-10 Cont.



William J. Berkley, WJBerkley@Gmail.com 858-395-8709 8

Letter I19

Commenter: Bill Berkley, Advisory Committee Member
Date: May 21, 2019

I19-1 The Groundwater Sustainability Agency (GSA) acknowledges your comments and suggested changes on the Draft Groundwater Sustainability Plan (GSP). In particular you are interested in the potential of stormwater capture and recharge using bioretention basins that could dilute pollutants from other sources of return flow such as irrigation and septic recharge. You also indicate that existing natural and extensive man-made stormwater drainage channels could substantially reduce construction costs and increase the basin recharge

I19-2 The GSA notes your comment that runoff should be captured prior to discharge to the Borrego Sink because of the potential for the dissolution of evaporite deposits that could result in poor water quality.

I19-3 The GSA notes the documentation you provide as evidence for the potential of stormwater capture and recharge including reference to the General Plan and Community Plan land use policies.

I19-4 The GSA notes your comment that Rick Alexander recently wrote a California Water Board Grant Application request for a Coyote Creek grant to research the capture groundwater in ponds. The GSA is unaware of this Water Board Grant Application request for a Coyote Creek and requests that you or Rick Alexander provide the grant information to the GSA for review. The GSA also notes your comment to expand the study to the Rams Hill and de Anza areas.

I19-5 The GSA notes your suggestion to incorporate potential stormwater capture and recharge projects in the Draft GSP. In addition, the GSA notes your comments that grants and bond funding should be pursued and incentives offered to homeowners and large property owners who have the ability to build bioretention basins, and the potential for use of residential greywater systems and rainfall capture.

I19-6 The GSA notes your excerpts from the GSP pertaining to the duration and intensity of rainfall patterns in the Borrego Springs area. In addition, you indicate that there are existing areas with extensive drainage systems that enhance their ability to capture stormwater at substantially lower construction costs (e.g., Viking Ranch and Rams Hill) and that Property owners could contribute the use of their land to bioretention projects and receive some form of compensation. Also, the GSA acknowledges your impression that the potential for stormwater capture and recharge is negatively reflected in the Draft GSP.

I19-7 The GSA acknowledges your comment that the Draft GSP should be revised to indicate that there are a number of reasons that bioretention basins should be built and that bioretention basin construction costs may be quite reasonable and the benefits to Borrego's critical water problems substantial.

I19-8 The GSA acknowledges your comment that the Draft GSP should include provisions to (1) prohibit the concentration of septic tanks, (2) eliminating home septic systems wherever possible and connecting to the BWD sewer system, and (3) obligate installation of greywater systems and capture stormwater from roofs, driveways, and direct flows from contoured land to bioretention basins and/or in underground tanks for landscape irrigation. The GSA notes that expansion of the Borrego Water District (BWD) sewer system has been studied as part of the *Final Tertiary Treatment Conversion Project Feasibility Study* (Dudek 2018). This report concluded that the expansion of the BWD sewer collection system for the three alternatives evaluated was not cost effective at this time.

As such, expansion of the BWD sewer system was not considered for a project in the Draft GSP. Installation of greywater systems and domestic stormwater capture are potential project-level actions to be considered as part of GSP implementation. Use of greywater systems may be evaluated as part of the Water Conservation Project and Management Action as indicated on Draft GSP page 2-32. Rainwater harvesting from roofs though rain barrels or cisterns could be evaluated as a project-specific management action. The GSA notes that similar rebate programs exist in the County however; the cost/benefit of such a program should be considered taking into account low rainfall in Borrego Springs.

I19-9 The GSA notes your comment that everyone agrees that Borrego needs every drop of water it can save. The GSA emphasizes that the Projects and Management Actions described in Chapter 4 of the Draft GSP prescribe a systematic process to evaluate the cost/benefit of various water conservation projects and contemplates securing funding such as through existing and future grants and low interest loan programs. The GSA also acknowledges your comment that the Draft GSP should encourage, not discourage, the capture of stormwater runoff in bioretention basins.

I19-10 The GSA acknowledges your proposed bioretention project at Rams Hill using the existing flood control system that collect stormwater and funnels it down to a central location that's perfect for the construction of a number of cascading bioretention ponds. In addition, the GSA notes you comment that the entire 200 acre Rams Hill Golf Course is a bioretention basin that currently captures water from hillsides, roads, parking lots, and roofs so that it can percolate into the aquifer and that some of the stormwater flows into the golf course lakes and is reused for irrigation which eliminates the need to pump water from the aquifer. As documented in the Draft GSP, stormwater retention will be evaluated on a case-by case basis in conjunction with future development in the Subbasin.

INTENTIONALLY LEFT BLANK

Comment Letter I20

Jack and Linda Laughlin
P.O. Box 626
625 Riata Drive
Borrego Springs, CA 92004-0626
Tel: (619) 840-4068
Email. desert.two@gmail.com

May 3, 2019

County of San Diego
Planning and Development Services
% Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Reference: Comments on the Borrego Valley Draft Groundwater Sustainability Plan

Dear Jim,

First of all let me say that after many years of effort to create a sustainable water management plan for the Borrego Valley it is rewarding to see in the draft GSP a roadmap to achieve this goal. This letter presents some relevant background from my perspective and comments on selected issues.

BACKGROUND
I am a retired registered professional engineer and have maintained an interest in the Borrego Valley aquifer overdraft problem since John Peterson began his well monitoring program in the early 1980's. My engineering work has been largely associated with water and power projects throughout the U.S. and overseas including work with California's water and electric utilities and California's state and federal agencies.

My involvement in past Borrego water management issues included leading a two year effort in the 1990's to confirm that the aquifer was in severe overdraft, examine alternatives for imported water sources, conduct community outreach meetings and draft a concept for a Borrego Valley water management plan. This effort included the State Park, DWR, USGS, San Diego State University and the Bureau of Reclamation. The program was discontinued because of a lack of support by the County and the BWD board of directors at the time. The positive outcome was a general acceptance of the aquifer overdraft problem, the conclusion that no viable alternative for imported water sources was likely and an interest by the state and federal agencies in participating in a future program if they received the necessary support to become involved.

1

Since that time BWD went through a difficult period that drained their finances but then recovered through the efforts of the recent and present board of directors and staff. While BWD will now be facing some difficult questions generated by the GSP process I feel they have made a great deal of progress in achieving financial viability, hiring competent contractors and focusing on the aquifer overdraft issue. Water conservation measures developed by BWD have significantly reduced the rate of domestic water use.

Golf courses have generally acknowledged the need for water conservation but have been hampered by changes in ownership and financial difficulties. While Rams Hill has been able to purchase water credits from agriculture to expand their golf courses, other golf courses are struggling financially. None has taken steps to significantly reduce water use through targeted design and other methods such as those being used in Phoenix and other desert cities. This would require capital investments that may be beyond their capability. The need to obtain water credits through fallowing agricultural land would add to their dilemma.

Agriculture has been at the heart of Borrego's evolution from an open desert to what it is today. Other than native Americans, explorers and miners, the people that populated the Borrego Valley were farmers. The people that invested in the major residential, commercial and recreational infrastructure of Borrego Springs came here originally to farm. Their families have been, and continue to be, some of Borrego's largest donors.

While the original major farming companies turned to development, the availability of unlimited free groundwater attracted the farming operations we see today. The USGS modeling studies conducted in the late 1970's as part of the Rams Hill permitting process assumed that water use for farming would be negligible in future years, leaving the rest of the newly defined aquifer to development interests. This conclusion probably resulted from the fact that the developers of Rams Hill were the farming companies that had recently discontinued intensive water use for grape vineyards and had influence on the study assumptions. In reality, citrus and tree farms were coming into full swing at the time. The concept that there was unlimited water in the aquifer came into question when John Peterson, San Diego County Hydrogeologist, found through his well level monitoring program that the aquifer was in a state of rapid depletion.

Because of the political influence of the developers and agricultural interests, both BWD and the County chose to deny the existence of the overdraft problem. This prompted community members with technical backgrounds to take the actions which led to the attempt to create a water management plan in the mid to late 1990's. While these efforts failed, the USGS aquifer model developed for the Rams Hill project was found to be basically sound and provided useful information for the modeling upgrades performed by graduate students from San Diego State University and subsequently by USGS and Dudek.

After several years of denial, agriculture was faced with published information that they were using about 70% of the aquifer extraction and that the aquifer was in severe overdraft. Instead of being considered an asset, agriculture began to look like a villain.

2

The owners of the major citrus and tree farms include both long-term family operations with close ties to the Borrego Springs community and large corporations whose interest would be primarily profit. Some of the operations have made substantial efforts to achieve efficient water use and an in-depth understanding of aquifer water quality in their area of extraction. The advent of SGMA and the sustainable yield mandate will result in a quantum change in agriculture as it now exists. How to incorporate the impact of that eventuality is undoubtedly the GSP's biggest challenge.

THE COUNTY'S ROLE
For many years the Borrego Springs community has enjoyed a high level of support from the County Commissioners, especially exemplified by Bill Horn in our new library and park complex and numerous other benefits he has bestowed. Jim Desmond has indicated that he will continue that precedent. The water issue, historically speaking, has not been treated so well. That has now changed.

Because BWD controls only a small part of the overall water use in the valley, it will be up to the County, its contractors and DWR to manage the overall GSP implementation effort which includes all three categories of water users. This is a complicated task involving technical, economic and political issues as well as policing and communications. I hope that you receive all the support you need to meet the challenge. Borrego's future depends on it.

COMMENTS
My comments are offered in a generalized manner because, other than being a reviewer of the recent USGS modeling program, I have not had a direct involvement with BWD in the meetings and work leading to the preparation of the draft GSP document.

Overview
I look at the draft GSP from the point of view of a project manager who has spent years dealing with large start-to-finish water-related projects with the attendant planning, permitting and project implementation elements. I am impressed by the scope and presentation of what you, along with your agency and contractor participants, have accomplished. I imagine that you are "breaking ground" in responding to SGMA's requirements and that there are few, if any, existing examples to follow.

One thing I feel is particularly important is the incorporation of tasks for adjusting the initial GSP assumptions. At the starting point there will be numerous uncertainties that will be clarified as new data and experiences are acquired. While there will be issues raised in the draft GSP responses, I feel that the basic road map you have created is a good working document for reaching the goals of compliance.

3

Data Acquisition and Aquifer Modeling
The selected sustainable yield estimate of 5,700 AF/Y is based on the best available information and a logical analysis of contributing sources developed in the USGS aquifer modeling program. Dudek's update of the modeling results shows some differences but confirms that the sustainable yield number is reasonable under present circumstances. The number, however, has an uncertainty factor due to the nature of estimating the selected stream inflows and the absence of metered data to confirm outflows.

The draft GSP includes creating a water balance of inflows and outflows based on increased flow metering, stream gauges and well level monitoring to calibrate the model and refine the sustainable yield factor. This task is particularly important because the water balance can encompass the assumptions for irrigation return flows, septic system return flows, evapotranspiration, etc. that are, in some cases, debatable. This represents a significant improvement of aquifer characterization, but one that is dependent on the cooperation of all involved water user groups to provide timely and credible data.

Past experiences have shown that agriculture when represented as a collective group has been very resistive to agency monitoring of flows or chemistry Their position has been that any data released by the owners should take place out of the public domain and under their complete control. This resistance may have changed during the cooperative sessions conducted before and during preparation of the draft GPS, however I feel we need to take extra steps to ensure that data accuracy and availability do not become an impediment to accurate annual updates of aquifer status.

Considering history, I feel that the flow monitoring data should be openly submitted to the County on a monthly basis and that the County check the meters on a quarterly basis, carefully confirming that the data being collected by the owners is credible. Monthly tracking by the County would identify any apparent discrepancy in the instrumentation or in the frequency of data taking. Any problems could then be addressed quickly to ensure the viability of the data stream. Quarterly checking and calibration of the equipment by the County would ensure the accuracy of the annual results. The frequency of these tasks could be reduced over time as indicated by experience.

If well level measurements and water quality sampling are carried out by agency staff or their contractors, and access is not restricted, data management for these tasks shouldn't be a problem. If not, special care should be taken as suggested for flow monitoring.

Water Use Allocation
The compliance allocations for domestic, recreational and agricultural water use shown in the draft GSP are controversial. As expressed in the Ratepayers community meetings, people can't understand why domestic use should be penalized at the same rate as agriculture when domestic water use has been reduced through BWD conservation measures and agriculture's use has not. They feel that BWD may have capitulated to agriculture in fear of potential

4

litigation, significantly raising future domestic water costs as required to purchase water credits from agriculture. They also feel that the community of Borrego Springs, along with the State Park are essential entities whose future viability must be guaranteed.

Lacking direct knowledge of how the water allocation decisions were made, or what negotiations may be ongoing, it seems to me that the issue is important and definitely needs to be clarified. If the reference period for domestic and agricultural water use does not truly reflect domestic water reduction, the water allocation should be reconsidered. Or, it seems to me that if the final domestic water allocation were set at the present usage rate, or a usage rate that is achievable through reasonable continuing conservation measures with a small contingency for future growth, that community viability would be protected without the need to buy water credits from agriculture. It is true that the increment of water allocation required to do this is nearly insignificant compared with agriculture's use.

20 Year Compliance Period

Another issue that has been raised is the need to reduce the 20 year period of the compliance schedule to retain as much aquifer storage as possible, thus minimizing the impacts of declining water table on water cost and environmental damage. The 20 year schedule may have been deemed necessary to account for the complications that large farming operations in California may face in adjusting to compliance, especially considering the importance of these operations to California's economy. There is a clear incentive, however, to reduce Borrego's time table.

While there are a lot of uncertainty factors involved in minimizing the schedule, it appears to me that the draft GPS addresses a majority of the individual issues. From a project management standpoint it might make sense to add a line item task that consolidates the issues with a stated objective of achieving the shortest possible compliance schedule. Thus, the goal could be tracked, reported and kept in focus.

Burden of GSP Program Costs on BWD Ratepayers

The draft GSP shows a concerted effort to estimate the cost of both the overall compliance program and the potential impacts on the cost of domestic water. Again, the number of variables creates a high degree of uncertainty for the accuracy of the estimates. This is especially true considering the possibility of future bond issues, changes in anticipated state or federal funding, as well as the difficulty of anticipating what the cost of downsizing agriculture will actually be.

My particular concern is the direct burden BWD will have to bear as a result of the GSP implementation process. The ratepayers of Borrego Valley represent a small group facing a large number of potential new expenses. It is my hope that the GSP team will be diligent in keeping the near-term and long-term expenses for BWD as low as possible.

5

CONCLUSION
I realize that this letter is long on history and short on the condensed comments that would normally be associated in a draft review of this kind. Being in my 80's now might give me some excuse for the tendency to look back and to add an educational tone to my response. I hope, however, that looking back will be of some help in moving forward with a successful water management program for the Borrego Valley. My best wishes toward that end. There is no need to reply to this letter.

Sincerely,

Jack K. Laughlin, P.E., ret.
Cc: Kathy Dice, President, BWD Board of Directors

6

Letter I20

Commenter: Jack K. Laughlin
Date: May 3, 2019

I20-1 The Groundwater Sustainability Agency (GSA) wants to acknowledge the comments that provide a breadth of historical perspective and insights from decades of participating and an ongoing interest in Borrego Springs water supply issues. Per commenter's request, no responses to comments are being made.

The comment letter does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary

INTENTIONALLY LEFT BLANK

Comment Letter I21

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

April 24, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennet:

In the final GSP for the Borrego Basin, the human consumption and use of water must have priority over agricultural and recreational claims. There cannot be any equal proportional reduction by all users. Such an argument for that position from anyone ignores the fact that for 70 years agriculture has been profiting from and over-drafting the basin and consuming 70% of the aquifer use on an annual basis. Even in recent years when Borrego Springs ratepayers have reduced their usage from 2,400 afy to 1,700 afy, agriculture has continued its same excessive consumption rate, if not more. The public record is clear. Twenty-five (25) agricultural corporate interests farming 4,000 acres do not deserve equal treatment and a financial reward for decades of aquifer abuse. We believe water case law in California supports this position of human consumption priority. I21-1

Borrego Springs must survive as a retirement and service-related community of 3,000 to 10,000 (including snowbirds) residents. Perhaps even more importantly, the town provides a destination and hub for thousands of annual world visitors, hikers, and campers to the largest desert state park in the nation, Anza-Borrego Desert State Park. Borrego Springs has been designated one of the few international dark sky communities easily accessible to the public. That basic survival requires a minimum of 1700 annual feet of water per year to be protected under the GSP for the use of ratepayers and visitors. Without that minimum amount of water, property values will plummet, and Borrego Springs could die. Such a demise would also threaten the communities of Ocotillo Wells, Ocotillo Wells Off Road State Vehicular Recreation Area, Ranchita, and Warner I21-2

Springs which all depend on the convenient goods and services found year-round in Borrego Springs. I21-2 Cont.

Implementation of the GSP cannot wait 20 years. The threat of decreased water quality as the aquifer declines mandates a much sooner completion timetable. I21-3

If the GSP fails to provide the 1700 afy of water Borrego Springs ratepayers and visitors need annually just to preserve the status quo, the State of California and the County of San Diego must provide the Borrego Water District with the necessary funding to buy out farming interests. Neither the community nor the water district have such assets. I21-4

Sincerely,

Richard W. Walker and Artemisa Walker
Borrego Springs residents for 16 years
373 Ocotillo Circle
92004-2053
Ph #760-767-4928
E-mail: casadelacholla@sbcglobal.net

Letter I21

Commenter: Richard and Artemisa Walker
Date: April 24, 2019

I21-1 The Groundwater Sustainability Agency (GSA) acknowledges your opposition to proportional reductions by all users and human consumption and use of water must have priority over agricultural and recreational water uses. While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I21-2 The GSA acknowledges your opposition to any groundwater use reductions for the municipal sector. While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The GSP further includes Project and Management Action No. 1 – Water Trading Program. The GSP states that the Water Trading Program would allow groundwater users (including the Borrego Water District) to purchase needed groundwater allocation from others to maintain economic activities in the Subbasin. The GSP indicates preparation of a Water Trading and Policy document is intended to begin upon adoption of the GSP. The timetable for implementation of the Water Trading Program is dependent upon whether implementation of the program requires CEQA review.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I21-3 The GSA acknowledges your request for the implementation of the GSP to be less than 20 years. While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I21-4 The GSA acknowledges the request for the State of California or County of San Diego to provide the Borrego Water District funding to buy water rights if Borrego Water District is subjected to groundwater use reductions below 1,700 acre-feet per year.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter I22

County of San Diego Planning & Development Services May 2, 2019

C/O Jim Bennett

I am a resident of Borrego Springs. I have read the proposed GSP and have the following personal comments:

The proposed GSP demonstrates a flawed and incomplete understanding of how a community such as Borrego Springs survives and prospers. As it is proposed, the GSP simply uses the amount of water pumped as the basis upon which all data is gathered and all plans are made. This is an incomplete view of the Borrego Springs environment and shows a lack of fundamental understanding of what sustains and drives our community. It is the economic benefit, that the USE of the water brings to the community, that should be the key consideration. This economic benefit should be taken into account when deciding how to mandate sector reductions. I22-1

In the Borrego Valley, the Municipal, Recreation and "Other" Sectors bring considerable economic benefit to the Borrego community when measured on a per acre foot of water used basis. However, the Agriculture Industry Sector brings relatively little economic benefit to the community when considered on an acre foot of water used basis. I22-2

A new plan should be considered which incorporates the dollar benefit on a per acre foot of water used basis. The new Plan should assess the acre feet used by each pumping sector and mandate reductions in water use until the dollar benefit per acre foot of water used, of each sector, is equal. The Municipal Sector (BWD) is made up of domestic and commercial users, where each brings value to the community by their domestic income stream or commercial business income. The Recreation Sector brings value to the community by providing a draw for golfers and sportsmen thus adding that local spending to the community. The "Other" category is made up of both recreation and domestic users, each bringing their value to the community as mentioned above. The Agriculture Sector does provide some jobs that do add income streams to the community. However, when these income streams of this sector are considered on an acre foot of water used basis, the value to the community is small. I22-3

A new plan based upon the dollar benefit on a per acre foot of water used would be fair to all sectors, and would provide an economically stable community while bringing the aquifer back into equilibrium.

The State and County proposed GSP is a one dimensional view of a complex economic environment which is limited by a precious resource. The proposed flawed Plan will economically devastate Borrego Springs and turn our quaint community into a desert wasteland within 20 years. I22-4

Respectfully submitted

Eric Nessa

949-348-1764


Nessa
26675 Cuenca Dr
Mission Viejo CA 92691-6215

SANTA ANA CA 926
03 MAY 2019 PM 2 L

RECEIVED
MAY 07 2019
Planning and Development Services

COUNTY OF SAN DIEGO PLANNING & DEVELOPMENT SERVICES
C/O JIM BENNETT
5510 OVERLAND AVE. SUITE 310
SAN DIEGO CA 92123
92123-123985

Letter I22

Commenter: Eric Nessa
Date: May 2, 2019

I22-1 The Groundwater Sustainability Agency (GSA) acknowledges your disagreement with the approach to the Groundwater Sustainability Plan (GSP) and your opinion that the focus of the GSP should be the economic benefit that the use of water brings to the community. In response, the GSP was developed in compliance with the Sustainable Groundwater Management Act (SGMA) of 2014 (California Water Code Section 10720-10737.8, et al.) and the Department of Water Resources (DWR) GSP Regulations (California Code of Regulations, Title 23, Section 350 et seq.). Appendix A of the GSP includes the Preparation Checklist for GSP Submittal, which identifies where in the GSP each of the statutory requirements of SGMA are addressed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I22-2 The GSA acknowledges your opinion that the municipal, recreation, and other water sectors bring considerable economic benefit to Borrego Springs versus the agricultural industry brings little economic benefit on a per acre-foot basis.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I22-3 The comment suggests a new plan be considered which incorporates the dollar benefit on a per acre foot of water used basis. In response, please see response to Comment I22-1.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I22-4 The comment provides a conclusory statement that the Plan is flawed and will economically devastate Borrego Springs and turn the community into a desert wasteland within 20 years.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I23

From: Marsha Bonng <wmb0911@gmail.com>
Sent: Monday, May 13, 2019 2:37 PM
To: LUEG, GroundWater, PDS
Subject: Draft GSP comments

I am a year-round resident of Borrego Springs and also a member of the Borrego Water Coalition. I have attended many meetings, including the presentation of the GSP to the group I've also just reviewed the GSP and overall find it to be comprehensive and well-planned I23-1

I do have some serious issues with the water pumping reduction and the BPAs. Project and Management Action #3 recommends an across the board reduction of 74%, which would maintain the current distribution percentages The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, converting to low-flow toilets, and overall conservation efforts I23-2

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water. I23-3

There is no reason to assume or plan for the historic water use percentages to remain at current levels. I believe that the municipal water allotment should not be lowered beyond the current level. That level of 1700 acre feet/yr would still be only 30% of the total 5700 acre feet/yr, which I believe is entirely reasonable. I23-4

Sincerely,
Marsha Bonng
PO Box 2054
575 Pointing Rock Drive
Borrego Springs, CA 92004

INTENTIONALLY LEFT BLANK

Letter I23

Commenter: Marsha Boring
Date: May 13, 2019

I23-1 The Groundwater Sustainability Agency (GSA) acknowledges this introductory comment. No response is necessary.

I23-2 The GSA acknowledges your concerns to groundwater use reductions/baseline pumping allocations (BPAs) and your comment that residential water use has already been cut by 50%. The Groundwater Sustainability Plan (GSP) specifies that 74% reductions are needed but it does not set specific groundwater use reductions by sector. As indicated in the GSP under Project and Management Action No. 3 – Pumping Reduction Program, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I23-3 The GSA acknowledges the comment that recreational and agricultural users have been slow or completely unwilling to make similar reductions as residential water use and it is unreasonable to assume farming should continue to use 70% of the allocated water.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I23-4 The GSA acknowledges your opposition to any groundwater use reductions for the municipal sector. While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The GSP further includes Project and Management Action No. 1 – Water Trading Program. The GSP states that the Water Trading Program would allow groundwater users (including the Borrego Water District) to purchase needed groundwater allocation from others to maintain economic activities in the Subbasin. The GSP indicates preparation of a Water Trading and Policy document is intended to begin upon adoption of the GSP. The timetable for implementation of the Water Trading Program is dependent upon whether implementation of the program requires CEQA review.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter I24

May 15, 2018

Jim Bennett, County Groundwater Geologist
Borrego Valley Groundwater Sustainability Agency
5510 Overland Avenue, Suite 310
San Diego Ca. 92123

Subject Response to Comments GSP for Borrego Valley March 2019.

Dear Mr Bennett

It is encouraging to see the progress that has been made regarding the hydrological parameters of the Borrego Valley aquifer. This basin has been monitored for almost 40 years and it has been long established as being in critical overdraft. The work completed for the GSP is positive steps to alleviate this adverse condition. I24-1

In my review of the draft GSP I would like to offer the following comments in the record regarding the document:

1) On page ES-2 it is stated that "*In the southeastern part of the Subbasin, where less groundwater has been pumped, groundwater levels have remained relatively constant during the same time period*" This does not adequately cover the hydrographic trends within this area of the Valley. As an example the Well MW-5, which is located east north east of the Borrego Sink, has fallen 8.94 feet in the last 10 year (49.22 feet below ground surface in October 2008 to a current level of 58.38 ' in November 2018). This well is located in the discharge area of the basin and likely reflects groundwater level declines in the Mesquite Bosque which in in critical decline. Also this statement "relatively constant" does not document significant groundwater level declines (greater than 3 feet per year) in the southeastern portions of the basin. Specifically Monitoring well MW-3 has shown a substantial decline (57.51 feet below ground surface November 2015 to 70.65 feet in March 2019). This is also seen in Figure 2.2-13E where well number 011S006E23J002S has almost a 20 foot decline in 3 years. The report must reflect accurate trends in the basin and should be modified to represent current groundwater trends in this area of the basin I24-2

2) It has been well known and long established that Borrego Valley drains (flows) toward the Borrego Sink and down Borrego Sink Wash toward the east. Various technical studies including those from the USGS and DWR point toward the basins discharge point being through the Borrego Sink wash. Figures 2.2-13 C and 2.2-13 D accurately reflects this flow path. However Figures 2.2-13 A (Spring 2018) and 2.2-13 B (Fall 2018) represents a different flow path with the discharge point (or basin low) appearing to be near the Borrego Valley Airport Also on page 2-51 the statement is made that groundwater flow is "*toward the center of the valley near Palm Canyon Drive about 2 miles north of Borrego Sink*". This "reversed northern flow direction from the sink" would be significant modification to historical flow path within the basin. This condition would be either produced by 1) a significant overdraft occurring in the area of the Borrego Springs Airport produced by extensive production (which we know is not the case), or 2) the potential incorrect interpretation of the data due to extreme lack of adequate groundwater level data from monitoring wells in this area of the basin. As given in response #5 below there is a significant data gap on a north\south line (almost 6 miles long) from the north of Henderson Canyon Road to the County Road Station Along this path only one data point exists (at the County Airport). It is very hard to accurately produce a groundwater level flow contour map with little to no data. If the contour lines are estimated or guessed they should be dashed and/or left out entirely. These two figures imply something that is very important (reserved flow direction north toward the airport from the sink) and it is based on extremely limited information. In science we should not arrive at a conclusion unless there is significant data to support that conclusion. I24-3
3) Just as a correction Figure 2 2-15 has our town center (Christmas Circle) listed as an active hazmat cleanup site as the Carrizo Impact Site. The text on page 2-61 provides additional detail that the Carrizo Impact bombing range covers ~400 square miles. It is suggested that some detail be added to the Figure to clarify this point. I24-4
4) Figure 2.2-21 B documents water use within the basin between 1945 and 2017. The figure identifies a significant decrease in annual total water use from ~18,500/yr. to ~14,500/yr. This is a significant trend of approximately 20%. If this is true why isn't the decline in water extraction reflected in Figure 2.2-22 B which represents the cumulative change in storage by year? This figure (2.2-22 B) implies a constant rate of consumption The only way I24-5

both figures would be correct is if a significant decrease in the amount of groundwater recharge had occurred and this is not considered to be the case. There seems to be a disconnect between Figure 2.2-21B which shows a significant decrease in extraction and Figure 2 2-22B which represents a consistent change (depletion) in storage over the same period. I24-5 Cont

5) Monitoring well distribution is discussed on page 2-54, where it is concluded that lateral distribution of monitoring wells "appears adequate to meet SGMA requirements within all of the management areas". However within the eastern central portions of the basin (south of Henderson Canyon road, east of Borrego Valley road and north of La Casa Del Zorro) there are only 4 monitoring wells This area covers almost 25 square miles making an overall density of 1 monitoring well per 6 square miles. Also three of the four monitoring wells are clustered along Palm Canyon Drive near the County airport. Given that almost 90% of 25 square miles have no monitoring wells it is hard to understand how it has been deemed that the distribution of wells is adequate. The gross number of wells likely meets the minimum requirements of SGMA but that is not the important issue. The problem is that the **distribution and location** of wells within and central eastern portion of the basin is clearly not adequate. This is also shown and represented in Figure 2.2-12. It is suggested that this region be identified as a data gap and that efforts be completed in the future to add additional monitoring wells within this area of the basin I24-6

6) I totally support the conclusion regarding identified data gaps within the groundwater quality network (pages 2-63 and 64). Monitoring groundwater quality trends is vital to the long term survival of the community and the basin. As identified in item #5 above the central eastern portion of the basin is not adequate covered by monitoring wells to estimate trends within the groundwater system. This includes both for groundwater levels and for groundwater quality. It is vitally important to develop a basic understanding of baseline groundwater characteristics throughout the basin The central eastern portion of the basin (which is located in both the Central and Southern Management Areas) is under represented for monitoring wells. The GSP identifies this as a data gap for groundwater quality but ignores the data gap for groundwater levels. I24-7

7) On page 2-70 it refers to the Horse Camp well within the section addressing the GDE Unit 2 Palm Canyon area. The Horse Camp Well is in the Unit 1 Coyote Creek area I24-8

8) Figure 3.3-1 "Key Indicator Wells" shows the significant gap in monitoring wells in the eastern central portion of the basin Only one well (the Airport Well) is located in 20 square miles. This is clearly not adequate to represent the basin Also Section 3 5.1 describes the monitoring network. Specifically Section 3.5.1.1 states that the ***density*** of wells meet the CASGEM requirements As previously stated the issue with the draft GSP is not the number of wells rather the adequate ***distribution*** of monitoring wells. It goes without saying that you can have adequate **number** of wells (say 50 wells) in an area 30 square miles, but if all of those wells are located within a small specific area of 10 square miles the average density is adequate but the well distribution is inadequate. Throughout the GSP reference is made to the adequate number of wells. However what is ignored is if the distribution of wells is adequate. This issue should be identified as a clear data gap within the GSP. Specifically section 3.5.4.2 does not identify this area of the basin as an area that requires additional data points. I24-9
9) Appendix D2 by ENSI appears to be a high quality comprehensive report. It is the best water quality summary that I have seen for the basin. Overall it is a great job! However comments include: 1) No title page is offered for the ENSI team. No license numbers or contact information has been included with the report (as required by our State licensing Board). The only contact information I could find is in the title box of the figures. 2) Figure 5 shows a graphic representation for groundwater quality in the basin. However the locations of the data sites appears to be incorrect. The data is spread out throughout the basin, as an example many sites are shown in the northeastern area of the basin. However Figure 4 shows no monitoring wells in the area. There appears to be a disconnect between the wells shown in Figure 4 and the data presented in Figure 5. And 3) Appendix A of this report is from DWR? It is quite confusing on the reprinting of the various data Is this one report or two? Many of the figures within the original report are also in the Appendix. Is this two reports using the same data? I cannot figure this out. I24-10

In summary it appears that significant technical work has been completed to assist in the development of the Borrego Valley GSP. However it is my professional opinion that a number of issues remain outstanding. These include: I24-11

1) Characterization that the southeastern portion of the basin have had stable groundwater levels.
2) Groundwater flow maps showing that the basin discharge has moved north to near the Borrego Springs Airport and away from the Borrego Sink
3) Figure 2.2-21B represents that annual water use has declined by ~20% but Figure 2.2-22 B indicates a constant rate of groundwater overdraft.
4) Monitoring well distribution is not identified as a data gap in the report, although the central and southeastern portions of the basin are severely underrepresented with wells. The document states in a number of areas of the report that the number of wells meet the requirements of SGMA. That is NOT the issue The issue is if the distribution of wells allows for an adequate technical understanding of the hydrological parameters of the basin This is clearly not the case within the central eastern portions of the basin.

I24-11 Cont

Thank you for the opportunity to offer these comments to the draft document. Please let me know if I can provide any assistance with this issues

Sincerely

John Peterson
California Certified Hydrogeologist #90
P.O. Box 512
Borrego Springs Cal. 92004
petersonenv@hotmail com
858-220-0877

INTENTIONALLY LEFT BLANK

Letter I24

Commenter: John Peterson, California Certified Hydrogeologist (No. 90)
Date: May 15, 2019

I24-1 The Groundwater Sustainability Agency (GSA) welcomes your comments on the Draft Groundwater Sustainability Plan (GSP) and acknowledgment of the positive steps the Draft GSP makes to achieving sustainability.

I24-2 The executive summary has been revised to clarify the location of wells where groundwater levels have remained stable at the edge of the Borrego Springs Subbasin compared to other areas of the South Management Area (SMA) where groundwater levels have been documented to be declining.

I24-3 The GSA notes your comment that it has been well known and long established that Borrego Valley drains (flows) toward the Borrego Sink and down Borrego Sink Wash toward the east. The groundwater water level contour maps produced in the Draft GSP are for the Spring of 2018, Fall 2018, 2010 and 1945 (Figure 2.2-13A-D). As pumping ramped up in the basin groundwater that flowed and discharged to the Borrego Sink under the pre-pumping conditions has been captured as evidenced by dry springs and wells, and desiccation of the honey mesquite bosque. Two pumping-related depressions are exhibited in the data collected, one centered on the agricultural areas north of Henderson Canyon Road, and possibly another centered around a cluster of wells north of the Ram's Hill Country Club (Figure 2.2-13A).

Best available data for developing groundwater level contours maps indicate that groundwater flow that historically moved to the Borrego Sink is being captured by pumping. That is the cone of pumping depression in the North Management Area (NMA) is broadening from the pumping center outward to the Borrego Springs Airport. As pumping currently greatly exceeds inflows to the Subbasin, it is expected that pumping centers will dramatically disrupt the natural groundwater flow gradients including intercepting flow that once traveled to the Borrego Sink and down Borrego Wash. While additional monitoring wells could improve development of groundwater level contours in the area of the County Airport, the lack of additional monitoring wells is not identified as a substantial data gap for GSP implementation at this time. That said, the GSA is reviewing the potential for funding additional monitoring wells throughout the Borrego Springs Subbasin.

I24 -4 The GSA notes your comment that Figure 2.2-15 should be clarified to indicate that the Carrizo Impact bombing range covers about 400 square miles. This is clarified in the GSP text on pg. 2-62.

I24-5 Inflows and outflows reported in the charts come from the Borrego Valley Hydrologic Model (BVHM), and the outputs from the model are included in the model update report (Appendix D1 of the GSP). Figure 2.2-22B represents the total cumulative change in storage, so each point on the graph represents an addition of the storage lost in that year to the total storage lost throughout the model period. Inflows exceed outflows for every year for the past 20 years, so the cumulative change in storage continues on a downward trend.

Additionally, average pumping as reported by the model does not change much during the last 20 years of the model run, with average pumping from the last 20 years of the model run of 16,466 acre-feet per year (AFY), average pumping for the last 10 years of the model run of 16,855 AFY, and average pumping for the last 5 years of the model run of 15,567 AFY. There are slight changes in the slope of the line in water years 2004, 2005, and 2012, when inflows to the basin in the model were higher than other years. The result of this is that the average annual change in storage for the past 20 years is a loss of 11,955 AFY, for the past 10 years is a loss of 13,098 AFY, and for the last 5 years is a loss of 10,604 AFY. Figure 2.2-22A depicts the groundwater inflows and outflows by year for the period 1945 to 2016. The period from 2010 to 2016 occurs during a dry period with low recharge compared to wetter periods. This results in continued loss of groundwater in storage at about the same rate even though groundwater extraction is reduced over this period.

I24-6 Data gap associated with the area north of the Borrego Sink is identified on pg. 2-54, and the GSP has been amended to clarify.

I24-7 As indicated in response to Comment I24-6, the data gap associated with the area north of the Borrego Sink is identified on pg. 2-54, and the GSP has been amended to clarify.

I24-8 GDE Unit 2 Palm Canyon area should reference Anza-Borrego Desert State Park (ABDSP) Well 3 and not the Horse Camp Well. The Draft GSP has been revised with the correct well.

I24-9 As indicated in response to Comment I24-6, the data gap associated with the area north of the Borrego Sink is identified on pg. 2-54, and the GSP has been amended to clarify.

I24-10 The GSA acknowledges your comments on the ENSI report. Figure 5 was produced by Tim Ross of the California Department of Water Resources (DWR). The DWR has data from private wells that are not available to the GSA because of confidentiality agreements between private pumpers and the DWR. As such, the exact location of these private wells is unknown and are therefore not presented on Figure 4. The ENSI Appendix D2 is one report not two. Appendix A of the ENSI report provides the seminal work from DWR referenced in the ENSI Report.

I24-11 The GSA acknowledges your professional opinion that several issues remain outstanding. The commenter provides conclusory remarks, and summarizes the comments provided in the letter. These issues have been responded to above under responses to Comment I24-1 through Comment I24-10.

INTENTIONALLY LEFT BLANK

Comment Letter I25

Groundwater Management at Borrego Springs

There are two additional sources of underground water flow that should be considered to help solve the issues with the decreasing underground water basin under Borrego Springs.

1. Clark Well, close to Clark Dry Lake between Coyote Mountain and the Santa Rosa Mountains, is one source. However, there might be concern over water quality. Also, going further up Rockhouse Canyon for cleaner water is limited by the Santa Rosa and San Jacinto Mountains National Monument. I25-1

2. San Felipe Wash is a much larger source of water which follows highway 78 to Texas Dip on the Borrego Springs Road and ends less than a half mile from highway 78. It also has drinkable water upstream at Yaqui Well and Tamarisk Grove campgrounds. Additional underground water flow is added from the south side of highway 78 from Pinyon Mountains. All of these sources follow the Felipe Wash to Ocotillo Wells where additional underground flow is added from Fish Creek Mountains to the South. The total groundwater flows south of the Salton Sea toward Brawley and the Mexican border where farming is supported from the Colorado River. I25-2

   2.1. It seems like the Narrows Earth Trail point along highway 78 is the optimum spot to tap into this flow for Borrego Springs and will require hydrologists checking into the quality and quantity of water at this point. If tests are okay, pipe can go around the east end of Yaqui Ridge and run downhill to Rams Hill steel tanks with enough water for Rams Hill and Casa del Zorro. I25-3

I recommend that 2.1 be tested A.S.A.P

Robert Kleist
Retired Stanford MSEE

Solar/Electric Management at Borrego Springs

Solar Energy Management (Mgt.) can collaborate with Water Mgt. for storing both water and electric energy for local distribution that needs to be optimized for geographical locations. I25-4

1. An example of solar energy generation has been completed at the new library. Here the covering the of the shaded parking has solar panels much like one would find on a rooftop. This type of shaded parking could be extended to schools, businesses, and hotels/motels.

2. Solar Energy Mgt. could collaborate with Groundwater Mgt. to pump water from additional underground water flows to elevations that would store both water and electric energy. I25-5

3. Underground utilities for both water and electrical energy have regional populated areas. Connections between these regions should be steel poles with safe conduction in severe weather. I25-6

4. The regional availability of water and electric energy at the lowest cost and safety varies geographically. Solar energy is optimal for Borrego Springs with local management and collaboration with Hydrologists. I25-7

Robert A. Kleist

Robert A. Kleist 5/8/2019

Letter I25

Commenter: Robert Kleist, California Certified Hydrogeologist (No. 90)
Date: May 8, 2019

I25-1 The Groundwater Sustainability Agency (GSA) acknowledges your comment that there are two additional sources of water flow that should be considered, including (1) Clark Well and (2) San Felipe Wash. Both of these sources of water supply have been studied extensively by the Borrego Water District who evaluated the feasibility of importing groundwater from the Clark Dry Lake, Ocotillo Wells Subbasin and Allegretti Farms (Ocotillo-Clark Valley Groundwater Basin) (Burzell 2006). The Borrego Water District (BWD) evaluation found these projects to be economically infeasible.

I25-2 As described in response to Comment I25-1, the Borrego Water District evaluated the potential for water supply from the Ocotillo Wells Subbasin near San Felipe Wash and found the project to be economically infeasible.

I25-3 While the Narrows Earth Trail point along Highway 78 has not been studied extensively, the cost for a pipeline to District wells near the intersection of Borrego Springs Road and Highway 78 (closer than the Narrows Earth Trail) was determined not to be economically feasible. Additionally, the Narrows Earth trail is located in the Anza-Borrego Desert State Park (ABDSP) who would likely not approve drilling and construction of wells within the park boundary.

I25-4 The GSA notes your comment that solar energy management can collaborate with water management for storing water and electric energy and that solar energy can be extended to additional facilities.

I25-5 The GSA notes your comment that solar and groundwater management could collaborate to pump water from underground to elevations that would store both water and potential electric energy.

I25-6 The GSA notes your comment that utility connection should be steel poles between regionally populated areas.

I25-7 The GSA notes your comment that solar energy is optimal for Borrego Springs.

INTENTIONALLY LEFT BLANK

Comment Letter I26

County of San Diego
Planning & Development Services
C/O Mr Jim Bennett (by email to. PDS.LUEGGroundWater@sdcounty ca gov)
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 21, 2019

CC (by email)
Gary Haldeman, BWD Ratepayer Representative
Borrego Water District

RE: Draft Groundwater Sustainability Plan for Borrego Valley Groundwater Subbasin

Dear Mr. Bennett,

I am a Borrego Springs resident and homeowner and I am writing to comment on the draft Groundwater Sustainability Plan (GSP) for Borrego Springs

Comment 1

Section 4.1.1, page 4-21 states "The BPA [Baseline Pumping Allocation] is determined to be the maximum annual groundwater extraction during the baseline pumping period .. The BPA methodology developed for the subbasin is detailed in Appendix F." It must be noted that the methodology outlined in Appendix F is not a measure of ***water extraction*** over the survey period It is, rather, a method to estimate the ***irrigation needs*** of agricultural and recreational pumpers in the subbasin.

This is not to say that the methodology in Appendix F is inappropriate – it is certainly better than nothing, but it is a scientific ***wild guess*** rather than a precise measurement. Could the number be off by a factor of 20%? As much as 30% or more? This imprecision was not addressed in the GSP.

This is important because:

1. The calculated BPA for the subbasin – and basis for possible future adjustments – is based on two sets of data: one is an historical record of pumping by the Borrego Water District (BWD), a history that goes back well over 50 years. The other is the estimate of unknown accuracy generated by Mann. The BWD data set should only be subject to future "adjustment" if the data are proven to be in error Any miscalculation of current water extraction from the subbasin must be assumed to be an error in the ***estimated value;*** any future adjustment to the BPA must only be applied to the ***estimated values.*** I26-1

2. Table 4-2 on page 4-15 quotes Mann (the author of the methodology in Appendix F): The "potential water savings for agriculture is less than 2% of the BPA. ." If the total volume of water extracted by agricultural and recreational interests can be only grossly estimated, it is unreasonable and unscientific to assign a precise value for potential water savings.

Support:

Appendix F outlines a methodology using ***evapotranspiration*** (ET) which estimates water use by an individual plant species in order to estimate the plant's water requirements over time This number is then used to estimate water use by a field of similar plants The methodology in Appendix F makes many assumptions about local terrain, temperature, wind conditions, growing seasons, and applies those assumptions to large tracts of land under irrigation in the Borrego Subbasin One of those assumptions, for example, involves ***soil moisture content*** (SMC)

1 of 3 | Page

The measurement of SMC is intimately tied to the ET in calculating irrigation needs of plants. SMC is not considered in the methodology outlined in Appendix F because variations in soil properties, terrain, temperature and wind conditions would make the task impossible. The resulting methodology outlined in Appendix F ignores SMC and assumes that all soil under every crop and every section of turf irrigated by agricultural and recreational pumpers is exactly equal. And the value derived, however inexact, is a calculation of the irrigation needs of the subbasin, not a measure of the water extracted over a five year period of time

Water use by agriculture in the region is an estimate based on numerous factors outlined on page 4-11 of the GSP Considering all of the unknowns involved in arriving at the agricultural and recreational portion of the 15,729 AFY (Acre Feet per Year) baseline, the accuracy of this number should be questioned or, at the very least, it should be assigned a margin of error to indicate the precision of the approximation Is the actual number 15,729 AFY +/- 20%? +/- 30%? I26-1 Cont.

Considering the inexact method for deriving the agricultural extraction values, 2% would seem to be well within the range for a rounding error. However the assumption made by Mann in his 2014 analysis is that the "potential water savings for agriculture is less than 2% of the BPA..." The 2% value is illogical and unreasonable, especially when this number (Estimated Potential Water Savings) is used in the calculus to determine the BPA for all users, including BWD ratepayers, where history shows *actual* water extraction data for over 50 years, not based on estimates.

Comment 2

The BWD has recorded over 50 years of pumping data, which represents the ***"best available information"*** for water extraction in the subbasin Chapter 4, section 4 0 of the GSP states "Under the Regulations, the Groundwater Sustainability Plan (GSP) is to include the following. 3. Projects and management actions [PMA] shall be supported by best available information and best available science." To achieve fidelity with this mandate the entire BWD water pumping record must be considered in the BPA allotment formula, not the narrow window of 2010-2015 which is used in the GSP. Considering only the BWD 2010-2015 usage levels (after significant conservation measures were already in place, reducing water use in the district by over 50%) penalizes municipal water users for their conservation efforts. The BPA for BWD ratepayers must factor in the entirety of the historical usage record

Support: Applying the 2010-2015 survey period for all entities may seem to level the playing field for all water users in the district, but that is an unreasonable assumption. I26-2

The opening of Section 4 3 of the GSP states: "The BWD has historically implemented measures to encourage efficient water use These include a tiered water rate structure and other incentive programs (BWD 2009). In the past, rebate programs were established for the purchase of low flow toilets, low water use washing machines, and high water use turf removal. [Note. these measures were implemented prior to the 2010-2015 BPA survey period.] The Borrego Springs Community Plan (County 2013) includes a policy requiring the continuation of ...aggressive, multi-faceted water conservation programs to reduce existing agricultural, golf course, commercial and residential [water] use"

The irony of this situation is that, even with significant savings by the BWD ratepayers, the water table in our aquifer has continued to drop an alarming rate. The only plausible explanation is that non-metered pumpers have extracted the entire BWD water savings Using the 2010-2015 dates to calculate the BWD share of BPA perversely increases agriculture and recreation's baseline by adding BWD's water savings to their total.

2 of 3 | Page

Comment 3

If a 74% reduction must be achieved for all pumpers in the subbasin, the BWD should be awarded a BPA of at least 1,000 AFY PMA #3 states in part: "Each non-de minimis groundwater user within the subbasin will be assigned an allocation based on its historical groundwater use." To achieve fidelity with PMA #3 the Baseline Pumping Allocation (BPA) for the Borrego Water District (BWD) must be based on the 50 year historical BWD average of over 4,000 AFY. Furthermore, since the BPA for BWD is based on historical fact (unlike the BPA for agricultural and recreational pumpers which is an estimate with an unknown level of accuracy) the BPA for BWD ratepayers must be fixed and not be subject to any downward adjustment in the future. If a downward adjustment in BPA would become necessary in the future it must be borne solely by those entities whose BPA is based upon an estimate I26-3

> Support: The BPA is derived from five years of recorded historical data from the BWD and *an estimate* of water extraction by agricultural and recreational pumpers from the 2010-2015. Selecting these dates, while ignoring over 50 years of historical pumping data from the BWD places the community of Borrego Springs at an extreme disadvantage because it fails to capture the success of the community's conservation efforts over the past two decades. Our community's population is relatively unchanged in decades but our water use has decreased by well over 50% in the last 20 years. The conservation efforts resulting in those water savings were, for the most part, already in place before 2010. Where actual historical data are available, as in the case of the Borrego Water District, it must be used as specified in PMA #3.

Comment 4

PMA #5 discusses Water Quality Optimization but only addresses naturally occurring contaminants. Contamination from outside sources must be considered in the GSP as well If contaminants are being introduced from an outside source the parties responsible must be held accountable for any remediation that might be necessary. I26-4

Comment 5

Tourism is the primary industry in Borrego Springs The 600,000-acre Anza-Borrego Desert State Park which surrounds the town is the largest desert state park in the nation, and attracts hundreds of thousand of visitors every year. Among the most popular local attractions are ***groundwater dependent ecosystems*** (GDEs). palm canyons, maidenhair waterfalls, and mesquite forests. The GSP recognizes that substantial damage has already been done to area GDEs, this damage is especially evident in dead mesquite forests and severely stressed mesquite bosques GDEs must be given greater consideration in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support. I26-5

Thank you for reviewing and considering my comments. Your efforts are greatly appreciated

Regards,

Garold L. Edwards
312 Ocotillo Circle; Box # 1858
Borrego Springs, CA 92004
caroldedwards@gmail.com

3 of 3 | Page

INTENTIONALLY LEFT BLANK

Letter I26

Commenter: Garold Edwards
Date: May 21, 2019

I26-1 The Groundwater Sustainability Agency (GSA) acknowledges the commenters concern regarding the lack of specificity and precision in reporting information on baseline pumping allocation. In response, the Groundwater Sustainability Plan (GSP) is explicit about how the baseline pumping allocation (BPA) was determined, including the method to estimate agricultural pumping. Title 23 California Code of Regulations (CCR) Section 354.18(b) states (emphasis added): "the water budget shall quantify the following, either through direct measurements ***or estimates based on data***: [...] Outflows from the groundwater system [...]." The methodology was not developed by Mann, but by the GSA as provided in Appendix F. The reference to Mann (2014) in Table 4-2 refers only to the estimated water savings that conservation measures might achieve for the agricultural uses in the Subbasin. The footnote to Table 4-2 references 2% as simply the percentage of the total BPA for the agricultural sector that potential water savings consist of. The GSA has edited GSP Section 4.4 (pg. 4-20) to further clarify that the BPA is partially estimated. The GSA acknowledges the comments regarding the methodology.

