

**Borrego Springs Watermaster Board
Special Meeting
March 31, 2020 @ 5:30 p.m.
Borrego Water District Office:
806 Palm Canyon Drive, Borrego Springs CA 92004**

COVID-19 UPDATE: The Borrego Springs Watermaster Board meeting on Tuesday, March 31st will be held as scheduled. BSWB will be providing public access to the Meeting thru electronic means only to minimize the spread of the COVID-19 virus, based upon direction from the California Department of Public Health, the California Governor's Office and the County Public Health Office. Anyone who wants to listen to the meeting is encouraged to observe the GO TO MEETING stream at:

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I. OPENING PROCEDURES

- A. Call to Order:
- B. Pledge of Allegiance
- C. Roll Call
- D. Approval of Agenda
- E. Approval of Minutes -None
- F. Comments from the Public on Items not on the Agenda
- G. Comments from Directors
- H. Correspondence Received from the Public: None
- I. Initial Comments from Legal Counsel re Conflict of Interest Issues
- J. Initial Comments from Legal Counsel re Watermaster Governance Documents and Voting

II. ITEMS FOR BOARD CONSIDERATION AND POSSIBLE ACTION

AGENDA: March 31, 2020 All Documents for public review on file with the Borrego Water District General Manager Director located at 806 Palm Canyon Drive, Borrego Springs CA 92004 Any public record provided to a majority of the Board of Directors of the Watermaster Board less than 24 hours prior to the meeting, regarding any item on the open session portion of this agenda, is available for public inspection during normal business hours, located at 806 Palm Canyon Drive, Borrego Springs CA 92004.

The Borrego Springs Watermaster complies with the Americans with Disabilities Act. Persons with special needs should call Geoff Poole – Board Secretary at (760) 767 – 5806 at least 48 hours in advance of the start of this meeting, in order to enable the District to make reasonable arrangements to ensure accessibility.

If you challenge any action of the Board of Directors in court, you may be limited to raising only those issues you or someone else raised at the public hearing, or in written correspondence delivered to the Board of Directors at, or prior to, the public hearing.

- A. Resolution No. 20-01 Ratifying Submission of DWR Annual Report (originally due on 4-1 but extended due to COVID)
- B. Selection Process and Approval/Direction re Request for Proposal for Selection of Executive Director
- C. Selection Process and Approval/Direction Request for Proposal for Legal Counsel –
- D. Resolution No. 20-02 regarding metering
- E. Direction re Potential RFP for Technical Consultant - Verbal
- F. Timing of Formation and First Meeting of Technical Advisory Committee - Verbal
- G. Election of Officers of Watermaster Board of Directors, if needed - Verbal
- H. Set Interim Principal Office of the Watermaster, if needed - Verbal
- I. Direction re Wastermaster / Watermaster Board Insurance Policy Issues – Verbal
- J. Public Participation in Watermaster Board Meetings – Verbal
- K. Set Future Meeting Dates; Potential Brief Meeting in Mid-April - Verbal

III. STAFF REPORT

- A. Informational Items – Various Verbal Updates
 - 1. Upcoming Deadlines from the Settlement Agreement / Judgment
 - a. BPA Fee Collection Schedule
 - b. Water Credit Letters
 - c. Other Upcoming Dates
 - 2. Brief Review of Procedures Applicable to Watermaster (Rules and Regulations)
 - 3. Status of Adjudication Proceedings
 - 4. Comments on SGMA Alternative Submitted to DWR
 - 5. Status of Watermaster / Informational Website
- B. Financial Reports: Interim Watermaster Budget, et al.
- C. Discussion re Future Establishment of Watermaster Bank Account
- D. Water Use Reports: None
- E. Executive Directors Report: None
- F. Legal Counsel Report
 - 1. BROWN ACT PRESENTATION - Steve Anderson (Attached)

IV. CLOSING PROCEDURE: The next Meeting has yet to be determined and will be set by the Board.

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INTERIM BORREGO SPRINGS WATERMASTER

BOARD OF DIRECTORS MEETING

MARCH 31, 2020

AGENDA ITEM II.A

March 26, 2020

TO: Board of Directors

FROM: Steve Anderson, Counsel to Borrego Water District (BWD)

SUBJECT: Annual Report to DWR

RECOMMENDED ACTION:

Review Draft Report, Discuss, Amend, if Needed and Endorse Submission of Borrego Springs Subbasin 2019 Annual Report to the California Department of Water Resources (DWR)

ITEM EXPLANATION:

The Sustainable Groundwater Management Act (SGMA) requires the submission of annual reports to DWR regarding groundwater elevation data and other information about basins and subbasins regulated under SGMA. The submission of annual reports is required for subbasins that have submitted groundwater sustainability plans (GSP) or alternatives to such plans. On January 30, 2020, an alternative to a GSP for the Borrego Springs Subbasin was submitted to DWR. As a result, an annual report for 2019 is also due.

Ordinarily, annual reports are to be uploaded to the DWR SGMA portal by April 1 each year. (Water Code, section 10728.) However, due to the COVID-19 emergency declaration by the State, DWR provided written notice that it will also accept 2019 annual reports uploaded after April 1, 2020.

The draft 2019 annual report is attached to this staff report for review by the Watermaster Board of Directors. If approved, the annual report and any accompanying documents will be uploaded to the DWR portal by BWD staff. Given the relaxation of the April 1, 2020 due date, the Watermaster Board could also direct that the annual report be modified before submission, as appropriate.

NEXT STEPS:

Consider approving Resolution No. 20-01 of the Borrego Springs Watermaster Endorsing the Submission of the Annual Report.

FISCAL IMPACT:

N/A

ATTACHMENTS:

1. Annual Report draft prepared by Dudek – To be released.
2. Proposed Resolution No. 20-01 of the Borrego Springs Watermaster Endorsing Submission of the Annual Report.

DRAFT

**Borrego Springs Groundwater Subbasin Annual Report: Covering
Water Years 2016 through 2019**

Prepared by:

DUDEK

605 Third Street

Encinitas, California 92024

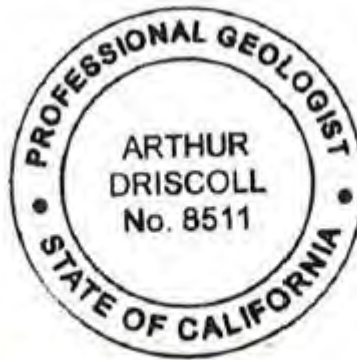
Contact: Trey Driscoll, PG No. 8511, CHG No. 936

Devin Pritchard-Peterson

APRIL 2020

SIGNATURE PAGE

This draft Annual Report for the Borrego Springs Groundwater Subbasin has been prepared under the direction of a professional geologist licensed in the State of California consistent with professional standards of practice.



A handwritten signature in blue ink that reads "Arthur Storer Driscoll, III". The signature is written in a cursive style and is positioned directly below the professional seal.

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

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ABDSP	Anza-Borrego Desert State Park
AF	acre-feet
AFY	acre-feet per year
amsl	above mean sea level
BWD	Borrego Water District
Basin	Borrego Valley Groundwater Basin
BVHM	Borrego Valley Hydrologic Model
CCP	Code of Civil Procedure
CFS	Cubic feet per second
CMA	Central Management Area
COC	contaminant of concern
County	County of San Diego
CWC	California Water Code
CIMIS	California Irrigation Management Information System
DWR	California Department of Water Resources
ETo	Reference evapotranspiration
GDE	Groundwater Dependent Ecosystem
GIS	geographic information system
GMP	Groundwater Management Plan
GPM	Gallons per Minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
NMA	North Management Area
SGMA	Sustainable Groundwater Management Act
SMA	South Management Area
SWID	State Well Identification
Subbasin	Borrego Springs Groundwater Subbasin
TAC	Technical Advisory Committee
TDS	total dissolved solids
USGS	U.S. Geological Survey