The GSA has recognized that direct measurement is preferable to estimating water use, and therefore is requiring that all non-de minimis wells in the Subbasin install flow meters, in accordance with the Metering Plan included as GSP Appendix E2.

I26-2 The commenter is referred to the Baseline Pumping Allocation and Pumping Reduction Program master response. While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed. In response to establishing 2010 through 2014 as the baseline pumping period, the GSA sought extensive public input prior to determining the time period for the baseline pumping allocation. Please see meeting minutes from September 28, 2017, November 17, 2017, and January 25, 2018. They can be found on the County's SGMA website at: https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html.

I26-3 The commenter is referred to response I26-2.

I26-4 The GSA acknowledges the comment on Project and Management Action (PMA) No. 5 (Water Quality Optimization). As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of PMA No. 5.

I26-5 The GSA acknowledges the comment on the importance of local attractions to the region's tourism. The commenter is referred to the master response on groundwater dependent ecosystems (GDEs).

Comment Letter I27

Mark C. Jorgensen
Post Office Box 7
665 Tilting T Drive
Borrego Springs, CA 92004

County of San Diego
Planning and Development Services
C/O Mr. Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 17, 2019

Mr. Bennett:

Thank you for your tireless involvement in the development and implementation of the Borrego Valley Groundwater Sustainability Plan. Your keen awareness of our valley overdraft has been key to the progress made by our local Borrego Water District and Ratepayers Committee. Mr. Gary Haldeman has held eighteen public meetings so far to inform local residents and to glean opinions and comments from hundreds of local citizens. Here, I offer my comments to the GSP and I am including data I have gathered from two transects measuring the health status of two separate mesquite bosques in Borrego and Clark valleys. I will be conducting at least three more transects in the Borrego Sink area from Borrego Valley Airport to the southeast margins of the Sink. My data show that in the Clark Valley, a nearby aquifer that is essentially untapped by pumpers, show that approximately 11.8% of the existing mesquite trees are dead, and in the overdrafted Borrego Sink area, I counted 53.8% of the mesquites were dead. I27-1

I have been a resident of Borrego Springs for more than forty years and have been involved in various water meetings and aquifer reports since the early 1980's. I worked at Anza-Borrego Desert State Park for thirty-three years in the capacity of Park Superintendent, Resource Ecologist, State Park Ranger and State Park Naturalist. I have observed the severe impacts of aquifer overdraft and have documented those impacts in the Mesquite Bosque as well as in the drying of Coyote Creek, where the creek completely dries up at the Second Crossing these days. Since observing Coyote Creek beginning in 1963, I never saw the Second Crossing dry until seeing it completely dry in three or four summers within the last decade.

First I'd like to state that my comments center around five basic principles:

1) A minimum of 2,000 acre feet of water should be allocated for municipal use here the Valley This will secure future water deliveries for household and small business use and potentially allow for some future development needs.
2) The timeframe originally set in the GSP extends out to 2040 for full implementation. This schedule for full compliance needs to be shortened considerably to preserve our finite groundwater supply. A twenty year timeframe allows for continued drawdown by agriculture, golf courses and households and further jeopardizes our aquifer. My opinion is that a maximum I27-2

of eight to ten years should be enforced for full compliance. Even in this scenario, our aquifer levels can be expected to decline another twenty feet.

3) Serious consideration needs to be given to water quality as the drawdown continues. As the total supply of water in the aquifer decreases, experts generally agree the quality of our potable water will also degrade.
4) The GSP discounts the impact of continued pumping on Groundwater Dependent Ecosystems. In fact, the plan states there are no GDE's in the Borrego Valley region that fall within the purview of the GSP. This is an absurd point of view. The guidelines set for inclusion of GDE impacts state that no impacts prior to 2015 can be considered. Does this do justice to the known impacts drawdown has obviously had on the Mesquite Bosque plant community? Which water consuming faction does this benefit? Certainly not the small business owners or the residents, but it obviously does benefit the farmers and golf course operators. To conveniently select 2015 as a cutoff date for environmental impacts is ludicrous and defies common sense. Sixty years of agricultural pumping, without consideration of environmental consequences, is what has brought us to this dire situation today. GDE's in Borrego Sink, Lower Willows of Coyote Canyon and Borrego Palm Canyon need to be embraced not rejected.
5) I have been commenting for a couple of decades on the data used to calculate the natural inflow of water into our aquifer as well as the estimated pumping figures. My problems with the numbers are as follows. The numbers have changed over the last fifteen years or so, based on no monitoring stations or well-head gauges on agriculture of golf courses. In the 1990's to early 2000's the figures we were given in public forums were that rainfall and runoff into the valley delivered approximately 4,000-4,500 a/f per year. Extraction figures were considered to be around 24,000 a/f per year. Today, in the absence of accurate measurements, the figures have changed to natural inflow of 5,700 a/f per year and pumping at about 20,000 a/f per year. Where did these data come from? The Coyote Canyon water gauging station was destroyed by flashfloods decades ago and when replaced by a new one at the Second Crossing by DWR, the new station quickly went into disuse. I was informed by DWR monitors the gauge never captured low flows or high water events experienced during flashflood events. The gauge in Borrego Palm Canyon was destroyed in a major flood event so data from that location has also been based on estimates. It appears once again that the changing data does not benefit the local residents or small business but has a definite benefit to future allocations to farmers and golf courses. The figure of 5,700 a/f per year is a benchmark for future allocations to residents, farms and golf courses. My opinion is this figure is high, based on estimates, and does not take into consideration our persistent droughts or future climate change.

I27-2 Cont.

I have concerns with several other aspects of the GSP and statements made within it. General assumptions are made within the Plan stating that water levels in the southeast region of Borrego Valley have remained "fairly constant". Actually, what is constant is the decline of the aquifer in this area, as evidenced by two wells monitored in this portion of the Borrego Sink, I27-3

Wells MW-3 and MW-5. Well MW-3 has declined more than thirteen feet in the last decade and well MW-5 has been drawn down by almost nine feet. These wells are located in the southeastern margin of our aquifer and this startling decline in indicative of the valley-wide water table drawdown.

Assumptions are made about various regions of the valley and the plan divides the aquifer into three regions, North, Central and South. Many of the wells are concentrated in the north and south, while I find the Central region is grossly under-studied, and therefore *conclusions on its status are lacking scientific scrutiny.* The area north of Borrego Valley Airport and east and west of Pegleg Road show virtually no monitored wells. There are a score of existing wells that could be studied, but are not. I suggest the County begin manual measurements over time, or that the County partners with the Borrego Water District to install monitors on the many well-heads available. Several of these which could be studied are located on County property at the Borrego Valley Landfill. Other wells are private but could be monitored with landowner cooperation. Data derived from more widespread wells could certainly provide a clear picture of what is really happening valley-wide. You have stated there are plenty of wells being monitored and you see no need to install more monitoring stations. I would agree there "are plenty of monitored wells" but would argue they are not evenly spread throughout the valley to give us a clear picture of the severity and widespread character of the overdraft. I27-3 Cont.

I thank you for the opportunity to comment during this public comment period and assume I will have another chance to preview the final version of the plan before it goes for final approval. I sincerely hope the timeframe of the implementation can be constrained to less than a ten year period, that GDE's will take a more realistic role in the plan, that a fair portion of available water is allocated to residents and small businesses, and that the figures for natural inflow and realistic pumping can be brought into a more rigorous scientific realm. I27-4

Sincerely,

Mark C. Jorgensen

Mark C. Jorgensen
Borrego Springs, CA

Attachment: Mesquite Transect 2019

Mesquite Transects, 2019

I27-5 Cont.

Clark Dry Lake, West Side, Rockhouse Canyon Road GPS CLKMES Elev. 555'

Start of Transect@ 33.32459N (first mesquite on Rockhouse Canyon Road)
116.28895W

End of Transect@ 33.36090N (Last mesquite north of old rock quarry)
116.30424W

Live Mesquite= 239

Dead Mesquite= 32

Total Mesquite Counted from Road= 271 **Percentage of Mesquite Dead= 11.8%**

Borrego Sink off Yaqui Pass Road GPS MESQ.2 Elev. 469'

(End of YP Road, turn left, 1st fork in dirt road)

Start of Transect@ 33.22811N Begin at 1st Fork in dirt Rd. W. of YP Road
116.33143W

End of Transect@ 33.23412N End at Old House
116.32790W

Live Mesquite= 456

Dead Mesquite= 525

Total Mesquite Counted from Dirt Rd.=981 **Percentage of Mesquite Dead=53.5%**

J
Mark Jorgensen
PO Box 7
Borrego Springs, CA 92004

SAN DIEGO CA 920
17 MAY 2019 PM 5 L

County of San Diego
PLANNING & DEVELOPMENT SERVICES
c/o Mr. JIM BENNETT
5510 OVERLAND AVE. SUITE 310
SAN DIEGO, CA 92123

RECEIVED
MAY 21 2019
Planning and
Development Services

92123-123585

INTENTIONALLY LEFT BLANK

Letter I27

Commenter: Mark Jorgensen
Date: May 17, 2019

I27-1 The Groundwater Sustainability Agency (GSA) acknowledges the comments about the health status of mesquite bosque communities in the Borrego and Clark Valleys. The commenter is referred to the master response on groundwater dependent ecosystems (GDEs).

I27-2 The GSA acknowledges the commenter's principles and opinions. The GSP adequately complies with Sustainable Groundwater Management Act (SGMA) and gives proper consideration to each issue raised, including baseline pumping allocation (BPA), Groundwater Sustainability Plan (GSP) implementation timeframe, water quality, GDEs, and the water budget. SGMA legislation does not require the GSA correct undesirable results that occurred prior to 2015. As stated in Chapter 3, "it is unfeasible that any PMA [project and management action] developed by the GSA will result in recovery of the honey mesquite GDE." It would require an immediate halt of water use in the Subbasin and an unrealistic reversal of groundwater level trends.

I27-3 With regard to the characterization of groundwater levels and the assertion that the Central Management Area (CMA) has insufficient monitoring data, the commenter is referred to the response to Letter I24, which raises similar concerns.

I27-4 The commenter is referred to response to Letters I47 – I89 regarding the GSP's implementation timeline.

I27-5 The GSA note the data provided by the commenter that measure the health status of the Mesquite Bosque. This information has been considered for inclusion into Appendix D4 of the GSP.

INTENTIONALLY LEFT BLANK

Comment Letter I28

From:	Don <lagoondon@gmail com>
Sent:	Tuesday, May 21, 2019 5:24 PM
To:	LUEG, GroundWater, PDS
Subject:	Borrego Groundwater Sustainability Plan
Attachments:	Comment Letter to Borrego Water District.pdf

Attached is my comment letter on the Borrego Valley Groundwater Sustainability Plan.

Don Rideout
145 Basil St.
Encinitas, CA 92024

1

Comment Letter on Borrego Valley Groundwater Sustainability Plan

Overall the document is well researched and well written There is no question that sustainability must be the goal and that the recommended reductions in water usage are necessary to ensure that there is adequate water available in the future for <u>any</u> users

My comments that follow address the question of what happens to agricultural land after it is fallowed The options are to convert the land to some type of non-irrigated agriculture, to develop the land for residential purposes, or to preserve the land as open space. Preservation of the land as open space will require the most planning by BWD.

When irrigation of agricultural land is discontinued, the effects will depend in part on the type of agriculture being carried out. Citrus and palm groves represent the majority of acreage. In general, the effects of fallowing will consist of invasion by non-native plants and windblown dust. Both effects would be very negative for the valley. As the document notes, active revegetation with native desert plants can be very expensive, requiring irrigation to get the plants established and significant labor to install and maintain the planting.

My recommendation is to pursue passive restoration. The first step should be to <u>not</u> remove existing palms or citrus trees The roots of these plants are important in retaining the soil and preventing windblown dust. The document notes that dead citrus trees will be unsightly. While this is true, these dead trees also shade the ground, helping to retain moisture after rain. Standing dead trees have some wildlife value, and they will serve as a reminder to us about how we got into our current predicament

I28-1

The next step would be to establish a conservancy to take ownership of the land and have management responsibility. I recommend a new conservancy because I doubt that BWD or Anza-Borrego Desert State Park would be interested in taking ownership of these lands. Management of fallowed agricultural land appears to be outside the mission of any existing governmental or non-governmental entity in our area. I envision the conservancy as being primarily volunteer based to keep costs at a minimum. The conservancy can pursue grants to carry out functions such as invasive weed removal, supplemented by volunteers.

In addition, the conservancy can carry out small scale revegetation projects by collecting seeds and cuttings of native plants from private properties in the valley, with permission from the owners. Plants such as creosote bush, burro bush, palo verde, ocotillo, cholla, jojoba, brittlebush, and many others can be started in this manner. Some minor irrigation may be required initially, but the quantity will be vastly less than either existing agriculture, residential development, or irrigation for dust control. Once these plants become established, they will become self-sustaining without need for irrigation, and they will play a major role in preventing windblown dust and invasion by non-native species In revegetated areas, remaining dead trees can be cut down to a stump and allowed to degrade naturally. Brush piles can be created in selected areas to provide hiding places for reptiles, birds, and small mammals. We will need to have a realistic timeline for passive restoration In my experience, 10-20 years will probably be needed to get good coverage with native plants While some residents might want to see this happen faster, we must remember that desert plants grow and propagate at their own rate We will need to adjust our expectations accordingly

The problem of invasive plant species is an enormous one for the community The best way to combat these weeds is to encourage native plants. We do not want fallow agricultural land to become a new opportunity for these noxious plants to expand. The conservancy will need to have a strong program of weed removal to accompany the passive restoration efforts. Fortunately, it is easier to keep weeds from fallow land because we will be starting with land that has already been cleared.

As former president of the Anza-Borrego Desert State Park Botany Society, I have some background in this subject. I would be happy to volunteer my time to assist with any of these tasks. I realize that our first step is adoption of the plan. However, agricultural land is already being fallowed, and we need to be ready to take effective management actions as soon as possible. Thank you for considering my comments

I28-1 Cont.

Don Rideout
145 Basil St.
Encinitas, CA

and

672 Verbena
Borrego Springs, CA

INTENTIONALLY LEFT BLANK

Letter I28

Commenter: Don Rideout
Date: May 21, 2019

I28-1 The Groundwater Sustainability Plan (GSP) includes Project and Management Action (PMA) No. 4 – Voluntary Fallowing of Agricultural Land. As indicated in the GSP, the Groundwater Sustainability Agency (GSA) will prepare policy development and the California Environmental Quality Act (CEQA) documentation after GSP adoption in advance of considering formal adoption and implementation of a voluntary fallowing program. The commenter is encouraged to review the CEQA document and submit comments on PMA No. 4 at that time.

INTENTIONALLY LEFT BLANK

Comment Letter I29

Judith R. Davis
P.O. Box 993
Marion MA 02738

May 14, 2019

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

I have spent time in the winter in Borrego Springs for the past eleven years and am an active participant in the Borrego community. During this time, I have learned first-hand about the need to conserve water there. I have also learned about the Groundwater Sustainability Plan (GSP) and would like to share with you some of my main concerns about the implementation of the GSP.

The Borrego Valley aquifer has been drastically over-drafted for many years. Borrego Springs must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District or BWD) – 10%
- Recreational pumpers (Golf courses) – 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) – 70%

The current GSP seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3,500 acre-feet/year to the current level of 1,700 acre-feet/year, a reduction of 50%. The Borrego Springs municipal ratepayers have done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets. I29-1

In contrast, the recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete the aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of the community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

Therefore, here are some objectives I believe must be included in the implementation of the Groundwater Sustainability Plan.

- ***The municipal baseline pumping allocation (BPA) should be no less than the 1,700 acre-feet/year currently being used by the BWD*** This is Borrego's only source of drinking water, which should be a priority for the community. This would allow for some limited growth of homes and businesses.

  Baseline pumping allocations (BPAs) are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to municipal ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3,926 acre-feet/year. In 2010, BWD pumped 2,730.5 acre-feet/year, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1,700 acre-feet/year. I29-2

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 acre-feet/year. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses. *Thus, choosing 2010-2014 as the baseline years to determine BPAs is to the detriment of the town's ratepayers. This timeframe is clearly unfair as it unquestionably favors farmers first and golf courses second, the same pumpers who have created Borrego's critical overdraft situation.* I29-2 Cont.

- ***Sustainability should be achieved sooner than the mandated 20-year period.*** The sooner Borrego can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin. I29-3

I hope you will consider these concerns and modify the GSP implementation to create a fairer and more sustainable solution to Borrego's serious water crisis.

Best regards,

Judith R. Davis

Letter I29

Commenter: Judith Davis
Date: May 14, 2019

I29-1 The comment provides introductory statements and does not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary.

I29-2 The Groundwater Sustainability Agency (GSA) acknowledges the commenter's request that Borrego Water District not be subject to reductions below 1,700 acre-feet per year, as well as the commenters concern about using the period from 2010 to 2014 to establish baseline pumping allocations.

While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed. In response to establishing 2010 through 2014 as the baseline pumping period, the GSA sought extensive public input prior to determining the time period for the baseline pumping allocation. Please see meeting minutes from September 28, 2017, November 17, 2017, and January 25, 2018. They can be found on the County of San Diego's (County's) Sustainable Groundwater Management Act (SGMA) website at: https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I29-3 The GSA acknowledges the commenter's request to front load groundwater reductions to a time period less than 20 years.

While the GSP does not set specific groundwater use reductions or rampdown schedule, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter I30

From: carylowe@cox.net
Sent: Friday, May 17, 2019 4:02 PM
To: LUEG, GroundWater, PDS
Subject: Comments on Borrego Valley Draft GSP

Dear Mr Bennett,
I wish to comment on the draft Borrego Valley Groundwater Basin Sustainability Plan I speak both as a land use professional with a long history in dealing with water issues and as a 40-year property owner in Borrego Springs. In an effort to avoid repetition of comments you have received from others, I will limit my comments to just a few key points:

I wish to comment on the draft Borrego Valley Groundwater Basin Sustainability Plan. I speak both as a land use professional with a long history in dealing with water issues and as a 40-year property owner in Borrego Springs. In an effort to avoid repetition of input you have received from others, I will limit my comments to just a few key points·

- Agriculture should bear a significantly greater share of mandated water use reductions than is currently proposed. Over 70% of historical water consumption in the Borrego Valley is attributable to agriculture. With no restrictions on pumping and little incentive to conserve, these interests have taken advantage of their rights under California water law to effectively drain the groundwater basin, thereby assuming primary responsibility for the current critical overdraft condition. In return, they have provided only a small contribution to the valley's economy in terms of jobs or revenue. Now, it is proposed that they reduce their consumption in the same proportion as the rest of the community. While that may seem fair at first impression, it ignores the fact that the agricultural landowners can reduce consumption by selling their property to parties who will maintain it as open space or convert it to non-ag uses. In other words, reducing consumption imposes little burden on the agricultural users; it actually provides them with a profit opportunity which would be unlikely to exist if there were not a legislative mandate to drastically reduce water consumption Consequently, agriculture should bear a disproportionately higher percentage burden for reduction in water consumption.

- Recreational users can be distinguished from ag users. Recreational water users, primarily golf courses, are responsible for about 18% of total water consumption. Like ag users, they have been free to pump without limit for many years, and similarly bear a disproportionate responsibility for the current overdraft condition. However, they may be distinguished from the ag users While the golf course and hotel interests also have the option, in theory, of "fallowing" their land, they have enormous investments in their operations and they make a substantially greater contribution to the local economy, so a stronger argument can be made for not burdening them to the point of undermining their economic viability

- Residential and other users should be exempted from mandatory water use reductions. Residential users are responsible for a mere 10% or so of water consumption. Given the very small amount of exterior landscaping at virtually all homes in the valley, any significant cutbacks in water usage will affect primarily indoor use and will therefore severely impact the health and safety of residents. That alone should invalidate the proposed reductions as applied to residential users. Moreover, this impact will be sufficiently great as to render most homes incapable of supporting human habitation. Since that is the only permitted use of those properties, the proposed cutbacks will constitute a complete and permanent regulatory taking of those properties. The county would then be liable for the value of all those homes This is particularly a concern as to specialized residential uses such as the Borrego Air Ranch which fall into the category of "other" users. A regulatory taking of those properties would subject the county to liability for not only the homes, but for all the flight facilities and other improvements as well. Given that water users in this category represent a mere fraction of a percent of total consumption, it seems irrational and punitive to impose on them the same percentage of use reductions to be

I30-1

1

applied to the major water users Inflicting such a burden on users in this category will have virtually no effect on basin conditions, while rendering their properties unusable and creating major liabilities for the county

In summary, I suggest reconsideration of the manner in which future mandated water use reductions are to be applied, with more of the burden being shifted to agricultural users and with residential users being burdened far less, if at all. Thank you for your consideration.

I30-1 Cont.

Cary D. Lowe, Ph.D., AICP
Land Use Attorney & Mediator
3517 Garrison Street
San Diego, CA 92106
Tel (619) 255-3078
E-mail carylowe@cox.net

Letter I30

Commenter: Cary Lowe, PhD, AICP
Date: May 17, 2019

I30-1 The Groundwater Sustainability Agency (GSA) acknowledges the commenter's request to exempt the municipal sector from reductions, and the burden or reductions to be placed on the agricultural sector.

While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions or rampdown schedule, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I31

From:	Bill Haneline <desertwrx15@gmail.com>
Sent:	Monday, May 20, 2019 7:54 AM
To:	LUEG, GroundWater, PDS
Subject:	GSP Borrego Basin Comments

We've been to many Advisory Committee meetings and have heard a lot over couple years. I'm also a board member of the Borrego Springs Community Sponsor Group and a member of the Rate Payer Group

My concerns are over .

Building on available lots. It appears that there will not be enough water in the plan for building out all lots. There needs to be a way to keep most of these lots unbuilt for the rest of us Borrego residents to have water for the future

Keep developments from being built. Do not let developments like Rams Hill and Borrego Springs Resort from building hundreds of new homes, which they have said they would We cannot support this extra burden on our aquifer Also do not let developers build their neighborhoods on virgin deserts or anywhere for that matter Our aquifer cannot support development and the current residents will sacrifice for these new homes. I31-1

Golf courses are very wasteful of water. Using our precious drinking water so golf course owners can make money is just not right. Golf courses boast how their customers keep our community running. They have never shown proof that they do this. Most of our visitors are here for the State Park and the desert. There are 6 golf courses here in the valley and they don't need our water, the residents do! I31-2

Agriculture is basically the biggest enemy of the basin. They overdraft us a tremendous amount. The reason why . they want to make money off our aquifer This water in our aquifer is what us residents need to keep living in the land we love. Agriculture hires a small amount of Borrego residents and the owners don't even live here.
Agriculture has been in the valley for many years and with the GSP it does not look good for them. The history of agriculture in our valley consists of thousands of acres of former farmlands. For decades they have been growing and leaving. Evidence is everywhere you look when you travel our roads. If most of these farms leave and fallow the land, then they will be just like the farms that came before them. Nothing new there. If it wasn't this water issue, then the same thing could happen to them from an insect invasion. I31-3

Water transfers and water credits. Water credits seem to be off the table, but water transfer isn't. There are concerns that wealthy owners can buy water and keep pumping as much as they want. Could there be a future issue with "Wall St." coming in here to make money off our water in a larger scale? Water will turn into a money game between agriculture and golf. I31-4

Anza-Borrego Desert State Park. The valley's economy relies on the State Park. A large majority of the valley's visitors come for the park and the beauty of the desert. Large areas of the Park are affected by the large scale pumpers. Again, these agriculture and golf pumpers are using our water to make a profit off it at the expense of the ecology of the Park. I31-5

What it comes down to is most of our overdraft has been created from businesses using our water for their profit. The residents really need to be protected and still be able to have our present quality of life in the valley I31-6

Thank you,
Bill Haneline

1

INTENTIONALLY LEFT BLANK

Letter I31

Commenter: Bill Haneline
Date: May 20, 2019

I31-1 The commenter suggests no new development be allowed in Borrego Springs. In response, the Groundwater Sustainability Plan (GSP) addresses water use for Borrego Springs subbasin and future land use decisions will need to be carefully coordinated with the County of San Diego, as the land use authority for the unincorporated land within Borrego Springs.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I31-2 The commenter suggests that golf courses are wasteful of water.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I31-3 The commenter suggests that agricultural use in Borrego Valley overdrafts the basin the most with little benefit to the community.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I31-4 The Groundwater Sustainability Agency (GSA) acknowledges the comment that rules to limit hoarding should be included to protect against interests with purchasing excessive amounts of water. Section 4.2.1 of the GSP includes a summary of the process to develop a water trading program which includes identifying unintended consequences of the Water Trading Program to be addressed in development of governing documents (e.g., hoarding, speculation, price fixing, collusion).

I31-5 The GSA acknowledges the commenter's concern for the Anza Borrego State Park.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I31-6 The GSA acknowledges the commenter's concern that the residents water supply needs to be protected.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I32

May 18, 2019

County of San Diego
Planning & Development
% Jim Bennett, Groundwater Geologist
5510 Overland Avenue, Suite 310
San Diego CA 92123

PDS.groundwater@sdcounty.ca.gov

Dear Mr. Bennett,

Concerning the Borrego groundwater plan, it is apparent to me the State and County will basically arrogate unto themselves all the groundwater. This will be a violation of basic property rights extending deep into the history of the the USA. The reason for this action will be the popular will. People want what is not theirs. They want to have what others bought, inherited or earned through legitimate use

Current water usage is measurable, and maybe we know how much is used. We can learn more and then decide what is a reasonable maximum allowable per year. The State and County can determine this usage and offer it for sale. Some kind of equitable limit, aimed at long-term stability, can be set and reset as the more information becomes available.

Since the State and the County will be deciding who gets the water, there must be a plan to allocate the amounts of water used. Based on the law of supply and demand, there will inevitably emerge an equilibrium price, a market price, if the users are required to bid dollar prices in a Dutch auction for water use units per year. Units would be fungible

To my mind, imagining a market for water, there will be one primary beneficiary· the current owners of large water rights who will bid for water like everyone else. They will try to optimize their water use, will have money to spend and cash flow from compensation payments to sustain bidding. I32-1

Secondary beneficiaries will be small users, who will have incentives to pay a lot for small amounts of water. It is possible for households to cut water usage to low levels.

The intention of a market price system is to raise the cost of purchase, thus driving down usage.

Of course, assuming a high price, there will also be auxiliary providers, trucking water in to anyone willing to pay the price.

Borrego is a beautiful peaceful place to live and work. It has a future for agriculture and residential use if water is continuously available. It is in the County's interest to maintain population and business here.

Please adopt my plan for your solution.

Hugh Dietz
PO Box 86
Borrego Springs, CA 92004

hugh.dietz@gmail.com
760 625 6587

INTENTIONALLY LEFT BLANK

Letter I32

Commenter: Hugh Dietz
Date: May 18, 2019

I32-1 The commenter makes suggestions for a future water trading market. While the Groundwater Sustainability Plan (GSP) does not include details of a water trading program, the GSP includes Project and Management Action No. 1 – Water Trading Program. The GSP indicates preparation of a Water Trading and Policy document is intended to begin upon adoption of the GSP.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I33

From: Cristin McVey <cnsmcvey@gmail.com>
Sent: Monday, May 20, 2019 2:34 PM
To: LUEG, GroundWater, PDS
Subject: Public Comment BVGSP

Dear Planning & Development Services,

I wanted to submit a few comments about the Borrego Valley GSP that I will hope will be considered in the next phases.

1. As a ratepayer in the municipal area, I expect to continue to find ways to conserve water at my residence. I know of many other homeowners that are deeply committed to water sustainability and look forward to finding ways to conserve our municipality's water resources, now and in the future. As a homeowner, I would gladly pay higher rates (or a fees from a bond) that would solve this problem and ensure the sustainability of the region. It would also help our home values stabilize and increase over time

2 As far as the structure of any new water rates, I would prefer that those rates be tiered, with water "wasters" paying higher rates (like we do for electricity) Currently we pay the same amount (I believe) per unit no matter how much we use. I know that some in the community feel that the residents should not have to cut back on water (learning that burden to the farms and golf courses), but I feel it should be a community-wide effort and many others feel this way too (maybe not as vocal though) Those who will not do so voluntary might if there was a little economic pressure I33-1

3 As a librarian for the county, I have the opportunity to meet many people, especially families. I am concerned that lower-income families and seniors on fixed incomes will be adversely affected by higher water rates. I would like to see something built into the plan to help with the cost of higher water fees for low-income residents, whether this be rebates for newer water-saving appliances or low-income rebates, like we currently have for electricity...but I would prefer the former, because the goal is not to only lower the cost but to lower cost by saving water (not lowering the cost and still wasting water) I33-2

4. The environmental health problems from fallowing farmland and the dust that might become airborne is a concern as well. A plan to put wood chips on the fallowed land was passed around, but we do get heavy winds, so how well that will work is unknown. Ideally, we would reseed the area with native plants, so that those fields could become new flower fields (not plant dead zones) and attract more tourism I also support low-water farming (if that exists?) for crops like cactus and others. I am not against having farms, but it needs to be done wisely. I33-3

Lastly, it is my sincere hope that Borrego Springs will enter into a new period of water sustainability, remembered and admired as a community that when confronted with a daunting assignment, pulled together to create a strategic plan that looked forward into the future, something that could become an example for other communities to emulate in managing their limited water resources I33-4

I know that lots of people have been tirelessly working on the GSP, and I want to know that your work is very much appreciated.

Cristin McVey
Borrego Springs resident/county worker

1

INTENTIONALLY LEFT BLANK

Letter I33

Commenter: Cristin McVey
Date: May 20, 2019

I33-1 The Groundwater Sustainability Agency (GSA) acknowledges your comments of being willing to pay higher rates to ensure sustainability. The GSA will take this comment into consideration when considering imposing fees to fund Groundwater Sustainability Plan (GSP) implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I33-2 The GSA acknowledges your concern about lower income families and developing options that protect this portion of the community from higher water rates including the potential of a tiered rate structure. The Borrego Water District (BWD) is responsible for water rates set for its ratepayers including lower income families and will take this comment into consideration when considering imposing fees to fund GSP implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I33-3 The GSA acknowledges your suggestion to reseed fallowed areas with native plants to attract more tourism. The GSP includes Project and Management Action No. 4 – Voluntary Fallowing of Agricultural Land. As indicated in the GSP, the GSA will prepare policy development and the California Environmental Quality Act (CEQA) documentation after GSP adoption in advance of considering formal adoption and implementation of a voluntary fallowing program.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I34-4 The GSA appreciates your comment regarding hope for Borrego Springs being an example for other communities to emulate in managing limited water resources.

INTENTIONALLY LEFT BLANK

Comment Letter I34

From: Henry Liu <henryarcadia@yahoo.com>
Sent: Monday, May 20, 2019 3:41 PM
To: LUEG, GroundWater, PDS
Subject: How will the Borrego Valley Groundwater Basin effect the properties

Hi,
Our client is going to buy the Borrego Springs Resort and golf, they are concerning about if it will effect the property after the GSP have been passed?

https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html

Thank you and look forward to your reply

I34-1

Best Regards

Henry Liu
Coldwell Banker Dynasty
77 W Las Tunas Drive #100
Arcadia, CA 91007
Cell Phone: (626)688-2208
Office Phone. (626)446-8999
Fax . (626)446-9997
eFax : (626)538-1159
CalBRE Lic# 01378289
E-mail: henryarcadia@gmail.com
http://www.AmericaRealestateResources.com

INTENTIONALLY LEFT BLANK

Comment Letter I34

From	Henry Liu <henryarcadia@yahoo com>
Sent:	Monday, May 20, 2019 3 41 PM
To:	LUEG, GroundWater, PDS
Subject:	How will the Borrego Valley Groundwater Basin effect the properties

Hi ,
Our client is going to buy the Borrego Springs Resort and golf , they are concerning about if it will effect the property after the GSP have been passed? I34-1

https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html

Thank you and look forward to your reply

Best Regards

Henry Liu
Coldwell Banker Dynasty
77 W Las Tunas Drive #100
Arcadia, CA 91007
Cell Phone (626)688-2208
Office Phone. (626)446-8999
Fax : (626)446-9997
eFax : (626)538-1159
CalBRE Lic# 01378289
E-mail henryarcadia@gmail.com
http://www.AmericaRealestateResources.com

INTENTIONALLY LEFT BLANK

Letter I34

Commenter: Henry Liu
Date: May 20, 2019

I34-1 It appears this comment involves a real estate transaction and the Groundwater Sustainability Agency (GSA) has reached out directly to the commenter. This comment does not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I35

From: BorregoSue <lakes138@yahoo.com>
Sent: Monday, May 20, 2019 5 43 PM
To: LUEG, GroundWater, PDS
Subject: Draft Groundwater Sustainability Plan (GSP) Borrego Valley Groundwater Basin

To Jim Bennett,

As a Borrego Springs ratepayer I am concerned about the proposed GSP. Borrego Springs ground water supply has dropped drastically the past 30 years. Resident ratepayers use 10% of the water supply and have reduced their use over the last 10 years from 2400 acre feet/year to 1700 acre feet/year, but their water bills have increased 3 times. Agriculture uses 70% and golf courses 20% and neither have reduced water use appreciably. Therefore, REDUCTIONS SHOULD MOT BE PROPORTIONAL and should take into consideration our Severely Disadvantaged Community status. The municipal user allotment should be no less than 1700 af/yr. I35-1

MANDATORY METERING of all water users, including agriculture and golf courses must be part of the plan and implemented immediately on approval of the GSP. I35-2

Water quality is also of great concern as our water supply dwindles. Mandatory water quality monitoring of wells, including agriculture and golf courses must be included in the GSP. I35-3

Borrego Springs is a desert community that attracts many visitors and retirees We benefit from the state park and all it offers, as well as a thriving arts community. When Jim Desmond came to town to promote the Borrego Springs Revitalization Committee there were great ideas but none of them will come to fruition unless the GSP enables people to continue to live here and maintain their businesses here Municipal ratepayers must be treated fairly. Perhaps a solution is for the revitalization committee and the county staff assigned to it to first find a way to come up with the approximately 20 million dollars needed to buy out the farmers. I35-4

Susan Boutwell, Borrego Springs ratepayer

1

INTENTIONALLY LEFT BLANK

Letter I35

Commenter: Susan Boutwell
Date: May 20, 2019

I35-1 The Groundwater Sustainability Agency (GSA) acknowledges your opposition to any groundwater use reductions for the municipal sector. While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I35-2 The GSA acknowledges your request that mandatory metering be required immediately upon approval of the GSP. In response, the GSP indicates that metering will be required with implementation of the GSP and is anticipated to be required within 90 days of GSP adoption.

I35-3 The GSA acknowledges the commenters request to impose mandatory water quality monitoring, including agricultural and golf course wells in the subbasin. The GSP indicates that the GSA has developed a water quality monitoring network of 30 wells and five additional wells were added to the network in Fall 2018. The GSP further states that the GSA continues to work with private landowners to expand the monitoring network.

I35-4 The GSA acknowledges the request for the possibility of using the County revitalization committee to find a way to come up with money to buy out farmers. This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I36

From: TJH <tjhlaw@eschelon.com>
Sent: Tuesday, May 21, 2019 2:51 PM
To: LUEG, GroundWater, PDS
Cc: carylowe@cox.net, Bill Carpenter; marya88w@gmail.com, eddifordem@gmail.com
Subject: Borrego Water Crisis

Mr. Bennet: I own 6 vacant and unbuilt lots in Borrego Springs.

It distresses me that I may never be able to use or sell my lots. The water shortage is a de facto and permanent moratorium for me an many others.

The real problem, as you know, is the wasteful and excessive agricultural use of our finite and valuable water resource from the very limited and slowly replenishing aquifer.

The use by the citrus and agricultural users has depleted the water resource and prevented its use to and by higher priority uses, such as municipal, quasi-municipal and domestic uses. I36-1

The time has come to eliminate all citrus and agricultural uses from within the Borrego Groundwater Basin.

The 75% reduction on ag diversions will go part of the way, but a 100% reduction would free up the limited water supply to be devoted to higher priority uses, as mentioned I36-2

Furthermore, the citrus and agricultural water users and landowners should be required to pay for the permanent fallowing of all disturbed lands.

To let the citrus and palm trees die off without water and then to strip the land of all vegetation actually will be a disaster as well

These owners should be held to the same standard as other users who extract a resource, cause damage and leave the mess for others to clean up.

If a miner dug a pit or mine, extracted minerals, he would be required to environmentally restore the site.

If a polluter spilled toxins on the ground, they would be held to clean it up.

If a farmer spilled chemicals on the ground, they would be compelled to clean it up.

If a farmer sells his farm with dead or dying trees on it, as "pollution", he should be held to clean up the "pollution" at his cost, not at that the community's public cost and expense.

"To pollute is to corrupt or defile, especially to contaminate the soil, air or water with noxious substances." Black's Law Dictionary (2004)

The real search should be for the proper fallowing protocol, and costs, to determine how much the citrus and agricultural land owners and operators owe and should pay, to clean up their lands.

Not a search for $20,000,000 to buy their lands, as someone has mentioned. I36-3

1

Another thought is to prohibit the export of water or the products of water out of the Borrego Water Basin.

Exporting all fruit, plants and trees, which have consumed our limited water, should be prohibited. 136-4

Are these radical thoughts? I do not think so.

Thomas J. Hall, Esq.

Box 3948,

Reno, Nevada

89505

Letter I36

Commenter: Thomas Hall
Date: May 21, 2019

I36-1 The comment provides introductory statements that do not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary. However, it should be mentioned that the GSP includes Project and Management Action (PMA) No. 1 – Water Trading Program, which upon implementation, would allow the ability for the permanent trade of baseline pumping allocations. Individuals such as yourself could purchase baseline pumping allocations for future development of your land.

I36-2 The Groundwater Sustainability Agency (GSA) acknowledges the request to require complete elimination of agricultural uses. While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I36-3 The GSA acknowledges suggestions to require the agricultural users to pay for cleanup of their land once it is fallowed. The GSP includes PMA No. 4 – Voluntary Fallowing of Agricultural Land. As indicated in the GSP, the GSA will prepare policy development and CEQA documentation after GSP adoption in advance of considering formal adoption and implementation of a voluntary fallowing program.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I36-4 The comment suggests prohibiting the export of water and fruit, plants, and trees which have consumed the water. In response, the GSA is not aware of any exportation of water out of the basin. In regard to the suggestion to prohibit actual products from being exported out of the basin, the GSA remains committed to utilizing the tools provided in Sustainable Groundwater Management Act (SGMA) to bring the groundwater basin into sustainability.

INTENTIONALLY LEFT BLANK

Comment Letter I37

May 21, 2019

Borrego Valley Groundwater Sustainability Agency
C/O County of San Diego Planning & Development Services
Jim Bennett
5510 Overland Avenue Suite 310
San Diego, CA 92123

Via E-mail. PDS.LUEGGroundWater@sdcounty.ca.gov

Re: Comments on Draft GSP Regarding Conversion of Water Credits to BPA

As part of the Borrego Water District's water credit program, the Borrego Water District and the County of San Diego have issued water credits to property owners overlying the basin who have voluntarily fallowed their land The purpose of the water credit program is to encourage voluntary cessation of water use in exchange for "water credits" that may be applied to future development. The draft Groundwater Sustainability Plan released on March 21, 2019 ("GSP") for the Borrego SpringsSubbasin ("Basin") provides that existing water credits associated with the water credit program *may* be converted*at some time in the future* to a program using Baseline Pumping Allocation ("BPA") applyingthe groundwater consumptive use factors developed by the groundwater sustainability agency ("GSA"). As a holder of water credits in the Basin, we urge the GSA to modify the GSP to explicitly provide for (a) the conversion of water credits to BPA using the same consumptive use factors applied to calculate BPAfor agricultural acreage during the baseline period, and (b) the issuance of BPA to water credit holders at the same time that BPAs are issued for all pumpers in the Basin. Without such modifications, the undersigned object to the GSP as inequitable and unlawful. I37-1

Although the Sustainable Groundwater Management Act provides that it is not intended to alter groundwater rights, nor is an allocation issued pursuant to a GSP to be deemed a determination of water rights,[1] the proposed management actions concerning BPA (i.e., Pumping Reduction Program)(PMA No. 3 in the GSP) and the Water Trading Program (PMA No. 1 in the GSP) will effectively determine and control all opportunities afforded by a water right. This includes the amount of groundwater that may be pumped, the cost of pumping, how and when groundwater rights may be transferred, etc. Thus, to remain equitable, lawful, and immune from successful legal challenge,BPA *must* be granted to water credit holders on the same terms (consumptive use factors) established to set BPA for existing irrigators and issued at the same time as all BPAs. Doing so will treat all similar pumpers equally and will avoid disadvantaging land owners who voluntarily reduced water usage early in an effort to help the Basin

[1] See Water Code sections10720.5(b)), 10726 4(a)(2), and 10726.8(b)

Borrego Valley Groundwater Sustainability Agency
May 21, 2019
Page 2

Conversion of water credits to BPA will also streamline management of the Basin by applying a single "currency" of water rights. For example, the BWD could develop a policy that requires a dedication to the BWD of BPA in exchange for extension of service for new developments (or an equivalent payment in lieu of BPA dedication) This would thereby avoid applying two BWD programs--one for water credit holders and one for BPA holders--that may result in disparate and unfair treatment of those pumpers that voluntarily worked with the BWD to advance water management in comparison to those that have not.[2] Without such conversion, other pumpers who aregranted BPA would be afforded greater water use opportunities and advantages, including opportunities to accrue carryover, lease of allocation, and transfer and use of allocation to support groundwaterproduction on different parcels, as compared to similarly-situated pumpers that were granted water credits. Such disparate treatment would render the Pumping Reduction Program ripe for legal challenge pursuant to a groundwater basin adjudication[3] or other litigation.

This concern can be readily remedied by modifying the GSP to provide for the conversion of water credits to BPA for all water credit holders pursuant to the same consumptive use factors set forth in Appendix F, the elimination of the existing water credits program, and the issuance of such BPA when all BPAs are issued. The GSP could explain that the BWD would soon develop a new dedication program for extension of new water service based exclusively on BPA.

Pursuant to such changes to the GSP and a new BWD dedication program, we agree that the water credits-to-BPA conversion satisfies all obligations of the BWD pursuant to the water credits program such that the BWD would not bear any potential liability for breach of contract, or otherwise, relating to the water credits program.

Thank you for the opportunity to comment on the draft GSP. I37-1 Cont.

Sincerely,

RUDY MONICA 5/21/19

[2] The BPA calculation methodology set forth in Appendix F would result in a grant of more BPA per acre than has been granted in water credits for the same crop grown with the same method of irrigation and during the same time period. Thus, to deny a conversion of water credits to BPA at the same consumptive use factors would result in disparate treatment unless the BWD were to maintain two dedication programs with different dedication ratios respective of BPA and water-credits, which would be unnecessarily complex.
[3] See Code of Civil Procedure sections 830 et seq

Letter I37

Commenter: Rudy Monica
Date: May 21, 2019

I37-1 The Groundwater Sustainability Agency (GSA) acknowledges the comment and the benefits of converting water credits to baseline pumping allocations within the Groundwater Sustainability Plan (GSP). In response, the GSP is clear that water credits may be converted in a future program using Baseline Pumping Allocation (BPA) using the groundwater consumptive use factors developed by the GSA. In regard to your comments pertaining to groundwater rights, the comment calls for a legal conclusion to which the GSA is not required to respond.

INTENTIONALLY LEFT BLANK

Comment Letter I38

May 21, 2019

Borrego Valley Groundwater Sustainability Agency
C/O County of San Diego Planning & Development Services
Jim Bennett
5510 Overland Avenue Suite 310
San Diego, CA 92123

Via E-mail: PDS.LUEGGroundWater@sdcounty.ca.gov

Re: Comments on Draft GSP Regarding Conversion of Water Credits to BPA

As part of the Borrego Water District's water credit program, the Borrego Water District and the County of San Diego have issued water credits to property owners overlying the basin who have voluntarily fallowed their land. The purpose of the water credit program is to encourage voluntary cessation of water use in exchange for "water credits" that may be applied to future development. The draft Groundwater Sustainability Plan released on March 21, 2019 ("GSP") for the Borrego Springs Subbasin ("Basin") provides that existing water credits associated with the water credit program *may* be converted *at some time in the future* to a program using Baseline Pumping Allocation ("BPA") applying the groundwater consumptive use factors developed by the groundwater sustainability agency ("GSA"). As a holder of water credits in the Basin, we urge the GSA to modify the GSP to explicitly provide for (a) the conversion of water credits to BPA using the same consumptive use factors applied to calculate BPA for agricultural acreage during the baseline period, and (b) the issuance of BPA to water credit holders at the same time that BPAs are issued for all pumpers in the Basin. Without such modifications, the undersigned object to the GSP as inequitable and unlawful. I38-1

Although the Sustainable Groundwater Management Act provides that it is not intended to alter groundwater rights, nor is an allocation issued pursuant to a GSP to be deemed a determination of water rights,[1] the proposed management actions concerning BPA (i.e., Pumping Reduction Program) (PMA No. 3 in the GSP) and the Water Trading Program (PMA No. 1 in the GSP) will effectively determine and control all opportunities afforded by a water right. This includes the amount of groundwater that may be pumped, the cost of pumping, how and when groundwater rights may be transferred, etc. Thus, to remain equitable, lawful, and immune from successful legal challenge, BPA *must* be granted to water credit holders on the same terms (consumptive use factors) established to set BPA for existing irrigators and issued at the same time as all BPAs. Doing so will treat all similar pumpers equally and will avoid disadvantaging land owners who voluntarily reduced water usage early in an effort to help the Basin.

[1] See Water Code sections 10720.5(b)), 10726.4(a)(2), and 10726.8(b)

Borrego Valley Groundwater Sustainability Agency
May 21, 2019
Page 2

Conversion of water credits to BPA will also streamline management of the Basin by applying a single "currency" of water rights. For example, the BWD could develop a policy that requires a dedication to the BWD of BPA in exchange for extension of service for new developments (or an equivalent payment in lieu of BPA dedication). This would thereby avoid applying two BWD programs—one for water credit holders and one for BPA holders—that may result in disparate and unfair treatment of those pumpers that voluntarily worked with the BWD to advance water management in comparison to those that have not.[2] Without such conversion, other pumpers who are granted BPA would be afforded greater water use opportunities and advantages, including opportunities to accrue carryover, lease of allocation, and transfer and use of allocation to support groundwater production on different parcels, as compared to similarly-situated pumpers that were granted water credits. Such disparate treatment would render the Pumping Reduction Program ripe for legal challenge pursuant to a groundwater basin adjudication[3] or other litigation.

This concern can be readily remedied by modifying the GSP to provide for the conversion of water credits to BPA for all water credit holders pursuant to the same consumptive use factors set forth in Appendix F, the elimination of the existing water credits program, and the issuance of such BPA when all BPAs are issued. The GSP could explain that the BWD would soon develop a new dedication program for extension of new water service based exclusively on BPA.

Pursuant to such changes to the GSP and a new BWD dedication program, we agree that the water credits-to-BPA conversion satisfies all obligations of the BWD pursuant to the water credits program such that the BWD would not bear any potential liability for breach of contract, or otherwise, relating to the water credits program.

Thank you for the opportunity to comment on the draft GSP.

I38-1 Cont.

Sincerely,

Lonn Lindberg
Lundarid LLC
Lindberg Family Trust

[2] The BPA calculation methodology set forth in Appendix F would result in a grant of more BPA per acre than has been granted in water credits for the same crop grown with the same method of irrigation and during the same time period. Thus, to deny a conversion of water credits to BPA at the same consumptive use factors would result in disparate treatment unless the BWD were to maintain two dedication programs with different dedication ratios respective of BPA and water credits, which would be unnecessarily complex.
[3] See Code of Civil Procedure sections 830 et seq.

Letter I38

Commenter: Lance Lundberg
Date: May 21, 2019

I38-1 The Groundwater Sustainability Agency (GSA) acknowledges the comment and the benefits of converting water credits to baseline pumping allocations within the Groundwater Sustainability Plan (GSP). In response, the GSP is clear that water credits may be converted in a future program using Baseline Pumping Allocation (BPA) using the groundwater consumptive use factors developed by the GSA. In regard to your comments pertaining to groundwater rights, the comment calls for a legal conclusion to which the GSA is not required to respond.

INTENTIONALLY LEFT BLANK

Comment Letter I39

From: barry <barry berndes@gmail com>
Sent: Thursday, April 11, 2019 5:02 PM
To: LUEG, GroundWater, PDS, Barry Berndes | SAN DIEGAN
Subject: Borrego Springs vacant land owner's solution

Sirs
The stewardship of this magnificent San Diego resources has a simplistic resolution less is more.

Its inhabitants as a group
must be restricted by a percentage of the water they use by category:
Agro users
Golf course users
Residential users
Resort hotel users
Service Industry users

Each User Group Gets An Equal amount of the Aquifer Pie

Then, just like with Solar, what the user don't use can be sold to the highest bidder or kept in the aquifer.

Ultimately, Borrego Springs will (die it's water shortage) be the desert retreat with fewer golf courses, fewer resorts, fewer agricultural orchards and fewer service industries as water allotments will allow.

So "Pull The Trigger" and do what you were appointed or elected to do.

I39-1

Sincerely,
Barry Berndes
Buckskin Road
Property parcel #
141-010-41-00

Sent from my iPhone

1

INTENTIONALLY LEFT BLANK

Letter I39

Commenter: Barry Berndes
Date: April 11, 2019

I39-1 The Groundwater Sustainability Agency (GSA) acknowledges the suggestion of reducing groundwater use by category and that each user group gets an equal amount of the water supply available. The Groundwater Sustainability Plan (GSP) includes Project and Management Action No. 3 – Pumping Reduction Program. The GSP does not set specific groundwater use reductions. Rather, as indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I40

From: David Leibert <david@thepalmsatindianhead.com>
Sent: Sunday, May 05, 2019 1 47 PM
To: LUEG, GroundWater, PDS
Subject: Borrego Springs Groundwater Sustainability Plan comment

May 5, 2019

County of San Diego Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue Suite 310
San Diego, CA 92123

PDS LUEGGroundWater@sdcounty ca gov

RE. Borrego Springs Sub Basin

Dear Sir or Madam:

I am writing in regards to water rights we own on our property located at 2220 Hoberg Road in Borrego Springs, CA. (Parcel # 141-080-04) I have owned the approximately 20 acre hotel and restaurant property since 1993. There is a well on the property and I have spent a substantial amount of money maintaining and improving the well over time. I have been helpless in watching the water level in the well drop from 271 feet in December of 1993 to 324 02 feet on 4/30/19. The water level has dropped 53.02 feet over the last 25.5 years as a result of overdraft.

If the Groundwater Sustainability Plan is to be implemented, I feel it important to recognize and fairly compensate property owners with existing water rights whether or not they were pumping from their well at the time of the baseline pumping allocations approximation. At that time I was purchasing water for our property from the Borrego Water District and our amount of water usage could be easily ascertained. I40-1

I would expect either a cash buyout for our water rights or marketable water shares in exchange for any adjudicated action.

Sincerely,

David G. Leibert

Virus-free www.avast.com

1

INTENTIONALLY LEFT BLANK

Letter I40

Commenter: David Liebert
Date: May 5, 2019

I40-1 The commenter indicates ownership of a well on a property located at Assessor's Parcel Number (APN) 141-080-04 which is not being used. As stated in Appendix F of the Groundwater Sustainability Plan (GSP), baseline pumping allocations were included for each identified non-de minimis groundwater user for all existing pumpers in the basin. The "baseline pumping allocation" is defined as the amount of groundwater each pumper in the Subbasin is allocated prior to Sustainable Groundwater Management Act (SGMA)-mandated reductions. It is further defined as the verified maximum annual production, in acre-feet per year, for each well owner over the baseline pumping period. The baseline pumping period is the 5-year period from January 1, 2010, through December 31, 2014. This was to consider water use that was being used prior to SGMA taking effect on January 1, 2015 (California Water Code 10720.5[a]).

The commenter indicates they obtained their water from the Borrego Water District during the 5-year time period in which baseline pumping allocations (BPAs) were determined. As such, the GSP does not include a baseline pumping allocation for the commenter's property. Borrego Water District, as the pumper of the groundwater, received a BPA that included water that they sold to each of their customers.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I41

From: Elena Thompson <elenathompson@cox.net>
Sent: Saturday, April 27, 2019 9:13 PM
To: LUEG, GroundWater, PDS
Subject: 4-29-19 Borrego Springs, CA, Groundwater Sustainability Plan (GSP) - Public Comment

Importance: High

https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html

By mail: County of San Diego Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue Suite 310
San Diego, CA 92123

To Whom It May Concern,

Our public comment is as follows:

1. Thank you for the opportunity to review and comment as a Borrego Springs resident, property owner and stakeholder, keen on seeing a stable and steady supply of potable residential water supply continue in our town.
2. In our view, the groundwater sustainability in Borrego Springs must be achieved before the mandated 2040 deadline seeing as Borrego Springs is in a "critical overdraft" situation TODAY (2019) and water is being used in a way by growers that fully risk depleting the entire water supply long before 2040.
3. Sustainability should be advanced to the earlier year of 2021, if not sooner. I41-1
4. Agricultural pumping of all water must begin to be measured starting in 2020 without exception. The agricultural sector is using 70% of all water in addition to polluting the water table with chemicals used in its operations. The growers/agricultural use in the valley poses the biggest risk to sustainability, both short and long term, and must totally stop in order to save the town of Borrego Springs and the ABD State Park. I41-2
5. The visuals and graphics in your presentation are shocking, to say the least. With plummeting water tables and water supply, deteriorating water quality, a radical approach must be taken immediately, now. No more waiting. I41-3
6. All water and wells must be protected and serviced to ensure potable drinking water and suitable water for residential use, without exception. I41-4
7. Municipal water supply must be the priority followed by golf courses (economic development). Agriculture is no longer sustainable in the Borrego Valley. Growers must go. Crops must be fallowed. There are few permanent jobs in this business. Those that are lost will find other opportunities in the valley. I41-5
8. Time is of the essence here. This matter has been studied over the decades without proper resolution as the aquifer continues to drop annually. I41-6
9. Residential real estate prices will all plummet without a reliable source of water. They have already been suppressed due to this ongoing and urgent crisis. I41-7
10. Stepped-up water conservation cannot increase amongst municipal users. These users cut back water usage years ago. There is no further opportunity for water reduction other than NOT to consume water or bathe. This is unacceptable. I41-8
11. Water increases cannot continue on municipal, residential users. Continual rate hikes are extremely harmful to municipal users, especially when growers get water for free and use 70% of it. It's unreasonable to expect municipal users to subsidize the growers and be punished with higher rates for unlimited grower usage, depleting the aquifer of its precious water supply. I41-9

Respectfully,

1

Elena & John Thompson
Residents and property owners, Borrego Springs
4-29-19

2

Letter I41

Commenter: Elena and John Thompson
Date: April 27, 2019

I41-1 The Groundwater Sustainability Agency (GSA) acknowledges the comment to accelerate groundwater reductions. While the Groundwater Sustainability Plan (GSP) does not set the specific groundwater reduction schedule, the GSP includes Project and Management Action (PMA) No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-2 In response to the request that agricultural pumping be measured starting in 2020, the GSP states that at Plan adoption all non-de minimis groundwater extractors will be required to record monthly groundwater production and report to the GSA on an annual basis.

In response to the request that agricultural use in the valley totally stop, the GSP includes PMA No. 3, Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of groundwater use reductions and specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-3 The GSP includes the framework to bring the basin into sustainability.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-4 Chapter 3 of the GSP includes sustainability goals to protect current and future beneficial users and uses of water. The GSP includes a sustainability goal for groundwater levels to stabilize to ensure groundwater is maintained at adequate levels for key municipal wells to protect residential users. The GSP also includes a sustainability goal for Title 22 drinking water standards to be met for potable water sources and water quality monitoring will occur throughout GSP implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-5 The GSA acknowledges the comment to prioritize municipal water supply, the golf course use, and for agricultural use to be removed. While the GSP does not set the specific groundwater reductions by sector, the GSP includes PMA No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific groundwater use reductions and a ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-6 This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-7 This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-8 The GSA acknowledges the commenter's request to not have any additional water conservation for municipal users. The GSP includes PMA No. 2 – Water Conservation Program. The program would consist of separate components for the three primary water use sectors: agricultural, municipal, and recreation. As stated in the GSP, the specific components of the water conservation program would be developed (after GSP adoption) through a process of public outreach, data compilation, and program design for each sector.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I41-9 The GSA acknowledges your concern regarding water rates for municipal, residential users. The GSA will take this comment into consideration when considering imposing fees to fund GSP implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment Letter I42

From: Joseph Tatusko <jatmpk@gmail.com>
Sent: Monday, April 01, 2019 5.39 PM
To: Bennett, Jim
Subject: GSP comment review process - Joe Tatusko #1

Hello Jim

I recommended as a retured 2014-2018 BWD Board member we add a second page in Spanish and English i.e. 2 sides important BWD information in the BWD bill envelope. I recommend a 2nd page in the BWD April bill a notice of this important GSP comment period of March 22 to May 21, 2019 Also, maybe an additional 2 day check out GSP physical document at the BWD office and SD County local BS library.
I will of course provide more technical comments in the near future. I42-1

Thanks,
Joe Tatusko
Retired BWD Board 2014-2018

P.S I got a invalid email address for the PDS (pg. 2) email, please reply

1

INTENTIONALLY LEFT BLANK

Letter I42

Commenter: Joe Tatusko
Date: April 1, 2019

I42-1 The Groundwater Sustainability Agency (GSA) acknowledges your request of the Borrego Water District (BWD) to include noticing via April water bills in English and Spanish that mention the Groundwater Sustainability Plan (GSP) comment period. Additionally, the GSA acknowledges the request to have a check-out approach for the physical GSP document at the BWD office and County library. To aid Spanish speakers, the BWD translated the Executive Summary into Spanish and posted it on their website. Additionally, a hard copy of the Draft GSP was made available at three locations: the County of San Diego, BWD office, and the Borrego Springs County library.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I43

Paul Ocheltree
203 Marine View Avenue
Del Mar, California 92014

[redacted]

April 15, 2019 SENT BY CERTIFIED MAIL

Kathy Dice President of the Borrego District Board of Directors
Geoffrey Poole General Manager of the Borrego Water District
P O. Box 1870
806 Palm Canyon Drive
Borrego Springs, California 92004

RE: Borrego Valley GSP and SGMA reports.
Property description. 1193 Rango Way, Borrego Springs CA 92004, 40 acres, APN 199-140-21

Hello Kathy and Geoffrey,

We, Marilyn A. and Paul C. Ocheltree, are the property owners for the above reference property We hereby hold and reserve the right to file a complaint (sue) to overturn and nullify any or all of the sections, restrictions, plans, actions and aspects of the GSP (Ground Water Sustainability Plan) which is being proposed for the Borrego Basin. We have and continue to reject similarly the SGMA (Sustainable Groundwater Management Act). We own the above land which inherently includes all of the titled land, soil, rocks, and water (a mineral) which are all a basic part of the titled land Our land rights are established by old English law, common law, Federal and State law. We own all of the water, just the same as we would own the oil, gold or silver which could exist below the surface of our land. An ordinance passed by the County of San Diego and supported by the Borrego Water District does not supersede but is subject to the above laws. The SGMA and GSP serve to undermine, restrict and negate our ownership of the mineral rights attached to our land. The above acts propose to take our mineral rights without due compensation which is a violation of our constitutional rights. Thank you for our right to stand in objection to the SGMA, the GSP and all of the previous and future generations of these acts Have a good day I43-1

Paul C. Ocheltree
4/15/19
Property Owner

Marilyn A Ocheltree
4/15/19
Property Owner

[redacted]

INTENTIONALLY LEFT BLANK

Letter I43

Commenter: Paul and Marilyn Ocheltree
Date: April 15, 2019

I43-1 The Groundwater Sustainability Agency (GSA) acknowledges the comment indicating the commenter reserves the right to file a complaint on any of information within the Groundwater Sustainability Plan (GSP) and that the commenter stands in objection to Sustainable Groundwater Management Act (SGMA) and any of its implementing requirements. Based on a review of historical aerial photography of the commenter's property located at 1193 Rango Way, Borrego Springs, California 92004, the on-site groundwater usage on said property appears to be 2 acre-feet or less per year. As such, the commenter is considered a de minimis extractor as defined by SGMA. A de minimis extractor is not subject to groundwater reduction requirements. The GSA will be regularly monitoring groundwater usage after the GSP is implemented. If available aerial photography or other information indicates that groundwater usage on the commenter's property is potentially increasing above 2 acre-feet per year, the commenter may be subject to reductions and additional requirements in accordance with the adopted GSP and implementing requirements.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I44

Lagerlof Senecal Gosney & Kruse LLP

301 North Lake Avenue
10th Floor
Pasadena, CA 91101 3123
Phone: 626.793.9400
Fax: 626.793.5900
www.lagerlof.com

Established 1908

To: Ray Shindler

From: Thomas S Bunn III

Date: September 11, 2017

Re: Groundwater allocations in the Borrego Springs basin

Question Presented

The Borrego Valley Groundwater Sustainability Agency must come up with a plan to make the Borrego Springs groundwater basin sustainable. The only practical way to do this is to limit groundwater extractions. Must the extractions be limited in proportion to current use?

Brief Answer

No. The agency may allocate groundwater extractions by any reasonable method One reasonable method is to allocate the Borrego Water District its current pumping, and reduce agricultural and golf course pumping over time to a sustainable level. However, if there is an adjudication of groundwater rights, it is likely that the allocation would have to be made consistent with the adjudicated rights

Statement of Facts

The Borrego Springs basin has been overdrafted for many years. The Department of Water Resources has designated the basin as a medium-priority basin subject to critical conditions of overdraft

The principal groundwater users in the basin are the Borrego Water District, agricultural users, golf courses, domestic wells, and Anza-Borrego State Park.

The Borrego Valley Groundwater Sustainability Agency, comprising the Water District and San Diego County, has been designated as the groundwater sustainability agency (GSA) for the basin. Under the Sustainable Groundwater Management Act (SGMA), the GSA must develop and implement a groundwater sustainability plan by January 31, 2020. The plan must achieve sustainability for the basin within 20 years.

There is no practical source of supplemental water to the basin As a result, to achieve sustainability, groundwater extractions must be substantially reduced.

I44-1

Extraction Allocations Under SGMA

If overdraft conditions are identified in a basin, SGMA requires the groundwater sustainability plan to contain projects or management actions to mitigate the overdraft.[1] SGMA provides groundwater sustainability agencies with an array of powers to implement and enforce the groundwater sustainability plan, including the power to establish groundwater extraction allocations.[2] Neither SGMA nor the implementing regulations provide any detail or standards about how allocations are to be made. It appears that GSAs have broad discretion to allocate extractions, as long as the sustainability goals of the plan are met.

That discretion is not unlimited, however. Groundwater management under SGMA must be consistent with Article X, Section 2 of the California Constitution, which provides that water must be used reasonably and beneficially.[3] Groundwater sustainability agencies must consider the interests of all beneficial uses and users of groundwater, including both holders of overlying groundwater rights and public water systems.[4] Most significantly, groundwater sustainability plans may not alter groundwater rights.[5] Specifically, a limitation on extractions by a groundwater sustainability agency is not a final determination of rights to extract groundwater.[6]

An argument can be made that the foregoing provisions mean that groundwater extraction allocations must be according to water rights. That would be consistent with the legislature's statement that its intent is to "respect overlying and other proprietary rights to groundwater."[7] But there is no express directive in the statute to this effect. Contrast that with the express statement in the statute that federally reserved water rights to groundwater "shall be respected in full."[8] Statements of legislative intent are generally not binding in and of themselves, but are used by courts to interpret other provisions of a statute.

Another consideration is that groundwater law is complex, and it is impossible to state with certainty how a court would adjudicate rights in any particular basin. GSAs themselves do not have the power to determine water rights.[9]

In my opinion, the most reasonable interpretation of the statute, and the one a court is most likely to adopt, is that GSAs may allocate extractions by any reasonable method. But if there is an adjudication of

I44-1 Cont.

[1] Wat. Code §10727.2(d)(3); Regs. §354.44
[2] Wat. Code §10726.4(a)(2)
[3] Wat. Code §10720.5(a).
[4] Wat. Code §10723.2
[5] Wat. Code §10720.5(b)
[6] Wat. Code §10726 4(a)(2)
[7] SGMA uncodified findings (b)(4)
[8] Wat. Code §10720.3(d)
[9] Wat. Code §10726.8(b).

Lagerlof Senecal Gosney & Kruse LLP

3

the basin, the allocations must be made consistent with the adjudicated water rights Otherwise, the GSA's allocation would effectively alter groundwater rights, in contravention of the statute.[10]

If the interested parties in a basin are unable to agree on a method of allocating extractions, it is very possible that an adjudication will be filed to determine water rights Therefore, in their negotiations, parties will be comparing proposals with the likely results of an adjudication The following overview is intended to help determine what those results might be.

California Groundwater Rights Law

Groundwater rights in an unadjudicated basin are traditionally classified as *overlying, appropriative*, or *prescriptive*. There is also a *self-help right*, as will be described below And there are other types of rights I don't discuss here, including imported water return flow rights and federal reserved rights.

Overlying rights are the right of a property owner overlying the basin to pump water for reasonable beneficial use on the overlying land. Overlying rights are not quantified, but are *correlative*—that is, in times of shortage, all have equal priority and all must reduce pumping.

Appropriative rights are rights not used on overlying land, and include rights of water suppliers such as the District. They are lower in priority than overlying rights. If the basin is overdrafted, then appropriative rights must be curtailed first.

If an appropriator nevertheless pumps a quantity of water in an overdrafted basin continuously for over five years, and if certain other conditions—such as notice of the overdraft—are met, the appropriator gets a *prescriptive right* to continue to pump that quantity of water For purposes of this analysis, I am assuming that the District has a prescriptive right in some amount.

The five-year period is referred to as the *prescriptive period* There can be multiple prescriptive periods in a single basin, as long as each one is a five-year period of continuous overdraft. However, SGMA provides that prescriptive periods may not include the period between January 1, 2015, and the adoption of a groundwater sustainability plan.[11]

A prescriptive right is higher priority than an overlying right. However, if an overlying landowner has pumped during the prescriptive period, it acquires a *self-help right* to the amount pumped during that period. The self-help right is a quantification of the overlying right, and is equal in priority to a prescriptive right.

It is apparent that in many cases, the total self-help rights plus the prescriptive rights will exceed the safe yield of the basin. The California Supreme Court has stated that when this happens, the prescriptive right is reduced, so that "the ratio of the prescriptive right to the remaining rights of the private defendant [is] as favorable to the former in time of subsequent shortage as it was throughout

I44-1 Cont

[10] Wat. Code §10720.5(b)
[11] Wat. Code §10720.5

Lagerlof Senecal Gosney & Kruse LLP

4

the prescriptive period."[12] It is not completely clear what this means, but I believe it means that the prescriptive right is the same percentage of the safe yield as the prescriptive pumping is of total pumping during the prescriptive period. For example, if the prescriptive pumping was 10% of the total pumping during the prescriptive period, then the prescriptive right would be 10% of the safe yield during that period.

Groundwater Rights in Borrego Springs

I assume that the Water District is the only appropriator that can claim prescriptive rights. Applying these principles in a manner that favors the Water District, we would choose a prescriptive period in which the Water District's continuous pumping was the greatest percentage of the total pumping. As mentioned above, that period must end before January 1, 2015. The Water District would be entitled to a prescriptive right equal to this percentage of the safe yield during that period. This will probably be a different amount than reducing all pumping proportionately from current amounts, because it depends on historical pumping, not current pumping.

Water Code Sections 106, 106.3, and 106.5

Water Code section 106 states that the domestic use of water is a higher use than irrigation. Water Code section 106.3 declares that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes, and state agencies must take that into account in policies, regulations, and grant criteria. Water Code section 106.5 provides for the protection of the right of a municipality to acquire and hold rights to the use of water for existing and future uses. Some have argued that these statutes mean that domestic and municipal uses should get priority in times of shortage. To my knowledge, no case has ever held that these statutes create a new category or priority of groundwater rights. But in the recent Santa Maria groundwater adjudication, the court did use these statutes to support its conclusion that parties with prescriptive rights (who are generally domestic and municipal users) do not lose their rights during times of surplus.[13]

For purposes of groundwater allocations under SGMA, I believe that Water Code sections 106, 106.3, and 106.5 furnish a powerful argument that domestic and municipal uses should not suffer the same reductions as irrigation.

Conclusion

The groundwater sustainability agency has broad discretion about how to allocate groundwater extraction among the competing uses, and is not required to reduce all users equally. There are several arguments for reducing domestic and municipal users less. It is a reasonable position that they should get what they are currently using, perhaps with a modest reduction for water conservation/water

[12] *City of Los Angeles v. City of San Fernando* (1975) 14 Cal.3d 199, 293.
[13] *City of Santa Maria v. Adam* (2012) 211 Cal.App 4th 266, 297.

Lagerlof Senecal Gosney & Kruse LLP

144-1 Cont.

5

efficiency, and that the remainder of the reduction should fall on irrigation users Borrego Water District should be taking this position. Ultimately, the results of the negotiation may depend on the parties' perception of the likelihood of an adjudication, and the likely results in any adjudication.

I44-1 Cont.

Lagerlof Senecal Gosney & Kruse LLP

INTENTIONALLY LEFT BLANK

Letter I44

Commenter: Ray Shindler
Date: September 11, 2017

I44-1 The Groundwater Sustainability Agency (GSA) received an email from Ray Shindler with an attached September 11, 2017, memorandum regarding "Groundwater allocations in the Borrego Springs basin."

This comment does not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I45

Lagerlof Senecal Gosney & Kruse LLP

301 North Lake Avenue
10th Floor
Pasadena, CA 91101 5123
Phone 626.793 9400
Fax 626.793 5900
www.lagerlof.com

Established 1908

To: Borrego Springs Basin Advisory Committee

From: Thomas S. Bunn III

Date: October 24, 2017

Re: Response to Agricultural Representatives Agenda Paper #1

This is a response to the Agricultural Representatives Agenda Paper #1, dated September 21, 2017. The paper contains a number of omissions and incorrect statements. This memo does not attempt a line-by-line rebuttal, but points out the most significant issues.

The paper ignores the prescriptive right of the Water District

The paper repeatedly makes the point that the groundwater rights of overlying landowners have priority over municipal water rights. It fails to mention, however, that this is only true if the municipal water rights are appropriative rights, not if they are prescriptive rights. Overlying rights do not have priority over prescriptive rights. "Acquisition of a prescriptive right in groundwater rearranges water rights priorities among water users, elevating the right of the one acquiring it above that of an appropriator to a right equivalent in priority to that of a landowner " (*City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 297.)

The prescriptive right of the Water District is not acknowledged anywhere in the paper. Yet the Water District clearly has acquired a prescriptive right by pumping water in an overdrafted basin for a continuous period of five years, where there was knowledge of the overdraft and where the pumping was actual, open and notorious, hostile and adverse to the overlying users, and under claim of right. (*City of Santa Maria v. Adam* (2012) 211 Cal.App 4th 266, 291.) I45-1

"The effect of a prescriptive right [is] to give to the party acquiring it [the Water District] and take away from the private defendant against whom it was acquired [overlying landowners] either (1) enough water to make the ratio of the prescriptive right to the remaining rights of the private defendant as favorable to the former in time of subsequent shortage as it was throughout the prescriptive period or (2) the amount of the prescriptive taking, whichever is less." (*City of Los Angeles v City of San Fernando* (1975) 14 Cal.3d 199, 293.) In other words, the pumping during the prescriptive period is reduced pro rata to the safe yield.

Thus, the argument in the paper that agricultural water use cannot be reduced without agreement on an agricultural fallowing and landowner pumping rights transfer program is incorrect.

2

The paper ignores the priority for domestic use in Water Code sections 106, 106.3, and 106.5

Water Code section 106 states that the domestic use of water is a higher use than irrigation. Water Code section 106.3 declares that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes, and state agencies must take that into account in policies, regulations, and grant criteria. Water Code section 106.5 provides for the protection of the right of a municipality to acquire and hold rights to the use of water for existing and future uses.

It is routinely argued in groundwater adjudications that these statutes mean that domestic and municipal uses should get priority in times of shortage. Because adjudications are generally resolved by settlement, no appellate court has yet considered the nature and extent of this priority. But in the recent Santa Maria groundwater adjudication, the court did use these statutes to support its conclusion that parties with prescriptive rights (who are generally domestic and municipal users) do not lose their rights during times of surplus. (*City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 297.)

For purposes of groundwater allocations under SGMA, Water Code sections 106, 106.3, and 106.5 furnish a powerful argument that domestic and municipal uses should not suffer the same reductions as irrigation.

Even if the Water District did not have a prescriptive right, the landowners would still have to reduce their pumping

The paper does not acknowledge that landowners, who represent the vast majority of pumping, would have to reduce their pumping by almost the same amount, even if no allocation were made to the Water District at all. As among overlying users, the rights are correlative: each may use only their reasonable share [of the safe yield] when water is insufficient to meet the needs of all. (*City of Santa Maria v. Adam* (2012) 211 Cal.App.4th 266, 279.)

The paper incorrectly cites *Mojave* and other cases

The paper cites the *Mojave* case (*City of Barstow v. Mojave Water Agency*[1] (2000) 23 Cal.4th 1224) for the proposition that groundwater rights of overlying landowners have priority over municipal water rights. But, as previously stated, that is only true if there are no prescriptive rights, as was the case in *Mojave*. (23 Cal.4th at p. 1241.)

The paper also cites *Mojave* for the following proposition: "[A]n across-the-board reduction of groundwater production by all sectors is contrary to California water law, except in the rare situation where an entire city's economy is built entirely on junior appropriations in excess of overdraft, which situation does not exist here." The "situation" described in the *Mojave*

[1] The paper uses the incorrect name of *City of Barstow v. Adelanto*.

Lagerlof Senecal Gosney & Kruse LLP

I45-1 Cont.

3

case, however, was not that at all, but where a "restriction to safe yield on a strict priority basis might have deprived parties who had been using substantial quantities of ground water for many years of all further access to such water." (23 Cal 4th at pp. 1246-47.) That is exactly the situation here.

Finally, the paper says that overlying water rights need to be based on the highest year of production during the period of overdraft. It cites three adjudications for this, but the formula used in those adjudications was based on stipulation, not a judicial ruling. It goes on to say the California Supreme Court has upheld use of the highest year of production, citing *Hi-Desert County Water Dist. v. Blue Skies Country Club, Inc.* (1994) 23 Cal.App.4th 1723, 1727. First, the case was not a Supreme Court case, but a court of appeal case. Second, and more significantly, the formula in the case was again based on a stipulation and was not an issue before the court. It is incorrect to say the formula was "upheld" by the court.

I45-1 Cont.

Conclusion

Groundwater sustainability agencies are given the authority to determine groundwater extraction allocations. (Wat. Code 10726 4(a).) A reasonable approach would be to allocate the Water District its historical use, and allocate the remainder of the safe yield to overlying users, without any compensation to those users This approach would be consistent with SGMA and California water rights law.

Lagerlof Senecal Gosney & Kruse LLP

INTENTIONALLY LEFT BLANK

Letter I45

Commenter: Thomas Bunn
Date: October 24, 2017

I45-1 The Groundwater Sustainability Agency (GSA) received an email from Ray Shindler with an attached October 24, 2017, memorandum regarding "Response to Agricultural Representative Agenda Paper #1."

This comment does not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

Comment Letter I46

From: Dr.Saul LMiller <drmiller@saulmiller.com>
Sent: Monday, April 29, 2019 9:04 AM
To: LUEG, GroundWater, PDS
Subject: Borrego Springs significant overdraft (SGMA)
Attachments: A Comment to the Board of the Borrego Water District.docx

Dr Saul L Miller
Performance Psychologist
Author Performing Under Pressure
Why Teams Win
Hockey Tough, a Winning Mental Game
email. drmiller@saulmiller.com
web. saulmiller.com
PO Box 1763, Borrego Springs CA 92004
760 767 5496

A Comment to the Borrego Water District Board and San Diego County

As a ratepayer very interested in the water situation, I would like to state the following: First, I appreciate the Borrego Water District Board has an important and challenging task to ensure that the ratepayers in the community are well served. I also appreciate they are efforting to do what they think is best.

With SGMA, there is the need to come up with an acceptable plan in the relatively near future to resolve the aquifer's critical overdraft. This is, of course, challenging.

The data are clear: Ratepayers, who use only about 10% of the water, have made significant reductions in their water use in the recent past. I46-1

It is also clear that Agriculture has overwhelmingly been the major pumper consuming approximately 70% of the water, thus principally causing the overdraft. Furthermore, agriculture's water use in recent decades has increased.

I am not privy to meetings between the BWD Board, Ag representatives and the recreational water use representatives. There has been very little disclosure as to what has been and is transpiring. However, from what I have learned to date, I do not believe that ratepayers' wishes are being well represented at these meetings.

Whereas it is understood we all have to reduce our water use to deal with the problem and the demands of SGMA, I and many of the ratepayers I have spoken with, feel that the ratepayers should not be asked to reduce the same proportional amount as the Ag people who through their 70% use of the water have been a principal cause of the problem. I46-2

If ratepayers were to reduce 45-50% instead of 75% as has been rumored, we would appreciably increase the water available to us... and would need to purchase less in the future. Further, that increase of 25-30% would have relatively little impact on the available water for the 20-30 Ag pumpers.

Three additional comments: 1. Clearly, the aquifer is severely stressed. The sooner Ag is made to reduce their intense pumping the better it is for preserving water quality and quantity. I46-3

2. In addition, every effort must be made to create some rules to limit hoarding. Without rules, it is conceivable certain interests with deep pockets could purchase excessive amounts of water. I46-4

3. It has been suggested it will be very expensive to refurbish and maintain the existing water infrastructure in the future. The BWD Board suggests that money will be available to buy whatever water we need in the future AND to maintain the aging infrastructure. Yet no clear plan has been articulated as to where this money will come from. I46-5

Thank you for your consideration of these matters.
Respectfully,
Saul L. Miller Ph.D.

Letter I46

Commenter: Saul Miller
Date: April 29, 2019

I46-1 The comment provides introductory statements regarding the need to resolve the overdraft and recent water use patterns of the Borrego Water District and agricultural pumpers.

This comment does not address the adequacy of the Draft Groundwater Sustainability Plan (GSP), and therefore, no further response is required or necessary.

I46-2 The Groundwater Sustainability Agency (GSA) acknowledges the commenter's request that Borrego Water District not be subject to the same proportional reductions as agricultural pumpers. The commenter further suggests reductions of 45 to 50% instead of 75% would appreciably increase water available to the Borrego Water District.

While the GSP does not set specific groundwater use reductions, the GSP includes Project and Management Action (PMA) No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

The comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I46-3 The GSA acknowledges the commenter's request to front load groundwater reductions for agricultural pumpers.

While the GSP does not set specific groundwater use reductions, the GSP includes PMA No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

I46-4 The GSA acknowledges the comment that rules to limit hoarding should be included to protect against interests with purchasing excessive amounts of water. Section 4.2.1 of the GSP includes a summary of the process to develop a water trading program which includes identifying unintended consequences of the Water Trading Program to be addressed in development of governing documents (e.g., hoarding, speculation, price fixing, collusion).

I46-5 The comment requests consideration regarding BWD expenses of future water and infrastructure needs.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Gary Haldeman

Gary Haldeman
Ratepayer Representative,
Advisory Committee, GSP
P.O. Box 2708
Borrego Springs CA 92004
gary@garybaldy.com

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 15, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I'd like to add a second letter to the mix, as the Ratepayer Representative for the GSP in order to address a single item of great interest to me and to the ratepayers I represent.

As you know, my involvement on the AC, as the Ratepayer Representative, only began late in October, early November. In some senses, I have been at a disadvantage when I look at my fellow representatives. On the other hand, I have had the benefit of a fresh, unimpeded perspective of the process.

Early on during the process, the baseline period selected to determine the BPAs for the basin pumpers is the 5-year period from January 1, 2010 to January 1, 2015. "This rate is determined by adding up the maximum amount of water used by each pumper of groundwater in the Subbasin" over this 5-year period.

At least in the initial years of plan implementation, this figure is one of the most important elements because it will determine, in BWD's case, when the ratepayer first begins to feel the effect of the reductions: the greater the BPA, the longer it will take to affect our water usage.

The 5-year time frame, in conjunction with the period being limited to only these five years, is certainly the worst possible situation for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for this timeframe of overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

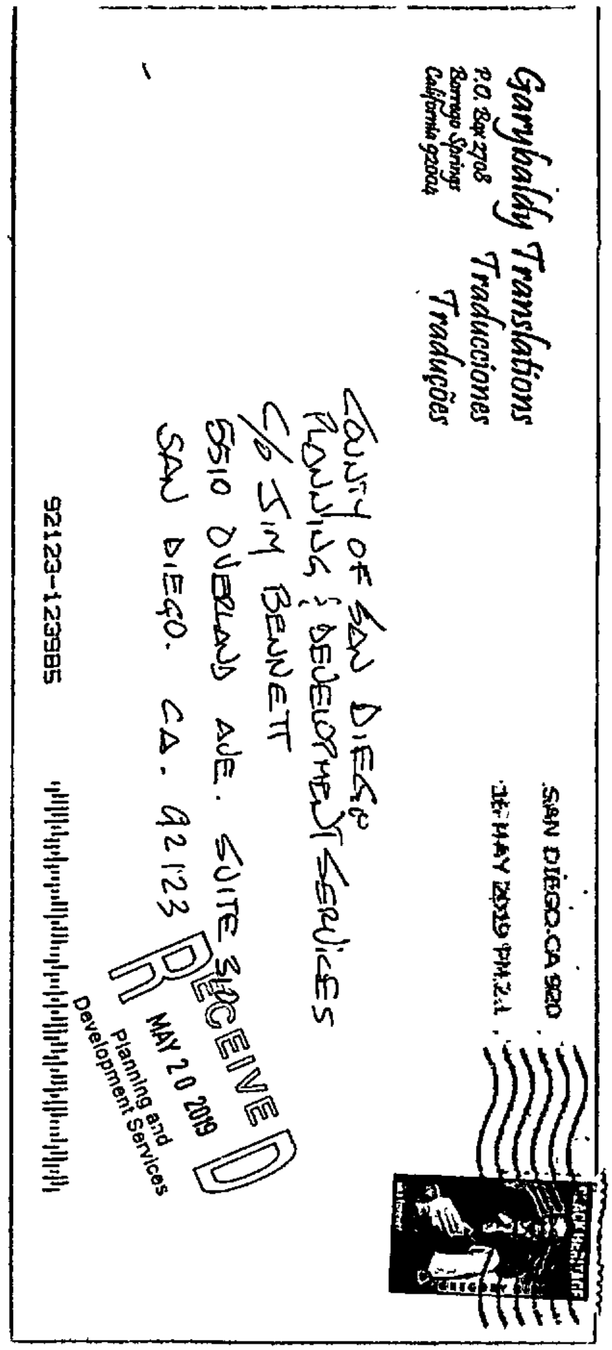
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer singularly, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit. How did this happen? How was the decision made?

I believe, in the spirit of fairness, that the period should be at least 10 years, perhaps the 10 years prior to 2010: 2000-2010. It should certainly not be based on the period of time when BWD began its reductions and, as the figures above show, other pumpers increased their water use.

Gary Haldeman

GARY HOLDEMAN
P.O. BOX 2708.
BS. CA 92004


Garybaldy Translations
Traducciones
Traduções
P.O. Box 2708
Borrego Springs
California 92004
SAN DIEGO CA 920
17 MAY 2019 PM 2 L
COUNTY OF SAN DIEGO
PLANNING & DEVELOPMENT SERVICES
C/O JIM BENNETT
5510 OVERLAND AVE. SUITE 310
SAN DIEGO. CA. 92123
RECEIVED
MAY 20 2019
Planning and
Development Services
92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

The aquifer that serves Borrego Springs has been in overdraft for decades and classifies as critical overdraft today. While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.
3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Sincerely,
Diane Martin (Roadrunner #225)

Scott and Diane Martin
25025 NE 108th St.
Redmond, WA 98053

RECEIVED
MAY 2 1 2019
Planning and
Development Services

SEATTLE WA 980
16 MAY 2019 PM 7 L

Liberty
FOREVER

County of San Diego
Planning and Development Services
c/o Jim Bennet
5510 Overland Ave, Suite 310
San Diego, CA 92123

92123-123985

County of San Diego
Planning & Development Services
C/O· Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives·

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any further reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

A. Donald
PO Box 2125
Borrego Springs, CA 92004

SAN DIEGO CA 920
17 MAY 2019 PM 5 L

USA

County of San Diego
Planing & Development Services
c/o Mr. Jim Bennet
5510 Overland Ave, Suite 310
San Diego, CA 92123

RECEIVED
MAY 2 1 2019
Planning and
Development Services

92123-123985

County of San Diego

May 14, 2019

Planning & Development Services

C/O: Jim Bennet

5510 Overland Avenue, Suite 310

San Diego, CA 92123

Ref: Groundwater Sustainability Plan

Borrego Valley Groundwater Basin

Borrego Springs Sub-basin

Dear Mr Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Herbert Stone

Herbert Stone

PO Box 1929

3275 West Star Rd.

Borrego Springs, CA 92004

Herbert Stone
PO Box 1929
Borrego Springs, CA
92004

PROVIDENCE RI 028
15 MAY 2019 PM 5 L

RECEIVED
MAY 21 2019
Planning and
Development Services

County of
San Diego Planning + Development Services
C/o Jim Bennet
5510 Overland Ave, Suite 310
San Diego, CA 92123

92123-123965

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs

Through modem day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any **further** reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Very Truly Yours, Frederic J. Wise

Karen & Fred Wise
315 S. Coast Hwy 101, Ste U. PMB 184
Encinitas, CA 92024

SAN DIEGO CA 920
17 MAY 2019 PM 1 L

RECEIVED
MAY 20 2019
Planning and
Development Services

County of S.D.
Planning & Dev. Services
5510 Overland Ave, #310
San Diego CA 92123

Attn: Jim Bennet

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

The aquifer that serves Borrego Springs has been in overdraft for decades and classifies as critical overdraft today. While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.
3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

THANK YOU,

Jeff Sims

Sims
PO Box 801
Borrego Springs, CA
92004

SAN DIEGO CA 920
17 MAY 2019 PM 1 L

RECEIVED
MAY 20 2019
Planning and
Development Services

County of San Diego
Planning & Development Services
c/o Jim Bennet
5510 Overland Ave. Suite 310
San Diego, CA 92123

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

We have a problem that needs your immediate attention. It's the water.

We are in dire need of a solution to our "critical overdraft" situation. You will learn quickly, if you don't already know, that agriculture, specifically, the Farmers, are depleting our aquifer at an unsustainable rate by irrigating their non-native citrus and palm orchards. They consume over 70% of the aquifer.

We, the ratepaying residents and businesses consume only 10%. Both residents and businesses have reduced consumption, in good faith, while the farmers have continued to install larger irrigation pipes and drill deeper down, thereby increasing their consumption. They are taking the amount that we have earnestly tried to preserve.

Agriculture was established in Borrego Springs before the town. They own the rights to the water. The town has grown as the agriculture has grown. There are now more people than orchards. People are more important than grapefruits.

Borrego Springs is a dazzling gem in this desert. We are a community of artists, anthropologists, archeologists, astronomers, paleontologists, naturalists, botanists, hikers, bikers, outdoor enthusiasts, all inspired by the endless wonder this desert provides.

Please consider deeply and act swiftly to find a solution to keep us from becoming a deserted dried up desert ghost town. There is too much to lose.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Regards,
Joanne Sims

P.O. Box 801
BS, CA 92004

SAN DIEGO CA 920
17 MAY 2019 PM 3 L

Jim Bennet
5510 Overland Ave. #310
San Diego, CA 92123

RECEIVED
MAY 20 2019
Planning and
Development Services

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

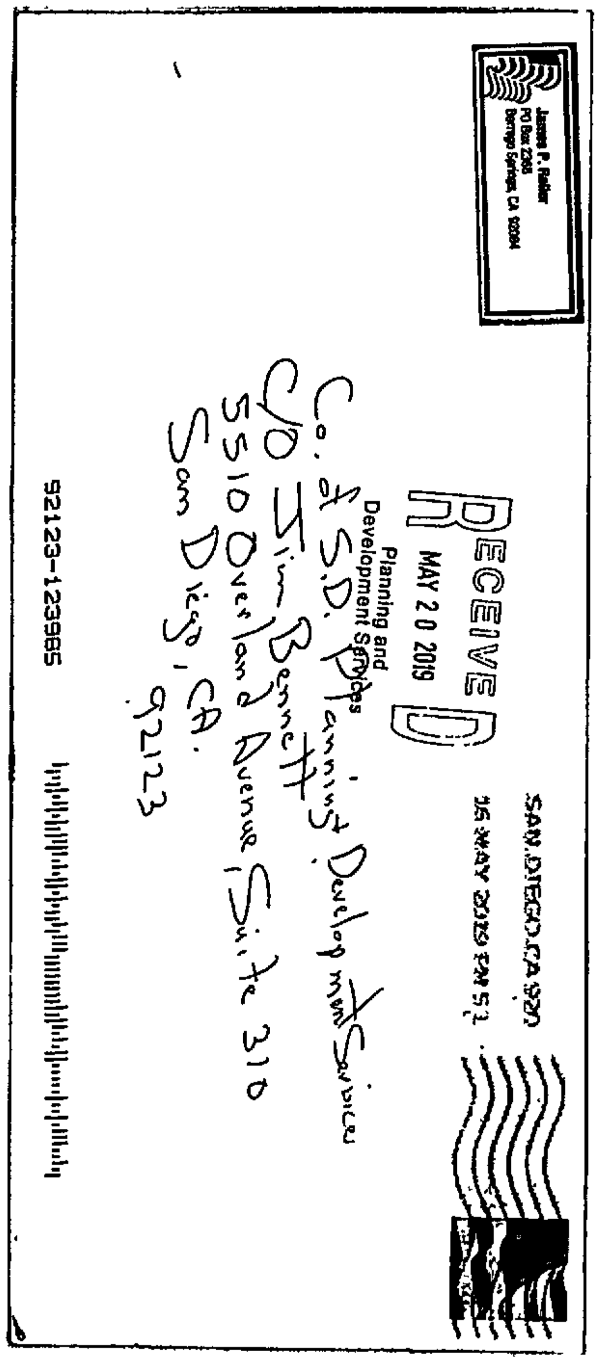
The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any **further** reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Thank you,

James Roller
561 Catarina Dr.
Borrego Springs, CA
92004


Borrego Springs, CA 92004
SAN DIEGO CA 920
15 MAY 2019 PM 5 L
RECEIVED
MAY 20 2019
Planning and
Development Services
Co. of S.D. Planning, Development Services
c/o Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA.
92123
92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin

Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

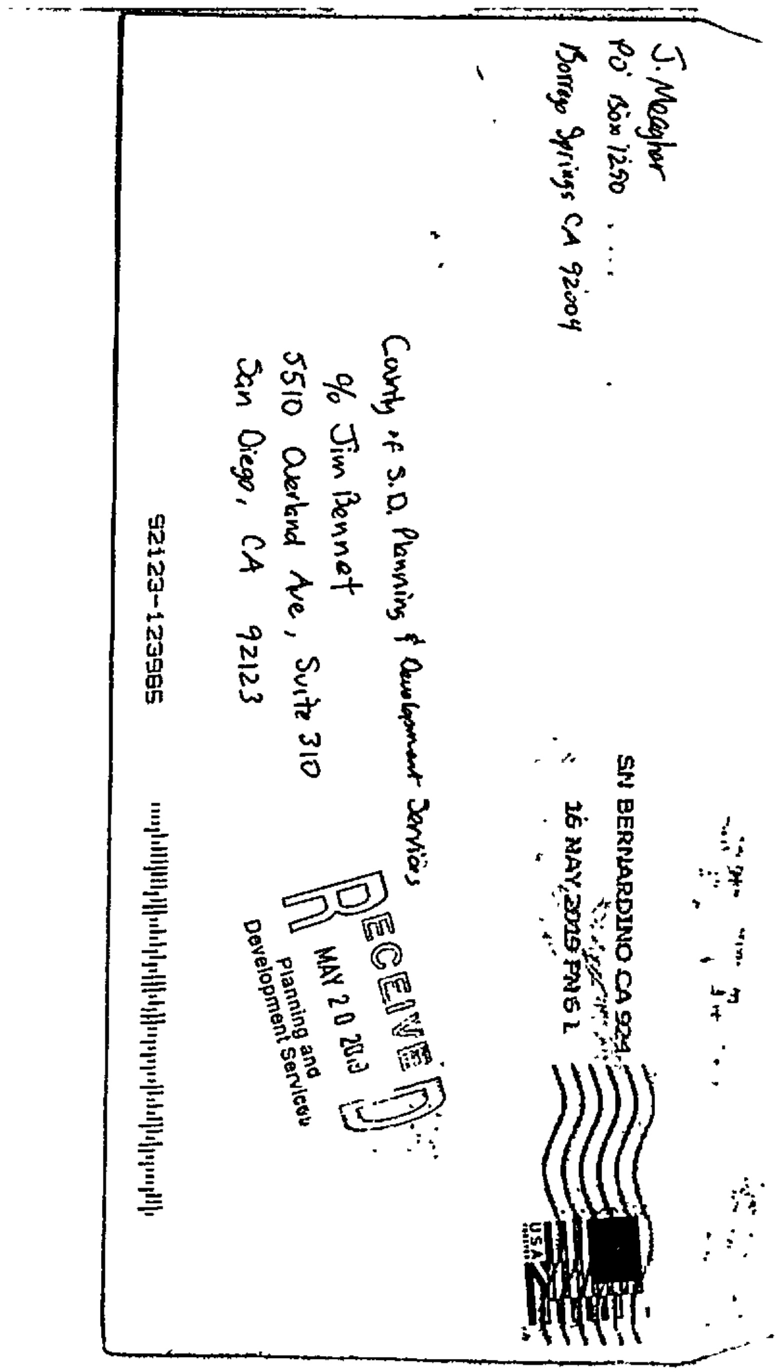
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Jeff Meagher


J. Meagher
PO Box 1250
Borrego Springs CA 92004

County of S.D. Planning & Development Services
% Jim Bennet
5510 Overland Ave, Suite 310
San Diego, CA 92123

SAN BERNARDINO CA 924
16 MAY 2019 PM 5 L

RECEIVED
MAY 20 2019
Planning and Development Services

92123-123965

County of San Diego May 14, 2019

Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

We have a problem that needs your immediate attention. It's the water.

We are in dire need of a solution to our "critical overdraft" situation. You will learn quickly, if you don't already know, that agriculture, specifically, the Farmers, are depleting our aquifer at an unsustainable rate by irrigating their non-native citrus and palm orchards. They consume over 70% of the aquifer.

We, the ratepaying residents and businesses consume only 10%. Both residents and businesses have reduced consumption, in good faith, while the farmers have continued to install larger irrigation pipes and drill deeper down, thereby increasing their consumption. They are taking the amount that we have earnestly tried to preserve.

Agriculture was established in Borrego Springs before the town. They own the rights to the water. The town has grown as the agriculture has grown. There are now more people than orchards. People are more important than grapefruits.

Borrego Springs is a dazzling gem in this desert. We are a community of artists, anthropologists, archeologists, astronomers, paleontologists, naturalists, botanists, hikers, bikers, outdoor enthusiasts, all inspired by the endless wonder this desert provides.

Please consider deeply and act swiftly to find a solution to keep us from becoming a deserted dried up desert ghost town. There is too much to lose.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next. This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Warmest Regards,

Heather Davidson
P.O. Box 1639
Borrego Springs, CA 92004

760.767.0145
LJHibiscus2@AOL.com

Heather Davidson
PO Box 1639
Borrego Spgs., CA 92004

SAN DIEGO CA 920
16 MAY 2019 PM 3 L

RECEIVED
MAY 20 2019
Planning and
Development Services

County of San Diego
Planning & Development Services
c/o Jim Bennet
5510 Overland ave., Ste. 310
San Diego, CA 92123

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any **further** reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Sincerely,

Linda A. Roller Linda A. Roller
PO Box 2368
Borrego Springs, CA 92004

Linda Roller
PO Box 2368
Borrego Spgs., CA 92004

SAN DIEGO CA 920
16 MAY 2019 PM 1

Co. of S.D. Planning + Development Services
c/o Jim Bennett
5510 Overland Avenue, Suite [illegible]
San Diego, CA
92123

RECEIVED
MAY 20 2019
Planning and
Development Services

92123-123985

John and Mary Delaney
P. O. Box 2537
Borrego Springs, CA 92004

Mr. Bennett,
Thank you for listening to our concerns. We're counting on you to save our town and the Park.

May 16, 2019

County of San Diego
Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett,

The aquifer that serves Borrego Springs has been in overdraft for decades and classifies as critical overdraft today. While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.

3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP -- 2010 to the end of 2014 -- is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Sincerely,

Jack Delaney
Mary Delaney

John and Mary Delaney
P. O. Box 2537
Borrego Springs, CA 92004

SAN DIEGO CA 920
16 MAY 2019 PM 1 L

Jim Bennett

RECEIVED
MAY 20 2019
Planning and
Development Services

County of San Diego
Planning & Development Services
c/o Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

92123-123965

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modem day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any farther reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Ellen Fitzpatrick
3457 Broken Arrow Rd, BS, CA 92004-2124

92004-2524

SAN DIEGO CA 920

15 MAY 2019 PM 5 L

County of San Diego Planning/Development
5510 Overland Avenue, Suite 310
San Diego, CA 9423

RECEIVED
MAY 2 1 2019
Planning and
Development Services

C/o Jim Bemet

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

The aquifer that serves Borrego Springs has been in overdraft for decades and classifies as critical overdraft today. While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.
3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD. 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you for your consideration.