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Executive Summary

The first Annual Report for the Borrego Springs Groundwater Subbasin has been prepared for submittal to the California State Department of Water Resources (DWR) per Article 7, Section 356.2—Annual Reports, of the California Code of Regulations.¹ This report has been prepared for the Borrego Water District (BWD) on behalf of the stipulating parties to the proposed groundwater rights adjudication for the Borrego Springs Groundwater Subbasin (Subbasin) (DWR Basin No. 7.024.01) of the Borrego Valley Groundwater Basin (Figure 1). BWD and other stipulating parties submitted to DWR a proposed Stipulated Judgment including a groundwater management plan (GMP), constituting a “Physical Solution” for DWR’s review and approval to serve as an alternative to a Groundwater Sustainability Plan (GSP) for the Subbasin in compliance with the Sustainable Groundwater Management Act (SGMA). The alternative to a GSP was submitted to DWR on January 30, 2020. SGMA regulations require that an annual report be submitted to the DWR by April 1 of each year following the adoption of the GSP. This annual report provides an update on the groundwater conditions in the Subbasin for water years 2016 through 2019 (October 1, 2015 through September 30, 2019).

¹ Title 23, Division 2, Chapter 1.5, Subchapter 2 of the California Code of Regulations, which is commonly referred to as the Groundwater Sustainability Plan Regulations (GSP Regulations).

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1 Introduction

1.1 Background

The County of San Diego (County) and the Borrego Water District (BWD), acting together as the groundwater sustainability agency (GSA) for the Borrego Springs Groundwater Subbasin (Subbasin) (California Department of Water Resources (DWR) Basin No. 7.024.01) of the Borrego Valley Groundwater Basin, collectively developed a draft final Groundwater Sustainability Plan (GSP). This GSP complies with the 2014 Sustainable Groundwater Management Act (SGMA) (California Water Code Section 10720–10737.8, et al.) and the DWR GSP Regulations (California Code of Regulations, Title 23, Section 350 et seq.). Information regarding the GSP including stakeholder process is available from the County’s website:

<https://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html>

On January 30, 2020, pursuant to California Water Code (CWC) Sections 10733.6 and 10737.4, BWD submitted to the DWR a proposed Stipulated Judgment including a groundwater management plan (GMP), constituting a “Physical Solution” for DWR’s review and approval to serve as an alternative to a GSP for the Subbasin in compliance with the SGMA. A complaint, seeking a comprehensive adjudication of the groundwater rights of the Subbasin, was filed by BWD in the Superior Court for San Diego County, pursuant to Code of Civil Procedure (CCP) sections 830, et seq. The comprehensive adjudication seeks to sustainably manage the entirety of the Subbasin under SGMA. (*Borrego Water District v. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin, et al.*, San Diego Superior Court case no. 37-2020-00005776 CU-OR-CTL.). The draft final GSP was modified to conform its terms to the Stipulated Judgment proposed in the comprehensive adjudication and repurposed as a GMP, an integral part of the proposed Stipulated Judgment. Both the original draft final GSP and modified GMP cover the entirety of the Subbasin as defined by DWR. BWD, together with the stipulating parties, intend that the GMP, together with the Physical Solution embodied in the Stipulated Judgment, fulfill all of the substantive requirements for sustainable management of the Subbasin as prescribed in SGMA. Adjudication Action documents are available from the DWR’s SGMA Portal website:

<https://sgma.water.ca.gov/portal/alternative/print/37>

The County withdrew from the Borrego Valley GSA effective December 31, 2019. The Borrego Valley GSA will continue to exist with BWD as the sole entity of the GSA, but will remain dormant during the period of the lawsuit and will be dissolved and replaced by the Watermaster once the Final Judgment is issued.