Sincerely,

Michael L. Wells

Borrego Springs, CA

Michael Wells
PO Box 298
Borrego Springs, CA 92004

SAN DIEGO CA 920
17 MAY 2019 PM 5 L

County of San Diego
Planning & Development Services
c/o Jim Bennet
5510 Overland Ave, Suite 310
San Diego, CA 92123

RECEIVED
MAY 21 2019
Planning and
Development Service

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

The aquifer that serves Borrego Springs has been in overdraft for decades and classifies as critical overdraft today. While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.
3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

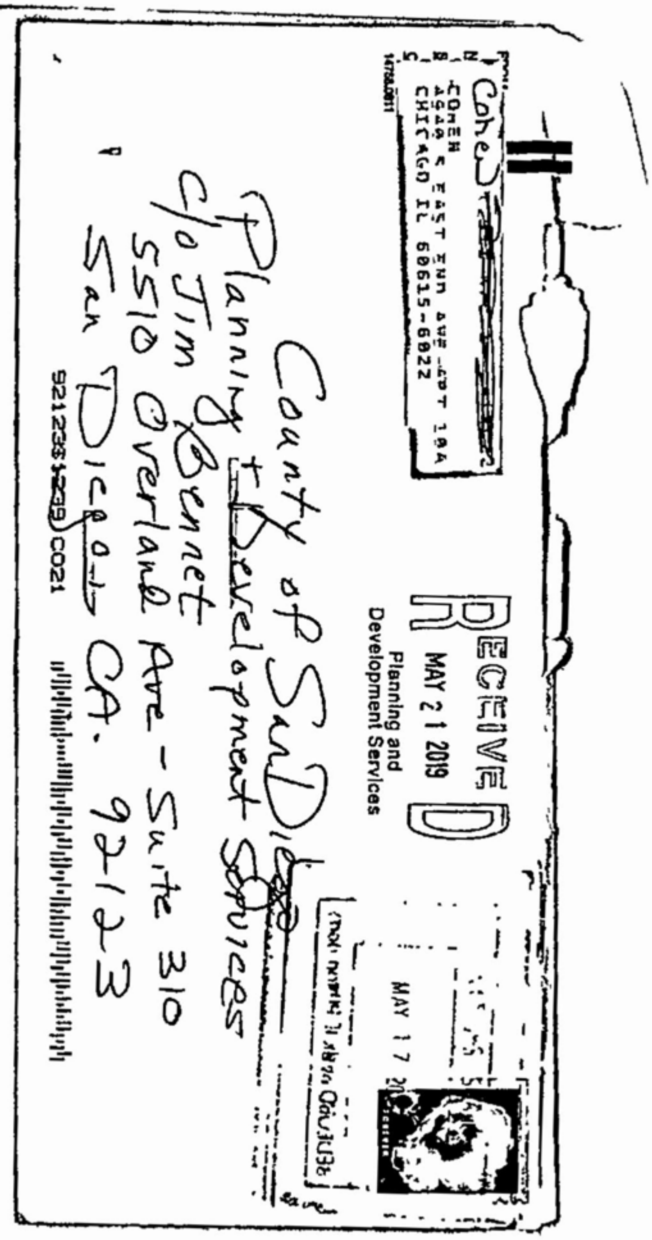
Sincerely,

Harold Cohen
Joanne Cohen

Harold and Joanne Cohen

618 Tilting T Drive

Borrego Springs, California 92004


COHEN
4940 S EAST END AVE APT 10A
CHICAGO IL 60615-6022
RECEIVED
MAY 21 2019
Planning and
Development Services
MAY 17
County of San Diego
Planning & Development Services
c/o Jim Bennet
5510 Overland Ave - Suite 310
San Diego CA. 92123

May 15, 2019

County of San Diego
Planning & Development Services
C/O Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

The aquifer that serves Borrego Springs has been in overdraft for decades and **classifies as critical overdraft today.** While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner who is committed to the rehabilitation of our aquifer, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.
3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

Sincerely,

Jennifer Edwards

Jennifer Edwards
P.O. Box 1858
312 Ocotillo Circle
Borrego Springs, CA 92004
superflute@gmail.com

J. Edwards
PO Box 1858
Borrego Springs, CA
92004

SAN DIEGO CA 920
17 MAY 2019 PM 5 L

County of San Diego
Planning & Development Services Attn: Jim Bennett
5510 Overland Avenue, Ste 310
San Diego, CA
92123

RECEIVED
MAY 2 1 2019
Planning and
Development Services

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

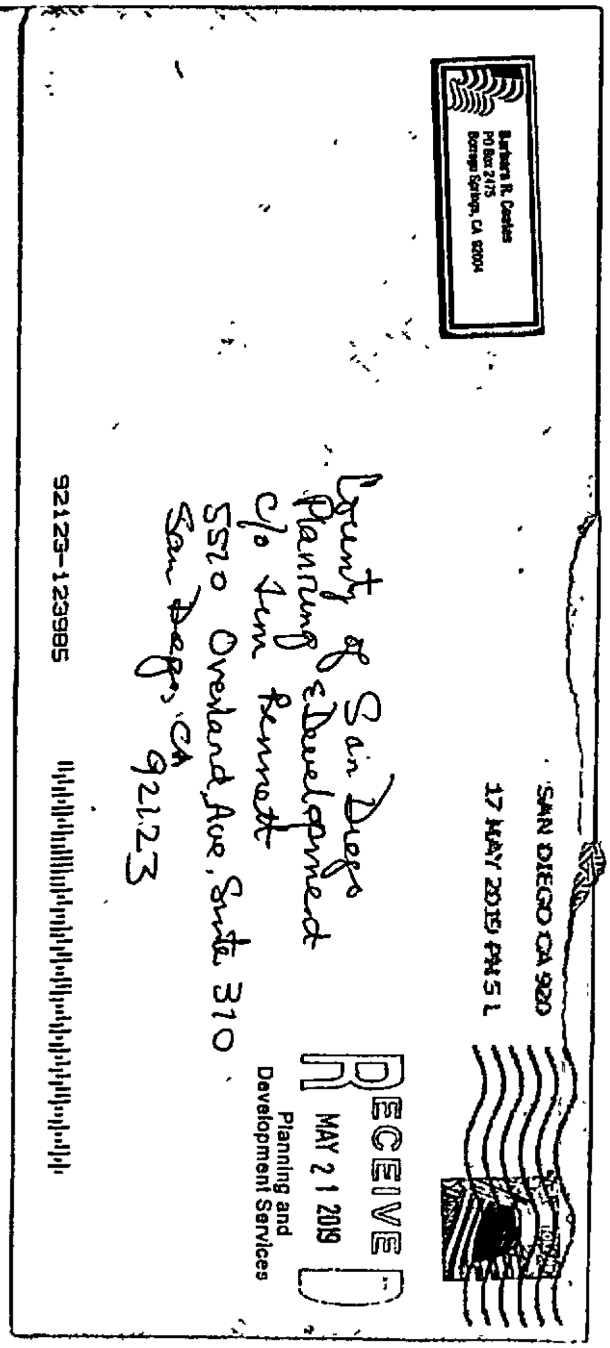
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Barbara Coates
P.O Box 2475
Borrego Springs, CA
92004



Barbara R. Coates
PO Box 2475
Borrego Springs, CA 92004

SAN DIEGO CA 920
17 MAY 2019 PM 5 L

RECEIVED
MAY 2 1 2019
Planning and
Development Services

County of San Diego
Planning & Development
C/o Jim Bennett
5510 Overland Ave, Suite 310
San Diego, CA
92123

92123-123985

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs, and I really appreciate your hard and long work in crafting the GSP. I would like to share with you some of my main concerns for our town. Water, water, and water!

The Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

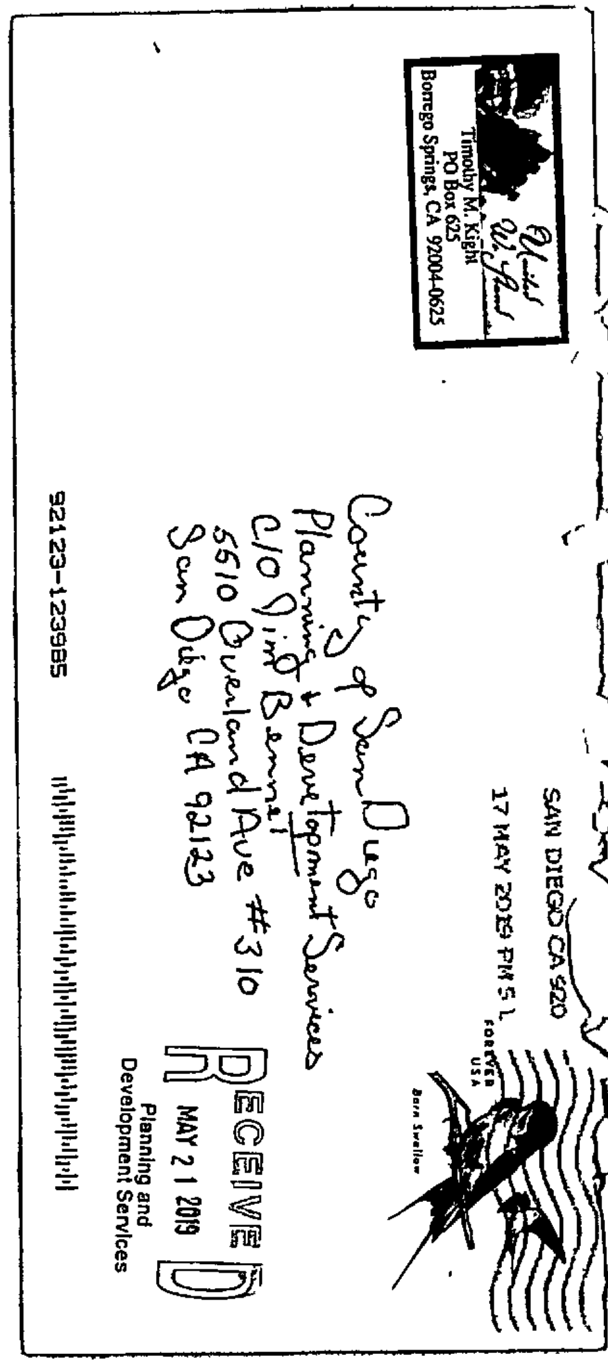
Therefore, we have identified some objectives that must be included in the implementation of the Groundwater Sustainability Plan.

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. This would allow for some limited growth of homes and businesses.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

I look forward to hearing from you.

Tuxt M G[illegible]
344 Carizzo Rd X 625
Borrego Springs, Ca 92004


Timothy M. Kight
PO Box 625
Borrego Springs, CA 92004-0625
SAN DIEGO CA 920
17 MAY 2019 PM 5 L
FOREVER USA
Barn Swallow
County of San Diego
Planning + Development Services
c/o Jim Bennett
5610 Overland Ave #310
San Diego CA 92123
RECEIVED
MAY 21 2019
Planning and
Development Services
92123-123985

County of San Diego
Planning & Development Services
c/o Mr. Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 17, 2019

EXPRESS U. S. MAIL

Re: Borrego Springs Groundwater Sustainability Plan

Dear Mr. Bennett:

I have been a Borrego Springs snowbird and BWD ratepayer for 30 years. I have a small home at Rams Hill. Though I appreciate and use the golf courses in Borrego, including the ones Rams Hill and Borrego Springs Resort, I am concerned about the water overdraft caused primarily by extensive citrus farming and golfing in Borrego.

We ratepayers have reduced our use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! I have served on the board of my neighborhood association during the same period of time, and our neighborhood association has gone to great effort to significantly reduce landscaping water use. **Neither agriculture nor golf courses have significantly reduced their water usage.**

Change is hard but we must all work together as a community to save Borrego Springs. I attended as many of the ratepayer meetings as I could when I was in Borrego this year. I agree completely with the four well stated and well documented concerns, beliefs and objectives of the group led by Gary Haldeman:

- BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any further reductions.
- The 20-year implementation period set out under SGMA should be shortened.
- Water quality should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- GDEs must be considered in the overall water allocation calculus.

BPAs are one of the most important elements in the implementation process. The timeframe in the GSP – 2010 to the end of 2014 – is the worst possible interval for BWD ratepayers. BWD began reducing its usage in 2003, when it pumped 3926 AF and has responsibly reduced its water usage to 1700 now. During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. The only conclusion possible is that farms and golf courses are responsible for the overdraft. **Thus, choosing 2010-2015 as the baseline years to determine unquestionably favors farmers and golf courses over the ratepayers and is patently unfair, arbitrary and manipulative.**

I respectfully request that:

- **BWD/Ratepayers be allocated an initial minimum of 1700 AFY and that this allocation not be further reduced**
- **The 20-year implementation period be shortened**
- **Water quality be addressed immediately**
- **Consideration be given to GDEs in the overall water allocation.**

Sincerely,

Mary Susan Leahy

Mary Susan Leahy
9 McKinley Street
Concord, New Hampshire 03301-2700


PRIORITY ★ MAIL ★ EXPRESS™
OUR FASTEST SERVICE IN THE U.S.
WHEN USED INTERNATIONALLY, A CUSTOMS DECLARATION LABEL MAY BE REQUIRED.
EP13F July 2013 OD: 12.5 x 9.5
PS10001000006
WRITE FIRMLY TO MAKE ALL COPIES LEGIBLE.
FROM: Mary Susan Leahy
9 McKinley Street
Concord, NH 03301-2700
TO: County of San Diego
Planning + Development Services
Mr. Jim Bennett
5510 Overland Ave, Suite 316
San Diego, CA 92123
del. 5/18/19 @ 9:12
EK 202490846 US
UNITED STATES POSTAL SERVICE
03103
5/17/19
5/20/19
5:48
$ 25.50
$ 25.50
2-CUSTOMER COPY
+ Money Back Guarantee for U.S. destinations only.
VISIT US AT USPS.COM®
ORDER FREE SUPPLIES ONLINE
UNITED STATES POSTAL SERVICE

County of San Diego
Planning & Development Services
C/O. Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 15, 2019

Ref: Groundwater Sustainability Plan, Borrego Valley Groundwater Basin, Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a 40-year, year-round resident, homeowner, and manager of a business and employer in Borrego Springs I thank you for your excellent, hard work in crafting the GSP. I would like to share with you some of my main concerns for our town related to water.

The Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows.

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3,500 acre feet/year to the current level of 1,700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

Therefore, we have identified some objectives that must be included in the implementation of the GSP:

- The municipal allotment should be *no less than* the 1,700 acre feet/year, which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. This would allow for some limited growth of homes and businesses

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

Finally, BPAs are arguably one of the most important elements in the implementation process, witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP, 2010 to the end of 2014, is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3,926 AF. In 2010, BWD pumped 2,730 50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1,700 AF.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first and golf courses next. This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit. Thank you for your attention I look forward to hearing from you.

Sincerely,
Betsy Knaak

Betsy Knaak, P.O. Box 2021, Borrego Springs, CA 92004-2021 * 760-767-4808 * betsyknaak@gmail com

May 14, 2019

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Ginger Dunlap Dietz
PO Box 86
Borrego Springs CA
92004

As a 12 year resident of Borrego and director of Borrego Art Institute Pottery Program I see our community as art-rich and a draw for residents and Southern California Tourists. We cannot lose this surprising place.

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs. I really appreciate your work in crafting the GSP. I would like to share with you some of my main concerns for our town.

As you know, the Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, converting to low-flow toilets, and being constantly mindful of water use in every way.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water. I have recently noticed that agriculture seems to be expanding around town. There are new multi-acre plantings of herbs and flowers that require water where previously there was just open land.

Therefore, it's my belief that the following objectives must be included in the implementation of the Groundwater Sustainability Plan

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. The municipal users have already reduced consumption to an almost painful level.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next. This is patently unfair, arbitrary and manipulative. Please consider using an earlier timeframe for the baseline years to determine BPAs

Thank you for considering my input.

Sincerely,

Charlene Aron Charlene Aron

437 Pointing Rock Dr., POB 1682

Borrego Springs CA 92004

Charlene Aron
PO Box 1682
Borrego Spgs, CA 92004

SAN DIEGO CA 920
20 MAY 2019 PM 3 L

County of San Diego
Planning & Development Services
c/o Jim Bennett
5510 Overland Av., Suite 310
San Diego CA 92123

RECEIVED
MAY 22 2019
Planning and
Development Services

92123-126610

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 19, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

• We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any further reductions.
• We believe that the 20-year implementation period set out under SGMA should be shortened.
• We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
• We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped

3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.
During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.
Thank you for the opportunity to provide input into this extremely important issue. As a resident of Borrego Springs I hope for the implementation of a plan that will be fair to its residents and sensitive to the environmental needs of this unique and spectacular area.

Sincerely,
Sandy Jorgensen-Funk

Sandy Jorgensen-Funk
2826 Back Nine Dr.
Borrego Springs, CA 92004
Sandyjfunk @cox.net

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

The aquifer that serves Borrego Springs has been in overdraft for decades and classifies as critical overdraft today. While residents have responded to this crisis by cutting back water use by over 50% in the past 40 years, agriculture has responded by drilling deeper wells and expanding. The net result is a water table that has already dropped over 100 feet and drops an additional 1-2 feet per year.

Borrego Springs is also in an uncomfortably unique situation in California: due to our geographic isolation we are not able to import water from elsewhere in the state. The aquifer that serves our community is our only source of water and it is in a 70% overdraft situation. Of the water removed from our aquifer annually, agriculture pumps 70%, golf courses pump 20% and residential and business rate-payers in Borrego use the remaining 10% of the total

As a Borrego Springs homeowner, I ask you to support the four objectives toward water sustainability stated by the Borrego Springs Water District Ratepayers for the Groundwater Sustainability Plan (GSP) under SGMA (Sustainable Water Management Act). This plan is currently under public review:

1. BWD Ratepayers should be allocated an initial minimum of 1700 AFY. This total represents an over 50% decrease in our historical average, a result of significant conservation efforts that are already in place. This allocation (1700 AFY) should be excluded from any reductions.
2. The 20-year implementation period set out in our GSP should be shortened significantly or planned reductions should be front-loaded. Straight-line reductions over a 20 year period will result in a greatly lowered aquifer, costlier water pumping and water of poorer quality.
3. Water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined the parties responsible must be held to account for any remediation that might be necessary.
4. Groundwater Dependent Ecosystems must be considered in the overall water allocation calculus and timing of reductions. Water set-asides for GDEs are meaningless if the "set-aside water" sits in a drastically reduced water table, unavailable to the ecosystems it is intended to support

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you for your consideration,

Sally Theriault

Sally Theriault
PO Box 1434
(3076 Broken Arrow Road)
Borrego Springs, CA 92004-1434

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any **further** reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

My family and I have been full-time residents in Borrego Springs for many years, and purchased our home in 1994. As a visitor since the 60's, I have noticed the mesquite forest in the lower valley fail, while mesquite in surrounding areas have not — my conclusion is the cause is the dropping water table. Farmers were originally striking water at a depth of 30' according to historical accounts.

Reduction in water usage by residents would have little impact on the problem, and it certainly seems that the greater impact should be shouldered by the big water users — primarily agriculture. If they do not significantly reduce water consumption, first the town of Borrego Springs will die, and then agriculture will follow. We must not allow this to happen!

Bob Theriault

ROBERT THERIAULT
PO BOX 1434 / 3076 BROKEN ARROW RD
BORREGO SPRINGS, CA 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730 50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Merritt Smith
1010 Palm Canyon #151
BS. CA 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Linda Moceri
1968 Desert Vista Terrace, Rams Hill

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs, and I really appreciate your hard and long work in crafting the GSP. I would like to share with you some of my main concerns for our town. Water, water, and water!

The Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

Therefore, we have identified some objectives that must be included in the implementation of the Groundwater Sustainability Plan.

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. This would allow for some limited growth of homes and businesses.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

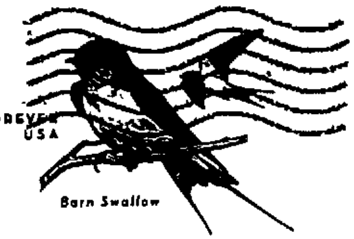
I look forward to hearing from you.

(D.E.Owen)
(R.A. Owen) 5-25-2019

Dr R. Owen
P.O. Box 1666
Borrego Springs
CA 92004

RECEIVED
MAY 30 2019
Planning & Development Services

SAN DIEGO CA 920
28 MAY 2019 PM 2 L



County of San Diego
Planning & Development Services,
c/o Jim Bennet
550 Overland Avenue, Suite 310
San Diego, CA 92123

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 19, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any further reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped

3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.
During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.
Thank you for the opportunity to provide input into this extremely important issue. As a resident of Borrego Springs I hope for the implementation of a plan that will be fair to its residents and sensitive to the environmental needs of this unique and spectacular area.

Sincerely,

Gary Funk

Gary Funk
2826 Back Nine Dr.
Borrego Springs, CA 92004
Sandyjfunk @cox.net

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any further reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD. 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Linda McBride
1010 Palm Cyn Dr #339
POB 1863
BS, CA 92004
760-767-3547

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs, and I really appreciate your hard and long work in crafting the GSP. I would like to share with you some of my main concerns for our town. Water, water, and water!

The Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious e□ort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

Therefore, we have identified some objectives that must be included in the implementation of the Groundwater Sustainability Plan.

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. This would allow for some limited growth of homes and businesses.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.
During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the

ratepayer, and unquestionably favors farmers first, and golf courses next.
This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

I look forward to hearing from you.

Jeanne Gemmell
1010 Palm Canyon # 149
Borrego Springs 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Cyril Weaver

Cyril Weaver

P.O Box 2469

Borrego Springs

Ca 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs, and I really appreciate your hard and long work in crafting the GSP. I would like to share with you some of my main concerns for our town. Water, water, and water!

The Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

Therefore, we have identified some objectives that must be included in the implementation of the Groundwater Sustainability Plan.

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. This would allow for some limited growth of homes and businesses.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.
During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the

ratepayer, and unquestionably favors farmers first, and golf courses next.
This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

I look forward to hearing from you.

Marjorie Schuessler
Paul Schuessler

PO Box 1013
Borrego Springs, CA 92004

760-668-5267
phrog47@gmail.com

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs. I really appreciate your work in crafting the GSP. I would like to share with you some of my main concerns for our town.

As you know, the Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows.

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious effort of removing fountains and swimming pools, grass and water intensive landscaping, converting to low-flow toilets, and being constantly mindful of water use in every way.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water. I have recently noticed that agriculture seems to be expanding around town. There are new multi-acre plantings of herbs and flowers that require water where previously there was just open land.

Therefore, it's my belief that the following objectives must be included in the implementation of the Groundwater Sustainability Plan.

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. The municipal users have already reduced consumption to an almost painful level.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next. This is patently unfair, arbitrary and manipulative. Please consider using an earlier timeframe for the baseline years to determine BPAs.

Thank you for considering my input.

Sincerely,
Alfred G. DeVico

437 Pointing Rock Dr., POB 1682

Borrego Springs CA 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

I am a year-round resident of Borrego Springs, and I really appreciate your hard and long work in crafting the GSP. I would like to share with you some of my main concerns for our town. Water, water, and water!

The Borrego Valley aquifer has been drastically over-drafted for many years. We must comply with state law, the California Groundwater Sustainability Act, and come into compliance by 2040. Current and historic water use in the basin has been as follows:

- Municipal pumpers (Borrego Water District) - 10%
- Recreational pumpers (Golf courses) - 20%
- Agricultural pumpers (Citrus, palm trees, herb and vegetable farms) - 70%

The current Groundwater Sustainability Plan (GSP) seems to recommend an across the board reduction of 74%, which would maintain the current distribution percentages. The residential water use has already been cut from a reported historic high of 3500 acre feet/year to the current level of 1700 acre feet/year, a cut of 50%. Our community has done this through the conscious e ort of removing fountains and swimming pools, grass and water intensive landscaping, and converting to low-flow toilets.

The recreational and agricultural users have been slow or completely unwilling to make similar reductions, continuing to deplete our aquifer. Clearly the major contributor to the aquifer overdraft has been and continues to be agriculture. Although agriculture has been an important part of our community, it is unreasonable to assume that farming should continue to use 70% of the allocated water.

Therefore, we have identified some objectives that must be included in the implementation of the Groundwater Sustainability Plan.

- The municipal allotment should be no less than the 1700 acre feet/year which is currently being used by the BWD. This is our only source of drinking water, which should be a priority for our community. This would allow for some limited growth of homes and businesses.

- We believe that sustainability should be achieved sooner than the mandated 20 year period. The sooner we can become sustainable, the better chance we have to maintain the water quality of our aquifer. This will also have a beneficial impact on some of the endangered ecosystems in the basin.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.
During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the

ratepayer, and unquestionably favors farmers first, and golf courses next.
This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

I look forward to hearing from you.

Liesel Paris
P.O. 2469
Borrego Springs
Ca 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Sal Moceri,
1968 Desert Vista Terrace
Borrego Hills

County of San Diego May 14, 2019

Planning & Development Services

C/O: Jim Bennet

5510 Overland Avenue, Suite 310

San Diego, CA 92123

Ref: Groundwater Sustainability Plan

Borrego Valley Groundwater Basin

Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply. With that false belief and extensive advertising came numerous agricultural farms, golf courses and, of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs. Following are our four main concerns, beliefs and objectives:

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY; this allocation should be excluded from any further reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Heidi H. Noyes full-time resident since '91

HEIDI H. NOYES
3252 East Star Rd. (P.O. Box 1080) mailing
Borrego Sprgs, CA 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.

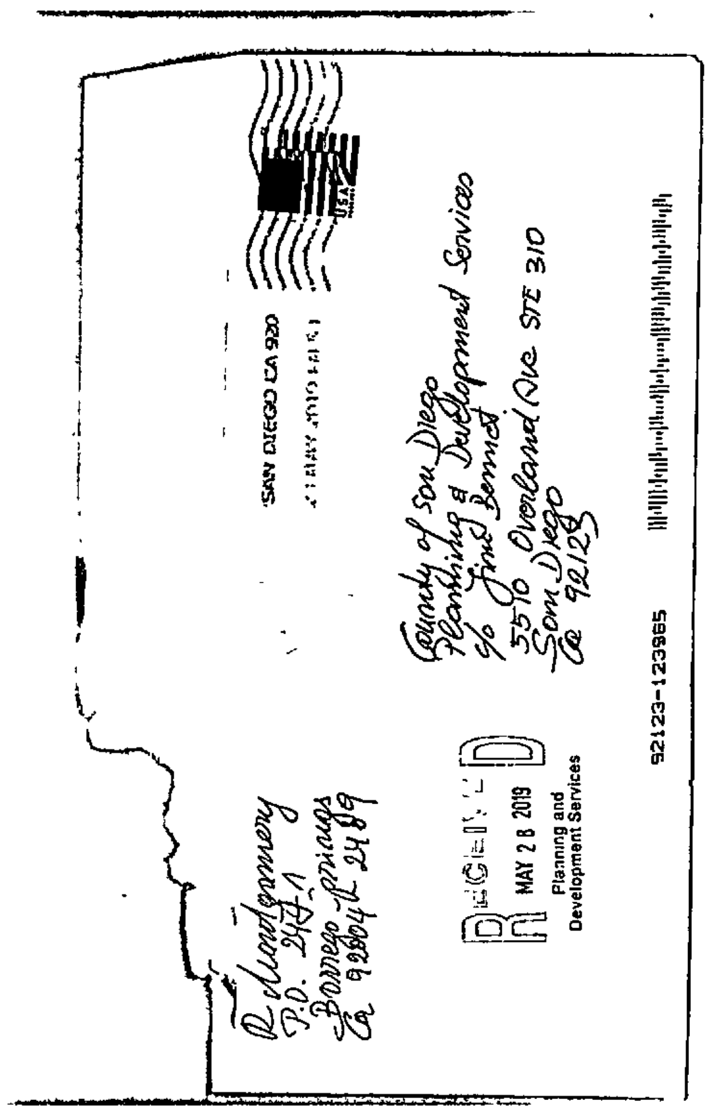
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

Robyn Montgomery
P.O. 2471
Borrego Springs
Ca 92004-2469


SAN DIEGO CA 920
County of San Diego
Planning & Development Services
c/o Jim Bennett
5510 Overland Ave STE 310
San Diego
Ca 92123
RECEIVED
MAY 28 2019
Planning and
Development Services
92123-123965

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 14, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

As the Ratepayer Representative for the Groundwater Sustainability Plan we've drafted under SGMA, a plan currently under public review, I'd like to briefly outline what we, the ratepayers of Borrego Springs, wish to see implemented in our process towards water sustainability:

- We, the ratepayers, who use 10% of the water available in the basin and are the only pumpers who have reduced our water usage significantly over these last few years. We therefore believe that the burden of all mandatory reductions should fall proportionately on the other pumpers in the valley. BWD should be allocated a minimum of 1700 AFY as soon as implementation is to begin.
- We strongly believe that a 20-year implementation period is much too long. Our aquifer has already dropped dramatically over the last 30 years. Prolonging this implementation can only affect the quality of our water and the cost of its extraction.
- The valley's native flora and fauna communities have been severely affected as a result of the long-term overdraft of the basin. In order to preserve the remaining ecosystems, two things must happen: first, there must be a set-aside for them; and second, the implementation period must be drastically shortened so as to ensure the survival of the remaining communities.

Although I do know that the position taken by the GSA is that proportional reductions and a 20-year implementation period, along with a hands-off position regarding GDEs, are currently the intended approaches to the GSP, what I would like to hear from you is, if you were in our shoes, what Projects and Management Actions would you utilize, and how would you go about implementing the above four objectives we, the ratepayers, wish to see implemented.

Thank you so much for your unrelenting efforts over these last few years. The GSP for the Borrego Basin is truly a benchmark piece of work that has laid the groundwork for all future efforts towards implementing the sustainable use the groundwater in our valley.

Best regards,

William E. Bennett

William Bonnell
Box 2566
Borrego Springs, CA
92004

SAN DIEGO CA 920
24 MAY 2019 PM 5 L

RECEIVED
MAY 28 2019
Planning and
Development Services

County of San Diego
Planning & Development
C/O Jim Bennett
5510 Overland Ave Suite 310
San Diego, CA 92123

92123-123985

James Rickard
PO Box 777, 737 San Pablo Rd
Borrego Springs CA 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 17, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

At one time, many decades ago, it was believed that Borrego Springs had an unlimited water supply With that false belief and extensive advertising came numerous agricultural farms, golf courses and. of course, residents to Borrego Springs.

Through modern day monitoring and measuring, unfortunately, we have determined the Borrego Springs ground water supply has dropped drastically and alarmingly the past 30 years. Although the residents use 10% of the water supply, agriculture uses 70% and golf courses use 20%.

The resident/ratepayers have buckled down and reduced their use over the last 10 years from some 2700 acre feet/year to 1700 acre feet/year and in the process have seen their water bills increase three times! Distressingly, agriculture has not significantly reduced their water usage nor have the golf courses.

Change is hard but we must all work together as a community to save the town of Borrego Springs Following are our four main concerns, beliefs and objectives

- We believe that BWD/Ratepayers should be allocated an initial minimum of 1700 AFY, this allocation should be excluded from any further reductions.
- We believe that the 20-year implementation period set out under SGMA should be shortened.
- We believe that water quality is an essential concern, it should be addressed immediately, and if/when water quality issues are determined, the parties responsible are held to account for any remediation that might be necessary.
- We believe that the GDEs (Groundwater Dependent Ecosystems) must be considered in the overall water allocation calculus

Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730 50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.
During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD: 70% due to farming, 20% due to recreation/golf courses.
Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next.
This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Sincerely yours,

James Rickard

James Rickard

Jim + Grace Rickard
PO Box 777
Borrego Springs
CA 92004

PRIORITY AERPHOST

Remember to Use Your EIRCODE

20 05 19
07204358

Éire 1.70

Co. of San Diego
Planning + Development Services
c/o Jim Bennett
5510 Overland Ave, Suite 310
San Diego, CA 92123
USA

RECEIVED
MAY 28 2019
Planning and Development Services

92123&1239 C021

Grace Rickard
PO Box 777, 737 San Pablo Rd
Borrego Springs CA 92004

County of San Diego
Planning & Development Services
C/O: Jim Bennet
5510 Overland Avenue, Suite 310
San Diego, CA 92123

May 17, 2019

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-basin

Dear Mr. Bennett;

We have a problem that needs your immediate attention. It's the water.

We are in dire need of a solution to our "critical overdraft" situation You will learn quickly, if you don't already know, that agriculture, specifically, the Farmers, are depleting our aquifer at an unsustainable rate by irrigating their non-native citrus and palm orchards They consume over 70% of the aquifer.

We, the ratepaying residents and businesses consume only 10%. Both residents and businesses have reduced consumption, in good faith, while the farmers have continued to install larger irrigation pipes and drill deeper down, thereby increasing their consumption. They are taking the amount that we have earnestly tried to preserve.

Agriculture was established in Borrego Springs before the town. They own the rights to the water. The town has grown as the agriculture has grown. There are now more people than orchards People are more important than grapefruits.

Borrego Springs is a dazzling gem in this desert. We are a community of artists, anthropologists, archeologists, astronomers, paleontologists, naturalists, botanists, hikers, bikers, outdoor enthusiasts, all inspired by the endless wonder this desert provides.

Please consider deeply and act swiftly to find a solution to keep us from becoming a deserted dried up desert ghost town There is too much to lose.

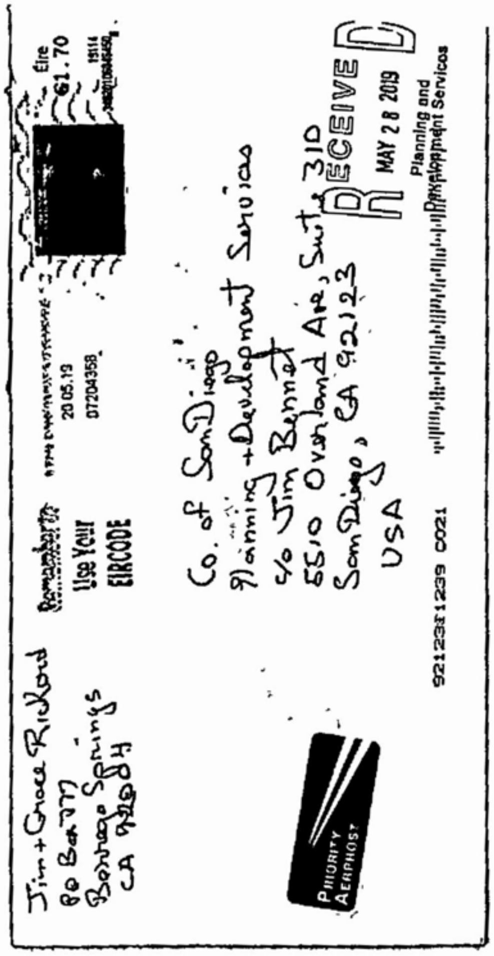
Finally, BPAs are arguably one of the most important elements in the implementation process: witness the ongoing battle among stakeholders to establish the highest BPA possible. For reasons unclear to us, the ratepayers, the timeframe set out in the GSP – 2010 to the end of 2014 – is certainly the worst possible interval for BWD. BWD began reducing its usage in 2003, when it pumped 3926 AF. In 2010, BWD pumped 2730.50 AF, and since then it has continued to responsibly reduce its water usage such that currently it pumps 1700.

During this same period of water reductions by BWD, water storage in the basin was reduced by approximately 160,000 AF. These figures are a clear indicator that the parties responsible for the overdraft were pumpers other than BWD. 70% due to farming, 20% due to recreation/golf courses. Thus, choosing 2010-2015 as the baseline years to determine BPAs is clearly to the detriment of the ratepayer, and unquestionably favors farmers first, and golf courses next

This is patently unfair, arbitrary and in the big picture, manipulative and probably illicit.

Sincerely,
Grace Rickard

Grace Rickard



Jim + Grace Rickard
PO Box 777
Borrego Springs
CA 92004
Remember to
Use Your
EIRCODE
20.05.19
07204358
[redacted]
Éire
61.70
Co. of San Diego
Planning + Development Services
c/o Jim Bennett
5510 Overland Ave, Suite 310
San Diego, CA 92123
USA
RECEIVED
MAY 28 2019
Planning and
Development Services
PRIORITY
AERPHOST
92123#1239 C021

Letter I47 – I89

Commenter: Borrego Water District Ratepayers
Date: Various

The Groundwater Sustainability Agency (GSA) acknowledges 43 comment letters submitted by the Borrego Water District ratepayers.

The GSA has summarized the comment letters with the following underlined comments followed by GSA responses:

Comment 1: <u>The Borrego Water District should not be subject to reductions below 1,700 acre-feet per year.</u> While the Groundwater Sustainability Plan (GSP) does not set specific groundwater use reductions, the GSP includes Project and Management Action (PMA) No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare the California Environmental Quality Act (CEQA) documentation (after GSP adoption) in advance of considering formal adoption and implementation of any groundwater use reductions and a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions and a specific ramp down schedule could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment 2: <u>The GSP implementation timeline should be shortened significantly or planned reductions should be front loaded.</u> While the GSP does not set specific groundwater use reductions or rampdown schedule, the GSP includes PMA No. 3 – Pumping Reduction Program. As indicated in the GSP, the GSA will prepare CEQA documentation (after GSP adoption) in advance of considering formal adoption and implementation of a specific ramp down schedule. The GSP also indicates an agreement among the pumpers is a possible scenario where groundwater use reductions and a specific ramp down schedule could be developed.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment 3: <u>Water quality should be addressed immediately, and if/when water quality are determined the parties responsibly must be held accountable for any remediation</u>. When and if water quality becomes a concern that may require mitigation within any portion of the Subbasin, the GSA may consider implementing PMA No. 4 – Water Quality Optimization and/or PMA No. 5 – Intra-Subbasin Water Transfers Program. Funding sources for the PMAs will be considered by the GSA prior to implementation.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment 4: Groundwater dependent ecosystems must be considered in overall water allocation calculus and timing of reductions. The GSA acknowledges the commenter's concern regarding groundwater dependent ecosystems. The GSP addresses groundwater dependent ecosystems as part of the analysis which can be found in Chapters 2 and 3, and Appendix D4. The GSP concludes that impacts to groundwater dependent ecosystems are a pre-2015 impact and is not currently an undesirable result applicable to the Subbasin.

Comment 5: What projects and management actions would need to be utilized to go about implementing the four objectives the ratepayers would like to see implemented, and how? Responses to Comments 1 and 2 indicate PMA No. 3 – Pumping Reduction Program would be utilized to implement specific reductions and the time schedule for those reductions and the potential scenarios and how they could be developed. For water quality, response comment 3 indicates PMA No. 4 – Water Quality Optimization and/or PMA No. 5 – Intra-Subbasin Water Transfers Program would be utilized if necessary. For groundwater dependent ecosystems, there is no project or management action since it is not considered an undesirable result applicable to the basin.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

Comment 6: The 2010 through 2014 period was the worst possible interval for the Borrego Water District for development of the baseline pumping allocations. How was the timeframe of 2010 through 2014 selected as the time period for determining baseline pumping allocations?
In response, the GSA sought extensive public input prior to determining the time period for the baseline pumping allocation. Please see meeting minutes from September 28, 2017, November 17, 2017, and January 25, 2018. They can be found on the County of San Diego's (County's) Sustainable Groundwater Management Act (SGMA) website at:
https//www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html.

Comment Letter I90

County of San Diego
Planning and Development
5510 Overland Ave, suite 310
San Diego, CA 92123
C/O: Jim Bennett

May 16, 2019

Ref: Borrego Valley Groundwater Sustainability Plan

Mr. Jim Bennett

During the last four plus years many of us have spent hundreds of hours working the over draft problem I don't recall there being any discussion that the plan for setting the pumping reductions would be established through negotiations with the pumpers to establish a Stipulated Agreement. Some question that could have been asked if shared with the A/C are; I would like to present now.

- Who are representing the Core team?
- Are all of the sectors included in the negotiations?
- Will the results of the negotiations be shared with the A/C before they are incorporated in the GSP?
- If the Stipulated Agreement is established can the reductions start while the two year CEQA review takes place?
- Will a consideration to front load the reductions to bank water to protect the program from possible unknown problems that may come up during the 20 year span of the GSP? (IE; multiyear drought resulting in reduction of recharge)
- Is the reductions that the rate payers have already achieved being considered?

If there are sufficient representation in the negotiations, it would greatly reduce the possibility of litigation, which is a good thing for he program.

It would be helpful if the Core Team would summarize the comments on the GSP received and share them with the A/C prior to the next meeting.

I90-1

Jim Wilson, Member at Large, Advisory Committee

INTENTIONALLY LEFT BLANK

Letter I90

Commenter: Jim Wilson
Date: May 16, 2109

I90-1 The Groundwater Sustainability Agency (GSA) acknowledges the questions regarding the stipulated agreement process that is occurring. In response, on July 9, 2019, the Borrego Water District (BWD) had a public meeting in which proposed stipulated agreement terms were made public. Additionally, per your request, the response to public comments were discussed at the Groundwater Sustainability Plan (GSP) advisory committee meeting held on July 25, 2019.

This comment does not address the adequacy of the Draft GSP, and therefore, no further response is required or necessary.

INTENTIONALLY LEFT BLANK

BWD Responses to Comments on Proposed SGMA Alternative to a GSP Stipulation Documents

January 2020

Borrego Water District
Response to Public Comment
Stipulated Judgment – Borrego Springs Sub Basin
January 3, 2020

COMMENTS RECEIVED FROM

Comment letters were received by BWD during the 30-day Stipulated Judgment review from the following:

COMMENT #	AUTHOR
#1	Borrego Springs Unified School District Elementary School Well, James Markman - Atty
#2	Gary Haldeman, Borrego Resident
#3	Bob Manthei, Borrego Resident
#4	Becky Falk, Borrego Resident
#5	Lundberg Family Trust, Water Credit Holder
#6	Seldon Mc Kee, Borrego Resident
#7	Judy Haldeman, Borrego Resident
#8	County of San Diego
#9	Tubb Canyon Desert Conservancy
#10	Tubb Canyon Landowners Association
#11	Audubon Society
#12	California State Parks
#13	Clean Water Action

Requested Changes to Stipulated Judgment

Water Rights/Legal Process

1. #1: *The amount of water production requested to be non-reducible is the annual amount of 22-acre feet stated in the July 13, 2018 allocation letter provided to the School District by the San Diego County Planning & Development Services department.*

   RESPONSE: Judgment Revised Accordingly, see section III.D.(2).

2. #3: *All BWD Ratepayers will be indirectly obligated to pay much more for water service as a consequence of the BWD actions as Plaintiff leading to overwhelming and unsustainable cost. There is no provision in the proposal protecting the ratepayer from extended litigation as that litigation directly and indirectly govern the cost of water service afforded the ratepayer:*

RESPONSE: Comment noted. BWD is not anticipating "overwhelming cost" as part of this process. It is anticipated that the adjudication will result in a stipulated judgment without significant litigation.

3. *#3: Stipulated Judgment must include assurances that the individual ratepayer will be allowed to drill a De Minimus well in the future.*

   RESPONSE: Well drilling permit issuance remains a function of the County of San Diego. Also, de minimis pumpers are exempt from most provisions of the Stipulated Judgment, see section III.H.

4. #13: *We propose that disadvantaged community water systems like Borrego Water District be exempt from mandatory reductions under the stipulated judgement, and instead be allowed to comply with laws and regulations that regulate residential water use, as they may be updated3.... We recommend that minimum usage be set at a level based on actual human needs and incorporating current best practices and available technology for water conservation.*

   RESPONSE: Comment Acknowledged:

5. *Include De Minimus pumpers in Stipulated Judgment requirements*

   RESPONSE: Comment Acknowledged: The Code of Civil Procedure provides the court with authority to make de minimis pumpers fully or partially subject to the judgment, or exempt, in the Court's discretion, and absent a finding that the de minimis pumpers are causing significant harm, there is no basis for subjecting them to the Stipulated Judgment requirements. (See Water Code, § 10730(a); CCP § 833(d).)

Governance

1. #2: *Community WM Board Member should be selected by the Community*
2. #4.2: *Community WM Board Member should be selected by Nominating Committee*
3. *#6: Community WM Board Member should be selected by BWD*
4. *#9: Community WM Board Member should be selected by Nominating Committee*
5. *#10: De Minimus Pumpers should have a seat on WM Board*
6. *#11: Lack of Environmental representation on Board*
7. *#13: WM Board should consist of 7 members without super majority*
8. *#13: WM Board should not select the Community Member*

   RESPONSE: The Stipulated Judgment has been revised accordingly to take into account concerns of community selection of Community Watermaster Board member. The BWD Board will make the selection of the WM Board Community after local organizations provide a slate of candidates and a public forum is held by the BWD.

9. #4.2: *It is important for the Community Member and Alternate Member to be appointed/selected and seated for the first meeting of the Watermaster (WM) Board.*

RESPONSE: WM Board Community Member will be seated as soon as practical, estimated to be Feb/Mar 2020

10. *#4 and #6: Community Member should have a budget of $10,000-$20,000/yr & staff and/or support equivalent to the staff and support the other members will have.*

RESPONSE: Comment noted. The community member will be given authorization in the Judgment to appeal Watermaster decisions, see section VII.A.1. However, we are not aware of any judgments that compel Watermaster funds to be collected and directed to support any particular sector. Each party is responsible for their own costs.

11. *4.2: There should be a mechanism for the Watermaster Board Membership or weight of votes to shift over time to accommodate major changes in the percentages of water rights held by the participating sectors.*

RESPONSE: Comment Acknowledged: While the court has authority to hear such a request and reformulate the WM Board in the future, if the court deemed appropriate,see Section VII.A., see section IV.

12. #8: *Include language to include an alternative in the event the County Board of Supervisors declines to participate on the WM Board.*

RESPONSE: Comment Acknowledged: BWD feels County involvement on the WM Board is essential.

13. #11: *WM Board should include a permanent Environmental Representative or a rotation of appointees representing the interests outside the influence of the other members already sitting on the Board.*

RESPONSE: Comment Acknowledged: Audubon Society, and others, could get involved in the existing nomination process by encouraging candidates with the desired knowledge and experience to apply.

14. #11, #12 and #13: The Environmental Working Groups (EWG) roles/duties should be elaborated

RESPONSE: Comment Acknowledged: The Stipulation requires the formation of the EWG, and the BWD will ensure the WM Board creates the EWG to meet the environmental interests affected by the Basin.

15. #12: *Avoid the potential of allowing a minority of members to make WM Board decisions.*

RESPONSE: Stipulated Judgment revised accordingly to require at least 3 affirmative votes on all matters not requiring a Supermajority, see section IV.B.2.

Rampdown/BPA

1. *#4.1: Eliminate Overpumping Provision: I would like to see an orderly decrease in water use as expected under the state sustainability law rather than an increased allowance for pumping in the first three years, because such increases encourage continued overpumping for three years followed by selling water rights before the overpumping needs to be made up within the first five years of the Plan by subsequent pumping of less water than allocated. This is a detrimental pattern for providing job transitions for residents.*

   RESPONSE: Comment Acknowledged: Although a benefit from overpumping, job retention was not the motivator for creating the provision; the vast majority of Agricultural pumpers are currently unmetered and the 3 years provides an opportunity for them to first determine their current actual usage and then how to meet rampdown provisions. If a property owner were to sell land where Overpumping has occurred, the new owner would inherit the obligation and under pump in years 4 and 5 or pay the penalty.

2. *#8 Revisit Carryover provisions and consider limiting to the following year. Current proposal may not satisfy DWR requirement for sustainability in 20 years.*

   RESPONSE: Comment Acknowledged: The TAC and Watermaster Board will evaluate this issue

3. *#8: De Minimus pumpers in SGMA for ALL users less than 2 afy and Stipulation defines as DOMESTIC, requesting change to SGMA definition of ALL.*

   RESPONSE: The Judgment is consistent with SGMA in allowing 2 afy or less of pumping for domestic use to qualify as de minimis. The Judgment also specifies that public agencies pumping less than 2 afy for any use are considered de minimis

4. #12: *20 afy allocation should not be impacted by future fee transfers and not include de minimus use from Horsecamp Park.*

   RESPONSE: The Judgment is not drafted to identify State Park APN's, so the State Park allocation may be used on all State Park lands existing now or in the future. Because the Horsecamp Park is de minimis use already, its status will not change under the Judgment and use at the camp will remain recognized as de minimis.

Water Quality

1. 4.1: *Keeping our water quality high, which means providing for environmental reviews for any intrabasin water transfers and for additional pumping allowed, especially in our Central Management Area, as these could affect water quality.*

   <u>RESPONSE:</u> BWD also places a high priority on water quality. WM, with input from TAC, may condition or restrict intrabasin transfers if necessary to protect the Basin, if scientifically merited, see section III.I.5.

2. *4.1: Close the data gap and expand the Water Quality Monitoring Program into the northern and eastern parts of the Central Management Area. That monitoring needs to happen now in order to have adequate data in two or three years to know if there is any impact from the Northern Management Area where water quality is impacted from agricultural use, on water in the Central Management Area that serves most of the town. This is especially important during the time we are entering that will see changing patterns of water pumping in the valley.*

   RESPONSE: Comment Acknowledged: The stipulating parties/BPA holders have agreed to fund the continuation on all water quality sampling started by the GSP process. BWD will continue to sample its wells more often than required and pursue grants to expand the network. The Stipulation includes language requiring the TAC and WM to develop a Water Quality program within 24 months, see section VI.B. Any party can attend the public meetings and raise the applicable issues regarding the future water quality monitoring program. The combined efforts of GSP initiated testing (soon to be paid by pumpers) and ongoing BWD sampling (approx. 40 total) is a good start and additional sites are always desired. BWD will continue to pursue grants for as many as 10 re-purposed abandoned wells for monitoring. BWD is comfortable with the current sampling and plans to expand in the future.

3. *#4.3: What provisions are there for environmental assessments prior to any intrabasin transfers and for ensuring that pumping after water trading doesn't impact one area more than another, or create new problems? Will there be an anti-degradation analysis for water use prior to such trades and transfers?*

   RESPONSE: BWD (for BWD-involved transfers), and WM, with input from the TAC, will have the flexibility to determine the extent of any additional science hased reviews and limitations on future water transfers, as may be needed and/or required by law.

4. *#4.3: A provision to limit this transfer of water rights to parcel(s) in the same management area as the original parcel, unless environmental assessments and degradation analyses as mentioned in item #1 above are conducted prior to the transfer being approved?*

   RESPONSE: The Judgment gives WM the authority, with input from the TAC, to so require if scientifically merited, see section III.I.5.

Fallowing Standards/Transfers

1. *#4.3: Is there any water right being left with fallowed land that can be used for restoration at some point? If not, please consider doing this. The water demand of land fallowing is not considered. Exhibit 3 includes minimal requirements for permanent land fallowing that are inadequate to prevent negative impacts including blight. At minimum, sufficient water should remain with the land to ensure proper dust mitigation, including cover cropping and/or spraying. Additionally, these requirements are not applied to temporary transfers, even if those transfers span multiple years. Given the severe local climate, we fear that dust mitigation could be required even for*

single-year transfers. We strongly recommend that these standards be made more protective of public health and applicable to both temporary and permanent transfers.4

RESPONSE: Comment Acknowledged: The use of water on future fallowed land, or not, would be determined as part of each land transaction and BPA adjusted accordingly, see section III.J.

2. #7: *Land in the basin is very inexpensive – 20 acres could be found for $20,000, which would make 100 AF of water very easy to acquire. If this is to be a deterrent to speculation, once acre for 5 AF of water is not good enough to inhibit speculation.*

   RESPONSE: Comment Acknowledged. Speculation will be further discouraged by other provisions of the Judgment, including rampdown and assessment requirements.

3. #8: *Revise Anti Speculation Provision: add "or project applicant/developer (with consent from the property owner) should have the ability to purchase needed water rights*

   RESPONSE: BWD believes this addition is unnecessary as under the Judgment developers can already work with the landowner to purchase BPA, attach the BPA to the land, and transfer the land and the BPA to the developer at the appropriate time. Also, allowing any entity claiming to be a developer to purchase BPA separate from land would defeat the purpose of the anti-speculation provision.

4. #8 *Add language stating a Fire Department burn permit and Smoke Management Plan approved by County APCD may be required for agricultural burning.*

   RESPONSE: Comment noted. Nothing in the Judgment relieves any party or entity from obtaining all legally required permits.

Miscellaneous

1. #11: *There should be a full discussion presented in the final report on why there was an exemption of CEQA oversight and under what circumstances.*

   RESPONSE: BWD will follow all required CEQA procedures. See accompanying BWD resolution and staff report. However, final approval of the Judgment rests with the Court and courts are not subject to CEQA. (State CEQA Guidelines § 15379; *see also Hillside Memorial Park & Mortuary v. Golden State Water Co.* (2011) 205 Cal.App.4th 534, 550-51 (West Coast Basin); *Calif. Am. Water v. City of Seaside* (2010) 183 Cal.App.4th 471, 481-82 (Seaside Basin).)

2. #12: *Cost Recovery for State Parks for WM entry to conduct environmental or cultural resource review.*

   RESPONSE: Comment noted. The State Parks can address this issue in any individual right of entry agreement it enters into with the Watermaster.

3. #12: *Water used for firefighting and other natural disasters should be exempted.*

   RESPONSE: Judgment revised accordingly, see section III.A.

Borrego Water District
Further Response to Public Comment/Questions/Clarifications
Stipulated Judgment – Borrego Springs Sub Basin
<u>January 3, 2020</u>

Comment letters were received by BWD from the following:

COMMENT #	AUTHOR
#1	Borrego Spring Unified School District Elementary School Well, James Markman - Attny
#2	Gary Haldeman, Borrego Resident
#3	Bob Manthei, Borrego Resident
#4	Becky Falk, Borrego Resident
#5	Lundberg Family Trust, Water Credit Holder
#6	Seldon Mc Kee, Borrego Resident
#7	Judy Haldeman, Borrego Resident
#8	County of San Diego
#9	Tubb Canyon Desert Conservancy
#10	Tubb Canyon Landowners Association
#11	Audubon Society
#12	California State Parks
#13	Clean Water Action

Water Rights/Legal Process

1. #3: *There is no clear indication that De Minimus Water Rights would be protected from confiscation. –*

   RESPONSE: De Minimus pumpers are largely exempt from SGMA and the Stipulated Judgment, as finally determined by the court approval.

2. #3: *Legal process of service alone to all affected parties will represent formidable expense to BWD.*

   RESPONSE: Cost of Service is being shared by all pumpers based on their proportional BPA (BWD @ 10% +/-) or an estimated $10,000 or less for BWD's share.

3. #3: *WM and Staff operating without Court approval is another cost for BWD Ratepayers.*

   RESPONSE: Except for the first several months of 2020, there is no time in which the WM will be running "without Court approval". WM start up and ongoing expenses will be shared by all pumpers based on their proportional BPA.

4. #3: *Economic and social Institutional forces at work will solve the problem naturally.*

   RESPONSE: In 1982 when USGS determined the Subbasin was in serious overdraft, this was the argument – "market forces would solve the overdraft by the year 2000." Yet, between 1982 and 2010 the overdraft more than doubled. In BWD's view, SGMA has been the driver toward resolving overdraft, in contrast to other forces.

1. #3: *Water policy should be defined and implemented by State and Federal agencies.*

   RESPONSE: Comment noted. SGMA requires local action to address the Basin's overdraft either in the form of a GSP or a court judgment that is approved by the California Department of Resources and establishes functionally equivalent management.

2. #11 *CEQA related review of implementation of the Physical Solution has been removed from the Stipulated Judgment. There should be a full discussion presented in the final report on why there was an exemption of CEQA oversight and under what circumstances.*

   RESPONSE: See above response.

Governance

1. *#4.2: There are regular meetings with 72 hours notice for agendas and Special meetings with 24 hours notice, and also the possibility of an Adjournment to a new location and time for a meeting with the notice put on the door of the meeting place within 24 hours of the Adjournment decision.*

   RESPONSE: These processes are described in and consistent with the Brown Act.

2. *#4.2: Is the Community Watermaster Board Member a "Party" in that he or she can appeal to a court, request mediation for an unresolved issue, and/or hire a specialist?*

   RESPONSE: The Judgment has been revised to make explicit that the Community Representative can appeal any Watermaster decisions, whether or not the representative is a Basin landowner.

3. #11: *The WM Board Term is not identified.*

   RESPONSE: The term of each WM member is indefinite, which is common in adjudicated basins, with the ability of the appointing entities to change their representatives.

4. #11: *More information is desired on the Environmental Group that will advise the Watermaster on Groundwater Dependent Ecosystems. What will the procedures be to form this group and how will their consultation be properly addressed during construction of policy? These should be clearly identified in the final prepared documents because this group is in important oversight and communication piece of the full plan.*

   RESPONSE: BWD is comfortable leaving this decision up to the Watermaster Board to decide, after receiving community input.

5. #13: *Watermaster Board does not function as a "local agency" under Government Code section 54951, and that compliance with the Brown Act is thus determined by the Court. A public agency for the purposes of the Brown Act is one "be created by statute or Constitution." (McKee v. Los Angeles Interagency Metropolitan Police Apprehension Crime Task Force (2005) 134 Cal.App.4th 354, 359; Gov. Code § 54951.) Watermasters are created by statute, even when the specific water rights are adjudicated by a court. (Wat. Code §§ 4026, 4027.) Therefore, the Watermaster board is a public agency for the purposes of the Brown Act.*

   RESPONSE: The "watermaster service areas" referenced in Water Code sections 4026 and 4027 are unrelated to a watermaster created by a court via a water rights judgment. Here, the watermaster is created by the Judgment and the Court, not by statute or Constitution.

Rampdown/BPA

<u>Comments/Questions & Response when Necessary:</u>

1. *#5: Requesting Confirmation of 294 AG-1 Water Credits for Parcel 1 of Viking Ranch:*

   RESPONSE: BWD agrees with the understanding of Water Credit issuance for this parcel. Such water credits will be converted to BPA under the Judgment, unless other arrangements are made by the water credit holder.

2. *#13: The environmental water demand of the basin is not identified or provided for in the BPAs.*

   RESPONSE: BPAs are assigned to pumpers with water rights. But the WM and EWG will further research and develop appropriate programs to address environmental concerns as is necessary.

Miscellaneous

1. *#4.1: I have been disheartened that the public process for discussing and shaping a water plan for Borrego in compliance with state law was abandoned in disdain of the kind of public participation that had begun in 2017. By early 2019, private talks with representatives of farmers and golf courses about their "water rights" were happening and they quickly ended up becoming private talks about all potentially controversial parts of a water plan. Plans for water reductions, water trading, fallowing, conservation, water quality and transfers of water within the basin (intrabasin transfers) were now the* subject of private negotiations instead of being publicly discussed and decided.

   RESPONSE: Water rights judgments are typically negotiated among water rights holders. In this case, BWD provided for an extended public review of the proposed Judgment and associated documents. Changes have been negotiated to the documents as a result of these comments, which have been very helpful. The Groundwater Management Plan (formerly the GSP) remains the foundation for the Subbasin physical solution that will be implemented as part of the Judgment.

2. *#4.1: BWD and the County of San Diego formed a partnership in 2017 to address our critically over drafted basin and to hold a public process to create a Groundwater Sustainability Plan*

for our water use. They received funds from the Department of Water Resources (DWR) to help with that public process. But when the farmers decided not to cooperate publicly, not to release data on their water use publicly, and in general not to agree to discuss issues publicly, that process was abandoned, and those of us volunteering our time and concern on the committee formed to create our water plan through a public process, were left with no decisions to discuss or make. Instead we became witnesses to presentations about hydrogeology and information about our basin setting—all important as documentation for and from experts about our basin—but not the same as the decision-making process we thought we had volunteered to join.

RESPONSE: See above response. Basin Hydrology and Project and Management actions developed as part of the GSP process were retained and included into the Stipulation. BWD negotiators made retaining the work done by BWD/County, Advisory Committee and Consultants within the GMP a top priority.

3. *#4.2: BWD says it represents members of the community who buy water from it, but BWD has shut out community input during this process.*

   RESPONSE: Comment Received: By definition, the primary purpose of the 30-day Public Review Period was to solicit input during the process. BWD determined, based on advice of Counsel and common practice, the negotiations process had to be confidential with non-disclosures binding the parties. In this and other adjudication negotiations "including the public" can hamper resolution as private parties generally do not feel free to share information publicly. BWD provided periodic updates once the components of the possible judgment documents were being formalized during the negotiations. In addition, BWD required a 30-day public review process before making any decisions with the full intent to renegotiate terms, as deemed appropriate by BWD.

4. *#8: The County is pleased that the GSP was used as the foundation for the Stipulation in substantially similar form.*

   RESPONSE: Comment Acknowledged

5. *#8:* The County requesting advanced notice and opportunity to review any proposed future changes to BWD Developers Policy.

   RESPONSE: BWD will notify the County as needed in the future.

BORREGO WATER DISTRICT

BOARD OF DIRECTORS MEETING – JANUARY 7, 2020

AGENDA ITEM III.B

TO: Board of Directors, Borrego Water District

FROM: Steve Anderson, Legal Counsel

SUBJECT: Settlement Agreement to Resolve Borrego Springs Subbasin Water Rights and Critical Overdraft Issues; Initiation of Adjudication Action; Submission of GSP Alternative to Department of Water Resources (DWR); Posting of CEQA Notice of Exemption

RECOMMENDED ACTIONS:

1. Authorize Board President, or designee, to execute Settlement Agreement
2. Authorize legal counsel to file Adjudication Action pursuant to the Settlement Agreement
3. Authorize staff to submit to DWR an alternative to a groundwater sustainability plan
4. Direct staff to file a Notice of Exemption with the clerk for the County of San Diego.

ITEM EXPLANATION:

The Sustainable Groundwater Management Act (SGMA) requires the Borrego Springs Subbasin (Basin) to be managed sustainably over the next twenty years and beyond. Because DWR has designated the Basin as critically overdrafted, there must be a groundwater sustainability plan (GSP), or alternative management plan, adopted and submitted to DWR by January 31, 2020.

SGMA does not allow for declarations or modifications of water rights, but management of the Basin, including necessary pumping reductions/rampdown, without a quantification and declaration of water rights may be difficult and/or lead to litigation. SGMA thus recognizes that legal actions to establish groundwater rights and manage basins, or "groundwater adjudications" may occur. These adjudications are governed by statutes enacted after SGMA and allow courts to enter judgments that manage groundwater basins sustainably. Further, SGMA allows that the management of a basin pursuant to a groundwater adjudication can serve as an alternative to a GSP, if DWR approves that management structure.

Accordingly, BWD has been negotiating with agricultural and resort community interests the potential terms of a "friendly" adjudication of water rights and management of the Basin. These negotiations have culminated in a proposed Settlement Agreement among BWD and other major pumpers and stakeholders in the Basin. The Settlement Agreement requires, among other things, that BWD file an Adjudication Action to manage the Basin and to submit as a GSP alternative the proposed Stipulated Judgment to be entered in the Adjudication Action for DWR to review for SGMA compliance.

1. <u>Settlement Agreement</u>

BWD proposes to enter into a Settlement Agreement with the significant groundwater pumpers in the Basin to resolve disputes regarding their respective groundwater rights. The Settlement Agreement provides terms for the parties to stipulate to a process that will result in a Stipulated Judgment and Physical Solution, including a Groundwater Management Plan (GMP), that will be entered in a comprehensive groundwater adjudication to be filed by BWD (Adjudication Action). The Stipulated Judgment and Physical Solution in the Adjudication Action will comprehensively determine and adjudicate all rights to pump groundwater from and store groundwater in the Basin and will provide for the sustainable management of the Basin in compliance with SGMA and the California Constitution. The Physical Solution and GMP will achieve sustainable Basin management through water trading, water conservation, pumping reductions, water quality optimization, and intra-basin water transfers.

The Settlement Agreement provides that BWD intends to file the Adjudication Action by January 24, 2020 and that the parties will share certain costs of the Adjudication Action, including reimbursement to BWD for its preparation of the GSP. The parties agree that they will accept BWD's service of the Adjudication Action complaint and other required pleadings and will file an answer. The parties also agree to be bound by, and to ask the Court for a preliminary injunction to establish, interim Basin management measures pending the entry of the Stipulated Judgment, including the formal establishment of an interim Watermaster to manage the Basin, installation of meters by all parties, continuation of water quality monitoring, and funding of Basin management measures.

Additionally, the Settlement Agreement requires BWD to submit the Stipulated Judgment and Physical Solution to DWR for a determination that it complies with SGMA as an alternative to a GSP to manage the Basin. BWD will submit the GSP alternative before January 31, 2020. Once DWR determines that the Stipulated Judgment can serve as a GSP alternative in compliance with SGMA, the parties will sign a stipulation and ask the court to enter the Stipulated Judgment in the Adjudication Action.

Collectively, these actions are intended to resolve the Adjudication Action, establish groundwater rights in the Basin, and sustainably manage the Basin in perpetuity. However, it is possible that (1) non-parties to the Settlement Agreement may object to the Stipulated Judgment and Physical Solution; (2) DWR may seek to change the Stipulated Judgment; and/or (3) the court may not enter the Stipulated Judgment that the parties have agreed to. Any of these possibilities could lead to more protracted litigation regarding groundwater rights in the Basin and how to sustainably manage the Basin.

2. Adjudication Action

Because SGMA cannot establish or modify water rights, a court action (Adjudication Action) is necessary to set groundwater rights and to establish a physical solution to manage the Basin pursuant to the Settlement Agreement. SGMA and the groundwater adjudication statutes under the California Code of Civil Procedure[1] both establish procedures to litigate groundwater rights and basin management. For example, SGMA recognizes that adjudication actions will occur, but instructs they should not interfere with the development of sustainable groundwater management.[2] Furthermore, a court shall only approve a judgment in an adjudication action if it "finds that the judgment will not substantially impair the ability . . . to achieve sustainable groundwater management."[3] Similarly, the groundwater adjudication statutes provide that its proceedings must be consistent with SGMA. Groundwater adjudications must be conducted "in a manner that is consistent with the achievement of groundwater sustainability within the timeframes" of SGMA.[4]

[1] Cal. Water Code §§ 10737-10737.8; Cal. Civ. Proc. Code §§ 830-852.
[2] Cal. Water Code § 10737.2.
[3] Id. at § 10737.8.
[4] Cal. Civ. Proc. Code § 830(b)(4).

While the recently enacted groundwater adjudication statutes seek to streamline the process, groundwater adjudications are typically long and expensive. However, the parties to the Settlement Agreement have negotiated the terms of a "friendly" Adjudication Action that seeks to avoid a long court battle over groundwater rights in the Basin and have already negotiated the terms of a Stipulated Judgment, Physical Solution, and GMP, which typically take years or decades to develop and establish. By the Stipulated Judgment, Physical Solution, and GMP to be entered in the Adjudication Action, the parties have already agreed to their respective groundwater rights and have agreed to measures necessary to reduce pumping from the Basin and to manage it sustainably in a manner that protects water rights and the Basin in compliance with SGMA and the California Constitution.

Additionally, the final judgment entered in the Adjudication Action will provide for the formation of a Watermaster, as an arm of the Superior Court, with five appointed board members, charged with administering the Judgment's terms. A Superior Court would have continuing jurisdiction over the Judgment and Watermaster, and the authority to modify the Judgment as necessary and to rule on disputes not resolved locally.

There is no guarantee that the Superior Court will enter the Stipulated Judgment that the parties request. But, due to the limited resources of and varied interests in the Basin, and due to SGMA's requirement that this critically overdrafted Basin be managed sustainably, litigation might otherwise occur. The proposed Adjudication Action and Stipulated Judgment seek to proactively manage this litigation risk. Accordingly, pursuant to the Settlement Agreement, BWD intends to file an Adjudication Action by January 24, 2020.

In addition, BWD circulated the proposed stipulated judgment for public review. The public review comment period ended December 20, 2019. As a result of the comments received, a number of changes have been made to the proposed judgment, including that the community representative to the Watermaster Board will be selected by the BWD Board of Directors.

3. <u>GSP Alternative</u>

To comply with SGMA, BWD, along with the County of San Diego, formed the Borrego Valley Groundwater Sustainability Agency and developed a GSP to sustainability manage the Basin. The GSP was prepared and submitted for public review in compliance with SGMA but was never formally adopted, and the County withdrew from the Borrego Valley Groundwater Sustainability Agency effective December 2019. SGMA allows that basin management pursuant to an adjudication action can serve as alternative to a GSP, if DWR approves the alternative.

Accordingly, to comply with SGMA and pursuant to the Settlement Agreement, by January 31, 2020, BWD will submit the proposed Stipulated Judgment, including its attached GMP, to DWR for review and approval to serve as an alternative to a GSP. BWD will also file with DWR, as appropriate, a "Coordination Document" or "checklist" that explains how the GMP and other documents satisfy SGMA's requirements to facilitate the DWR review process.

4. <u>CEQA Analysis</u>

In its capacity as lead agency, the Board of Directors is charged with exercising its independent judgment to determine whether the authorizations at issue constitute a "project" within the meaning of the California Environmental Quality Act (CEQA); and if they do constitute a project, whether they are exempt from CEQA review.

Authorizing the Board President to execute the Settlement Agreement and the related documents; authorizing legal counsel to commence the Adjudication Action; and authorizing Staff to submit the GSP alternative to DWR does not constitute a "project" subject to CEQA because these are not activities that may cause either a direct or reasonably foreseeable indirect change in the environment. (Pub. Res. Code § 20165; CEQA Guidelines § 15378(a).) Further, the authorizations are not a project subject to CEQA because the Court will oversee and implement the Adjudication Action and Stipulated Judgment and CEQA does not apply to the courts of the state. (CEQA Guidelines § 15379.) CEQA only applies to specified actions taken by a "public agency" (Pub. Res. Code § 21065) and CEQA Guidelines section 15379 explicitly states that the term public agency "does not include the courts of the state." The authorizations are therefore not a project because the Adjudication Action and Stipulated Judgment will be approved, overseen and implemented by the Court and by the Watermaster, the Watermaster Technical Consultant, and the Technical Advisory Committee under the Court's supervision, and none of these are public agencies. (CEQA Guidelines § 15379; see *Hillside Memorial Park & Mortuary v. Golden State Water Co.* (2011) 205 Cal.App.4th 534, 550-51 (West Coast Basin); *Calif. Am. Water v. City of Seaside* (2010) 183 Cal.App.4th 471, 481-82 (Seaside Basin).)

Even if the authorizations discussed above are deemed a project subject to CEQA, they are exempt under California Water Code section 10728.6. Under section 10728.6. GSPs adopted pursuant to SGMA are exempt from CEQA. Because SGMA specifically authorizes GSP alternatives, the exemption applies to the authorizations described in this staff report. Finally, the authorizations are also exempt under the "common sense exemption." (CEQA Guidelines § 15061(b)(3).) The authorizations do not by themselves authorize or approve any project, development, or construction activity. Accordingly, it can be seen with certainty that the authorizations will not lead to any physical changes in the environment. There is no evidence that the authorizations involve any unusual circumstances that might cause a significant effect on the environment. (CEQA Guidelines § 15300.2.)

5. <u>Conclusion</u>

The Borrego Basin is critically overdrafted and must be sustainably managed under SGMA, but SGMA cannot declare or modify groundwater rights, so management under SGMA could lead to litigation. Here, stakeholders in the Basin, including BWD, seek to manage the Basin through a combination of a court-entered judgment and a DWR-approved groundwater management plan. This proposal intends to create greater certainly regarding groundwater rights in the Basin and to result in the sustainable management of the Basin in perpetuity as required by SGMA.

ATTACHMENTS:

DOCUMENTS CAN BE FOUND ON: www.BorregoWD.org (Home Page Bulletin Board)

RESOLUTION NO 2020-01-01 OF THE
BOARD OF DIRECTORS OF BORREGO WATER DISTRICT AUTHORIZING BOARD PRESIDENT TO EXECUTE SETTLEMENT AGREEMENT; AUTHORIZING LEGAL COUNSEL TO FILE ADJUDICATION ACTION; AUTHORIZING STAFF TO SUBMIT A GROUNDWATER SUSTAINABILITY PLAN ALTERNATIVE TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES; AND AUTHORIZING STAFF TO FILE NOTICE OF EXEMPTION

WHEREAS, in 2014, the State of California adopted the Sustainable Groundwater Management Act ("SGMA"), which took effect in 2015, and requires local agencies to manage groundwater basins designated as high or medium priority basins.

WHEREAS, the Borrego Springs Subbasin No. 7.024-01 ("Borrego Basin" or "Basin") was designated by the California Department of Water Resources (DWR) as high priority and critically overdrafted under SGMA.

WHEREAS, SGMA requires that a groundwater sustainability plan (GSP) or alternative must be adopted and submitted by a local agency by January 31, 2020 for basins such as Borrego Basin that have been designated as subject to conditions of critical overdraft.

WHEREAS, SGMA provides for the submission of a proposed stipulated judgment to

DWR for evaluation and assessment, as part of an adjudication action, as an alternative to a GSP.

WHEREAS, the Borrego Valley Groundwater Sustainability Agency, which comprised the District and the County of San Diego, developed a GSP for the Borrego Basin. The GSP has been repurposed as a Groundwater Management Plan (GMP), an integral part of a proposed Stipulated Judgment for the Borrego Basin (Stipulated Judgment), and the District believes it prudent to implement a "Physical Solution" as part of a forthcoming groundwater rights adjudication action, consistent with the requirements of SGMA (Adjudication Action).

WHEREAS, the District is a local agency that believes management pursuant to a proposed Stipulated Judgment approved as part of an Adjudication Action, including a proposed Physical Solution and GMP, will satisfy the objectives and requirements of SGMA to manage the Borrego Basin.

WHEREAS, the entry of the Stipulated Judgment requires the filing of an Adjudication Action to comprehensively determine rights to extract and store groundwater in the Borrego Basin pursuant to Code of Civil Procedure sections 830, et seq.

WHEREAS, the District and other Basin groundwater pumpers propose to enter into a

Settlement Agreement to resolve disputes they may have regarding their respective rights to pump groundwater from the Borrego Basin and to agree to a proposed Stipulated Judgment that will establish a Physical Solution, including a GMP, for the perpetual, sustainable management of the Borrego Basin as required by SGMA and the California Constitution.

WHEREAS, the Stipulated Judgment, GMP, and the Physical Solution have been developed through a process of stakeholder negotiations among the District, major water pumpers, and landowners in the Borrego Basin to serve as an alternative to a GSP and to constitute the functional equivalent of a GSP as permitted by SGMA and the California Code of Regulations.

WHEREAS, the Settlement Agreement provides that the District intends to file the Adjudication Action on or before January 24, 2020.

WHEREAS, the Settlement Agreement provides that the parties will share certain costs related to the Adjudication Action.

WHEREAS, the Settlement Agreement provides that the parties will seek to have the Stipulated Judgment attached thereto approved by DWR and entered by the court as the final judgment in the Adjudication Action.

WHEREAS, the parties to the Settlement Agreement agree to certain interim Basin management measures pending the entry of judgment in the Adjudication Action.

WHEREAS, the Settlement Agreement, Stipulated Judgment, Physical Solution, GMP, and supporting documents have been subject to a 30-day public review process.

WHEREAS, the execution of the Settlement Agreement, filing of the Adjudication Action, and entry of the Stipulated Judgment, including imposition of the Physical Solution and the GMP, are intended to comprehensively determine and adjudicate all groundwater rights in the Borrego Basin and to provide a physical solution for the perpetual, sustainable management of the Borrego Basin as required by SGMA and the California Constitution.

WHEREAS, authorizing the Board President to execute the Settlement Agreement and the related documents; authorizing legal counsel to commence the Adjudication Action; and authorizing Staff to submit the GSP alternative to DWR does not constitute a "project" subject to the California Environmental Quality Act (CEQA) because these are not activities that may cause either a direct or reasonably foreseeable indirect change in the environment. (Pub. Res. Code § 20165; CEQA Guidelines § 15378(a).) Further, the authorizations are not a project subject to CEQA because the Court will oversee and implement the Adjudication Action and Stipulated Judgment and CEQA does "not apply to the courts of the state." (CEQA Guidelines § 15379; *Hillside Memorial Park & Mortuary v. Golden State Water Co.* (2011) 205 Cal.App.4th 534, 550-51 (West Coast Basin); *Calif. Am. Water v. City of Seaside* (2010) 183 Cal.App.4th 471, 481-82 (Seaside Basin).) Even if the authorizations are deemed a project subject to CEQA, they are exempt under California Water Code section 10728.6 as a statutorily-authorized GSP alternative. Finally, the authorizations are exempt under the "common sense exemption" because by themselves, they do not authorize or approve any project, development, or construction activity. (CEQA Guidelines § 15061(b)(3).) Accordingly, it can be seen with certainty that the authorizations will not lead to any adverse physical changes in the environment. There is no evidence that the authorizations involve any unusual circumstances that might cause a significant effect on the environment. (CEQA Guidelines § 15300.2.)

NOW, THEREFORE, be it resolved by the Board of Directors of the Borrego Water District, as follows:

1. The Board of Directors hereby authorizes the Board President or her designee to execute the Settlement Agreement, and all other related documents, attached hereto as Exhibit "A."

2. The Board of Directors hereby authorizes District legal counsel to file the Adjudication Action pursuant to the terms of the Settlement Agreement.

3. The Board of Directors further delegates to the District General Manager and District legal counsel authority to finalize for the Board President's execution the final form of the Settlement Agreement, including the Stipulated Judgment, Physical Solution, GMP, and other related documents.

4. The Board of Directors hereby authorizes District staff to submit the proposed Stipulated Judgment, including its attached GMP to DWR for review and approval to serve as an alternative to a Groundwater Sustainability Plan pursuant to SGMA. District staff is also directed to file with DWR, as appropriate, a "Coordination Document" and/or "checklist" that explains how the GMP and other documents satisfy SGMA's requirements.

5. The Board of Directors further delegates to the District General Manager and District legal counsel authority to finalize and submit the final form of Stipulated Judgment, GMP and other related documents to DWR for review and approval to serve as an alternative to a Groundwater Sustainability Plan pursuant to SGMA.

CEQA Compliance:

a. For all the reasons stated in the above recitals and based upon substantial evidence in the record as a whole, the Board of Directors finds that authorizing the Board President to execute the Settlement Agreement and the related documents; authorizing legal counsel to commence the Adjudication Action; and authorizing Staff to submit the GSP alternative to DWR: (1) is not a "project" subject to CEQA because these are not activities that may cause either a direct or reasonably foreseeable indirect change in the environment (Pub. Res. Code § 20165; CEQA Guidelines § 15378(a).); (2) is not a project subject to CEQA because the Court will oversee and implement the Adjudication Action and Stipulated Judgment and CEQA does "not apply to the courts of the state" (CEQA Guidelines § 15379); (3) alternatively, is exempt under California Water Code section 10728.6 as a statutorily-authorized GSP alternative and under CEQA Guideline § 15061(b)(3)'s "common sense exemption"; and (4) none of the exceptions to the application of the common sense exemption exist under State CEQA Guidelines § 15300.2.

b. The Board of Directors hereby directs that all documents and other materials constituting the record of proceedings related to this Resolution be maintained by the General Manager of the Borrego Water District, or his designee, on file at the Borrego Water District, 806 Palm Canyon Drive, Borrego Springs, California 92004.

c. The Board of Directors directs Staff to file a Notice of Exemption with the County Clerk for the County of San Diego.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Borrego Water District held on the 7th day of January 2020, by the following vote:

Ayes:

Noes:

Absent:

President	Secretary
Board of Directors of Borrego Water District	ATTEST

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 7, 2020
AGENDA ITEM III.C

January 3, 2020

TO: Board of Directors

FROM: Geoffrey Poole, General Manager

SUBJECT: Schedule for Nominating and/or Selecting Water Master Board Community and Borrego Water District Representatives – Core Team

RECOMMENDED ACTION:

Discuss schedule for selection of WM Community and BWD Representatives for Water Master Board

ITEM EXPLANATION:

If the Stipulated Judgment is approved, Staff is requesting a Board discussion of possible meeting dates for the selection of the Community and Representatives on the WM Board.

The Committees who have been sked to provide nominees for the Community Rep position has been discussing this issue and Staff will have an update for the Board at the meeting on 1-7-20.

Staff's goal is to get both positions filled as soon as practical.

NEXT STEPS

Staff and CT implement Board direction on this issue

FISCAL IMPACT

N/A

ATTACHMENTS

None

BORREGO WATER DISTRICT
BOARD OF DIRECTORS MEETING
JANUARY 7, 2020
AGENDA ITEM III.D

January 3, 2020

TO: Board of Directors

FROM: Geoffrey Poole, General Manager

SUBJECT: Cancellation of Borrego Basin Groundwater Sustainability Plan Public Hearing – S Anderson

RECOMMENDED ACTION:

If Stipulation is approved, cancel previously scheduled GSP Public Hearing

ITEM EXPLANATION:

The GSP process required submittal of the document by 1-31-20 and prior to that a Public Hearing is to be held. To facilitate successful negotiation of the Stipulation but also provide a safety net in the event negotiations are not successful, a Public Hearing was scheduled for January 14th.

NEXT STEPS

Do not hold Public Hearing

FISCAL IMPACT

N/A

ATTACHMENTS

None

Comment Letters Received During Public Review Period on Proposed SGMA Alternative to a GSP Stipulation Documents

January 2020

1

BORREGO SPRINGS SUB BASIN STIPULATED JUDGMENT
PUBLIC COMMENT FORM: Due 12-20-19 @ 4 PM

NAME: Borrego Springs Unified School District by James L. Markman, Special Counsel (Required)

ADDRESS: 2281 Diegueno Road, Borrego Springs, CA Mail to: 1315 Palm Canyon Drive, , Borrego Springs CA (Required) 92004

CONTACT INFO (EMAIL/PHONE): jmarkman@rwglaw.com 714-990-0901 (Required)

I have the following comments on the Proposed Stipulation and request consideration of the following changes in the documents: This comment on the proposed Stipulation and Judgment circulated by Borrego Springs Water District is made on behalf of Borrego Springs Unified School District ("the School District" hereinafter). On May 21, 2019, we addressed a letter to the County of San Diego Planning & Development Services Department on the Draft Sustainability Plan then being considered to achieve sustainability for the Borrego Springs Groundwater Basin. In that letter, we noted that the School District had been producing well water for a long period of time for irrigation on the site of the Scho District's elementary school. Accordingly, we also pointed out that the School District exercised a priority overlying right not subject to prescription during overdraft due to the provisions of California Civil Code section 1007. We suggested that if the SGMA Implementation Plan included a cutback or rampdown, the School District allocation be excluded from that program on the basis of Civil Code 1007. For that reason and because the School District and its elementary school recreational programs are a community asset and, particularly, are an asset of the economically disadvantaged community in Borrego Springs, the School District requests that its water production from its elementary school be treated in the same manner as the treatment afforded to the State Park in subsection III D of the proposed Judgment. The amount of water production requested to be so treated is the annual amount of 22 acre feet stated in the July 13, 2018 allocation letter provided to the School District by the San Diego County Planning & Development Services department.

(continued on page 2)

BORREGO SPRINGS SUB BASIN STIPULATED JUDGMENT
PUBLIC COMMENT FORM: Due 12-20-19 @ 4 PM

NAME: Borrego Springs Unified School District (Required)
By James L. Markman, Special Counsel

ADDRESS: ______________________, Borrego Springs CA (Required)

CONTACT INFO (EMAIL/PHONE) : ______________________ (Required)

I have the following comments on the Proposed Stipulation and request consideration of the following changes in the documents: We would appreciate your including us as a recipient of your response to this comment in addition to providing the same directly to the School District. Our address is: Richards, Watson & Gershon, 1 Civic Center Circle, P.O. Box 1059, Brea, California 92822-1059. The email address is: jmarkman@rwglaw.com.

Thank you for your anticipated attention to this comment.

James L. Markman
Special Counsel
Borrego Springs Unified School District

#2
GARY HALDEMAN

Section IV.B. **Watermaster Board**

1. Composition and Selection. The Watermaster Board will be comprised of five members, with each member having one vote, as follows: one representative and one alternate selected by BWD; one representative and one alternate selected by the County; one representative and one alternate selected by the San Diego County Farm Bureau; one representative and one alternate selected by the recreational sector Parties; one public/community representative and one alternate. The Parties within the recreational sector and the process for selecting the recreational and public/community representative are specified in **Exhibit "7".**

Not being an attorney, I will not be able to argue this point from a legal standpoint, but can certainly point out the inequity in this appointment process, an inequity that is clear to any lay reader of the above Watermaster Composition and Selection process. Four of the five members to the Waterboard self-select. The fifth member is to be selected by the above self-appointed members. Thus, the fifth member – the Community Representative – is set aside as a separate, non-equal member, whose appointment is to be determined by individuals with potentially differing interests in the Sub-basin's water future. The Community Representative, selected under this process, will be chosen by two individuals representing interests historically in conflict with his/hers, by another who has no knowledge of the dynamics that have defined the Sub-basin for decades, and by BWD (one of four votes) which does work for the ratepayer, but which has not always been in sync with the community's interests.

This process is, again by definition, unfair and inequitable.

The Community Representative must be selected by the community, whatever form this takes, and this must be the same process implemented by the other constituent entities of this Watermaster Board.

Unless determined following an identical process, any future decision-making as part of the Watermaster will be de facto tainted, and tainted in the eyes of all community members for the duration of the process.

A RATEPAYORS COMMENTS ON

THE BORREGO SPRINGS SUB BASIN STIPULATION PROPOSAL

AS PRESENTED BY THE BORREGO WATER DISTRICT

From the desk of Bob Manthei

December 9, 2019

CONTACT INFO:

2005 St Vincent Drive

dsrborrego69@gmail.com

442 293 0431

GENERAL UNDERSTANDING

The proposal appears to support the "forceful acquisition of private water rights now afforded property owners as governed by their deeds of ownership. The proposal appears to differentiate between "stipulated parties" as defined as pumpers whose pump volumes exceed 2 acre feet per year and those who pump less than 2 acre feet per year. Yet, all would be sued as defendants. The proposal appears to exempt the latter class from "forced participation" yet, it is clear the relief of those individuals may require their participation to a limited degree with some financial cost, and there is no clear indication that the water rights of the latter class would be protected from confiscation. All property owners, large and small have water rights associated with their property.

A POTENTIALLY INSOLVENT BWD AND THE THINGS LAWYERS WILL NOT TELL YOU

The proposal is totally predicated on a single court judgment projected out an estimated 18 to 36 months from the final formulation of the proposal by BWD, yet it is claimed that ALL parcel owners are to be served with suit by the BWD as plaintiff in this matter. Presumably, this is because a law suit affecting a select group of landowners would not be binding in the court. Yet, the proposal differentiates between two groups based on pumping volume. The proposal exempts the "de minimis" pumper from the need to participate in the suit. Downstream, there is no guarantee that BWD will prevail in that court, yet ALL ratepayors will be indirectly obligated to pay much more for water services as a consequence of the BWD actions as plaintiff. Because of the sheer volume of defendents who may choose or are required to defend their water rights, I anticipate an overwhelming and unsustainable cost to BWD as a private entity. The legal process of service alone to all affected parties will represent formidable time and expense to BWD. An interum "water master" and staff operating without court approval represents another cost. Any efforts to speed up due process will result in the loss of individual water rights. Courts exist to insure the rights of citizens and contrary to the proposal summary no single court operates in a vacuum. Appeals may occur. The projected time to judgment is more likely to be ten years as legal fees and court costs accumulate potentially threatening the finances of BWD. There is nothing in the proposal to protect the BWD ratepayor from (1) an insolvent BWD provider as the sole provider of water, or (2) untenable water rate increases which could drive real estate prices down and force some to loose their property. There is no provision in the proposal protecting the ratepayor from extended litigation as that litigation directly and indirectly governs the cost of water services afforded the ratepayor. There can be no blank check. As the BWD costs are passed to their customers, the participants in the law suits are no longer affected equally. BWD ratepayors will loose their water rights while also being subjected to an unregulated and increasing costs of a sole source of water. No doubt, the courts will not view this inequity with favor.

The proposal for a stipulated judgment must include assurances that the individual ratepayor will be able to drill a "de minimus" well in the future should there ever be a circumstance where the ratepayor is forced into an excalating cost of sole source water, or if BWD fails to exist.

SOCIAL DARWINISM VS. SOCIAL ENGINEERING

I happen to believe in all processes natural and further maintain social engineering efforts always fail.

Most of the time the least action taken is the best action taken. BWD should not take upon itself the burden of expensive litigation to force the balance of water overdraft and control. There are economic and social institutional forces at work which will solve the problem naturally over less time than it will likely take to initiate costly and tenative legal outcomes. For example, the value of fallowed land offers a new and exciting economic incentive for controlled growth to the basin with less water draw. If we as residents carefully provide stewardship to this opportunity so as to not allow uncontrolled population growth the water table will naturally, and over time adjust itself. Governing new metering requests is one way the BWD can exercise a measured and responsible "enforcement" action to insure future water availability. The BWD already has that authority without costly and protracted courts and attorney fees.

The BWD should solely exist in support of its ratepayors and do nothing that would threaten its financial stability. If BWD tends solely to the needs of its metered customers thereby keeping rates under control it will still have formidable challenges. It does not need to engineer water policy for the basin. Water policy for the basin should be defined and implemented by State and Federal agencies. If property and water rights are to be taken, BWD should advocate for and require the government agencies to adjudicate it. BWD should not act as a governing agency. It is not a public utility. It does not have the resources.

#4.1

Public Comment Letter on the Lack of Public Participation in the Borrego Springs Subbasin Stipulation Judgment/Water Plan
Rebecca Falk, 3260 Flying H Road, Borrego Springs, CA 92004
760-331-7526, rebfalk7@gmail.com

December 17, 2019

There are three sections below: General Comment, Specific Requested Changes, and Closing

General Comment

As someone who agreed to serve as the representative for our local land use planning group (Borrego Springs Community Sponsor Group) to the advisory committee for a Groundwater Sustainability Plan (GSP), I served from March 2017 to October 2019, attending long public meetings, reading and trying to follow relevant documents, attending BWD meetings, and in general trying to take my role seriously in providing a voice for the community in the shaping of our water plan. The thoughts that follow are my own as an individual, though of course informed by that experience.

I have been disheartened that the public process for discussing and shaping a water plan for Borrego in compliance with state law was abandoned in disdain of the kind of public participation that had begun in 2017. By early 2019, private talks with representatives of farmers and golf courses about their "water rights" were happening and they quickly ended up becoming private talks about all potentially controversial parts of a water plan. Plans for water reductions, water trading, fallowing, conservation, water quality and transfers of water within the basin (intrabasin transfers) were now the subject of private negotiations instead of being publicly discussed and decided.

BWD and the County of San Diego formed a partnership in 2017 to address our critically overdrafted basin and to hold a public process to create a Groundwater Sustainability Plan for our water use. They received funds from the Department of Water Resources (DWR) to help with that public process. But when the farmers decided not to cooperate publicly, not to release data on their water use publicly, and in general not to agree to discuss issues publicly, that process was abandoned, and those of us volunteering our time and concern on the committee formed to create our water plan through a public process, were left with no decisions to discuss or make. Instead we became witnesses to presentations about hydrogeology and information about our basin setting—all important as documentation for and from experts about our basin—but not the same as the decision-making process we thought we had volunteered to join. We were finally informed about the extent of these private negotiations in July of this year, and we had only one meeting after that July meeting. The group was disbanded at the next, final meeting on October 4·.

In a room with lawyers and representatives of AAWARE (the organization that represents farmers in the Valley), Rams Hill, La Casa, and BWD, decisions about how water will be assigned, traded, held, reduced, and how fallowing (cutting down trees of farms no longer in business) will occur, how related environmental issues will be handled, and more, have all been negotiated and decided by a handful of people with no public input. BWD says it represents members of the community who buy water from it, but BWD has shut out community input during this process.

Every time proposals have been made to include safeguards for Borrego in a water plan, we were told by this group of negotiators and their lawyers that there could be an expensive law suit if we press the matter, or that it would be difficult legally to follow those proposals. For instance, the idea of setting aside enough water for the town's residences and businesses before considering water reductions has been dismissed in this way. Substantial anti-hoarding and anti-monopoly provisions for water were not included, although there is some provision that prevents new investors in the Valley from acquiring water without also purchasing land, but this is a relatively weak provision given current land costs.

The public wasn't, in the end, at the table, and our water and therefore what happens in our town in the future, is to an uncomfortably large degree in the hands of the private negotiators and their lawyers. They seem to be already making agreements and plans to act on the knowledge they have that we haven't had—accumulation of water rights, lucrative sales of water rights, and plans to develop that might seem counterintuitive for a desert town with a sole-source aquifer that has to reduce its water use by 76% over the next twenty years.

Our town matters, not only the number of acre feet per year that is pumped from our aquifer. Do we as a town want to have 1/10th of the total water we can use in 2040 for the whole town go to one newly reestablished golf course at a development that already has a golf course? What happens to the existing golf courses, the communities built around them, the people that work there, and the school district that the attendance of those workers' children makes possible? Shouldn't community members' perspectives play a part in how water is traded, held and assigned (allocated) and who gets to accumulate control of the rights for big percentages of our water? The already-negotiated Stipulated Agreement decides the rules for water matters and we will be left scrambling to deal with its consequences.

I have heard of no process for altering the Agreement/Plan after public comments, except to return to the negotiators who already have had trouble coming to agreement for the plan that is about to be released. The public comment period ends December 20·2019 and the Borrego Water District will vote on the Stipulation Judgment on January 7, 2020, a very short window that includes Christmas and New Year holidays.

The window is closing for significant changes to the rules we'll have to follow going forward under a Stipulation Agreement once it is court approved—and evidently even in the two to three years before it is court approved. It is hard to think about the future development of the town, but it is important to consider at this time.

Specific Requested Changes

I would like to see an orderly decrease in water use as expected under the state sustainability law rather than an increased allowance for pumping in the first three years, because such increases encourage continued overpumping for three years followed by selling water rights before the overpumping needs to be made up within the first five years of the Plan by subsequent pumping of less water than allocated. This is a detrimental pattern for providing job transitions for residents. I would like to see the water plan protect the town, with protections centered on those who live here, giving attention to increasing options for work and time for transitions for the people who live here.

I would also like to see attention to keeping our water quality high, which means providing for environmental reviews for any intrabasin water transfers and for additional pumping allowed, especially in our Central Management Area, as these could affect water quality.

I would like to see an agreement to close the data gap and expand the Water Quality Monitoring Program into the northern and eastern parts of the Central Management Area. That monitoring needs to happen now in order to have adequate data in two or three years to know if there is any impact from the Northern Management Area where water quality is impacted from agricultural use, on water in the Central Management Area that serves most of the town. This is especially important during the time we are entering that will see changing patterns of water pumping in the valley.

In Closing

I would like to see a water plan that involves the community in these kinds of decisions about our future rather than giving power to determine those decisions to a handful of people or corporations who have been overpumping our water.

#4.2

Public Comment Letter on the Proposed Watermaster Board in the Borrego Springs Subbasin Stipulation Judgment/Water Plan

Rebecca Falk, 3260 Flying H Road, Borrego Springs, CA 92004
760-331-7526, rebfalk7@gmail.com

December 17, 2019

There are two sections below: General Comment, and Specific Points and Requested Changes

General Comment

The proposed Stipulation Judgment and associated documents will be our water plan (Plan) to make our water use sustainable by 2040 in accordance with state law. In general, carrying out the Plan for our water use will be managed by a Watermaster Board, although unresolved disputed matters can be appealed to the Court that will have authority to enforce the Plan and oversee its being carried out. The Stipulation documents describe a Watermaster Board that is composed of only five people, three of whom come from outside the basin. Two fifths of its votes are assigned to those who pump the most water now. They represent individuals or corporations whose investors are based elsewhere. The Stipulation Judgment that determines how water will be managed in our valley far into the future, was negotiated by lawyers representing these interests, and also the interests of BWD, which represented itself and its ratepayers, and will also have one out of the five votes. These three members will serve on the Watermaster Board as of February of 2020.

Another vote is reserved for the County but it is unclear if the County will choose to participate. If it does participate, it may be with a staff member or a political appointee, and that person won't be a Watermaster Board Member until July or so. Finally, there is one vote for a Community Watermaster Board Member, who we are told will be appointed in or before June of 2020.

The carrot in the Stipulation Judgment that brought the farmers to the negotiating table is that with the Plan they will have a marketable water asset, so that if their farms are no longer viable, they have a way to leave with substantial funds anyway. The Stipulation Judgment makes permanent the unchallengeable right to pump the assigned Baseline Pumping Allocations to the parties who negotiated it, now subject to rampdowns (reductions according to a schedule) and a total amount of water that can be pumped valley-wide by 2040 (although this amount likely will be challenged every five years of the reduction period and could be revised). It also determines that all Baseline Pumping Allocations are of equal priority, thereby giving up a potential for municipal water rights to be recognized as of higher priority than other water rights.

Whether this Plan works out over time to the benefit of the community or to its detriment is something we can't know at this point, although it does provide a path to meet the goal of sustainable water use by 2040. But citizens will need to keep an eye on the Watermaster Board. The rules are that it will meet publicly. The Stipulation Judgment provides for a minimum of quarterly meetings. How much will happen in the public view? There are regular meetings with 72 hours notice for agendas and Special meetings with 24 hours notice, and also the possibility of an Adjournment to a new location and time for a meeting with the notice put on the door of the meeting place within 24 hours of the Adjournment decision (all according to the published Stipulation documents). The Technical Advisory Committee that will be appointed by the Watermaster Board can meet by phone but still as a public meeting, publicly noticed. The Watermaster Technical Consultant, once appointed, may also be the Watermaster Board's Executive Director, and that person will track allocations, water use and trading, and issue reports that will be available to the public by request.

All Members but the Community Member of the Watermaster Board will have funds available to them from those they represent for such things as mediation, a court appeal on Watermaster Board actions or decisions, and the hiring of an expert, if these are needed. The Community Member doesn't have its own lawyer, as do the others. The Community Member, of course, also won't be contributing funds additional to BWD's contributions via pumping fees for operating the Watermaster Board. But because decisions of the Watermaster Board will have the greatest effect on those of us who live here, on our lives and families, on our property values, and on the viability of our town, the Community Watermaster Board Member's role is very important.

If all goes well, as the Stipulators have worked hard to make happen, we will have good water into the future. Many decisions that deeply affect our town will be out of our hands, although we will have one person who will have one fifth of the votes to represent us on the five person Board that will be managing our basin, and we will have BWD and its one fifth vote to watch out for water quality, delivery and for basin management. Maybe we can find a way to plan and shape our town without much say in who accumulates rights to the water in our basin, or over decisions about how water is managed in our basin. I'm guessing that is going to be an ongoing challenge, and we will need to be active participants in the way it plays out, using persuasion and public opinion where we don't have votes.

Specific Points and Requested Changes

1. It is important for the Community Member and Alternate Member to be appointed/selected and seated for the first meeting of the Watermaster Board. At the first Watermaster Board meeting each year, the Board will elect the Chair and Vice Chair, and also can appoint a non-member secretary and treasurer. Other possible

appointments are a Technical Advisory Committee and a Technical Consultant who can also be an Executive Director. Since the Watermaster Board budget is published by June 30 for the following year, if there is no Community Member until June, there will be no Community input for the 2020-2021 budget, which determines the year beginning in Oct of 2020, and all matters leading up to the setting of that budget. There will be no community input on setting up an Environmental Working Group and providing it with direction and a budget for that year as well.

2. Gary Haldeman, former GSP AC Member, raised an issue of concern at the December 10th community meeting that was held to present information about the Stipulation Judgment—that the only Watermaster Board Community Member and that person's Alternate will be voted on/selected by three Watermaster Board Members who represent Agriculture, Recreation/Golf, and BWD respectively. I think a more fair way to select that person would be to have the Sponsor Group, the BWD (GSP) Ratepayer Group, the Stewardship Council membership and the Park, in consultation with its scientific specialists and staff, vote on selecting the Community Member and Alternate from the list of nominees, with results reported back in time to seat the Community Watermaster Board Member at the first meeting in February.

3. In order to strengthen the position of the Community Member, there needs to be some amount of money available specifically to that Member for any needed funds in the case the Community Member needs to hire an expert on a given matter, needs to ask for mediation, or needs to bring a matter to the attention of the Court. Otherwise these options are available to other Watermaster Board Members, who have funds available to them, but not to the Community Member. Is $10,000 enough for such a fund? $20,000?

4 De Minimis pumpers (those pumping less than 2 acre feet per year, as is likely the case for a residence with its own well) need to be notified about the Dudek study about how their wells may be affected by pumping allowed in a water plan that reaches sustainable use over a twenty year period. A De Minimis pumper could replace the County Member if the County declines to participate.

#4.3

Public Comment Letter with Items of Concern in the Borrego Springs Subbasin Stipulation Judgment/Water Plan

Rebecca Falk, 3260 Flying H Road, Borrego Springs, CA 92004760-331-7526, rebfalk7@gmail.com

Items of Concern

1. What provisions are there for environmental assessments prior to any intrabasin transfers and for ensuring that pumping after water trading doesn't impact one area more than another, or create new problems? Will there be an anti-degradation analysis for water use prior to such trades and transfers?
2. Proposed Stip Judgment p. 26-27: "c. Transfers of BPA Excluded from Conveyance of Parcel. Upon written notice to the Watermaster, a Party may transfer all or any portion of that Party's BPA excluded from the conveyance in accordance with Section III.I(9)(b) to any other parcel or portion thereof overlying the Basin owned by that Party or its affiliate provided that such notice identifies the BPA Parcel(s) and well(s) to which the BPA is to be assigned."

   I understand that this type of transfer could happen with a pumper who owns multiple parcels in the same Management Area, especially if they are adjacent parcels. And I see that the party accepting the transfer has to have a BPA parcel already. But shouldn't there be a provision to limit this transfer of water rights to parcel(s) in the same management area as the original parcel, unless environmental assessments and degradation analyses as mentioned in item #1 above are conducted prior to the transfer being approved?
3. Is the Community Watermaster Board Member is a "party" in the following passage? (Same question of the County Watermaster Board Member, if the County chooses to participate). The following passage also raises the related question: Is the Community Member (County Member) of the Watermaster Board a "party" in the sense that he or she can appeal to a court, request mediation for an unresolved issue, and hire a specialist? Or indeed, can these Members participate in Article II, 2.10 of the Rules and Regs? See the definition of "Party (Parties) that follows. The Community Member of the

Watermaster Board should have equal powers with regard to management as other Members.

1. Section 2.62 of Rules and Regs for the WM Board, p. 4 provides for Watermaster Consultant removal and replacement with notice to the parties, and removal can also happen immediately with unanimous vote of the parties.