1.2 Plan Area

For purposes of the GMP and this Annual Report, the Plan Area is defined as the Borrego Springs Groundwater Subbasin, which has surface area of approximately 98 square miles or 62,776 acres (Figure 1). The western and southwestern boundary of the Borrego Springs Groundwater 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 Groundwater Subbasin (DWR Basin No. 7.024.02).

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.

Within the Plan Area, the majority of the land is undeveloped open space. The primary developed land uses in the Plan Area are agriculture, residential, transportation infrastructure, and recreational (including golf course).

1.2.1 Climate

1.2.1.1 Precipitation

Within the Plan Area, average annual precipitation ranges from up to 8 inches per year along the northwest edge of the valley, to less than 4 inches per year to the southeast (SDCFCD 2004). Average yearly precipitation is greater outside the plan area in the mountains to the west, north, and northeast of the Borrego Valley.

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 travels 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. 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 defining the water year type, years with precipitation within one standard deviation (3.45 inches) of the long-term average precipitation are defined as “normal”, years with above “normal” precipitation are considered “wet,” and years with below “normal” 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 present. Based on this record, the mean annual precipitation at Borrego Desert Park Station is approximately 5.65 inches (NOAA 2020).

1.2.1.2 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 (NOAA 2020).

1.2.1.3 Evapotranspiration

Reference evapotranspiration (ETo) in the Plan Area has been calculated from the data collected at California Irrigation Management Information System Station (CIMIS) Station 207 on a daily basis since 2008 (Figure 2; Table 1-1). The average ETo measured at CIMIS Station 207 between 2008 and 2019 is 71.11 inches per year or 5.93 feet per year (Table 1-1). In contrast, the average annual precipitation in the Plan Area is 5.65 inches per year (NOAA 2020). 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 1-1
Monthly and Yearly Reference Evapotranspiration (ETo) Totals for CIMIS Station No. 207 from 2008 to 2019 (Inches)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
2008 ^{a, b}	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 ^b	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 ^b	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 ^b	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 ^b	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 ^b	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 ^b	2.67	3.66	5.94	7.23	8.66	9.72	9.24	8.38	6.97	4.70	3.14	1.58	71.89
2015 ^b	2.17	3.54	5.83	7.23	7.95	8.52	8.76	8.74	6.55	5.16	3.35	2.43	70.23
2016 ^b	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 ^b	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
2018 ^b	2.75	3.46	5.43	7.66	8.63	9.13	8.65	8.00	6.48	4.20	2.96	1.65	69.00
2019 ^b	2.00	2.38	4.68	6.56	6.82	7.61	8.19	7.67	6.10	4.60	2.94	2.21	61.76
11-Year Average	2.50	3.57	5.97	7.51	8.42	9.02	8.90	8.46	6.75	4.87	3.07	2.08	71.11

Source: CIMIS 2020.

Notes:

a. 2008 is excluded from the average as the record for that year is not complete.

b. Values reported herein were downloaded from CIMIS daily data and compiled on 3/22/2020.

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 (DWR 2012). This regional average annual ETo estimate is comparable to the ETo measured at CIMIS Station 207 (Table 1-1).

1.2.2 Surface Water and Drainage Features

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 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 (Figure 2). These include Borrego Palm Creek, and washes exiting the San Ysidro Mountains, Pinyon Ridge, Yaqui Ridge, Coyote Mountains, and the Borrego Badlands. The other, though less voluminous, source of recharge are return flows from agricultural irrigation. Septic tank treatment and disposal systems also constitute a source of recharge to the basin, but is considered negligible when compared to natural recharge.

Only one drainage entering the Subbasin is currently monitored with an active streamgage. USGS Station Number 10255810, is located on Borrego Palm Canyon downstream on the palm oasis. This streamgage has a 59-year period of record with sub-daily data (15 minute) from 2015 to 2019, and daily data from 1950 to 2003 (USGS 2020). 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 1 shows the daily discharge from Borrego Palm Canyon USGS streamgage 10255810 for the period from 1950 to 2003, and 2015 to 2019.

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 2020b). 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 2020b).