From Definitions, Proposed Stipulation Judgment:

" 40. Party (Parties). Any Person(s) that has (have) been named and served or otherwise properly joined, or has (have) become subject to this Judgment of this Court and all their respective heirs, successors-in-interest and assigns."

Also from Rules and Regs, same definition: " 1.3.15 Party (Parties). Any Person(s) that has (have) been named and served or otherwise properly joined, or has (have) become subject to this Judgment of this Court and all their respective heirs, successors-in-interest and assigns."

4. Prior County fallowing standards included leaving .95 acre foot per parcel so that the fallowed land could be used for a residence with landscaping in the future. The fallowing standard in the Plan does not provide for revegetation or restoration of the land. Is there any water right being left with fallowed land that can be used for restoration at some point? If not, please consider doing this.
5. There should be a mechanism for the Watermaster Board Membership or weight of votes to shift over time to accommodate major changes in the percentages of water rights held by the participating sectors.

#5

December 15, 2019

Lundberg Family Trust
c/o Mr. Lance Lundberg
6 Fraser Road
Westport, CT 08880

Dear Lance:

This letter is in response to your request regarding your water credits issued pursuant to the Borrego Water District's former water credit policy and the "Demand Offset Mitigation Water Credits Policy," which was in effect in 2013 and subsequently amended in June 2014. The following facts remain true and correct as of the date of this letter:

1. Lundavid LLC, a Connecticut limited liability company ("Lundavid"), and the Borrego Water District (the "District") entered into that certain Bargin Sale and Donation Agreement, dated October 22, 2010, as amended by First, Second, and Third Amendments, respectively dated November 23, 2010, July 8, 2011, and September 24, 2014 (as amended, the "Agreement"). A copy of the Agreement is available upon request.
2. The Agreement provides, among other items, that Lundavid will sell certain real property and water credits to the District for Parcel 2 (as defined therein), and that the District will issue certain water credits to Lundavid for Parcel 1 (as defined below) and Lundavid will donate such Parcel 1 without water credits to the District, in each case after fallowing activities are completed on former citrus acreage in Borrego Springs.
3. Parcel 2 was sold to the District, along with all water credits related to Parcel 2, in accordance with the Agreement.
4. Parcel 1 includes real property at the former citrus farm located at APN 140-030-03, DiGiorgio Road, Borrego Springs, as more specifically described and shown on <u>Exhibit A</u> ("Parcel 1").
5. Pursuant to the Agreement, Lundavid and the District agreed that the water credits for Parcel 1 and Parcel 2 would be 294 AG-1 water credits per parcel. (See the Third Amendment)
6. Pursuant to the Agreement, Lundavid assigned its rights to the 294 AG-1 water credits for Parcel 1 (the "Parcel 1 Water Credits") to Lundberg Family Trust. (See the Third Amendment.)
7. The Parcel 1 Water Credits are evidenced by a Borrego Water District Water Credit Certificate issued to Lundberg Family Trust on [____________, 2014],a copy of which is attached as <u>Exhibit B</u>.
8. The Parcel 1 Water Credits are based on that certain Grant of Groundwater Easement to the Borrego Water District between Lundavid LLC and the District, dated September 24, 2014, and recorded in the real property records of San Diego County as document number ______________ (the "Easement"). A copy of the Easement is attached as <u>Exhibit C</u>.
9. All requirements for fallowing were met for the Parcel 1 Water Credits, as acknowledged by the District in the Third Amendment to the Agreement and as evidenced by the recording of the Easement. Specifically, the following minimum requirements – or better – were met for Parcel 1:
    a. All agricultural tree crops were destroyed.

b. All land where the crops were destroyed was stabilized. Dust abatement has been established and completed.

c. All above ground irrigation lines/piping has been permanently removed.
d. All hazardous materials (e.g., drums of used oil) have been removed from the fallowed site.

Further, the Borrego Water District knows of no reason why the Parcel 1 Water Credits would not be converted to Baseline Pumping Allocation of approximately [377] acre-feet in accordance with Exhibit "4" to the stipulated judgment that is expected to be filed in a San Diego County court in January, 2020. This letter may be assigned by the addressed party in connection with a transaction for the Parcel 1 Water Credits, and this letter will benefit such future holder of the Parcel 1 Water Credits as well as the addressed party.

Sincerely,

Geoff Poole
General Manager

Exhibit A to Estoppel

Parcel 1 Legal Description and Survey Exhibit

See attached.

Exhibit B to Estoppel

Borrego Water District Water Credit Certificate

[to be provided by BWD]

Exhibit C to Estoppel

Grant of Groundwater Easement

[recorded copy to be provided by BWD]

#6

Comments about the Borrego Springs Sub Basin Proposed Stipulated Judgment:

My comments are about the governance and governing body (WaterMaster Board) that will be created to oversee the implementation of the plan. It appears to me that the representative of the small ratepayers and customers (Community Representative) is not given the independent representation they need and should have.

First, the provision that the other members should select the Community Representative is not right. The Community Rep must be selected by the community they are meant to represent. The large commercial water users, agriculture and recreational, should not have a say in the selection of this representative. Perhaps the best way to do this is for the BWD to publicly solicit applicants for that position, and have each fill out an application with resume and reasons for wanting to be on the W/M Board. The public should have time to comment on those applicants, to the BWD. After reviewing the applications and recommendations from the community, the BWD should select the Community Representative. Only in that way can the public have any say in the selections of the Community Rep, whose job will be to represent us, the small ratepayers and customers. That representative should be selected at the time the others are selected, so there are no discussions or decisions without the Community Representative taking part. No meetings or business should be enacted by the W/M Board until that representative is selected.

There also needs to be some provision to provide staff and/or support for that representative equivalent to the staff and support the other members will have.

In other words, all efforts must be made to give us, the small ratepayers, a voice on the W/M Board.

Yours
Selden McKee
3193 Club Circle West

#7

BORREGO SPRINGS SUB BASIN STIPULATED JUDGMENT
PUBLIC COMMENT FORM

Date:	December 18, 2019
NAME:	Judy Haldeman
ADDRESS:	3142 Duffer Court, B.S., CA 92004
CONTACT E-MAIL:	gary@garybaldy.com

I have the following comments on the Proposed Stipulation and request consideration of the following changes in the documents:

Re: "Ownership of one acre of land in the basin for each 5 AF of BPA"

Land in the basin is very inexpensive – 20 acres could be found for $20,000, which would make 100 AF of water very easy to acquire. If this is to be a deterrent to speculation, once acre for 5 AF of water is not good enough to inhibit speculation.

#8

County of San Diego

MARK WARDLAW
DIRECTOR

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE, SUITE 310, SAN DIEGO, CA 92123
(858) 505-6445 General • (858) 694-2705 Codes • (858) 565 5920 Building Services
www SDCPDS org

KATHLEEN A. FLANNERY
ASSISTANT DIRECTOR

December 19, 2019

Geoff Poole
General Manager
Borrego Water District
PO Box 1870
806 Palm Canyon Drive
Borrego Springs, CA 92004

Delivery via E-Mail
(geoff@borregowd.org)

Comments on Proposed Borrego Springs Subbasin Stipulation

Dear Mr. Poole:

The County of San Diego (County) has reviewed the draft Borrego Springs Subbasin (Basin) Stipulation documents that were provided for public review by Borrego Water District (BWD) on November 19, 2019. It is understood that the public comment period ends on December 20, 2019 and BWD intends on filing the Stipulation with the Superior Court of California (Court) prior to January 31, 2020. Once approved by the Court and the California Department of Water Resources (DWR), this Stipulation would provide a comprehensive determination of groundwater rights, establish a Watermaster to manage groundwater resources in the Basin, and be considered an Alternative Submittal in accordance with the Sustainable Groundwater Management Act [California Water Code (CWC) § 10733.6(b)(2)].

Given the substantial public outreach involved in developing the Groundwater Sustainability Plan (GSP) for the Basin, the County is pleased that the GSP was used as the foundation for the Stipulation in substantially similar form. The County acknowledges the significance of reaching agreement in the Stipulation and also recognizes the requirement to satisfy the objectives of SGMA (CWC §§ 10727.2 and 10727.4) while maintaining consistency of water rights (California Code of Civil Procedure (CCP) § 850(a)). Based on this, County staff have prepared the following comments on the draft Stipulation documents:

1. **Overview of Proposed Stipulated Judgment.** The overview references BWD's Developer's Policy. The County requests that BWD provide advanced notice and

an opportunity for County review of any proposed revisions to BWD's Policy for Water and Sewer Service to New Developments.

2. **Draft Stipulated Judgment. III. B. Carryover.** County staff recommend revising the Carryover provision in the Stipulation. Similar to other Stipulated Judgments in California, Carryover could be limited to the following year – as in the West Coast Basin; or an allocation percentage carried over with a five-year expiration date – similar to Oxnard and Pleasant Valley Groundwater Basins. As proposed in the Stipulation, the only limitation placed on Carryover is that accrual cannot exceed two times the amount of a pumper's allocation. Without further limitations to account for the inclusion of water credits as additional allocation, the Stipulation may not satisfy DWR requirements of achieving sustainability within 20 years (CWC § 10727.2(b)(1)).
3. **Draft Stipulated Judgment. III. H. De Minimis Pumpers.** The Stipulation exempts groundwater users who use 2 acre-feet per year (afy) or less for <u>domestic</u> purposes [emphasis added]. The GSP exempted from regulation <u>all</u> groundwater users who use 2 afy or less. County staff recommend removing 'for domestic purposes' and exempting all users who use 2 afy or less since they would not have a material effect on the groundwater rights of other parties. This is consistent with CCP § 833 (d).
4. **Draft Stipulated Judgment. III. I. 1. Good Standing and Intervention Requirements.** The Stipulation states that, '[a] transferee who is not already a Party must intervene as a Party as a condition of completing any Lease or Permanent Transfer." It is unclear if property owners must sign on to the Stipulation in order to participate. Note that a Party is defined as "Any Person(s) that has (have) been named and served or otherwise properly joined, or has (have) become subject to this Judgment of this Court and all their respective heirs, successors-in-interest and assigns."
5. **Draft Stipulated Judgment. III. I. 2. Anti-Speculation Provision.** The Stipulation states that only a property owner can purchase water rights. County staff recommend that for discretionary permits approved by the County, only a property owner <u>or project applicant/developer (with consent from the property owner)</u> should have the ability to purchase needed water rights. BWD and the County are excepted from this provision.
6. **Draft Stipulated Judgment. IV. B. Watermaster Board.** The Stipulation currently lists the County as a proposed member of the Watermaster Board. While it is understood that the Court will need to appoint members to the Watermaster Board, the County's participation would require approval by the County Board of Supervisors at a future hearing. Staff recommends including

language to that effect in the Stipulation and consideration of an alternative if the County Board of Supervisors declines to participate on the Watermaster Board.

7. **Draft Stipulated Judgment. Exhibit 3. Minimum Fallowing Standards.** The Stipulation requires all agricultural tree crops be destroyed (e.g., chipped or burned). County staff recommend adding clarifying language stating that a fire department burn permit and Smoke Management Plan approved by County Air Pollution Control District may be required for agricultural burning.

Thank you for the opportunity to provide comments. Should you have any questions or need additional information, please contact Jim Bennett, Water Resources Manager, at 858-694-3820 or jim.bennett@sdcounty.ca.gov.

Sincerely,

MARK WARDLAW, Director
Planning & Development Services

cc.

Steven Anderson
Best Best & Krieger LLP
3390 University Ave., 5th Floor
Riverside, CA 92501

Jim Bennett, Water Resources
Manager
Planning & Development Services
County of San Diego
5510 Overland Avenue, Suite 310
San Diego, CA 92123

#9

Tub Canyon Landowners Association

230 W. Palm St.
San Diego, CA 92103

December 20, 2019

Geoff Poole
General Manager, BWD
Borrego Springs, CA 92004

Dear Geoff,

I am writing in my capacity as President of the Tub (sic) Canyon Landowners Association, which is a non-profit mutual benefit water corporation that operates a well and provides water to four seasonal residences in the Tubb Canyon neighborhood. This well, which is within the boundaries of the Borrego Basin, has been in operation for approximately 50 years.

My understanding is that our well will be designated a de minimis pumper under the draft Groundwater Sustainability Plan (GSP) created by the Borrego Basin Groundwater Sustainability Agency (GSA) and published in late 2019. I say this is my "understanding" because neither I nor the association I represent have been notified of any of the proceedings of the GSA.

It is with concern that I inform you that not only has my organization not been notified of any of the proceedings which will determine our water future, but it appears de minimis pumpers such as my organization are to have no representation on the Watermaster Board as proposed in the Stipulated Agreement.

I understand that de minimis pumpers are explicitly "not a part of the plan" nor are de minimis pumpers regulated by the plan. **Nevertheless, the management actions of the Watermaster Board will have existential consequences for everyone whose survival is dependent upon the amount and quality of water in the Borrego Basin, including de minimis pumpers.** For this reason and from the perspective of my water association, it is unacceptable that de minimis pumpers will have no representation on the Watermaster Board.

Representation is particularly critical from the standpoint of my association which has seen its water level decline by 4 feet/year for the 12 years ending in 2017. Our water consumption has not changed in that period of time, and if anything, has decreased. Thus, the decline in the water table that we are witnessing at our well is attributable to the decline of the Borrego Basin aquifer. At the current rate of decline our well will run dry within a decade, which we would view as an unacceptable consequence of the Stipulated Agreement and Groundwater Management Plan.

The survival of the homes and families who have lived in the Tubb Canyon neighborhood for more than 50 years is at stake and will be impacted by the decisions of the Watermaster Board. **I understand that our survival is threatened by the current conditions that the Stipulated Agreement and Groundwater Management Plan are designed to address. Nevertheless, there are many routes to sustainability, some of which would lead to the drying up of our well, and others which would not.** For this reason, it is imperative that de minimis pumpers have input into the management decisions that will get us to sustainability.

Therefore, I propose that de minimis pumpers be allotted one seat on the proposed Water Master Board and that this representative be selected by, and from among, the owners of de minimis wells.

Thank you,

J. David Garmon, M.D.
President, TCLA

#9

Tubb Canyon Desert Conservancy

December 20, 2019

Geoff Poole
General Manager, BWD
Borrego Springs, CA 92004

Dear Mr. Poole,

Thank you for your herculean efforts to bring our basin into sustainability.

I am writing today in response to the publication of the proposed Stipulated Agreement, and in particular would like to address the selection, seating, and funding of the proposed Community Representative to the Watermaster Board. If the implementation of the Stipulated Agreement is to have the support of the community, it is imperative that the community have the right to select its own representative, and that the Community Representative be fully empowered to carry out his/her obligations to the community. As currently envisioned, the Stipulated Agreement falls far short of meeting these requirements. I offer the following paragraphs as descriptions of the shortcomings and suggestions for cure.

Selection of the Community Representative

As currently written, four community groups are to nominate three candidates for the Community Representative position, and the school district is to nominate one. I submit there is no reason that serves the interests of the community to give more "nominating power" to the school district than to the other four community organizations—the Anza-Borrego Desert State Park (that manages the entire watershed), the Sponsor Group, the Ratepayer Group, and the Stewardship Council.

Greatly compounding the arbitrary and indefensible nature of the nominating process, as currently proposed, is the fact that the Agricultural and Recreational Representatives to the Watermaster Board would then select the "community representative" from among the four nominees. I submit that this selection process would serve no purpose but to transform the "community representative" into the

8899 University Center Lane, Suite 170, San Diego, CA 92122
Phone 858 535-9121 Fax 858 535-9156

creature of those entities doing the final selection—Agriculture and Recreation—thereby depriving the community of unfettered, unbeholden representation. Despite the good intentions of all parties, allowing the Agriculture and Recreation Representatives to select the Community Representative does not pass the appearance test nor the smell test.

I suggest that the two flaws outlined above can be cured with the following change to the selection of the Community Representative to the Watermaster Board: representatives, as currently defined, of the State Park, the Sponsor Group, the Stewardship Council, the Ratepayer Group, and the School District elect the Community Representative. Period. This group of five people, four of whom served on the Advisory Council, plus a school board representative will nominate, vet, and elect the community representative.

This solution avoids the appearance of excessive and undue influence on the Community Representative by other members of the Watermaster Board.

Seating of the Community Representative

As currently envisioned, the Community Representative would not be seated until mid-2020. Thus, the Community Representative would not be seated until after the seating of the Agricultural Representative, the Recreational Representative, the BWD Representative, and perhaps the County Representatives. Thus, the Community Representative would not be seated until after critical decisions have been made, at a minimum about the 2020-2012 budget.

Is this delay in seating the Community Representative because the Community Representative is not really important to the process? Is it because the Community Representative would have nothing of importance to contribute the initial, formative decisions of the Watermaster Board? Is it because the Community Representative is just an afterthought that can be attended to when there is time to address details of secondary importance? I offer these questions to illuminate the optics of delaying the seating of the Community Representative.

I am aware of no justifiable reason as to why the seating of the Community Representative should be delayed, thereby leaving the community out of the seminal decision-making processes that may define the course of the Waterboard for years, if not decades, to come.

The cure for this procedural problem is to seat the Community Representative at the same time as the other Representatives to the Watermaster Board. To do otherwise would be to send a message to the Borrego community that their input is not needed until after the important, foundational decisions have been made.

8899 University Center Lane, Suite 170, San Diego, CA 92122
Phone 858 535-9121 Fax 858 535-9156

Delaying the seating of the Community Representative is not a recipe for garnering public support for what will be a long and arduous process.

Funding of the Community Representative

The Representatives to the Watermaster Board will be empowered to hire advisors to the Technical Advisory Committee and the Environmental Advisory Committee. They will be empowered to negotiate and bring suit on behalf of their constituencies. All of these critically important prerogatives and activities require funding. Four of the Representatives to the Watermaster Board will have deep pockets—Agriculture, Recreation, BWD, and the County of San Diego—that can fund these critical activities. The Community Representative will not.

As currently envisioned the Community Representative will have no available source of funding for any of the important activities listed above. If the Community Representative is to be a fully empowered, credible representative of community interests, the Community Representative must have access to a source of funding that would be sufficient to hire technical advisors and legal advisors on par with the other members of the Watermaster Board. If the Community Representative does not have access to such funding, s/he would have only the power of suasion—a not insignificant power, but a power that struggles mightily against those with financial resources.

I suggest a cure for this inequity would be to make sufficient funding available to the Community Representative through the BWD or the GSA as to put the Community Representative on equal footing with the other members of the Watermaster Board.

Thank you for your consideration.

J. David Garmon, M.D.
President, TCDC

8899 University Center Lane, Suite 170, San Diego, CA 92122
Phone 858 535-9121 Fax 858 535-9156

#10

Tub Canyon Landowners Association

230 W. Palm St.
San Diego, CA 92103

December 20, 2019

Geoff Poole
General Manager, BWD
Borrego Springs, CA 92004

Dear Geoff,

I am writing in my capacity as President of the Tub (sic) Canyon Landowners Association, which is a non-profit mutual benefit water corporation that operates a well and provides water to four seasonal residences in the Tubb Canyon neighborhood. This well, which is within the boundaries of the Borrego Basin, has been in operation for approximately 50 years.

My understanding is that our well will be designated a de minimis pumper under the draft Groundwater Sustainability Plan (GSP) created by the Borrego Basin Groundwater Sustainability Agency (GSA) and published in late 2019. I say this is my "understanding" because neither I nor the association I represent have been notified of any of the proceedings of the GSA.

It is with concern that I inform you that not only has my organization not been notified of any of the proceedings which will determine our water future, but it appears de minimis pumpers such as my organization are to have no representation on the Watermaster Board as proposed in the Stipulated Agreement.

I understand that de minimis pumpers are explicitly "not a part of the plan" nor are de minimis pumpers regulated by the plan. **Nevertheless, the management actions of the Watermaster Board will have existential consequences for everyone whose survival is dependent upon the amount and quality of water in the Borrego Basin, including de minimis pumpers.** For this reason and from the perspective of my water association, it is unacceptable that de minimis pumpers will have no representation on the Watermaster Board.

Representation is particularly critical from the standpoint of my association which has seen its water level decline by 4 feet/year for the 12 years ending in 2017. Our water consumption has not changed in that period of time, and if anything, has decreased. Thus, the decline in the water table that we are witnessing at our well is attributable to the decline of the Borrego Basin aquifer. At the current rate of decline our well will run dry within a decade, which we would view as an unacceptable consequence of the Stipulated Agreement and Groundwater Management Plan.

The survival of the homes and families who have lived in the Tubb Canyon neighborhood for more than 50 years is at stake and will be impacted by the decisions of the Watermaster Board. **I understand that our survival is threatened by the current conditions that the Stipulated Agreement and Groundwater Management Plan are designed to address. Nevertheless, there are many routes to sustainability, some of which would lead to the drying up of our well, and others which would not.** For this reason, it is imperative that de minimis pumpers have input into the management decisions that will get us to sustainability.

Therefore, I propose that de minimis pumpers be allotted one seat on the proposed Water Master Board and that this representative be selected by, and from among, the owners of de minimis wells.

Thank you,

J. David Garmon, M.D.
President, TCLA

#11

Fostering the protection and appreciation *of birds, other wildlife and their habitats...*

BORREGO SPRINGS SUB BASIN STIPULATED JUDGMENT

PUBLIC COMMENT FORM: Due 12-20-19 @ 4PM

NAME: Jim Peugh
ADDRESS: San Diego Audubon Society, San Diego, CA
CONTACT INFO (EMAIL/PHONE): peugh@cox.net and meyer@sandiegoaudubon.org

San Diego Audubon Society has the following comments of the proposed stipulation and request consideration of the following changes in the documents: We commented on the GSP under the SGMA on 5/17/2019, and follow up with comments here on the stipulated judgment.

There are 3 issues, starting with the makeup of the Watermaster Board of Directors. There is a lack of environmental representation on the Board. There is one seat to be filled, that is to be chosen from four nominees picked by BWD Ratepayers, Borrego Springs Community Sponsor Group, Anza-Borrego Desert State Park, Borrego Valley Stewardship Council, and Borrego Springs Unified School District. Then the other four members already appointed to the Board choose the nominee. There is no timetable disclosed to the duration of Board member's appointment. Environmental issues might never get the attention they deserve to be addressed or discussed with a Board composed and appointed in this way. There should be a permanent seat on the Board of Directors for an Environmental Representative due to the sensitive nature of water in the Borrego Springs ecosystem. At the very least, there should be a dedicated rotation of appointees representing the interests of the groups mentioned above outside the influence of the other members already sitting on the Board. This will allow critical issues to be acknowledged and addressed before the Board.

Secondly, more information is desired on the Environmental Group that will advise the Watermaster on Groundwater Dependent Ecosystems. What will the procedures be to form this group and how will their consultation be properly addressed during construction of policy? These should be clearly identified in the final prepared documents because this group is in important oversight and communication piece of the full plan.

Lastly, all CEQA related review of implementation of the Physical Solution has been removed from the Stipulated Judgment. There should be a full discussion presented in the final report on why there was an exemption of CEQA oversight and under what circumstances. We would appreciate notice upon this letter being received and express thanks for the opportunity to provide input. We look forward to seeing these issues addressed in the final report.

Sincerely,

James A. Peugh

James A. Peugh
Conservation Chair
San Diego Audubon Society

\#12

State of California • Natural Resources Agency
Gavin Newsom, Governor
DEPARTMENT OF PARKS AND RECREATION
Lisa Ann L. Mangat, Direct
COLORADO DESERT DISTRICT
200 PALM CANYON DRIVE
BORREGO SPRINGS, CA 92004
760-767-4037

December 20, 2019

Geoff Poole
General Manager
Borrego Water District
896 Palm Canyon Drive
Borrego Springs, CA 92004

RE: Draft Borrego Springs Subbasin Stipulated Judgment

E-mail: geoff@borregowd.org

Thank you for the opportunity to comment on the Proposed Stipulation Documents. Anza-Borrego Desert State Park® ("ABDSP") is approximately 1,000 square miles and surrounds the approximate 98 square mile Borrego Springs Subbasin ("Subbasin"). ABDSP continues to grow. Currently ABDSP anticipates receiving an additional 331 parcels totaling 17,598 acres from its partner, Anza-Borrego Foundation ("ABF"). There will likely be other acquisitions in the future through ABF. See further details in State Parks' letter to San Diego County, dated May 21, 2019, attached.

State Parks has several comments, primarily seeking clarification of several of the terms in the Proposed Stipulated Judgment ("Judgment").

1. **I.A.9. and III.D.** The allocation of 20 acre feet to State Parks for its purposes should not be impacted by future State Parks fee title transfers.

Because State Parks' allocation under the Judgment does not appear to be connected to any parcel, and ABDSP is comprised of many parcels, the Judgment should clarify that the term BPA Parcel (I.A.9.) does not include the parcels in State Parks' ownership at the time of filing the Complaint. Should State Parks acquire parcels in the future that qualify as BPA Parcels, State Parks may acquire the BPA pursuant to the terms of the Judgment.

Instead of applying the default rule identified in paragraph II.I.6. to State Parks' allocation, subsection III.D. should clarify that State Parks' allocation of 20 acre feet would not be impacted by any transfer of parcels in or out of ABDSP's jurisdiction.

2. **III.D.** The allocation of 20 acre feet should clarify whether the allocation includes the *de minimis* groundwater pumping at Vern Whitaker Horse Camp ("Horse Camp").

Under the draft Groundwater Sustainability Plan, the Horse Camp was considered a *de minimis* pumper, and not included in State Parks' baseline pumping allocation. See attached letters from San Diego County Planning & Development Services. The Judgment does not clarify whether pumping from the Horse Camp is still considered *de minimis*.

3. **IV.E.10. and VI.B.2.** The Entry Agreement should include cost recovery for State Parks should the Watermaster's entry onto State Parks' property require State Parks employees to conduct environmental or cultural resource review.

Pursuant to the State Administrative Manual section 8752, State Parks requires full cost recovery for provision of goods or services except where statutes so prohibit. The Entry Agreement provides for expansive activities beyond entry upon property to conduct water quality testing. If the activities the Watermaster intends to engage in on ABDSP land require environmental or cultural resource review, the Entry Agreement should provide for cost recovery to State Parks.

4. **IV.G.** The Judgment should elaborate its description regarding the Environmental Working Group. How is the group formed and who determines its members?

5. **V.A.2.** The Judgment should clarify whether there will be any exemptions to the overproduction penalty assessment, such as water pumped for firefighting purposes or used during declared natural disasters.

Sincerely,

Emma Sivaser
for

Ray Lennox
District Superintendent
Colorado Desert District

Enclosures

State of California • Natural Resources Agency
Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION
COLORADO DESERT DISTRICT
200 PALM CANYON DRIVE
BORREGO SPRINGS, CA 92004
760-767-4037

Lisa Ann L. Mangat, *Direct*

December 20, 2019

Geoff Poole
General Manager
Borrego Water District
896 Palm Canyon Drive
Borrego Springs, CA 92004

RE: Draft Borrego Springs Subbasin Stipulated Judgment

E-mail: geoff@borregowd.org

Thank you for the opportunity to comment on the Proposed Stipulation Documents. Anza-Borrego Desert State Park® ("ABDSP") is approximately 1,000 square miles and surrounds the approximate 98 square mile Borrego Springs Subbasin ("Subbasin"). ABDSP continues to grow. Currently ABDSP anticipates receiving an additional 331 parcels totaling 17,598 acres from its partner, Anza-Borrego Foundation ("ABF"). There will likely be other acquisitions in the future through ABF. See further details in State Parks' letter to San Diego County, dated May 21, 2019, attached.

State Parks has several comments, primarily seeking clarification of several of the terms in the Proposed Stipulated Judgment ("Judgment").

1. **I.A.9. and III.D.** The allocation of 20 acre feet to State Parks for its purposes should not be impacted by future State Parks fee title transfers.

Because State Parks' allocation under the Judgment does not appear to be connected to any parcel, and ABDSP is comprised of many parcels, the Judgment should clarify that the term BPA Parcel (I.A.9.) does not include the parcels in State Parks' ownership at the time of filing the Complaint. Should State Parks acquire parcels in the future that qualify as BPA Parcels, State Parks may acquire the BPA pursuant to the terms of the Judgment.

Instead of applying the default rule identified in paragraph II.I.6. to State Parks' allocation, subsection III.D. should clarify that State Parks' allocation of 20 acre feet would not be impacted by any transfer of parcels in or out of ABDSP's jurisdiction.

2. **III.D.** The allocation of 20 acre feet should clarify whether the allocation includes the *de minimis* groundwater pumping at Vern Whitaker Horse Camp ("Horse Camp").

Under the draft Groundwater Sustainability Plan, the Horse Camp was considered a *de minimis* pumper, and not included in State Parks' baseline pumping allocation. See attached letters from San Diego County Planning & Development Services. The Judgment does not clarify whether pumping from the Horse Camp is still considered *de minimis*.

3. **IV.E.10. and VI.B.2**. The Entry Agreement should include cost recovery for State Parks should the Watermaster's entry onto State Parks' property require State Parks employees to conduct environmental or cultural resource review.

Pursuant to the State Administrative Manual section 8752, State Parks requires full cost recovery for provision of goods or services except where statutes so prohibit. The Entry Agreement provides for expansive activities beyond entry upon property to conduct water quality testing. If the activities the Watermaster intends to engage in on ABDSP land require environmental or cultural resource review, the Entry Agreement should provide for cost recovery to State Parks.

4. **IV.G.** The Judgment should elaborate its description regarding the Environmental Working Group. How is the group formed and who determines its members?

5. **V.A.2.** The Judgment should clarify whether there will be any exemptions to the overproduction penalty assessment, such as water pumped for firefighting purposes or used during declared natural disasters.

Sincerely,

Emma Sivoser
for

Ray Lennox
District Superintendent
Colorado Desert District

Enclosures

#13

Local Government Commission

Leaders for Livable Communities

CLEAN WATER ACTION

December 20, 2019

Geoff Poole,
General Manager
Borrego Water District

Re: Comments on draft Stipulated Judgement for Borrego Groundwater Basin (7-024.01)

Dear Mr. Poole,

On behalf of Clean Water Action and the Local Government Commission, we would like to make the following comments on the draft stipulated judgement for the Borrego groundwater basin. Our organizations are strong advocates for sustainable groundwater management and appreciate the intent of the plan to reach sustainability within the time period mandated by the Sustainable Groundwater Management Act. However, we do have some concerns about the extent to which disadvantaged communities and the environment are protected in this proposal. Our concerns and suggested remedies are outlined below.

I. The Proposed Adjusted Pumping Allocation, as applied to residential uses, does not comply with state law and disproportionately burdens a severely disadvantaged community.

California State Law says that "the use of water for domestic purposes is the highest use of water."[1] Yet the proposed judgement requires a specific level of water use reduction for residents of both public water systems and state small water systems - 76% - without regard to the actual amount required for human consumption. While we agree that water waste needs to be minimized and that significant reductions, possibly as great as the 76% reduction called for, can be achieved, we are concerned that setting a specific floor could result in the Borrego Water District and other small water systems in the basin being forced to compete with private

i. [1] California Water Code §106 "It is hereby declared to be the established policy of this State that the use of water for domestic purposes is the highest use of water and that the next highest use is for irrigation."

interests to purchase water to meet minimum health and safety requirements. As your own Groundwater Management Plan identifies, Borrego Springs is a severely disadvantaged community and its ability to raise rates is limited by the community's ability to pay. By effectively forcing Borrego Water District to compete for additional groundwater shares, likely to the detriment of affordable water rates, the GSA is setting itself up to be in conflict with the Human Right to Water[2]. While the Human Right to Water does not apply directly to GSAs, it does apply to the Department of Water Resources, which must take the state policy into consideration while reviewing Groundwater Sustainability Plans.

The Borrego Water District is already required to comply with the "Conservation as a Way of Life" legislation passed in 2018. Regulations to implement that legislation are currently in development.

Recommendation: We propose that disadvantaged community water systems like Borrego Water District be exempt from mandatory reductions under the stipulated judgement, and instead be allowed to comply with laws and regulations that regulate residential water use, as they may be updated[3]. The Watermaster Board should work with the District on measures that would allow the District to reduce groundwater usage in a way that does not result in unaffordable water rates. For other residential systems, we recommend that minimum usage be set at a level based on actual human needs and incorporating current best practices and available technology for water conservation.

II. The Water Master Board, as proposed, lacks sufficient transparency and oversight

We have several concerns with the Water Board makeup and function and recommend the following changes to address those concerns.

- The supermajority requirement of 80% to take certain actions seems high, and appears to be a function of the size of the Watermaster Board. We think an increase in size to 7 members would allow a less onerous supermajority of 5
- At the same time, the language in the stipulated judgement could allow as few as 2 members to make decisions on some issues. This is because majority decisions are made based on members present rather than the total number of seats. We recommend using the latter count to make decisions to avoid the potential of allowing a minority of members to make decisions.
- We recommend that two members should be added to the Watermaster Board; one representing de minimis users and one representing environmental concerns.

---

[2]California Water Code §106.3

[3] The State Water Board has identified 55 gallons of water per capita per day as the conservation goal for indoor use (Resolution 2016-0010), while the Model Water Efficient Landscape Ordinance, which is currently being updated, sets standards for determining outdoor water use.

- While the draft judgement currently excludes de minimis pumpers from oversight, that decision can be reversed. Additionally, while these users are not subject to pumping restrictions, the continued groundwater overdraft will impact their ability to use groundwater. These interests have a legal right to participate in the adjudication process; we strongly recommend that clear arrangements be made to accommodate those rights. The appointment can be made by a coalition of those pumpers
- While agricultural and recreational interests have seats on the board, the interests of the environment do not. This seems incongruous in a basin surrounded by a state park that is an economic driver in the community. Further, this is an economic driver that will be minimally impacted by the pumping reductions required to meet groundwater sustainability requirements. If, as many local residents believe, eco-tourism has the potential to play an important role in the future of the valley, it should also play a role on the Watermaster Board. We think the current Borrego Stewardship Council could make this appointment.

➢ We also recommend that the selection process for the community member already identified for the Watermaster Board be made independently of the other Board members. It seems inappropriate for Board members to select their colleague when that process is not used for the other appointments. It exacerbates a power imbalance that unfortunately already exists.

➢ We disagree with the assertion on Page 31 of the stipulated judgement that the Watermaster Board does not function as a "local agency" under Government Code section 54951, and that compliance with the Brown Act is thus determined by the Court. A public agency for the purposes of the Brown Act is one "be created by statute or Constitution." (*McKee v. Los Angeles Interagency Metropolitan Police Apprehension Crime Task Force* (2005) 134 Cal.App.4th 354, 359; Gov. Code § 54951.) Watermasters are created by statute, even when the specific water rights are adjudicated by a court. (Wat. Code §§ 4026, 4027.) Therefore, the Watermaster board is a public agency for the purposes of the Brown Act.

➢ We're concerned that representatives on the technical advisory committee are restricted to those holding Basin Pumping Allowances (BPAs). This effectively bans expertise representing the environment and de minimis pumpers and has a strong potential of generating recommendations that are not in the public interest

➢ The Environmental Working Group is created by the judgement, but provided with no required membership, qualifications, or direction. We strongly urge that additional thought be put into this proposed group, including what its role and authority will be, what expertise might be needed and how its recommendations will be approved, funding and implemented.

III. The Propose Transfer Program does not adequately protect communities or the environment

While we appreciate the opportunity to comment on this document, we're troubled by the secretive process under which it was developed. Specifically, the proposed judgement lacks sufficient protections for communities and the environment, even though these uses form a very small portion of overall water use.

- First, while we agree that all users should be required to conserve water, residential users should be guaranteed a basic level of safe drinking water, as noted above.
- Second, the document identifies de minimis users as not having an impact on the basin, but reserves the right to change that finding in future. At the same time, the potential impact of the proposed BPAs on de minimis users are not considered. This means that de minimis users have no rights, but are subject to impacts and future regulation
- The environmental water demand of the basin is not identified or provided for in the BPAs.
- The water demand of land fallowing is not considered. Exhibit 3 includes minimal requirements for permanent land fallowing that are inadequate to prevent negative impacts including blight. At minimum, sufficient water should remain with the land to ensure proper dust mitigation, including cover cropping and/or spraying. Additionally, these requirements are not applied to temporary transfers, even if those transfers span multiple years. Given the severe local climate, we fear that dust mitigation could be required even for single-year transfers. We strongly recommend that these standards be made more protective of public health and applicable to both temporary and permanent transfers.[4]

Thank you for considering these comments. We are happy to schedule a meeting to discuss these concerns.

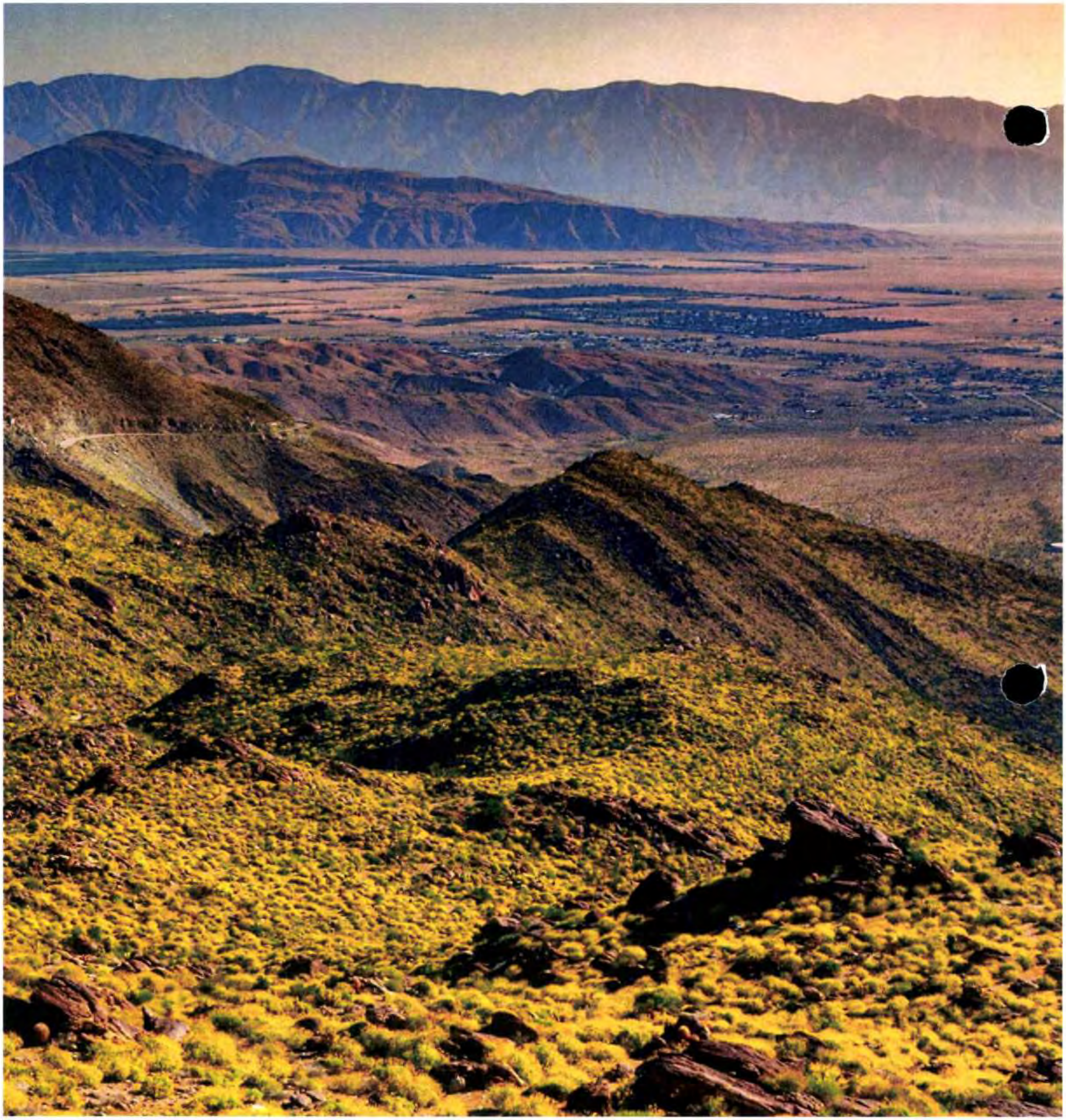
Sincerely,

Jennifer Clary
Water Program Manager
Clean Water Action

Danielle J. Dolan

Danielle Dolan
Water Program Director
Local Government Commission

[4] The Imperial Irrigation District recently adopted a robust dust mitigation program, which can be found at https://www.iid.com/water/library/qsa-water-transfer/mitigation-implementation/air-quality-mitigation




January 2020

EXHIBIT

2

EXHIBIT 2

JAMES B. GILPIN, Bar No. 151466
james.gilpin@bbklaw.com
STEVE M. ANDERSON, Bar No. 186700
steve.anderson@bbklaw.com
SARAH CHRISTOPHER FOLEY, Bar No. 277223
sarah.foley@bbklaw.com
BEST BEST & KRIEGER LLP
655 West Broadway
15th Floor
San Diego, California 92101
Telephone: (619) 525-1300
Facsimile: (619) 233-6118

Attorneys for Plaintiff
BORREGO WATER DISTRICT

Exempt from Filing Fees Pursuant to Government Code Section 6103

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF ORANGE

BORREGO WATER DISTRICT,

Plaintiff,

v.

ALL PERSONS WHO CLAIM A RIGHT TO EXTRACT GROUNDWATER IN THE BORREGO VALLEY GROUNDWATER SUBBASIN NO. 7.024-01 WHETHER BASED ON APPROPRIATION, OVERLYING RIGHT, OR OTHER BASIS OF RIGHT, AND/OR WHO CLAIM A RIGHT TO USE OF STORAGE SPACE IN THE SUBBASIN; et al.

Defendants.

Case No. 37-2020-00005776
Judge: Peter J. Wilson
Dept. CX102

STIPULATION FOR JUDGMENT

Complaint filed: January 30, 2020
Trial Date: None Set

Plaintiff BORREGO WATER DISTRICT and Defendants (collectively, the "Stipulating Parties") hereby stipulate and agree as follows:

1. To entry of the proposed Stipulated Judgment, attached hereto as Exhibit "A" and incorporated herein by reference, by the Court pursuant to Code of Civil Procedure sections 830 et seq., to (i) comprehensively determine and adjudicate all groundwater rights in the Borrego Springs Subbasin ("Basin") of the Borrego Valley Groundwater Basin, whether based on appropriation, overlying right, prescriptive right, or other basis of right in the Basin; and (ii) establish a physical solution for the perpetual and sustainable management of the Basin consistent with the substantive objectives of the Sustainable Groundwater Management Act ("SGMA") and the reasonable and beneficial use of the Basin required by Article X, section 2 of the California Constitution.

2. This Stipulation shall bind and benefit them, and will be binding upon and benefit all their respective heirs, successors-in-interest, and assigns prior to and until entered by the Court. In the event the Stipulated Judgment is contested by third parties and not entered by the Court, this Stipulation will not bind any Stipulating Party.

3. Each signatory to this Stipulation represents and affirms that he or she is legally authorized to bind the Stipulating Party on behalf of whom he or she is signing.

4. This stipulation may be signed in counterparts by the Stipulating Parties, and if executed in counterparts, will be deemed to be the same instrument and valid and binding on the Stipulating Parties as if fully executed all in one copy. Signatures may be made electronically and sent via email.

Dated: March 11, 2021

BEST BEST & KRIEGER LLP

By: ______________________

JAMES B. GILPIN
STEVE M. ANDERSON
SARAH CHRISTOPHER FOLEY
Attorneys for Plaintiff
BORREGO WATER DISTRICT

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW
655 WEST BROADWAY, 15TH FLOOR
SAN DIEGO, CALIFORNIA 92101

Dated: March 18, 2021	O'MELVENY & MYERS LLP By: [signature] RUSSELL MCGLOTHLIN Attorneys for Defendants T2 BORREGO LLC; T2 FARMS LLC; and T2 HOLDING LLC
Dated: ____________, 2021	JACKSON TIDUS By: ____________ MICHELE A. STAPLES GREGORY P. REGIER BOYD L. HILL Attorneys for Defendants DAVID AND JULI BAUER, CO-TRUSTEES OF THE D&J BAUER FAMILY TRUST 11-18-04; JM ROADRUNNER, LLC; SELEY RANCHES, L.P.; SHENANDOAH GROWERS, INC.; GAMINI D. WEERASEKERA; ROLAND J. JENSEN, TRUSTEE OF THE JENSEN FAMILY TRUST 8-5-83; JAMES SOMMERVILLE, TRUSTEE OF THE SOMMERVILLE TRUST 11-22-83; ROY BRISBOIS, TRUSTEE OF THE CONZELMAN FAMILY TRUST A 11-22-83; and STEVEN MOHLER, TRUSTEE OF THE CONZELMAN TRUST C 11-22-83; MICHAEL C. WARD
Dated: ____________, 2021	GUPTA EVANS & ASSOCIATES, PC By: ____________ JACOBS AYRES Attorneys for Defendant WILLIAM M. BAUER

Dated: ____________, 2021	O'MELVENY & MYERS LLP By: ______________________ RUSSELL MCGLOTHLIN Attorneys for Defendants T2 BORREGO LLC; T2 FARMS LLC; and T2 HOLDING LLC
Dated: March 12, 2021	JACKSON TIDUS By: *Michele A. Staples* MICHELE A. STAPLES GREGORY P. REGIER BOYD L. HILL Attorneys for Defendants DAVID AND JULI BAUER, CO-TRUSTEES OF THE D&J BAUER FAMILY TRUST 11-18-04; JM ROADRUNNER, LLC; SELEY RANCHES, L.P.; SHENANDOAH GROWERS, INC.; GAMINI D. WEERASEKERA; ROLAND J. JENSEN, TRUSTEE OF THE JENSEN FAMILY TRUST 8-5-83; JAMES SOMMERVILLE, TRUSTEE OF THE SOMMERVILLE TRUST 11-22-83; ROY BRISBOIS, TRUSTEE OF THE CONZELMAN FAMILY TRUST A 11-22-83; and STEVEN MOHLER, TRUSTEE OF THE CONZELMAN TRUST C 11-22-83; MICHAEL C. WARD
Dated: ____________, 2021	GUPTA EVANS & ASSOCIATES, PC By: ______________________ JACOBS AYRES Attorneys for Defendant WILLIAM M. BAUER

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW
655 WEST BROADWAY, 15TH FLOOR
SAN DIEGO, CALIFORNIA 92101

Dated: March 18, 2021	PARK & SOLAR LLP By: Keith R. Solar KEITH R. SOLAR Attorneys for Defendant BORREGO AIR RANCH MUTUAL WATER & IMPROVEMENT CO.
Dated: ____________, 2021	BORREGO NAZARETH, LLC By: ____________ MAISER ABONEAAJ, MANAGER
Dated: March 10, 2021	BORREGO UNIFIED SCHOOL DISTRICT By: ____________ MARK STEVENS, SUPERINTENDENT
Dated: ____________, 2021	CWC CASA DEL ZORRO, LLC By: ____________ JACK MCGRORY, MANAGER
Dated: ____________, 2021	JOHN DOLJANIN By: ____________ JOHN DOLJANIN
Dated: ____________, 2021	LANCE LUNDBERG, TRUSTEE OF THE LUNDBERG FAMILY TRUST 10-01-98 By: ____________ LANCE LUNDBERG

Dated: ____________, 2021	PARK & SOLAR LLP By: ______________________ KEITH R. SOLAR Attorneys for Defendant BORREGO AIR RANCH MUTUAL WATER & IMPROVEMENT CO.
Dated: 3/2, 2021	BORREGO NAZARETH, LLC By: ______________________ MAISER ABONEAAJ, MANAGER
Dated: ____________, 2021	BORREGO UNIFIED SCHOOL DISTRICT By: ______________________ MARK STEVENS, SUPERINTENDENT
Dated: ____________, 2021	CWC CASA DEL ZORRO, LLC By: ______________________ JACK MCGRORY, MANAGER
Dated: ____________, 2021	JOHN DOLJANIN By: ______________________ JOHN DOLJANIN
Dated: ____________, 2021	LANCE LUNDBERG, TRUSTEE OF THE LUNDBERG FAMILY TRUST 10-01-98 By: ______________________ LANCE LUNDBERG

Dated: ____________, 2021	PARK & SOLAR LLP By: ____________________ KEITH R. SOLAR Attorneys for Defendant BORREGO AIR RANCH MUTUAL WATER & IMPROVEMENT CO.
Dated: ____________, 2021	BORREGO NAZARETH, LLC By: ____________________ MAISER ABONEAAJ, MANAGER
Dated: ____________, 2021	BORREGO UNIFIED SCHOOL DISTRICT By: ____________________ MARK STEVENS, SUPERINTENDENT
Dated: ____________, 2021	CWC CASA DEL ZORRO, LLC By: ____________________ JACK MCGRORY, MANAGER
Dated: ____________, 2021	JOHN DOLJANIN By: ____________________ JOHN DOLJANIN
Dated: 3/2, 2021	LANCE LUNDBERG, TRUSTEE OF THE LUNDBERG FAMILY TRUST 10-01-98 By: [signature] LANCE LUNDBERG

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW
655 WEST BROADWAY, 15TH FLOOR
SAN DIEGO, CALIFORNIA 92101

Dated: 3/24, 2021	MONICA REAL ESTATE HOLDINGS, L.P. By: ______________________ RUDY MONICA
Dated: ____________, 2021	THE ROADRUNNER CLUB AT BORREGO, LP By: ______________________ ELIAS WEINER, SOLE MEMBER
Dated: ____________, 2021	THE SPRINGS RV AND GOLF RESORT, LP By: ______________________ ELIAS WEINER, SOLE MEMBER

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW
655 WEST BROADWAY, 15TH FLOOR
SAN DIEGO CALIFORNIA 92101

Dated: ____________, 2021	MONICA REAL ESTATE HOLDINGS, L.P. By: ____________________ RUDY MONICA
Dated: ____________, 2021	THE ROADRUNNER CLUB AT BORREGO, LP by Borrego GP LLC, its General Partner By: ____________________ ELIAS WEINER, SOLE MEMBER
Dated: ____________, 2021	THE SPRINGS RV AND GOLF RESORT, LP by Borrego GP LLC, its General Partner By: ____________________ ELIAS WEINER, SOLE MEMBER

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW
655 WEST BROADWAY 15TH FLOOR
SAN DIEGO, CALIFORNIA 92101

Dated: 3/8, 2021	CWC CASA DEL ZORRO, LLC By: ____________

Dated: 3/8, 2021	JACK MCGRORY, TRUSTEE CHARITABLE REMAINDER TRUST By: [signature]

EXHIBIT

3

EXHIBIT 3

Exhibit "3"

Minimum Fallowing Standards

- All agricultural tree crops shall be destroyed (e.g., chipped or burned).
- All land where the crops were destroyed shall be stabilized (e.g. mulched with the resulting tree crop chippings or ash, planted with rye grass, barley or other acceptable cover crop, application of other product to aid in dust abatement, or combination thereof).
- All irrigation wells not used for irrigation of other property, for monitoring or for other allowable purposes shall be properly abandoned, converted to monitoring wells, or otherwise exempted under applicable County standards.
- All above ground irrigation lines/piping shall be permanently removed.
- All hazardous materials (e.g., drums of used oil) will be removed from the fallowed site.

EXHIBIT

4

EXHIBIT 4

Exhibit "4"

BASELINE PUMPING ALLOCATIONS

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
Agri-Empire		574	140-320-10 140-320-19	010S006E23M001S
Rick and Joan Anson, co-trustees of the Anson Family Trust 08-18-08[3]		2	Unassigned	Unassigned
Alan & Tracy Asche	B&J Landscaping	5	199-020-04	DEH1980-LWELL-8027
Gary D. & Darlis A. Bailey		7	140-130-42	Unassigned
David and Juli Bauer, co-trustees of the D&J Bauer Family Trust 11-18-04		1,826	140-070-24 140-070-27 140-110-14 140-070-18 140-070-17 140-010-11	DEH2008-LWELL-19669 DEH2012-LWELL-21135 DEH2008-LWELL-18911 DEH 1998-LWELL-12508 DEH2015-LWELL-006 DEH2017-LWELL-001658
William M. Bauer		670	140-010-08	DEH2016-LWELL-001642
Borrego Air Ranch Mutual Water & Improvement Co.	Borrego Air Ranch	12	201-192-08[4]	011S007E30L001S
Borrego Nazareth LLC	Borrego Springs Resort and Club Circle	1,462	198-021-08-00 198-270-18-00 199-010-16-00 199-010-17-00 199-010-18-00 199-010-19-00	WM ID 1245829

[1] Allocations to the Anza-Borrego Desert State Park and Borrego Unified School District (Borrego Elementary) are separate from BPA, per the terms of the Judgment.
[2] Except for BPA allocated to BWD and mutual water companies, BPA must be assigned to APN(s) and Well Number(s) to be effective per Section III.A of the Judgment. If state well number(s) are not found following a Party's good faith review of DWR's well completion report database, County well files and the Party's available records, the Party shall provide the Watermaster Executive Director with a written summary of such good faith efforts to locate the state well number(s), and the Watermaster Executive Director shall assign local well number(s) (WM ID) in order to account for the Party's exercise of its BPA.
[3] Full amount is water credit to BPA conversion.
[4] Water eligible for use at all parcels served by Borrego Air Ranch Mutual Water & Improvement Co. as shown on the attached service area map, and those parcels will be treated as the Original BPA Parcel.

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
			199-010-23-00 199-010-24-00 199-010-25-00 199-010-26-00 199-080-10-00 199-011-04-00 199-100-24-00 199-080-11-00 199-080-20-00 199-080-21-00 199-080-22-00 199-080-15-00 199-080-16-00 199-080-17-00	WM ID 1245942 011S006E09B002S
Borrego Water District	N/A	2,581[5]	N/A	N/A
Raymond A. Carpenter and Susan R. Carpenter, co-trustees of the Carpenter Family Trust 12-11-07		6	140-280-35	Unassigned
Roy Brisbois, trustee of the Conzelman Family Trust A 11-22-83; Steven Mohler, trustee of the Conzelman Family Trust C 11-22-83; Roland J. Jensen, trustee of the Jensen Family Trust 8-05-83; James Sommerville, trustee of the Sommerville Trust 11-22-83[6]	Cogan Ranch	686	140-130-24-00 140-130-40-00 140-130-43-00	DEH2012-LWELL-21118[7] WM ID 1245990
Roy Brisbois, trustee	Gable House	486	140-130-01-00	

[5] Includes water credit to BPA conversion of 359 AF of BPA.
[6] All six of the jointly owned and operated Conzelman/Jensen/Sommerville Trust properties are interconnected, with wells on some of the ranches serving other ranches, as noted.
[7] Does not serve Cogan Ranch; serves Gable House Ranch.

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
of the Conzelman Family Trust A 11-22-83; Steven Mohler, trustee of the Conzelman Family Trust C 11-22-83; Roland J. Jensen, trustee of the Jensen Family Trust 8-05-83; James Sommerville, trustee of the Sommerville Trust 11-22-83	[served by well located on Cogan Ranch]			DEH2012-LWELL-21118
Roy Brisbois, trustee of the Conzelman Family Trust A 11-22-83; Steven Mohler, trustee of the Conzelman Family Trust C 11-22-83; Roland J. Jensen, trustee of the Jensen Family Trust 8-05-83; James Sommerville, trustee of the Sommerville Trust 11-22-83	Gigi Ranch	878	140-130-06-00 140-130-07-00 140-130-08-00 140-130-09-00 140-130-10-00 140-130-11-00 140-130-12-00 140-130-13-00 140-130-14-00 140-130-15-00 140-130-16-00 140-130-17-00 140-130-18-00 140-130-21-00 140-130-22-00 140-130-25-00 140-130-26-00 140-130-27-00 140-130-41-00	DEH2007-LWELL-18244[8]
Roy Brisbois, trustee of the Conzelman Family Trust A 11-22-83; Steven Mohler, trustee of the Conzelman Family Trust C 11-22-83;	Peg Leg Ranch	676	140-110-15-00 140-110-16-00	DEH1990-LWELL-10048

[8] Currently inactive. Owner in process of providing replacement well on the same parcel.

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
Roland J. Jensen, trustee of the Jensen Family Trust 8-05-83; James Sommerville, trustee of the Sommerville Trust 11-22-83				
Roy Brisbois, trustee of the Conzelman Family Trust A 11-22-83; Steven Mohler, trustee of the Conzelman Family Trust C 11-22-83; Roland J. Jensen, trustee of the Jensen Family Trust 8-05-83; James Sommerville, trustee of the Sommerville Trust 11-22-83	Rancho Caterina	1,379	140-010-03-00 140-010-06-00 140-010-09-00	DEH1993-LWELL-9977[9] DEH2004-LWELL-15891[10] DEH2020-LWELL-002643[11] DEH1995-LWELL-3866[12]
Roy Brisbois, trustee of the Conzelman Family Trust A 11-22-83; Steven Mohler, trustee of the Conzelman Family Trust C 11-22-83; Roland J. Jensen, trustee of the Jensen Family Trust 8-05-83; James Sommerville, trustee of the Sommerville Trust 11-22-83	De Anza Ranch	636	140-070-22-00	010S006E07A001S[13]

[9] Rancho Caterina Well 1, currently inactive and being replaced by Caterina Well 4 DEH2020-LWELL-002643.
[10] Rancho Caterina Well 3, same as DEH2004-LWELL-15890 [well number changed to correct the APN].
[11] Rancho Caterina Well 4, currently replacing Rancho Caterina Well 1.
[12] Rancho Caterina Well 2.
[13] This well is located on an adjacent property owned by Jensen/Conzelman/Sommerville (APN 1400606400) and operated pursuant to an appurtenant easement.

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
Desert Farm LLC Scott M. Crumrine and Stacey L. Crumrine, co-trustees of the Crumrine Family Trust 04-19-06		21	141-210-61	DEH2015-LWELL-001073
CWC Casa Del Zorro, LLC	La Casa del Zoro Desert Resort and Spa	22	200-030-28-00 200-030-29-00 200-090-05-00 200-090-11-00 200-090-19-00 200-090-20-00 200-090-21-00 200-090-22-00 200-090-23-00 200-090-24-00 200-090-25-00 200-090-27-00 200-090-29-00 200-090-30-00 200-090-31-00 200-090-32-00 200-090-33-00 200-090-34-00 200-090-35-00 200-090-36-00 200-090-37-00 200-090-38-00 200-090-45-00 200-090-47-00 200-090-48-00 200-090-50-00 200-090-63-00 200-090-64-00 200-090-65-00	011S006E23E001S
De Anza Desert Country Club	De Anza Desert Country Club	957	140-185-19 140-242-62 140-261-01 140-264-08 140-242-57-00	010S006E20N001
John B. & Silvia H. Hogan	Desert Flora Nursery	8	199-01-112	Unassigned
John Doljanin	West Coast	887	140-110-19	

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
	Trees		140-110-20 140-110-24 140-290-05 140-290-08	DEH1979-LWELL-4103 DEH1979-LWELL-4104 DEH1984-LWELL-4102
Genus, L.P.[14]		112	141-030-35-00	Unassigned
John McGrory; JM Roadrunner, LLC	Cogan	555	140-130-44 140-130-45 140-029-11 141-030-60	010S006E15D003S[15] 010S006E15D004S
JM Roadrunner, LLC	Road Runner I	671	140-130-28 140-130-34 140-130-35 140-130-36 140-130-38	010S006E15D003S 010S006E15D004S
JM RoadRunner, LLC	Road Runner II	387	141-030-26 141-030-27	WM ID 1245980 WM ID 1245981 010S006E15D003S 010S006E15D004S
Robert Larkins[16]		2	Unassigned	Unassigned
Michael Maiter and John Savittieri[17]		1	200-253-02-00 140-060-54-00 140-060-55-00	Unassigned
Gamini D. Weerasekera	Mountain Springs Organics	103	140-110-21	010S006E17J003S 010S006E17J001S
Manuel & Araceli C. Navarro		14	141-210-16	010S006E34M001S DEH1982-LWELL-1076
Monica Real Estate Holdings, LP[18]		18	198-112-04-00	Unassigned

[14] Full amount is water credit to BPA conversion.
[15] Each of the three ranches owned by JM Roadrunner, LLC, with John McGrory as its principal, are interconnected, with water produced from some ranches used to serve other ranches. The only currently producing wells are located on APN 140-130-28 of the Road Runner I ranch.
[16] Full amount is water credit to BPA conversion.
[17] Full amount is water credit to BPA conversion.
[18] Full amount is water credit to BPA conversion.

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
Doug & Patricia Munson[19]		1	Unassigned	Unassigned
Ronald Pecoff		114	141-030-14	010S006E29N002S 010S006E29N001S
The Roadrunner Club at Borrego, LP[20]	Roadrunner Golf and Country Club	520	141-210-64-00	WM ID 1245946
RTA Borrego, LLC[21]		12	Unassigned	Unassigned
Jose G. & Maria E. Sanchez		4	199-130-03	Unassigned
Seley Ranches, L.P.		2,226	140-070-14 140-070-16 140-090-04	010S006E09G001S 010S006E09Q001S 010S006E09J002S
Shenandoah Growers, Inc.		61	141-160-47	DEH2006-LWELL-17726
Max Siefker[22]		2	Unassigned	Unassigned
Brian Siefker, trustee of the Brian Siefker Trust 12-18-01[23]		3	141-271-07-00	Unassigned
Kent R. Smith, trustee of the Smith Kent R. Revocable Living Trust 01-04-90[24]		32	141-080-05-00 200-312-06-00	Unassigned
The Springs RV and Golf Resort, LP	The Springs at Borrego RV Resort and Golf Club	287	141-210-62-00 141-210-65-00	WM ID 1245948
T2 Borrego LLC		965	140-010-10 140-070-02	010S006E05F001S 010S006E08B001S
T2 Borrego LLC[25]	Ram's Hill Golf Club	2,518	200-120-20 200-160-26 200-160-27 200-160-28 200-273-03	011S006E24Q002S 011S006E25A001S 011S006E25C002S 011S006E25C001S 011S006E26H001S

[19]Full amount is water credit to BPA conversion.
[20] Includes water credit to BPA conversion of 171 AF of BPA.
[21]Full amount is water credit to BPA conversion.
[22]Full amount is water credit to BPA conversion.
[23] Full amount is water credit to BPA conversion.
[24] Full amount is water credit to BPA conversion.
[25] Includes water credit to BPA conversion of 1,523 AF of BPA.

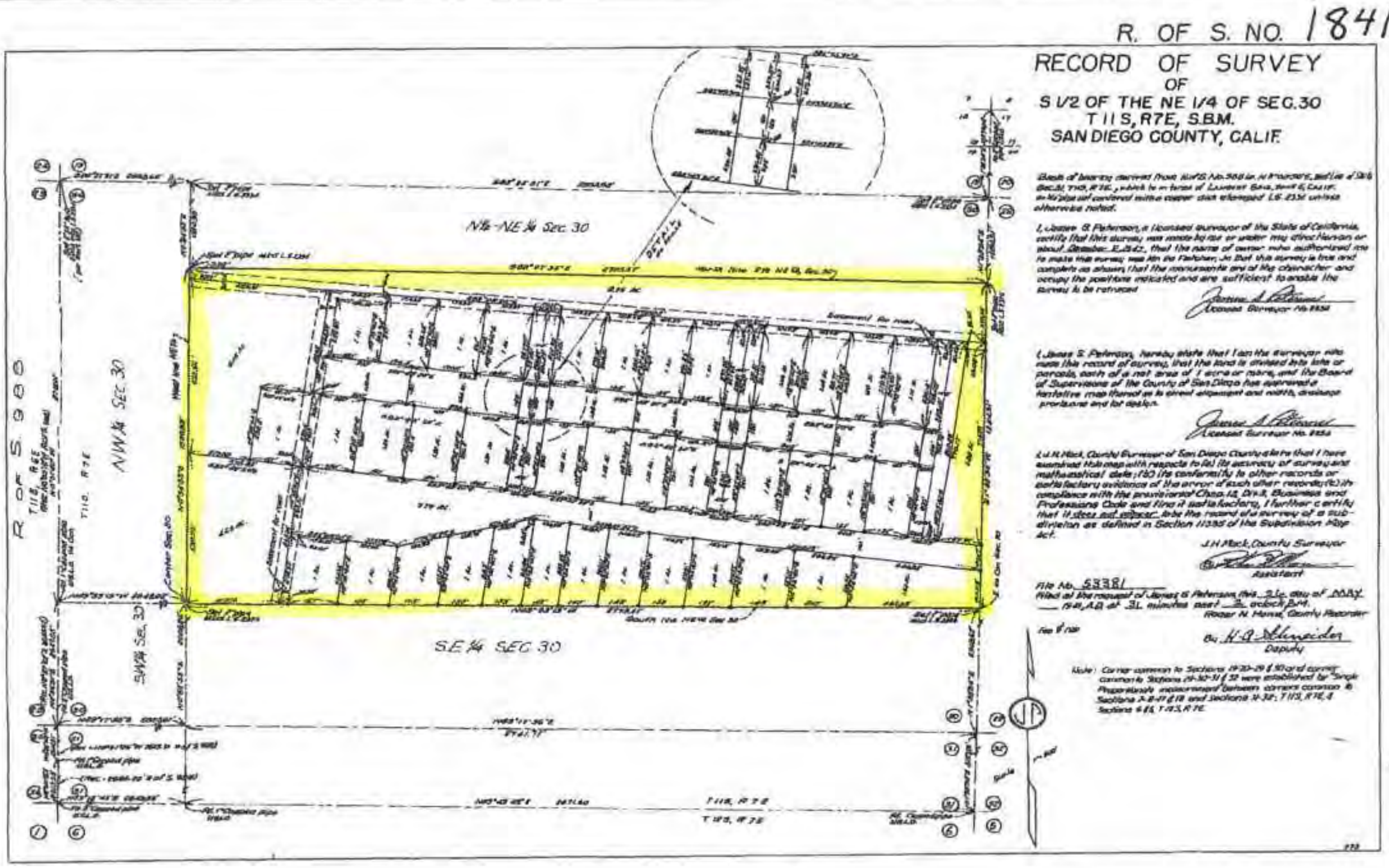
Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
			200-273-08	011S006E26B001S
			200-120-29	
			200-120-30	
			200-120-31	
			200-120-39	
			200-120-41	
			200-120-48	
			200-120-51	
			200-120-52	
			200-120-53	
			200-140-12	
			200-160-30	
			200-210-21	
			200-210-22	
			200-271-03	
			200-271-04	
			200-271-06	
			200-271-07	
			200-271-15	
			200-271-16	
			200-271-21	
			200-271-22	
			200-271-23	
			200-271-24	
			200-271-29	
			200-271-32	
			200-271-35	
			200-271-36	
			200-271-37	
			200-271-38	
			200-272-08	
			200-273-02	
			200-273-04	
			200-273-05	
			200-273-06	
			200-273-07	
			200-274-02	
			200-275-08	
			200-275-09	
			200-275-10	
			200-275-11	
			200-311-12	
			200-311-13	

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
			200-311-14 200-311-15 200-311-16 200-311-17 200-311-18 200-340-49 200-340-50 200-340-51 200-340-91 200-340-92 200-340-93 200-340-94 200-340-95 200-350-01 200-350-24 200-360-17 200-360-18 200-370-37 200-370-38 200-380-29 200-400-02 200-400-03 200-400-04 200-400-05 200-400-06 200-400-07 200-400-08 200-400-09 200-400-10 200-401-07 201-240-01	
T2 Farms LLC		485	140-070-31	010S006E09C001S (DEH1990-LWELL-6865)
Bagdasarian Farms, LLC[26]		1,142	140-070-15 140-070-20 140-070-28	DEH1990-LWELL-3907 DEH1981-LWELL-10728[27] DEH2011-LWELL-21069
Joel Vanasdlen		36	199-160-04 199-160-40	Unassigned
Michael C. Ward		82	141-030-28	DEH1991-LWELL-10402

[26] Successor-in-interest to Trojan Citrus, LLC.
[27] Currently inactive.

Owner(s)	Common Property Name	BPA[1] Acre Feet	APN(s)[2]	Well Number(s)[2]
Wisdom Gabriel B&Weis-Wisdom Diana Family 2008 Trust 08-01-08[28]		1	198-251-07-00 198-251-08-00	Unassigned
William D. Wright and Edna J. Wright, co-trustees of the Wright Family Living Trust 06-19-89		158	141-21-067	010S006E33C002S
TOTAL BPA		**24,293**		

[28] Full amount is water credit to BPA conversion.


R. OF S. NO. 1841
RECORD OF SURVEY
OF
S 1/2 OF THE NE 1/4 OF SEC.30
T 11 S, R7E, S.B.M.
SAN DIEGO COUNTY, CALIF.
N½ NE¼ Sec. 30
NW¼ Sec. 30
SE¼ SEC 30
SW¼ Sec. 30
R OF S 988
J.H. Mack, County Surveyor
Assistant
File No. 53381
Deputy

EXHIBIT

5

EXHIBIT 5

RULES AND REGULATIONS

OF THE

BORREGO SPRINGS WATERMASTER

(Updated February 23, 2021)

TABLE OF CONTENTS

Page

ARTICLE I

GENERAL PROVISIONS

1.1 Title. This document will be known as the Borrego Springs Watermaster Rules and Regulations or Rules and Regulations. This document was adopted as part of and pursuant to the Judgment.

1.2 Amendment. The Rules and Regulations may be amended only by a Supermajority Vote of the Watermaster Board. All amendments shall be consistent with the Judgment and are subject to approval by the Court at the request of the Watermaster or upon the request of any Party after consideration of the objections of any Party.

1.3 Definitions. The definitions below are set forth for convenience of reference and are intended to be consistent with those set forth in the Judgment (to the extent there is overlap of terms). In the case of any inconsistences, the definitions in the Judgment prevail over those described below. Any capitalized term used in these Rules and Regulations not defined herein, but defined in the Judgment, will have the meaning ascribed to such term in the Judgment.

1.3.1 Annual Allocation. The maximum amount of Pumping allowed for a Party to the Judgment in a given Water Year (excepting any Pumping of Carryover or imported water if available), which for any particular Water Year will be determined by multiplying the Party's BPA by the Pumping Percentage in effect for that Water Year. Annual Allocation will be rounded to the nearest whole acre-foot.

1.3.2 Annual Report. An annual report of Basin management and Watermaster activities filed with this Court

1.3.3 Basin. Borrego Springs Subbasin of the Borrego Valley Groundwater Basin, as defined by California Department of Water Resources (DWR) Bulletin No. 118, Subbasin No. 7.024.01.

1.3.4 BPA. The maximum allowed Pumping quantity allocated to a Party to the Judgment

1.3.5 Brown Act. The Ralph M. Brown Act, California Government Code sections 54950, et seq., as may be amended from time to time.

1.3.6 Carryover. Any portion of a Party's Annual Allocation not Pumped in the Water Year in which it is allowed, which may be accrued and produced in future Water Years

1.3.7 County. San Diego County government.

1.3.8 Groundwater Dependent Ecosystem (GDE). Ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface (California Code of Regulations, tit. 23, § 351(m)).

1.3.9 Groundwater Management Plan (GMP). The plan, attached as Exhibit 1 to the Judgment, which together with the Judgment is intended to implement the Physical Solution for the Basin, satisfy the substantive objectives of SGMA, and serve as an alternative to a groundwater sustainability plan under SGMA following approval by DWR, as authorized by Water Code sections 10733.6 and 10737.4.

1.3.10 Judgment. The Judgment entered by the Court on [date] in the action [case].

1.3.11 Lease. A transfer of Annual Allocation or Carryover for one Water Year (a single year Lease) or for several water years (a multi-year Lease), as will be set forth in the Lease agreement.

1.3.12 Management Areas. The North, Central and South areas of the Basin, as described in the GMP.

1.3.13 Overproduction. Pumping by a Party in any particular Water Year in excess of the sum of the Party's Annual Allocation and any leased Annual Allocation for that Water Year plus any accrued Carryover.

1.3.14 Overproduction Penalty Assessment. A penalty fee for Overproduction.

1.3.15 Party (Parties). Any Person(s) that has (have) been named and served or otherwise properly joined, or has (have) become subject to this Judgment of this Court and all their respective heirs, successors-in-interest and assigns.

1.3.16 Pumping Percentage. The percent of a Party's BPA that is authorized to be Pumped in any particular Water Year.

1.3.17 Rules and Regulations or Borrego Springs Watermaster Rules and Regulations. This document, as amended and supplemented.

1.3.18 SGMA. The Sustainable Groundwater Management Act set forth at California Water Code section 10720, et seq.

1.3.19 Sustainable Yield (Safe Yield). The maximum quantity of water, calculated over a base period representative of long-term conditions in the Basin that can be withdrawn annually from a groundwater supply without causing an Undesirable Result.

1.3.20 TAC. Technical Advisory Committee.

1.3.21 Undesirable Results. As defined in Water Code section 10721(x).

1.3.22 Water Year. October 1st to September 30th, consistent with Water Code section 10721(aa).

1.4 Construction. Unless the context clearly requires otherwise:

1.4.1 The plural and singular forms include the other;

1.4.2 "Shall," "will," and "must" are each mandatory;

1.4.3 "May" is permissive;

1.4.4 "Or" is not exclusive; and

1.4.5 "Includes" and "including" are not limiting.

1.4.6 The masculine gender shall include the feminine and neutral genders and vice versa.

1.4.7 Reference to any agreement, document, instrument, or report means such agreement, document, instrument or report as amended or modified and in effect from time to time in accordance with the terms thereof.

1.4.8 These Rules and Regulations shall be construed consistent with the Judgment. In the event of a conflict between these Rules and Regulations and the Judgment, the Judgment shall prevail.

ARTICLE II

WATERMASTER ADMINISTRATION

2.1 Composition. Pursuant to Section IV.A of the Judgment, the Court has appointed a Watermaster to administer the provisions of the Judgment, including the GMP and any subsequent instructions or orders of this Court thereunder.[1]

2.2 Terms. Once appointed in the manner set forth in the Judgment, Watermaster Board members shall continue as board members indefinitely until they resign, are replaced by their respective appointing entity(s), vacate their seat or are removed by the Court for cause.

2.3 Organization of Watermaster. At its first meeting each year, the Watermaster Board will elect a chairperson and a vice chairperson from its membership. The Watermaster Board may also appoint a secretary and a treasurer either from its membership or non-voting staff members to the Watermaster Board.

2.4 Watermaster Staff. The Watermaster may hire staff consistent with the procedures and requirements of the Judgment. The Watermaster Board may delegate specified powers to any officer or employee of the Watermaster, subject to policies and standards established by the Watermaster Board.

2.5 Compensation. The entities and/or Parties appointing individuals to the Watermaster Board will be responsible for payment of compensation, if any, and reimbursement of expenses of their respective Watermaster Board representative.

[1] To the extent not inconsistent with law or the terms of the Judgment, these Rules and Regulations shall be applicable to any Interim Watermaster approved by the Court or otherwise operated by the Parties following agreement to implement the provisions of the Judgment by a substantial majority of the Parties before the Court's entry of the Judgment.

2.6 Powers and Duties of the Watermaster.

2.6.1 Standard of Performance. The Watermaster shall carry out its duties, powers, and responsibilities in an impartial manner without favor or prejudice to any Management Area, Party, or purpose of use. In carrying out its charge, the Watermaster shall as required segregate and separately exercise in all respects the Watermaster powers delegated by the Court under the Judgment. In exercising its powers and fulfilling its duties, the Watermaster shall rely on and use the best available science, records, and data to implement the Judgment and these Rules and Regulations, consistent with the provisions of Section IV.E(9) of the Judgment.

2.6.2 Selection of Watermaster Technical Consultant. The Watermaster shall select the Watermaster Technical Consultant with the advice of the Technical Advisory Committee. The Watermaster Technical Consultant may exercise any duty or authority vested in the Watermaster as authorized by the Watermaster Board and permitted by the Judgment and applicable law. The Watermaster Technical Consultant may be an independent engineering firm or qualified individual experienced in groundwater hydrology to make recommendations to the Watermaster. The Watermaster Technical Consultant shall serve at the pleasure of the Watermaster Board and may be removed and replaced, subject to 30 days' advance written notice to the Parties and the approval of the Court if such Court approval is requested by any Party. Provided, however, that the Watermaster Technical Consultant may be removed immediately by unanimous vote of the Watermaster Board. The Watermaster Technical Consultant may also serve as Executive Director of the Watermaster.

2.6.3 Environmental Working Group (EWG). An EWG shall be established to advise the Watermaster on GDE and any other matters approved by the Watermaster Board.

2.6.4 Accounting. The Watermaster shall provide for the levy, billing, and collection of all assessments provided for under the Judgment, for the payment of costs and expenses of the Watermaster, and for the performance of such accounting and related functions as may be required in connection with those functions. All funds received, held, and disbursed by the Watermaster shall be by way of separate Watermaster accounts, subject to separate accounting and auditing.

2.6.5 Investment of Funds. The Watermaster may hold and invest all Watermaster funds in investments authorized from time to time for public agencies of the State of California, taking into account the need to increase the earning power of such funds and to safeguard the integrity thereof.

2.6.6 Borrowing. The Watermaster may borrow in anticipation of receipt of proceeds from any assessments authorized in the Judgment in an amount not to exceed the amount of assessments for one year following the procedures described in the Judgment.

2.6.7 Liability Insurance. The Watermaster shall be authorized to obtain and maintain such insurance policies as the Watermaster Board deems appropriate.

2.6.8 Powers/Contracts. The Watermaster may exercise any of the powers described in the Judgment, and may enter into contracts and agreements for the performance of any of such powers on its behalf, provided that Watermaster maintains full oversight of the exercise of such powers.

2.6.9 Record of Transfers. On an annual basis, the Watermaster shall prepare and maintain a report or record of any transfer of BPA among Parties, and update as needed Exhibit 4 to the Judgment. The Watermaster shall file, on an annual basis, an updated Exhibit 4 to the Judgment with the Court, or a statement that no transfer of BPA has occurred in the prior Water Year. Upon reasonable request, the Watermaster shall make such report or record available for inspection by any Party, subject to any order of the Court related to the privacy of information or otherwise.

2.6.10 Enforcement Authority. The Watermaster shall enforce the terms of the Judgment and Groundwater Management Plan as described in the Judgment, and in doing so, may exercise the enforcement authority granted to a groundwater sustainability agency under Water Code section 10732 in addition to any other authority authorized by the Judgment or subsequent order of the Court.

2.6.11 Unauthorized Actions. The Watermaster shall bring such action or motion as is necessary to enjoin any conduct prohibited by the Judgment or Groundwater Management Plan following the procedures described in the Judgment.

2.6.12 Notice List. At all times, the Watermaster shall maintain a current list of Parties to whom notices are to be sent and their addresses for purpose of service.

(a) The Watermaster shall also maintain a current list of such names and addresses of all Parties or their successors, as filed herein.

(b) The Watermaster shall make copies of such lists available to any requesting Party.

(c) Each Party shall designate a name, mailing address and email address to be used for purposes of all notices and service herein, either by its endorsement on the Judgment or by a separate designation to be filed within thirty (30) days after Judgment has been entered.

(d) If no designation is made, a Party's designee shall be deemed to be, in order of priority:

(i) The Party itself at the address on the Watermaster list; or

(ii) The Party's attorney of record.

(e) A Party may change its designation by submitting a written notice of such change to the Watermaster.

(f) A Party that desires to be relieved of receiving notices of Watermaster activity may submit a waiver of notice in a form to be provided by the Watermaster.

2.6.13 Service. Service of notices, determinations, requests, demands, objections, reports, and other papers pursuant to the Judgment, the Groundwater Management Plan and these Rules and Regulations is the responsibility of the Watermaster. The Watermaster will annually establish the service costs. Unless otherwise ordered by the Court, delivery to or service of any Party by the Watermaster, the Court, or any Party of any document required to be served upon or delivered to a Party pursuant to the Groundwater Management Plan or these Rules and Regulations shall be deemed made if made by electronic-filing on a website to be maintained by the Watermaster, with email correspondence to all Parties that have provided Watermaster with an email address pursuant to Section 2.6.12.

Delivery to or service upon any Party by the Watermaster, by any other Party, or by the Court, of any item required to be served upon or delivered to a Party under or pursuant to the Groundwater Management Plan or these Rules and Regulations may also be made by one of the following methods:

(a) First class mail, postage prepaid, addressed to the latest designee of the Party to be served and at the address on the latest designation field by the Party. If the item required to be served is available online, mail service is deemed complete upon mailing of the notice of the exact website location where the item may be viewed.

(b) Electronic Mail addressed to the latest designee of the Party to be served at the email address identified on the latest designation filed by the Party pursuant to Section 2.6.12.

2.6.14 Defense of Judgment. The Watermaster shall reasonably defend the Judgment, the GMP, these Rules and Regulations, and any decision of the Watermaster made pursuant to these Rules and Regulations against challenges brought by any person. Costs incurred by the Watermaster in defending such actions shall be considered a Watermaster general administrative expense.

2.7.16 Grant Funding. The Watermaster shall use best efforts to apply for available grant funding to further sustainable management of the Basin and offset its costs.

2.7 Administration.

2.7.1 Offices. The principal office of the Watermaster shall be located at the Executive Director's office. The Watermaster may establish a local office in Borrego Springs at such location or locations as may be designated from time to time by the Watermaster.

2.7.2 Records. The Watermaster's records shall be maintained at its principal office.

(a) Subject to protection of information not subject to disclosure by order of the Court, the Watermaster's records can be reviewed during regular business hours. If copies are requested, they may be obtained by paying for the cost of duplication.

(b) If records are requested in electronic format, the person requesting the records will be responsible for the cost of a consultant to prepare the documents plus the cost of any storage device necessary to provide electronic records.

(c) The Watermaster shall maintain a website.

(d) Subject to protection of information not subject to disclosure by order of the Court, the Watermaster shall publish those records and other matters that it deems to be of interest to the Parties, the general public, or the Court on its website.

2.8 Watermaster Meetings and Notice. The Watermaster shall hold meetings and provide notice of such meetings as provided for in the Judgment and these Rules and Regulations. Unless contrary to the provisions of the Judgment or the body of these Rules and Regulations, the Watermaster Board agrees to use best efforts to conduct its proceedings in conformance with the Governance Charter attached hereto as Exhibit A.

2.8.1 Regular Meetings. The Watermaster Board will conduct regular meetings at least quarterly at such location in Borrego Springs designated by the Watermaster Board and at such time(s) as specified in the necessary notice(s) thereof. The Watermaster shall provide electronic notice of any changes in the time or place of scheduled or regular meetings to all persons that request such notice.

2.8.2 Special Meetings. Special meetings may be called at any time by delivering notice thereof at least twenty-four (24) hours before the time of such meeting. The Watermaster Board shall ensure all special meetings are conducted in substantial accordance with the applicable provisions of the Brown Act.

2.8.3 Adjournment. Any Watermaster Board meeting may be adjourned to a time and place that is specified in the order of adjournment. A copy of the order or notice of adjournment shall be conspicuously posted on or near the door of the place where the meeting was held or to be held, within twenty-four hours after the adoption of the order of adjournment.

2.8.4 Minutes; Statement of Proceedings. The secretary of the Watermaster Board (or designee) shall cause the preparation and subscription of the minutes of each Watermaster Board meeting and make available a copy thereof to all Parties and each person who has filed a request for copies of all minutes or notices in writing. The minutes shall contain a full and complete record of the proceedings of the Watermaster Board at each meeting, including the entry in full of all resolutions and of all decisions. The minutes shall constitute notice of all actions therein reported. Unless a reading of the minutes is ordered by a majority of the members of the Watermaster Board, minutes may be approved without reading. The Watermaster shall publish a copy of its minutes on the Watermaster's website.

2.8.5 Closed Sessions. The Watermaster Board may hold closed sessions when authorized by and in compliance with the Brown Act.

2.9 Voting Procedures.

2.9.1 Each member of the Watermaster Board shall have one (1) vote. No proxy or absentee voting is permitted.

2.9.2 All Watermaster decisions shall be by quorum, subject to any Supermajority Vote requirement, as described in the Judgment. A quorum is three members of the Watermaster Board.

2.10 Court Removal of Watermaster Board Members. Notwithstanding any other provisions of these Rules and Regulations, the Court retains and reserves full jurisdiction, power, and authority to remove any Watermaster, or member of the Watermaster Board, for good cause and substitute a new Watermaster or board member in place, upon its own motion or upon motion of any Party in accordance with the notice and hearing procedures set forth in the Judgment. The Court shall find good cause for the removal of a member of the Watermaster upon a showing that the Watermaster member(s) at issue has:

2.10.1 Failed to exercise its powers or perform its duties; or

2.10.2 Otherwise failed to act in the manner consistent with the provisions set forth in the Judgment or subsequent order(s) of the Court.

ARTICLE III

WATERMASTER TECHNICAL ADVISORY COMMITTEE

3.1 Authorization; Composition. Pursuant to the Judgment, a committee of representatives shall be organized to act as a Technical Advisory Committee (TAC).

3.2 Compensation and Expenses. The TAC members shall serve without compensation or reimbursement of expenses by Watermaster.

3.3 Powers and Functions. The TAC shall have the powers and duties described in the Judgment.

3.4 Advisory Committee's Rules and Regulations. Subject to section 3.5, procedures regarding organization, meetings, and other activities of the TAC shall be at the discretion of the TAC, with oversight by the Watermaster.

3.5 TAC Duties. The TAC shall:

3.5.1 Meet on a regular basis as described in the Judgment;

3.5.2 Review Watermaster's activities within the subject matter expertise described in the Judgment on at least a semi-annual basis; and

3.5.3 Make recommendations based on best science and data collected, consistent with the provisions of the Judgment, regarding the matters described in the Judgment and other matters as directed by the Watermaster.

ARTICLE IV

WATERMASTER TECHNICAL CONSULTANT

4.1 Selection. The Watermaster Board shall select the Watermaster Technical Consultant, who may also serve as the Watermaster Executive Director, with the advice of the TAC through the process described in the Judgment.

4.2 Duties.

4.2.1 Performance of Duties. In exercising its powers and fulfilling its duties, the Watermaster Technical Consultant shall rely on and use the best available science, records, and data to support the implementation of the Judgment and these Rules and Regulations.

4.2.2 Monitoring Sustainable Yield. The Watermaster Technical Consultant shall monitor production and related data and conduct Borrego Valley Hydrologic Model (BVHM) model runs as required by the Judgment, and include them in the Annual Report.

4.2.3 Reduction in Groundwater Pumping. The Watermaster Technical Consultant shall ensure that any required reductions of groundwater pumping take place pursuant to the terms of the Judgment and any orders by the Court.

4.2.4 Measuring Devices, Etc. The Watermaster Technical Consultant shall propose, and the Watermaster Board shall adopt and maintain, rules and regulations regarding metering and data collection consistent with the provisions of the Judgment.

4.2.5 Hydrologic Data Collection. The Watermaster Technical Consultant shall:

(a) Operate, and maintain wells, measuring devices, and/or meters necessary to monitor stream flow, precipitation, groundwater levels, and Management Areas as directed by the Judgment and the Watermaster and in compliance with the terms of any Entry Agreement required by the Judgment or by order of the Court, and cooperate with those who own and operate other wells and measuring devices to obtain the necessary data; provided, that the Watermaster Technical Consultant need not conduct such activities to the extent such data is reasonably available through other means, including but not limited to through meters installed on private wells that report data to Watermaster telemetrically; and

(b) Obtain such other data as may be necessary to carry out the Judgment and GMP, in compliance with the terms of the Judgment.

4.2.6 Pumping Reports. The Watermaster Technical Consultant shall require each Party to file an annual pumping report with the Watermaster. Pumpers shall prepare the pumping reports in a form prescribed by the Watermaster consistent with the provisions of the Judgment. Such pumping reports shall be prepared in accordance with any relevant orders of the Court.

4.2.7 Data, Estimates and Procedures. The Watermaster Technical Consultant shall rely on and use the best available science, records, and data to support the implementation of the Judgment, including BVHM model runs. Where actual records of data are not available, the Watermaster Technical Consultant shall rely on and use sound scientific and engineering estimates. The Watermaster Technical Consultant may use preliminary records of measurements and, if revisions are subsequently made, may reflect such revisions in subsequent accounting.

4.2.8 Annual Report Procedure. The Watermaster Technical Consultant shall prepare an Annual Report containing the information set forth in Section IV.E(5)(b) of the Judgment for filing with the Court not later than April 1 of each Year, beginning April 1, 2021. Prior to filing the Annual Report with the Court, the Watermaster shall notify all Parties that a draft of the Annual Report is available for review by the Parties. The Watermaster shall provide notice to all Parties of a public hearing to receive comments and recommendations for changes in the Annual Report. At the hearing, the Watermaster will receive comments and recommendations for changes in the report. The notice of public hearing may include such summary of the draft Annual Report as the Watermaster may deem appropriate. The Watermaster shall distribute the Annual Report to any persons requesting copies and providing an email address for receipt of such Annual Report.

4.2.9 Five Year Reports. Per Water Code, section 10733.8, the Watermaster Technical Consultant shall prepare and present to the Watermaster Board for approval any five-year updates to the Groundwater Management Plan required by SGMA/DWR consistent with the terms of the Judgment.

4.2.10 Additional Technical Duties and Undertakings. The Watermaster Technical Consultant shall perform such additional technical duties and undertakings as assigned by Watermaster following input and recommendations from the tac prior to such assignment.

ARTICLE V

MONITORING

5.1 Monitoring. By March 31, 2020, all Parties shall install approved meters on their wells for monitoring pumping and submit proof thereof to the Watermaster. The Watermaster or its designee shall provide forms to submit proof of meter installation. Each Party shall bear the cost of installing and maintaining meter(s) on each of its wells.

5.2 Meters. Approved meters are required, such as the SWIIM meter system that can electronically transmit water pumping and other data to the Watermaster in real time on a schedule as determined by the Watermaster, and include calibration by a qualified professional that the well owner will submit annually to the Watermaster. Upon installation and annually thereafter, each pumper shall arrange for the manufacturer or qualified installer of such meters to provide written verification to the Watermaster of the ongoing accuracy of the meter readings and meter calibration, as well as verification that there are no valves or other devices upstream of the meter that could lead to pumped water being diverted before being read by the meter. The meter shall be accessible and installed according to good design practices. The Watermaster or its designee shall assist any Party having any question as to installation requirements.

5.3 Interim Meter Tests. Should a Party discover that the meter which measures the water pumping from any of the Party's wells is measuring inaccurately, the Party must immediately notify the Watermaster of the problem, and have the meter repaired within thirty

(30) calendar days after discovery of the problem. Upon completion of such repair, the repaired meter shall be tested and sealed by any meter tester authorized by the Watermaster, as provided in these Rules and Regulations. Results of such meter tests shall be furnished to the Watermaster within ten (10) business days after testing.

5.4 Estimation of Pumping Due to Meter Maintenance. When pumping must be estimated due to lack of accurate meter measurements for any reason, the Watermaster or the Watermaster Technical Consultant must approve the method of estimation. A copy of the estimate calculations shall be supplied to the Watermaster.

5.5 Pumping Reports. The pumping reports described in Rule 4.2.6 shall be submitted to the Watermaster no later than December 15 of each Year.

ARTICLE VI

ASSESSMENTS

6.1 Assessments. The Watermaster's administrative budget shall be funded through the procedure described in the Judgment.

6.2 Delinquent Assessment Payments. Any assessment which becomes delinquent shall bear interest at the rate described in Water Code section 10730.6(b). This interest rate shall apply to any said delinquent assessment from the due date thereof until paid.

6.3 Levy. Unpaid Pumping Assessments and Overproduction Penalty Assessments will be recoverable as a lien against the parcel to which BPA is assigned and may be foreclosed in the manner provided by law. In addition, unpaid Pumping Assessments and Overproduction Penalty Assessments may be collected on the County property tax rolls, as allowed by law for public water agencies. The delinquent assessment, together with interest thereon, costs of suit, attorneys' fees and reasonable costs of collection, including obtaining a lien on the property, may also be collected pursuant to:

(a) Motion by the Watermaster giving notice to the delinquent Party only;

(b) Order to show cause proceeding, or

(c) Such other lawful proceeding as may be instituted by the Watermaster or the Court.

6.4 Delinquent Assessment List. The Watermaster shall annually certify a list of all such unpaid delinquent assessments.

6.5 Assessment Accounting. The Watermaster shall account for receipt of all collections of assessments collected pursuant to the Judgment.

6.6 Payment of Assessments Pending Review. Payment of assessments levied by the Watermaster hereunder shall be made pursuant to the time schedule set forth in Sections IV.E(3) and V of the Judgment.

6.7 Assessment Adjustments. The Watermaster shall make assessment adjustments in whole or in part for assessments to any Party as a result of erroneous pumping reports or otherwise as necessary for the reporting period as either a credit or debit in the next occurring assessment invoice unless otherwise decided by the Watermaster. Assessment adjustments may be necessary due to overstated pumping, understated pumping, or errors in the assessment invoice discovered after the assessments have been approved.

EXHIBIT A: GOVERNANCE CHARTER

To achieve the mission of the Watermaster, Board members agree to the following goals for working together and membership on the Board:

- Commit to finding solutions for the common good to reduce critical overdraft in the Basin;
- Commit to the SGMA deadline of 2040 for reaching Sustainable Yield;
- Commit to working openly, honestly, and collaboratively with other Board members;
- Understand that different stakeholder interests must be considered to adequately evaluate all reasonable scenarios for resolving the overdraft; and
- Board members shall be principals or affiliates, not hired representatives of specific interests.

Section A – Unless otherwise directed by a Consensus of the Watermaster Board, Robert's Rules of Order govern the operation of the Board in all cases not covered by this Governance Charter, though the Board may formulate specific procedural rules of order to govern the conduct of its meetings.

Section B – Meetings shall be held under the following discussion goals:

- Focus on the future as much as possible.
- All perspectives are valued. You are not required to defend your perspective, but you are asked to share it and to provide supporting rationale.
- All ideas have value. If you believe another approach is better, offer it as a constructive alternative.
- Everyone will have an equal opportunity to participate.
- Everyone will be encouraged to talk.
- One person speaks at a time.
- No side conversations.
- View disagreements as problems to be solved rather than battles to be won.
- Avoid ascribing motives to or judging the actions of others. Please speak about your experiences, concerns, and suggestions. Treat each other with respect.
- Avoid right-wrong paradigms.
- When communicating outside of a Watermaster Board meeting, Members are asked to speak only for themselves when asked about Watermaster activities unless there has been an official decision made by Watermaster consistent with the terms of the Judgment and these Rules and Regulations.

Section C – No vote of the Board shall be considered as reflecting an official decision of the Watermaster unless a vote was taken at a meeting conducted in compliance with the Judgment.

EXHIBIT

6

EXHIBIT 6

EXHIBIT 6.1

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

(Space Above for Recorder's Use)

DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS (WATER ALLOCATION RESULTING FROM CONVEYANCE OF BPA PARCEL AND GRANTOR'S RESERVATION OF ALL OR A PORTION OF BPA FOR USE ON OTHER LAND)

This DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS (WATER ALLOCATION) ("***Restrictive Covenant***") is made this ___ day of _______, 20__, by *[Name of Declarant - Use Complete Name as Specified in Judgment]* ("***Declarant***").

RECITALS

WHEREAS, Declarant is the sole owner in fee simple of certain real property legally described on Exhibit "A" and depicted on Exhibit "B" attached hereto and incorporated herein by this reference (the "***Restricted Property***"), which consists of approximately _____ acres in the County of San Diego, State of California.

WHEREAS, Declarant is a party to that certain judgment comprehensively adjudicating all rights to extract water from, or store water within, the Borrego Springs Subbasin entered in Borrego Water District vs. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01 San Diego County Superior Court Case No. 37-2020-00005776 recorded as Document No. __________ in the Official Records of the Office of the County Recorder, County of San Diego ("***Official Records***") ("***Judgment***").

WHEREAS, pursuant to the Judgment, Declarant owns a Baseline Production Allocation, as defined in the Judgment, of ____ acre-feet ("***Declarant's Existing BPA***") for use on the Restricted Property.

WHEREAS, following recordation of this Restrictive Covenant, Declarant intends to convey fee title to the Restricted Property to *[Name of Grantee - Use Complete Name as Specified in Judgment and/or on Deed]* ("***Grantee***") subject to the covenants, conditions and restrictions described below and set forth in the deed to be recorded for conveyance of the Restricted Property to Grantee.

WHEREAS, upon recordation of the deed conveying fee title to the Restricted Property to Grantee and notice to the Watermaster pursuant to the Judgment, *[all] [__ acre-feet]* of Declarant's Existing BPA ("***Declarant's Retained BPA***") shall be severed from the Restricted Property and ownership of the Declarant's Retained BPA shall remain in the name of Declarant and be assigned to the Benefited Property (defined below) overlying the Borrego Springs Subbasin, as described below.

WHEREAS, Declarant is recording this Restrictive Covenant against the Restricted Property to restrict pumping of groundwater from the Restricted Property consistent with the terms of the Judgment and as set forth in this Restrictive Covenant.

RESTRICTIONS

NOW THEREFORE, in consideration of the above recitals which are incorporated herein by this reference, Declarant hereby covenants, agrees and declares that the Restricted Property shall be held, transferred, conveyed, leased, occupied, used or otherwise disposed subject to the following covenants, conditions and restrictions, which shall run with the Restricted Property or any portions into which it may be divided, and shall be binding upon and burden the Restricted Property, successor owners, administrators, assigns, lessees and other occupiers and users of the Restricted Property, or any portion thereof, and all parties having or acquiring any right, title or interest in the Restricted Property, or any portion thereof, and their successors and assigns, and shall inure to the benefit of the Declarant, its successors and assigns, and the Benefited Property. The following covenants, conditions and restrictions are imposed upon the Restricted Property and every part thereof as a servitude in favor of Declarant and the Benefited Property and every portion thereof as the dominant tenement or tenements. Grantee, and all parties having or acquiring any right, title or interest in the Restricted Property, or any portion thereof, and their successors and assigns, by accepting title to the Restricted Property shall be deemed to acknowledge and agree to all of the covenants, conditions and restrictions as set forth in this Restrictive Covenant.

1. Upon recordation of the deed conveying fee title to the Restricted Property to Grantee and notice to the Watermaster pursuant to the Judgment:

   A. Declarant's Existing BPA that is <u>not</u> retained by Declarant and is thus conveyed with the Restricted Property to Grantee for the benefit of the Restricted Property is ___ acre-feet ("**Grantee's BPA**"). "Pumping" of "Groundwater", as defined in the Judgment, from the Restricted Property is limited to the Grantee's BPA, except for Pumping as a "De Minimis Pumper", as defined in the Judgment. Except for Pumping of Groundwater as a De Minimis Pumper, any Pumping of Groundwater from the Restricted Property in excess of the Grantee's BPA is prohibited unless an allocation of Groundwater is subsequently acquired for the benefit of the Restricted Property by way of lease or permanent transfer of Groundwater allocation approved in accordance with the terms of the Judgment. Except as specifically allowed in this Section 1(A), or under a duly approved lease or permanent transfer of water allocation approved in accordance with the Judgment, the following uses are expressly prohibited on the Restricted

Property:

(i) pumping, producing, extracting and/or using Groundwater located in or under the Restricted Property or any portion thereof in excess of the Grantee's BPA, or

(ii) installing, maintaining, using, repairing, relocating or replacing any production well(s) in or on the Restricted Property except for the purpose of Pumping as a De Minimis Pumper, Pumping the Grantee's BPA or Pumping Groundwater allocation acquired for the benefit of the Restricted Property by way of lease or permanent transfer in accordance with the terms of the Judgment.

B. Declarant retains ownership of the Declarant's Retained BPA assigned to the Benefited Property.

2. Upon recordation of the deed conveying fee title to the Restricted Property to Grantee and notice to the Watermaster pursuant to the Judgment, Declarant retains ownership of the Declarant's Retained BPA assigned to the Benefited Property.

3. This Restrictive Covenant is for the benefit of Declarant, and of the real property legally described on <u>Exhibit "C"</u> and depicted on <u>Exhibit "D"</u>, attached hereto and incorporated by this reference (the "***Benefited Property***"). The wells on the Benefited Property that will be used to Pump the Declarant's Retained BPA are identified as [ENTER STATE WELL NUMBERS], which wells may be replaced from time to time with notice to the Watermaster. This Restrictive Covenant may be enforced only in accordance with Section VII.A(1) of the Judgment by Declarant, by any Party to the Judgment having or acquiring any right, title or interest in the Declarant's Retained BPA or in the Benefited Property, by the Watermaster appointed under the Judgment (the "***Watermaster***"), or by the Court maintaining continuing jurisdiction over the Judgment. Declarant may assign any of its rights and powers under this Restrictive Covenant to any Party to the Judgment having or acquiring any right, title or interest in the Declarant's Retained BPA or in the Benefited Property. Upon the recordation of such assignment in the Official Records, such assignee, to the extent of such assignment, shall have the same rights and powers as are given to Declarant herein.