1.2.2.1 Manual Stream Flow Measurements

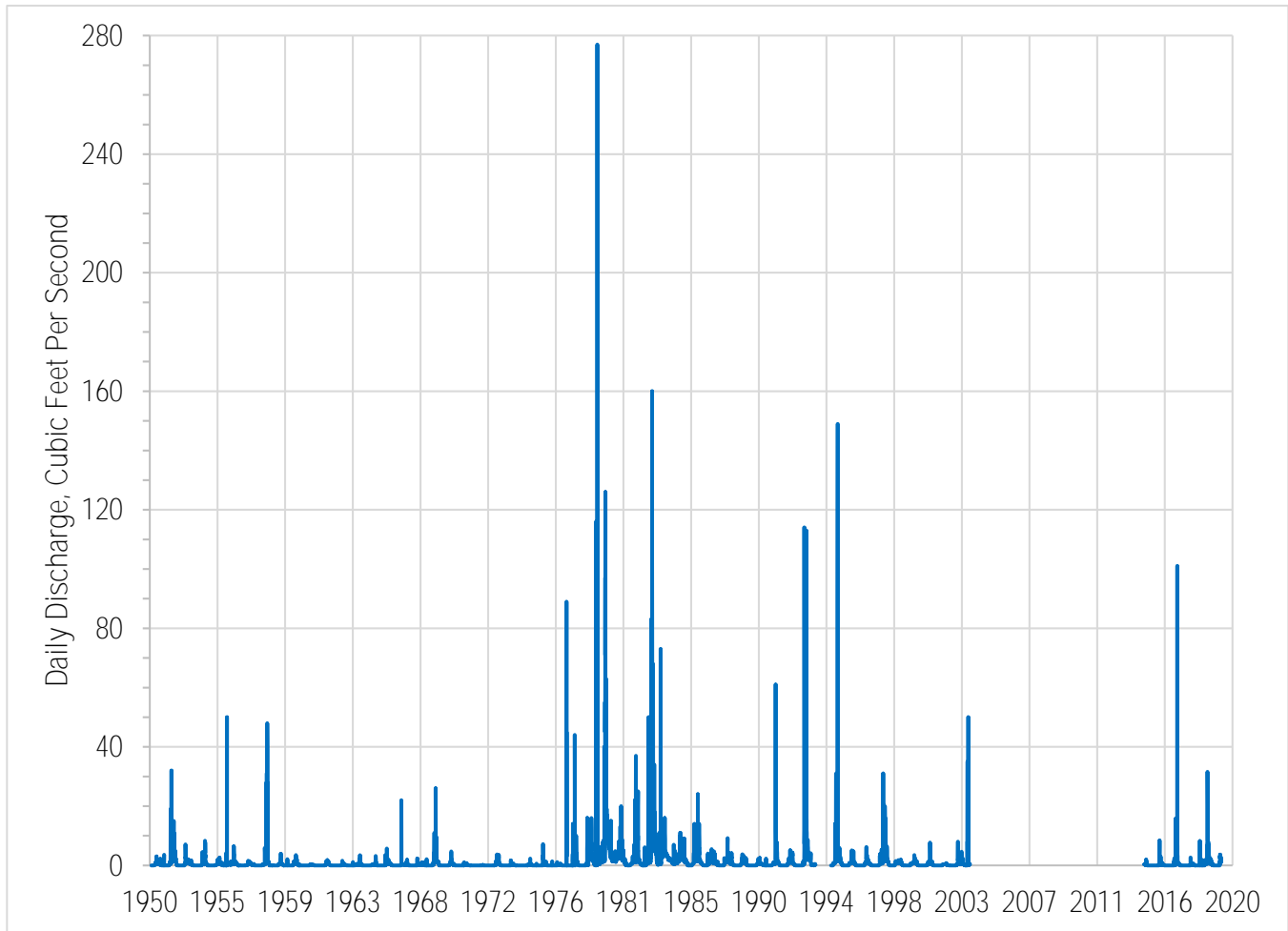
To evaluate the potential groundwater dependent ecosystems (GDEs) associated with Coyote Creek, the GSA has investigated whether the perennial and ephemeral creek segments are gaining water or losing water to the underlying aquifer system. To complete this analysis, the GSA has commenced mapping the 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 the spring 2018, which converts to 206.5 gallons per minute (GPM). At that time, the former lower historical USGS streamgage station was observed to be dry. In the fall 2018, the upper historical streamgage location was not accessible due to excessive vegetative growth. Stream flow was measured downstream of the historical streamgage at “third crossing” in the fall 2018 at 0.52 CFS (232.6 GPM). At that time, instantaneous stream flow at the former lower historical USGS streamgage station was 0.08 CFS (34.3 GPM).