4. This Restrictive Covenant may not be modified, terminated or rescinded, in whole or in part, except by a written instrument duly executed and acknowledged by the Declarant, with the approval of the Watermaster, and recorded in the Official Records.

5. This Restrictive Covenant shall become effective upon its recordation in the Official Records. Within thirty (30) days of the date of recordation, Grantee shall provide written notice to the Watermaster of such recordation and the transfer of the Declarant's Retained BPA to the Benefited Property.

6. In the event any action shall be instituted in connection with this Restrictive Covenant, the party prevailing in such action shall be entitled to recover from the other parties all

of its costs and expenses incurred therein, including without limitation reasonable attorneys' fees as finally determined by a court of competent jurisdiction.

7. In the event that any portion of this Restrictive Covenant shall become illegal, null or void or against public policy, for any reason, or shall be held by any court of competent jurisdiction to be illegal, null or void or against public policy, the remaining portions of this Restrictive Covenant shall not be affected thereby and shall remain in force and effect to the full extent permissible by law.

8. This Restrictive Covenant shall be given a fair and reasonable construction in accordance with the intentions of the parties and without regard for or aid from any canons requiring construction against the party drawing this Restrictive Covenant.

9. The breach of any covenants, conditions or restrictions herein contained shall not defeat, invalidate nor impair the obligation or priority of any mortgage or deed of trust now or hereafter executed and constituting a lien upon the Restricted Property or any portion thereof, which is made in good faith and for value; provided, however, that any party, including the holder of the mortgage or deed of trust, who acquires title through private or judicial foreclosure, trustee's sale or deed in lieu of foreclosure (a "***Foreclosure-Purchaser***") and all successors and assigns of such Foreclosure-Purchaser shall take title subject to all of the covenants, conditions and restrictions contained in this Restrictive Covenant.

[Signatures on the following page]

Signature Page to
DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS
(WATER ALLOCATION RESULTING FROM CONVEYANCE OF BPA PARCEL AND GRANTOR'S RESERVATION OF ALL OR A PORTION OF BPA FOR USE ON OTHER LAND)

DECLARANT

Dated: ____________________

____

By: ______________________________

Its: ______________________________

ACKNOWLEDGED BY WATERMASTER:

Dated: ____________________ ______________________________

By: ______________________________

Its: ______________________________

A notary public or other officer completing this certificate verified only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF ____________________)

On ________________________, 2020, before me, ______________________________________ _______, Notary Public, personally appeared ____ ______________, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they/executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

____
Notary Public

Exhibit "A"
Legal Description of Restricted Property

Exhibit "B"
Plat of Restricted Property

Exhibit "C"
Legal Description of Benefited Property

Exhibit "D"
Plat of Benefited Property

EXHIBIT 6.2

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

(Space Above for Recorder's Use)

DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS (WATER ALLOCATION RESULTING FROM CONVEYANCE OF PORTION OF BPA PARCEL AND ASSIGNMENT OF BPA BETWEEN PARCELS)

This DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS (WATER ALLOCATION RESULTING FROM CONVEYANCE OF PORTION OF BPA PARCEL AND ASSIGNMENT OF BPA BETWEEN PARCELS) ("***Restrictive Covenant***") is made this ___ day of _______, 20__, by *[Name of Declarant - Use Complete Name as Specified in Judgment]* ("***Declarant***").

RECITALS

WHEREAS, Declarant is the sole owner in fee simple of certain real property legally described on Exhibit "A" and depicted on Exhibit "B" attached hereto and incorporated herein by this reference (the "***Original Property***"), which consists of approximately _____ acres in the County of San Diego, State of California.

WHEREAS, Declarant is a party to that certain judgment comprehensively adjudicating all rights to extract water from, or store water within, the Borrego Springs Subbasin entered in Borrego Water District vs. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01 San Diego County Superior Court Case No. 37-2020-00005776 recorded as Document No. __________ in the Official Records of the Office of the County Recorder, County of San Diego ("***Official Records***") ("***Judgment***").

WHEREAS, pursuant to the Judgment, Declarant owns a Baseline Production Allocation, as defined in the Judgment, of ____ acre-feet ("***Declarant's Existing BPA***") for use on the Original Property.

WHEREAS, following recordation of this Restrictive Covenant, Declarant intends to convey a portion of the fee title to the Original Property to *[Name of Grantee - Use Complete Name as Specified in Judgment and/or on Deed]* ("***Grantee***"), which portion is the real property legally described on Exhibit "C" and depicted on Exhibit "D," attached hereto and incorporated by this reference ("***Grantee's Parcel***"), subject to the covenants, conditions and restrictions described below and set forth in the deed to be recorded for conveyance of Grantee's Parcel to Grantee. Declarant intends to retain the remainder of the Original Property, which portion is the real property legally described on Exhibit "E" and depicted on Exhibit "F," attached hereto and incorporated by this reference ("***Declarant's Retained Parcel***"), subject to the covenants, conditions and restrictions described below.

WHEREAS, upon recordation of the deed conveying fee title to Grantee's Parcel to Grantee, Grantor intends that *[all] [none] [__ acre-feet]* of Declarant's Existing BPA shall benefit and be assigned to Grantee's Parcel ("***Grantee's BPA***") and *[all] [none] [__ acre-feet]* shall benefit and be assigned to Declarant's Retained Parcel ("***Declarant's Retained BPA***"). The division and assignment of Declarant's Existing BPA between Grantee's Parcel and Declarant's Retained Parcel is hereinafter referred to as the "***BPA Division.***" The BPA Division will become effective upon recording of this Restrictive Covenant on both Grantee's Parcel and Declarant's Retained Parcel and notice of the BPA Division to the Watermaster pursuant to Section 10 below.

WHEREAS, Declarant is recording this Restrictive Covenant against both Grantee's Parcel and Declarant's Retained Parcel to restrict pumping of groundwater for use on those properties consistent with the terms of the Judgment and the BPA Division as set forth in this Restrictive Covenant.

RESTRICTIONS

NOW THEREFORE, in consideration of the above recitals which are incorporated herein by this reference, Declarant hereby covenants, agrees and declares as follows:

Covenants, Conditions, and Restrictions Applicable to Grantee's Parcel

1. Grantee's Parcel shall be held, transferred, conveyed, leased, occupied, used or otherwise disposed subject to the following covenants, conditions and restrictions, which shall run with Grantee's Parcel or any portions into which it may be divided, and shall be binding upon and burden Grantee's Parcel, successor owners, administrators, assigns, lessees and other occupiers and users of Grantee's Parcel, or any portion thereof, and all parties having or acquiring any right, title or interest in Grantee's Parcel, or any portion thereof, and their successors and assigns, and shall inure to the benefit of the Declarant, Declarant's successors and assigns, and the Declarant's Retained Parcel. The following covenants, conditions and restrictions are imposed upon Grantee's Parcel and every part thereof as a servitude in favor of Declarant and Declarant's Retained Parcel and every portion thereof as the dominant tenement or tenements for purposes of Sections 1 through 4 herein. Grantee, and all parties having or acquiring any right, title or interest in Grantee's Parcel, or any portion thereof, and their successors and assigns, by accepting title to Grantee's Parcel shall be deemed to acknowledge and agree to all of the covenants, conditions and restrictions as set forth in this Restrictive Covenant.

2. Upon recordation of the deed conveying fee title to Grantee's Parcel to Grantee and notice to the Watermaster pursuant to the Judgment, "Pumping" of "Groundwater," as defined in the Judgment, from well(s) specified in Section 3 below will be limited to Grantee's BPA, except for Pumping as a "De Minimis Pumper," as defined in the Judgment. Except for Pumping of Groundwater as a De Minimis Pumper, any Pumping of Groundwater from Grantee's Parcel in excess of Grantee's BPA is prohibited unless an allocation of Groundwater is subsequently acquired for the benefit of Grantee's Parcel by way of lease or permanent transfer of Groundwater allocation approved in accordance with the terms of the Judgment. Except as specifically allowed in this Section 2, or under a duly approved lease or permanent transfer of water allocation approved in accordance with the Judgment, the following uses are expressly prohibited on Grantee's Parcel:

A. pumping, producing, extracting and/or using Groundwater located in or under Grantee's Parcel or any portion thereof in excess of Grantee's BPA, or

B. installing, maintaining, using, repairing, relocating or replacing any production well(s) in or on Grantee's Parcel except for the purpose of Pumping as a De Minimis Pumper, Pumping Grantee's BPA or Pumping Groundwater allocation acquired for Grantee's Parcel by way of lease or permanent transfer in accordance with the terms of the Judgment.

3. The wells that will be used to Pump Grantee's BPA are identified as [ENTER STATE WELL NUMBERS], which wells may be replaced from time to time with notice to the Watermaster.

4. The covenants conditions, and restrictions set forth in Sections 1 through 3 herein are for the benefit of Declarant and Declarant's Retained Parcel. This Restrictive Covenant may be enforced only in accordance with Section VII.A(1) of the Judgment by Declarant, by any Party to the Judgment having or acquiring any right, title or interest in Declarant's Retained BPA or in Declarant's Retained Parcel, by the Watermaster appointed under the Judgment (the "***Watermaster***"), or by the Court maintaining continuing jurisdiction over the Judgment. Declarant may assign any of its rights and powers under this Restrictive Covenant to any Party to the Judgment having or acquiring any right, title or interest in Declarant's Retained BPA or in Declarant's Retained Parcel. Upon the recordation of such assignment in the Official Records, such assignee, to the extent of such assignment, shall have the same rights and powers as are given to Declarant herein.

[End of Covenants, Conditions, and Restrictions Applicable to Grantee's Parcel]

__Covenants, Conditions, and Restrictions Applicable to Declarant's Retained Parcel__

5. Declarant's Retained Parcel shall be held, transferred, conveyed, leased, occupied, used or otherwise disposed subject to the following covenants, conditions and restrictions, which shall run with Declarant's Retained Parcel or any portions into which it may be divided, and shall be binding upon and burden Declarant's Retained Parcel, successor owners, administrators, assigns, lessees and other occupiers and users of Declarant's Retained Parcel, or any portion thereof, and all parties having or acquiring any right, title or interest in Declarant's Retained Parcel, or any portion thereof, and their successors and assigns, and shall inure to the benefit of Grantee, Grantee's successors and assigns, and Grantee's Parcel. The following covenants, conditions and restrictions are imposed upon Declarant's Retained Parcel and every part thereof as a servitude in favor of Grantee and Grantee's Parcel and every portion thereof as the dominant tenement or tenements for purposes of Paragraphs 5 through 8 herein. Declarant, and all parties having or acquiring any right, title or interest in Declarant's Retained Parcel, or any portion thereof, and their successors and assigns, by accepting title to Declarant's Retained Parcel shall be deemed to acknowledge and agree to all of the covenants, conditions and restrictions as set forth in this Restrictive Covenant.

6. Upon recordation of the deed conveying fee title to Grantee's Parcel to Grantee and notice to the Watermaster pursuant to the Judgment, . "Pumping" of "Groundwater," as defined in the Judgment, from Declarant's Retained Parcel is limited to Declarant's Retained BPA, except for Pumping as a "De Minimis Pumper," as defined in the Judgment. Except for Pumping of Groundwater as a De Minimis Pumper, any Pumping of Groundwater from Declarant's Retained Parcel in excess of Declarant's Retained BPA is prohibited unless an allocation of Groundwater is subsequently acquired for the benefit of Declarant's Retained Parcel by way of lease or permanent transfer of Groundwater allocation approved in accordance with the terms of the Judgment. Except as specifically allowed in this Section 6, or under a duly approved lease or permanent transfer of water allocation approved in accordance with the Judgment, the following uses are expressly prohibited on Declarant's Retained Parcel:

A. pumping, producing, extracting and/or using Groundwater located in or under Declarant's Retained Parcel or any portion thereof in excess of Declarant's Retained BPA, or

B. installing, maintaining, using, repairing, relocating or replacing any production well(s) in or on Declarant's Retained Parcel except for the purpose of Pumping as a De Minimis Pumper, Pumping Declarant's Retained BPA, or Pumping Groundwater allocation acquired for Declarant's Retained Parcel by way of lease or permanent transfer in accordance with the terms of the Judgment.

7. The wells that will be used to Pump Declarant's Retained BPA are identified as [ENTER STATE WELL NUMBERS], which wells may be replaced from time to time with notice to the Watermaster.

8. The covenant's conditions, and restrictions set forth in Sections 5 through 7 herein are for the benefit of Grantee and Grantee's Parcel. This Restrictive Covenant may be enforced only in accordance with Section VII.A(1) of the Judgment by Grantee, by any Party to the Judgment having or acquiring any right, title or interest in Grantee's BPA or in Grantee's Parcel, by the Watermaster, or by the Court maintaining continuing jurisdiction over the Judgment. Grantee may assign any of its rights and powers under this Restrictive Covenant to any Party to the Judgment having or acquiring any right, title or interest in Grantee's BPA or in Grantee's Parcel. Upon the recordation of such assignment in the Official Records, such assignee, to the extent of such assignment, shall have the same rights and powers as are given to Grantee herein.

[End of Covenants, Conditions, and Restrictions Applicable to Declarant's Retained Parcel]

General Provisions

9. This Restrictive Covenant may not be modified, terminated or rescinded, in whole or in part, except by a written instrument duly executed and acknowledged by the Declarant, with the approval of the Watermaster, and recorded in the Official Records.

10. This Restrictive Covenant shall become effective upon its recordation in the Official Records. Within thirty (30) days of the date of recordation, Grantee shall provide written notice to the Watermaster of such recordation and the BPA Division set forth in this Restrictive Covenant.

11. In the event any action shall be instituted in connection with this Restrictive Covenant, the party prevailing in such action shall be entitled to recover from the other parties all of its costs and expenses incurred therein, including without limitation reasonable attorneys' fees as finally determined by a court of competent jurisdiction.

12. In the event that any portion of this Restrictive Covenant shall become illegal, null or void or against public policy, for any reason, or shall be held by any court of competent jurisdiction to be illegal, null or void or against public policy, the remaining portions of this Restrictive Covenant shall not be affected thereby and shall remain in force and effect to the full extent permissible by law.

13. This Restrictive Covenant shall be given a fair and reasonable construction in accordance with the intentions of the parties and without regard for or aid from any canons requiring construction against the party drawing this Restrictive Covenant.

14. The breach of any covenants, conditions or restrictions herein contained shall not defeat, invalidate nor impair the obligation or priority of any mortgage or deed of trust now or hereafter executed and constituting a lien upon Grantee's Parcel or any portion thereof, which is made in good faith and for value; provided, however, that any party, including the holder of the mortgage or deed of trust, who acquires title through private or judicial foreclosure, trustee's sale

or deed in lieu of foreclosure (a "***Foreclosure-Purchaser***") and all successors and assigns of such Foreclosure-Purchaser shall take title subject to all of the covenants, conditions and restrictions contained in this Restrictive Covenant.

15. The breach of any covenants, conditions or restrictions herein contained shall not defeat, invalidate nor impair the obligation or priority of any mortgage or deed of trust now or hereafter executed and constituting a lien upon Declarant's Retained Parcel or any portion thereof, which is made in good faith and for value; provided, however, that any Foreclosure-Purchaser and all successors and assigns of such Foreclosure-Purchaser shall take title subject to all of the covenants, conditions and restrictions contained in this Restrictive Covenant.

[Signatures on the following page]

Signature Page to
DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS
(WATER ALLOCATION RESULTING FROM CONVEYANCE OF PORTION OF BPA PARCEL AND ASSIGNMENT OF BPA BETWEEN PARCELS)

DECLARANT

Dated: ______________________

____

By: ___________________________________

Its: ___________________________________

ACKNOWLEDGED BY WATERMASTER:

Dated: ______________________

____

By: ___________________________________

Its: ___________________________________

A notary public or other officer completing this certificate verified only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF ____________________)

On ________________________, 2020, before me, ____, Notary Public, personally appeared ____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they/executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

____
Notary Public

Exhibit "A"
Legal Description of Original Property

Exhibit "B"
Plat of Original Property

Exhibit "C"
Legal Description of Grantee's Parcel

Exhibit "D"
Plat of Grantee's Parcel

Exhibit "E"
Legal Description of Declarant's Retained Parcel

Exhibit "F"
Plat of Declarant's Retained Parcel

EXHIBIT 6.3

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

(Space Above for Recorder's Use)

DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS (WATER ALLOCATION RESULTING FROM TRANSFER OF ALL OR A PORTION OF BPA FOR USE ON OTHER LAND)

This DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS (WATER ALLOCATION RESULTING FROM TRANSFER OF ALL OR A PORTION OF BPA FOR USE ON OTHER LAND) ("***Restrictive Covenant***") is made this ___ day of _______, 20__, by *[Name of Declarant - Use Complete Name as Specified in Judgment]* ("***Declarant***").

RECITALS

WHEREAS, Declarant is the sole owner in fee simple of certain real property legally described on Exhibit "A" and depicted on Exhibit "B" attached hereto and incorporated herein by this reference (the "***Restricted Property***"), which consists of approximately _____ acres in the County of San Diego, State of California.

WHEREAS, Declarant is a party to that certain judgment comprehensively adjudicating all rights to extract water from, or store water within, the Borrego Springs Subbasin entered in Borrego Water District vs. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01 San Diego County Superior Court Case No. 37-2020-00005776recorded as Document No. __________ in the Official Records of the Office of the County Recorder, County of San Diego ("***Official Records***") ("***Judgment***").

WHEREAS, pursuant to the Judgment, Declarant owns a Baseline Production Allocation, as defined in the Judgment, of ____ acre-feet ("***Declarant's Existing BPA***") for use on the Restricted Property.

WHEREAS, following recordation of this Restrictive Covenant, Declarant intends to retain fee title to the Restricted Property subject to the covenants, conditions and restrictions described below and to transfer *[all] [___ acre-feet]* of the BPA ("***Transferred BPA***") to *[Name of Transferee - Use Complete Name as Specified in Judgment]* ("***Transferee***") and be assigned to the Benefited Property (defined below) overlying the Borrego Springs Subbasin, as described below.

WHEREAS, upon conveyance of the Transferred BPA to Transferee and notice to the Watermaster pursuant to the Judgment, the Transferred BPA shall be severed from the Restricted Property and ownership of the Transferred BPA shall transfer to Transferee and be assigned to the Benefited Property overlying the Borrego Springs Subbasin, as described below.

WHEREAS, Declarant is recording this Restrictive Covenant against the Restricted Property to restrict pumping of groundwater from the Restricted Property consistent with the terms of the Judgment and as set forth in this Restrictive Covenant.

RESTRICTIONS

NOW THEREFORE, in consideration of the above recitals which are incorporated herein by this reference, Declarant hereby covenants, agrees and declares that the Restricted Property shall be held, transferred, conveyed, leased, occupied, used or otherwise disposed subject to the following covenants, conditions and restrictions, which shall run with the Restricted Property or any portions into which it may be divided, and shall be binding upon and burden the Restricted Property, successor owners, administrators, assigns, lessees and other occupiers and users of the Restricted Property, or any portion thereof, and all parties having or acquiring any right, title or interest in the Restricted Property, or any portion thereof, and their successors and assigns, and shall inure to the benefit of the Transferee, its successors and assigns, and the Benefited Property (defined below). The following covenants, conditions and restrictions are imposed upon the Restricted Property and every part thereof as a servitude in favor of Transferee, its successors and assigns, and the Benefited Property and every portion thereof as the dominant tenement or tenements. Declarant, and all parties having or acquiring any right, title or interest in the Restricted Property, or any portion thereof, and their successors and assigns, by accepting title to the Restricted Property shall be deemed to acknowledge and agree to all of the covenants, conditions and restrictions as set forth in this Restrictive Covenant.

1. Upon the transfer of the Transferred BPA to Transferee and notice to the Watermaster pursuant to the Judgment:

A. Declarant's Existing BPA retained for the benefit of the Restricted Property (i.e., not transferred to Transferee for the benefit of the Benefitted Property) is ____ acre-feet (**"Retained BPA"**). "Pumping" of "Groundwater", as defined in the Judgment, from the Restricted Property is limited to the Retained BPA, except for Pumping as a "De Minimis Pumper", as defined in the Judgment. Except for Pumping of Groundwater as a De Minimis Pumper, any Pumping of Groundwater from the Restricted Property in excess of the Retained BPA is prohibited unless an allocation of water is subsequently acquired for the benefit of the Restricted Property by way of lease or permanent transfer of Groundwater allocation approved in accordance with the terms of the Judgment. Except as specifically allowed in this Section 1(A), or under a duly approved lease or permanent transfer of water allocation approved in accordance with the Judgment, the following uses are expressly prohibited on the Restricted Property:

(i) Pumping, producing, extracting and/or using Groundwater located in or under the Restricted Property or any portion thereof in excess of the Retained BPA, or

(ii) installing, maintaining, using, repairing, relocating or replacing any Groundwater production well(s) in or on the Restricted Property except for the purpose of Pumping as a De Minimis Pumper, Pumping the Retained BPA or Pumping Groundwater allocation acquired for the Restricted Property by way of lease or permanent transfer in accordance with the terms of the Judgment.

B. Transferee will be the owner of the Transferred BPA assigned to the Benefited Property.

2. This Restrictive Covenant is for the benefit of Transferee, its successors and assigns, and of the real property legally described on Exhibit "C" and depicted on Exhibit "D", attached hereto and incorporated by this reference (the "***Benefited Property***"). The wells that will be used to Pump the Transferred BPA are identified as [ENTER STATE WELL NUMBERS], which wells may be replaced from time to time with notice to the Watermaster. This Restrictive Covenant may be enforced only in accordance with Section VII.A(1) of the Judgment by Transferee, its successors and assigns, by any Party to the Judgment having or acquiring any right, title or interest in the Transferred BPA or in the Benefited Property, by the Watermaster appointed under the Judgment (the "***Watermaster***"), or by the Court maintaining continuing jurisdiction over the Judgment upon a motion of any party to the Judgment. Transferee, its successors and assigns, may assign any of its rights and powers under this Restrictive Covenant to any Party to the Judgment having or acquiring any right, title or interest in the Transferred BPA or in the Benefited Property. Upon the recordation of such assignment in the Official Records, such assignee, to the extent of such assignment, shall have the same rights and powers as are given to Transferee herein and under the deed to be recorded for conveyance of the Transferred BPA.

4. This Restrictive Covenant may not be modified, terminated or rescinded, in whole or in part, except by a written instrument duly executed and acknowledged by the Transferee with the approval of the Watermaster, and recorded in the Official Records.

5. This Restrictive Covenant shall become effective upon its recordation in the Official Records. Within thirty (30) days of the date of recordation, Transferee shall provide written notice to the Watermaster of such recordation and the transfer of the Transferred BPA to the Benefited Property.

6. In the event any action shall be instituted in connection with this Restrictive Covenant, the party prevailing in such action shall be entitled to recover from the other parties all of its costs and expenses incurred therein, including without limitation reasonable attorneys' fees as finally determined by a court of competent jurisdiction.

7. In the event that any portion of this Restrictive Covenant shall become illegal, null or void or against public policy, for any reason, or shall be held by any court of competent jurisdiction to be illegal, null or void or against public policy, the remaining portions of this Restrictive Covenant shall not be affected thereby and shall remain in force and effect to the full extent permissible by law.

8. This Restrictive Covenant shall be given a fair and reasonable construction in accordance with the intentions of the parties and without regard for or aid from any canons requiring construction against the party drawing this Restrictive Covenant.

9. The breach of any covenants, conditions or restrictions herein contained shall not defeat, invalidate nor impair the obligation or priority of any mortgage or deed of trust now or hereafter executed and constituting a lien upon the Restricted Property or any portion thereof, which is made in good faith and for value; provided, however, that any party, including the holder of the mortgage or deed of trust, who acquires title through private or judicial foreclosure, trustee's sale or deed in lieu of foreclosure (a "***Foreclosure-Purchaser***") and all successors and assigns of such Foreclosure-Purchaser shall take title subject to all of the covenants, conditions and restrictions contained in this Restrictive Covenant.

[Signatures on the following page]

Signature Page to
DECLARATION OF COVENANTS, CONDITIONS & RESTRICTIONS
(WATER ALLOCATION RESULTING FROM TRANSFER OF ALL OR A PORTION OF BPA FOR USE ON OTHER LAND)

DECLARANT

Dated: ______________________

____

By: __________________________________

Its: __________________________________

ACKNOWLEDGED BY WATERMASTER:

Dated: ______________________ ______________________________________

By: __________________________________

Its: __________________________________

A notary public or other officer completing this certificate verified only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF ____________________)

On ______________________, 2020, before me, ____ ______, Notary Public, personally appeared ____ ____________, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they/executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

____
Notary Public

Exhibit "A"
Legal Description of Restricted Property

Exhibit "B"
Plat of Restricted Property

Exhibit "C"
Legal Description of Benefited Property

Exhibit "D"
Plat of Benefited Property

EXHIBIT

7

EXHIBIT 7

Exhibit "7"

Process for Selecting Watermaster Public/Community Representative

Representatives on the GSP Advisory Committee, as of June 1, 2019, representing BWD Ratepayers, Borrego Springs Community Sponsor Group, Anza-Borrego Desert State Park, and Borrego Valley Stewardship Council shall nominate a minimum of two candidates and preferably three candidates, and the Borrego Unified School District shall nominate one candidate, to serve as the potential public/community representative for the Watermaster. The public representative will be at a minimum (i) a full-time resident of Borrego Springs for at least nine months of the year, (ii) a Borrego voter living on real property overlying the Basin, (iii) a community member as opposed to a government agency employee, and (iv) familiar with the Judgment and Groundwater Management Plan. BWD shall conduct a public forum during which members of the Watermaster Board may ask questions of the candidates. Members of the public may also ask questions of the candidates during such forum. After the conclusion of the public forum, the BWD shall select the community representative from among the candidates during the open session of a public meeting of the BWD Board of Directors.

If, for any reason, one of the selecting organizations cease to exist, the other selecting organizations described herein may ask another public entity with community-wide planning interests to participate in the selection of the slate of candidates.

If for any reason the selection of a slate of candidates or the selection of a public representative as described above cannot be made, the Court shall appoint a full-time resident of Borrego Springs for at least nine months of the year who is also a voter living on real property overlying the Basin to represent the public on the Board. However, in no circumstance shall this appointed member be a current member of the BWD Board or BWD staff.

Process for Selecting Watermaster Recreational Sector Representative

On the Watermaster Board there will be one representative and one alternate that are selected from the Golf Course (GC) Owners. For purposes of selecting the representative and the alternate, each GC Owner will be afforded an opportunity to vote for the representative, with each GC Owner's vote weighted proportionately by the amount of total BPA held by such GC Owner and any of its affiliates. The representative will be the individual receiving the highest vote and the alternate will be the individual receiving the second highest vote. After the vote for the initial recreational sector representative, there will be subsequent votes held In December 2025 and every five years thereafter.

GC Owners are:

1. Parties to the Judgment,
2. Who own Baseline Pumping Allocation (BPA), and
3. Who own or operate a commercial golf course that overlies the Basin.

At the time of the Judgment, the following golf courses overly the Basin:

a. Borrego Springs Resort
b. Club Circle / Circle Club
c. De Anza Country Club
d. Rams Hill Golf Club
e. Road Runner Golf and Country Club
f. The Springs at Borrego Springs RV Resort and Golf Course

Process for Selecting Watermaster Agricultural Sector Representative

On the Watermaster Board there will be one representative and one alternate representing the agricultural sector Parties (AG Parties) selected by vote of the AG Parties. For purposes of selecting the AG Parties representative and alternate, each AG Party will be afforded an opportunity to vote for the AG Parties representative, with each AG Party's vote weighted proportionately by the amount of total BPA held by such AG Party and any of its affiliates. The representative will be the individual receiving the highest vote and the alternate will be the individual receiving the second highest vote.

AG Parties are:

1. Parties to the Judgment,
2. Who own Baseline Pumping Allocation (BPA), and
3. Who own or operate a commercial agricultural operation that overlies the Basin, defined as any agricultural business or trade activity, including farms, nurseries, and orchards, that produce crops or plants with the intent to make a profit.

The individual serving as the AG Parties representative and/or the individual serving as the AG Parties alternate may be replaced at any time by the same procedure specified above.

EXHIBIT

8

EXHIBIT 8

ENTRY PERMIT

This Entry Permit is dated as of ________________, 20__, and is made by ________________________ ("***Property Owner***") and the Borrego Valley Groundwater Basin Watermaster ("***Watermaster***") appointed under that certain Borrego Springs Subbasin Stipulated Judgment entered in *Borrego Water District v. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin, etc*., Orange County Superior Court Case No. 37-2020-00005776 ("***Stipulated Judgment***"). Where appropriate, Property Owner and Watermaster are referred to collectively as "Parties" and individually as "Party." References to a Party include, bind, and inure to the benefit of that Party's Boardmembers, officers, agents, employees, successors in interest and assigns.

RECITALS

A. Property Owner is the owner of that certain real property commonly known as Assessor's Parcel Number(s) ____________ within the County of San Diego, depicted on Exhibit "A" attached hereto and incorporated herein by reference ("***Property***").

B. Property Owner is a party to the Stipulated Judgment. The Stipulated Judgment contemplates [*specify purpose for entry, i.e.,* regular water quality monitoring of certain wells under the approved Water Quality Monitoring Plan attached hereto as Exhibit "B" and incorporated herein by reference, as that Water Quality Monitoring Plan may be amended by the Watermaster from time to time]. Watermaster has requested that Property Owner provide access to [*specify location on property, i.e.,* the well(s) ("***Well(s)***") located on the portion(s) of the Property referenced as the "***Well Site(s)***"] on Exhibit "A" so that Watermaster may [*specify activities, i.e.,* take water quality samples from the Well(s) under the Water Quality Monitoring Plan] pursuant to the terms of this Permit (the "***Activities***").

C. The Property is used by Property Owner for residential, commercial or other business purposes, including but not limited to extensive agricultural business uses. Unrestricted entry by Watermaster could interfere with those uses and expose Property Owner, and Property Owner's agents, employees and invitees, Watermaster's employees and contractors, and others on the Property to risk of injury.

D. Property Owner desires to allow Watermaster to enter onto the [*specify location on property, i.e.,* Well Site(s)] as necessary for Watermaster to access the [*specify what is being monitored, i.e.,* Well(s)] and carry out the Activities pursuant to the terms of this Permit.

TERMS

This Entry Permit is issued subject to the following terms and conditions:

1. Purpose and Scope.

(a) For the Term of this Permit, as defined in Section 2 below, Property Owner hereby provides Watermaster a limited, non-exclusive license to enter onto the [Well

Site(s)], under the terms and conditions set forth in this Entry Permit, solely in order to carry out the Activities.

(b) Only Watermaster's employees and contractors covered by Watermaster's or such contractors' comprehensive liability insurance, automobile insurance and workers compensation insurance consistent with the requirements of Section 7 below are permitted to enter the Well Site and conduct the Activities.

(c) Watermaster shall not enter onto the [Well Site(s)] other than as necessary to conduct the Activities and shall not enter onto any other portion of the Property. Watermaster's request to enter onto any other portions of the Property in connection with Activities shall be considered by the Property Owner on a case by case basis and shall be subject to a new written entry permit agreement with Property Owner.

(d) Each entry shall be limited to the hours between _____ a.m. and _____ p.m., Monday through Friday, excluding holidays, unless otherwise agreed to in advance and in writing by Property Owner.

(e) At the sole election of Property Owner, Property Owner or its representative may accompany Watermaster in any or all of the Activities. Upon Property Owner's request, Watermaster shall provide [*specify data to be collected, i.e.*, a split sample] to Property Owner or its representative without cost to the Property Owner. Property Owner shall have no responsibility or obligation whatsoever in connection with the Activities, except as provided in Section 6 below.

(f) If the Activities include any survey, test or other investigation, Watermaster shall provide Property Owner a copy of the results of the Activities within ten (10) calendar days after the draft results are first made available to Watermaster and prior to their publication, without cost to the Property Owner.

(g) Failure to comply with the terms and conditions contained herein shall be cause for immediate termination of this Entry Permit.

2. Term of this Entry Permit.

(a) The term of this Entry Permit shall commence upon its full execution by the Parties (the "***Effective Date***") and shall remain in effect through [*specify effective period consistent with the plan approved by the Watermaster, i.e.*, the period that the Well(s) are required to be sampled under the Water Quality Monitoring Plan] (the "***Termination Date***").

(b) Watermaster's entry and the Activities must cease on the Termination Date.

(c) The Parties' rights and obligations under Sections 4, 6, 7, 8, 9, 10, 11, 18 and 19 below shall survive the termination of this Entry Permit and continue in effect until all claims against the Property Owner, Watermaster and the Property related to this Entry Permit are absolutely barred by the applicable statutes of limitation.

3. Notice of Entry.

(a) Watermaster shall notify Property Owner by telephone ___________ and email ______________________, at least seventy-two (72) hours prior to each entry onto the [Well Site(s)]. The notice shall contain all of the following information:

1) The date, approximate time and approximate duration of the entry;

2) The Watermaster personnel who will be conducting the Activities during the entry; and

3) Watermaster's certification that the Watermaster personnel who will be conducting the Activities have been provided with a copy of this Entry Permit and are covered by Watermaster's comprehensive liability insurance, automobile insurance and workers compensation insurance.

4. Government Permits and Authorizations.

Watermaster shall comply with all Applicable Legal Requirements (defined in Section 10 below) and shall be solely responsible for and obtain at its expense all governmental permits and authorizations required by all Applicable Authorities (defined in Section 10 below) for Watermaster to perform the Activities and the restoration of the Property pursuant to this Entry Permit.

5. Non-Interference with Property Owner's Use of Property.

(a) Watermaster shall not modify the Property or the [Well(s)] without the Property Owner's prior written consent. No ground disturbances are permitted without the Property Owner's prior written consent.

(b) Watermaster's entry upon and use of the [Well Site(s)] shall at all times be subject to the rights of Property Owner to use the Property and the [Well(s)] located thereon. Watermaster shall not interfere with or disrupt the residential, agricultural, commercial or other business activities on the Property, and shall not endanger the health, safety or welfare of the Property Owner or Property Owner's agents, employees, invitees, or Watermaster's employees or contractors, or others on the Property.

6. Assumption of Risk, Release and Indemnity.

(a) Watermaster assumes all risk of loss, damage and injury to itself, its employees and contractors which in any manner may arise out of entry upon or use of the Property under this Entry Permit. Property Owner shall not have any liability to Watermaster, its employees or contractors or to any insurer, by way of subrogation or otherwise, on account of any loss, damage or injury to Watermaster's property, or to Watermaster's employees or contractors, regardless of whether such loss or damage is caused by any negligence of Property Owner or Watermaster, unless Watermaster affirmatively demonstrates that Property Owner acted with willful misconduct, and that such willful misconduct is the proximate cause of such loss, damage or injury. Any award of damages following such a showing of willful misconduct shall be limited to the actual amount of the monetary injury. If any dispute is not resolved following compliance with the dispute resolution procedures specified in Section VII.A of the Judgment, either Party may seek declaratory relief, specific performance and/or monetary damages for willful misconduct in accordance with the procedures set forth in Section VII.A of the Judgment, but no other remedies in law or equity.

(b) Watermaster shall keep the Property free of mechanic's liens and claims resulting from or in any way related to Watermaster's entry onto the Property or the Activities. Watermaster shall defend Property Owner and the Property against, and indemnify and hold Property Owner and the Property harmless from all liens, claims, loses, liabilities and expenses asserted against or incurred by the Property Owner or the Property and caused by Watermaster's entry or the Activities or in any way related to such entry or Activities, including the actual expense of legal representation whether by special counsel or by Property Owner's attorneys, and expert witness fees, arising out of or resulting from injury to or death of any person, or damage to any property or damage to any other interest of Property Owner, including, but not limited to, suit alleging noncompliance with any applicable Legal Requirements by Watermaster. Watermaster's duty to defend as described above shall arise immediately upon the making of any claim, the assertion of any cause of action, the initiation of any regulatory proceeding or other action against Property Owner, and shall not be dependent upon a finding of any wrongdoing or fault on the part of Watermaster. The Parties' rights and obligations under this <u>Section 6</u> shall survive termination of this Entry Permit and shall continue until all claims against Property Owner, Watermaster, and the Property are absolutely barred by the applicable statutes of limitation.

7. <u>Insurance</u>.

(a) <u>Scope of Insurance</u>. Watermaster shall, prior to any entry onto the Property, acquire and keep in full force and effect comprehensive liability insurance with a combined single limit coverage limit of not less than Two Million Dollars ($2,000,000.00) covering bodily injury, personal injury, death and property damage liability per occurrence and in the aggregate, insuring the Property Owner against any and all liability with respect to or arising out of the entry or Activities. No policies issued on a "claims made" basis will be acceptable and no policies will have any deductible provision in excess of five percent (5%) of the total coverage maintained by the Watermaster. Watermaster shall also obtain and maintain all automobile and workers compensation insurance required by law with respect to the Activities. Watermaster shall provide the Property Owner with a certificate evidencing such coverage prior to Watermaster's entry onto the Property.

(b) <u>Policy Form</u>. All such liability insurance policies shall name the Property Owner as an additional insured. All public liability, property damage, and other casualty policies shall be written as primary policies and any insurance carried by the additional insureds on such policies shall not be contributing with such policies. All policies of insurance under this Entry Permit shall be issued by reputable insurance companies with general policy holder's ratings of not less than A-, and which are qualified to do business in California.

(c) <u>Blanket Policies</u>. Notwithstanding anything to the contrary contained in this <u>Section 7</u>, Watermaster's obligation to carry insurance may be satisfied by coverage under a so-called blanket policy of insurance, provided, that the requirements set forth in this Section 7 are otherwise satisfied.

(d) Failure by Watermaster to Maintain Insurance. If Watermaster fails to secure and maintain insurance policies complying with the provisions of this Section 7, then the Property Owner may secure the appropriate insurance policy or policies, and Watermaster shall pay, upon demand, the cost of same to the Property Owner, plus a service fee equal to fifteen percent (15%) of the total annual premium cost of the policy or policies.

8. Remedies.

(a) If the Property suffers any damage by reason of the acts or omissions of Watermaster, Watermaster shall be solely responsible for restoring the Property to its condition existing immediately prior to the occurrence of such damage to the satisfaction of the Property Owner, and shall compensate the Property Owner for any damages caused by reason of the acts or omissions of Watermaster, including but not limited to the market value of any crops damaged or destroyed by Watermaster.

(b) Watermaster shall be liable to Property Owner for all damage to any person or property which in any manner may be caused by Watermaster. Property Owner's remedies for any such damage shall include, without limitation:

1) requiring that Watermaster immediately pay for the cost of repair and other losses to Property Owner (including without limitation, consequential damages) caused by Watermaster; and

2) requiring that Watermaster restore any damaged property, including without limitation the Property Owner's [Well(s)], to a condition as near as reasonably possible to that which existed immediately prior to Watermaster's entry. If Property Owner elects to require that Watermaster make such repairs and restoration and Watermaster does not timely perform such repairs and restoration, then Watermaster shall be liable to Property Owner for the cost of restoring the damaged property to such condition, and shall further be liable to Property Owner for all damages (including, without limitation, consequential damage) resulting from Watermaster's activities on the Property, and any and all associated costs Property Owner incurs in its related restoration/repair activities.

9. Removal of Materials.

(a) Watermaster hereby warrants and represents that it will not cause the presence, use, storage or disposal of any Hazardous Substances (defined in Section 10 below) on or about the Property without the prior written consent of Property Owner. Excluded from this provision are substances necessary to carry out the Activities, provided that said substances are labeled, packaged, stored, contained, handled, managed, transported, documented and disposed of by Watermaster in full compliance with all Applicable Legal Requirements.

(b) Any substance, product, waste or other material of any nature whatsoever which may give rise to liability under any of the Applicable Legal Requirements that Watermaster releases to the Property must be removed and properly disposed of by Watermaster in compliance with the Applicable Legal Requirements and all negative impacts remediated at the sole expense of Watermaster. Said remediation shall restore the Property to the condition existing immediately prior to the Effective Date of this Entry Permit.

(c) Watermaster agrees to immediately notify Property Owner when Hazardous Substances have been released on the Property. Watermaster further agrees to properly notify all Applicable Authorities in the event of a release of Hazardous Substances on the Property. If Watermaster discovers any materials suspected to be hazardous in nature in or around the Watermaster's work area during the course of its Activities, it shall halt all Activities until Property Owner, or its agent, can determine the nature of the material and the proper remediation, if any, that is required.

(d) All conditions and stipulations of this Section 9 shall be carried out to the satisfaction of both Property Owner and the California Regional Water Quality Control Board — Colorado River Region.

(e) Failure by Watermaster to comply with any of the above provisions within ninety (90) days of written notification of default shall give Property Owner authority to have said default cured and remediated, and Watermaster agrees to pay Property Owner all direct and indirect costs of said default.

(f) The Parties' rights and obligations under this Section 9 shall survive the termination of this Entry Permit and continue in effect until all claims against the Property Owner, Watermaster and Property related to this Entry Permit are absolutely barred by the applicable statutes of limitation.

10. Defined Terms.

For purposes of this Entry Permit, the following capitalized terms shall be defined as follows:

(a) Applicable Authorities: The Court administering the Stipulated Judgment, County of San Diego and any other applicable federal, state, regional or local governmental or quasi-governmental agency, body or authority having jurisdiction over the Property or the Water Quality Monitoring Plan.

(b) Applicable Legal Requirements: Environmental Laws (as defined below), Stipulated Judgment, and any other statutes, ordinances, rules, codes, requirements, permits, regulations, standards (including any standards or requirements now or hereafter applicable to residential use or development of the Property), judgments, orders, writs, injunctions or decrees or the like, of Applicable Authorities.

(c) Environmental Laws: Any federal, state, regional or local statute, regulation, ordinance, rules, codes, requirements, permits, standards or requirements (including any standards or requirements now or hereafter applicable to residential use or development of the Property), judgments, regulations, orders, writs, injunctions or decrees or the like, relating to environmental conditions on, under or about the Property that could affect use or development of the Property for residential purposes, including, without limitation, soil and groundwater conditions underlying the Property, and environmental conditions pertaining to wetlands, waters of the United States, waters of the State of California, and listed state- or federally-, threatened or endangered species.

(d) Hazardous Materials: Any materials or substances (a) defined as a "hazardous waste," "extremely hazardous waste" or "restricted hazardous waste" under Sections 25115, 25117 or 25122.7, or listed pursuant to Section 25140 of the California Health and Safety Code; (b) defined as a "hazardous substance" under Section 26316 of the California Health and Safety Code; (c) defined as a "hazardous material," "hazardous substance" or "hazardous waste" under Section 25501 of the California Health and Safety Code, or under Section 25281 of the California Health and Safety Code; (d) petroleum or any other hydrocarbonic substance or by-product; (e) asbestos, PCBs, and other substances regulated under the Toxic Substances Control Act, 15 U.S.C. § 2601 et seq.; (f) polychlorinated biphenyls; (g) listed under Article 9 or defined as "hazardous" or "extremely hazardous" pursuant to Article 11 of Title 22 of the California Administrative Code; (h) designated as a "hazardous substance" pursuant to the Clean Water Act (33 U.S.C. § 1251 et seq.); (i) defined as a hazardous substance" pursuant to Section 101 of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 6901 et seq.); (j) listed by the State of California as a chemical known by the State to cause cancer or reproductive toxicity pursuant to Section 25249.8(a) of the California Health and Safety Code; or (k) found to be a pollutant, contaminant, toxic or hazardous waste or toxic or hazardous substance by any Applicable Authorities or in any reported decision of a federal or state court, or which may give rise to liability under any federal or state common law theory based on negligence, trespass, intentional tort, nuisance or strict liability or under any reported decisions of a state or federal court.

11. Successors and Assigns.

Watermaster shall not assign any of its rights under this Entry Permit without the prior written consent of Property Owner, which consent may be withheld for any reason or for no reason. Any assignment by Watermaster of this Entry Permit shall not release Watermaster from its obligations under this Entry Permit without an express release executed by Property Owner.

12. Authorized Signatories.

The individuals executing this Entry Permit represent and warrant that they are authorized to execute this permit entry on behalf of the Party for whom each individual purports to sign and that when executed and delivered to the Parties, this Permit shall be a valid and binding obligation of the Parties.

13. No Business or Agency Relationship.

Property Owner and Watermaster acknowledge and agree that (i) nothing contained in this Entry Permit shall be construed to constitute the Parties as participants in a joint or common undertaking, (ii) nothing contained in this Entry Permit shall create any agency relationship between Property Owner and Watermaster, and (iii) no Party shall have any right or authority to act on behalf of the other Party.

14. No Third Party Beneficiary.

This Entry Permit is not intended for the benefit of any third party and shall not be enforceable by any party who is not a Party.

15. Counterparts.

This Permit may be executed in any number of counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same Entry Permit.

16. Waiver of Covenants and Conditions; No Waiver of Claims.

No covenant, condition, right or remedy under this Entry Permit shall be waived unless the waiver is in writing and signed by the Party claimed to have made the waiver. One waiver shall not be interpreted as a continuing waiver. The waiver by one Party of the performance of any covenant or condition under this Entry Permit shall not invalidate this Entry Permit nor shall it be considered a waiver by it of any other covenant or condition under this Entry Permit. By entering into this Entry Permit, Property Owner does not waive any legal rights with respect to potential claims or causes of action Watermaster has (or may have in the future) against Watermaster or against any other person or entity not a Party to this Entry Permit and all such claims are expressly reserved.

17. Governing Law.

The interpretation and enforcement of this Entry Permit shall be governed by the laws of the State of California. This Entry Permit shall be interpreted to give effect to its fair meaning and shall be construed as though it was prepared by both Parties. This Entry Permit contains the entire agreement of the Parties with respect to Watermaster's entry on and investigation of the Property, and all prior negotiations, documents, and discussions regarding the Watermaster's entry and Activities herein are superseded by this Entry Permit. Section headings in this Entry Permit are for convenience only and shall not be used in interpreting its provisions.

18. Venue.

Any controversy or claim arising out of or relating to this Entry Permit, or the breach thereof, shall be brought in the Court administering the Stipulated Judgment in the manner specified in Section VII.A of the Stipulated Judgment for a party to appeal a decision by the Watermaster Board.

19. Attorney's Fees.

In the event any Party to this Entry Permit initiates proceedings to enforce the terms of this Permit, the Party not substantially prevailing in such proceedings shall pay to the substantially prevailing Party all attorneys' fees incurred by the substantially prevailing Party, together with all costs of such proceeding.

20. Severability.

In the event that any provision of this Entry Permit is deemed unenforceable, the remaining provisions shall remain in full force and effect. In the event any provision of this Entry Permit is so held invalid, the Parties shall promptly renegotiate in good faith new provisions to restore this Entry Permit as nearly as possible to its original intent and effect.

21. Notice.

Unless otherwise specified herein, all notices or other communications between the Parties required or permitted hereunder shall be in writing and personally delivered, or sent by certified United States mail, postage prepaid, return receipt requested, or sent via overnight air courier (example, Federal Express) to the following addresses:

If to Property Owner, to: ______________________

____

____

____

Phone: ______________________
Fax: ______________________
E-mail: ______________________

With a copy to: ______________________

____

____

____

Phone: ______________________
Fax: ______________________
E-mail: ______________________

If to Watermaster, to: ______________________

____

____

____

Phone: ______________________
Fax: ______________________
E-mail: ______________________

With a copy to: ______________________

____

____

____

Phone: ______________________
Fax: ______________________
E-mail: ______________________

A notice shall be effective on the date of personal delivery if personally delivered, the next business day after deposit with the overnight air courier, or two (2) business days following the date the notice is postmarked, if mailed via certified mail as set forth above. Either Party may change the address to which notice is to be given to it by giving notice of such change of address in the manner set forth above for giving notice.

22. Watermaster Acceptance.

Watermaster shall indicate its acceptance of the terms and conditions of the permission granted under this Entry Permit by signing in the space provided below and returning the original executed copy of this Entry Permit to Property Owner.

[Signatures on the following page]

IN WITNESS WHEREOF, the Parties have caused this Entry Permit to be executed as of the latest day and year written below.

Dated: ______________________

WATERMASTER

____

By: ___________________________________

Its: ___________________________________

Dated: ______________________

PROPERTY OWNER

____

By: ___________________________________

Its: ___________________________________

EXHIBIT A
PLAT DEPICTING AND DESCRIBING PROPERTY

EXHIBIT B

[*Insert name of plan approved by Watermaster, i.e.*, WATER QUALITY MONITORING PLAN]

EXHIBIT

9

EXHIBIT 9

EXHIBIT 9

FACILITY STANDARDS FOR MUTUAL WATER COMPANIES FORMED AFTER ENTRY OF JUDGMENT

For mutual water companies formed after entry of Judgment, all mutual water company infrastructure shall be constructed to meet Federal/State/County of San Diego/American Waterworks Association (AWWA) potable and recycled/non potable standards in effect at time of infrastructure construction, including but not limited to the following:

- Health & Safety Code section 116527 (Requirements and Compliance with the California Safe Drinking Water Act), as applied to "public water systems" defined in Health & Safety Code section 116275.
- California Code of Regulations, Title 22 section 64551 et seq., as applied to "public water systems" (California Waterworks Standards).
- Health & Safety Code section 116815, to include purple piping for recycled/non potable water systems.
- AWWA PVC Pipe-Design and Installation, Manual M23.
- AWWA PE Pipe – Design and Installation, Manual M55.
- C502-54: AWWA Standard Specifications for Fire Hydrants for Ordinary Water Works Service.
- C503-88: AWWA Standard for Wet-Barrel Fire Hydrants (California-type).
- County of San Diego Consolidated Fire Code ("County Code") requirements, including those related to fireflow as applicable (County Code, sections 96.1.507.3 and 96.1.507.5.7, referencing Cal. Fire Code, sections 507.3 and 507.5.7).