In the spring of 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 the spring of 2018 at the lower inactive USGS streamgage, which is one of the permanent locations for manual flow readings. In the fall of 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 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. Flow in the stream was observed to decrease incrementally from the upper inactive USGS streamgage to two locations measured downstream.

Table 1-2
Manual Stream Flow Measurements Coyote Creek

Location	Latitude	Longitude	Spring 2018 (CFS)	Fall 2018 (CFS)	Spring 2019 (CFS)	Fall 2019 (CFS)
Upper Historical Stream Gage Site	33.3728	-116.4257	0.46	1.06	0.64	Not Accessible
Third Crossing	33.3714	-116.4245	0.27	0.85	0.57	0.52
Locking Gate (South of Third Crossing)	33.3685	-116.4214	0.17	0.94	0.44	0.36
Second Crossing (At Lower Historical Stream Gage)	33.3655	-116.4164	Dry	0.65	0.14	0.08
First Crossing	33.3601	-116.4022	Dry	0.34	Dry	Dry

Exhibit 1
USGS 10255810 Borrego Palm Canyon Stream Flow 1950 to 2019



Source: USGS 2020a

Notes: Streamgage was inactive September 30, 2003 to January 6, 2015. The GMP included provisional streamgage data for 2018 and 2019. This figure has been updated with data approved by the USGS for publication.

1.2.3 Principal Aquifer and Aquitards

The groundwater system within the Borrego Springs Groundwater Subbasin has been subdivided 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. The basin fill sediments of the Borrego Valley consist of unconsolidated to poorly consolidated mixtures of gravel, sand, silt, and clay. 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. The lower aquifer is the most fine-grained unit, containing higher amounts of silt and clay. For the purpose of this Annual Report and calculation of change in groundwater storage, the three aquifers are considered to comprise a single unconfined aquifer.

1.3 Annual Report Organization

This is the first Annual Report prepared since the GMP for the Subbasin was submitted to DWR. The report is organized to provide all of the required components of an annual report as per Article 7, Section 356.2—Annual Reports, including groundwater elevation, groundwater extraction, and surface water supply data, and an evaluation of change in groundwater in storage. A discussion of the monitoring network and implementation progress is also provided.

2 Groundwater Monitoring

2.1 Monitoring Network

The groundwater monitoring network in the Subbasin was established for the draft final GSP and will also be used to implement the GMP. The monitoring network was designed to collect sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater conditions, and provide representative information about Subbasin-wide groundwater conditions as necessary to evaluate GMP implementation. The location and type of monitoring for wells in the Subbasin are shown on Figure 2 and listed in Table 2-1. Water wells included in the groundwater monitoring network were incorporated from previous monitoring networks established by the BWD and consultants, County, DWR, and USGS. The Borrego Springs Groundwater Subbasin monitoring network currently consists of 50 groundwater wells owned by BWD, the County, Anza-Borrego Desert State Park (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. Two additional monitoring wells, Nel Well (State Well Identification (SWID) 012S007E03L001S) and State Well (SWID 012S007E04R001S), are located immediately outside of the Subbasin, but are used to monitor groundwater levels. 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.

The GMP establishes three management areas for the Subbasin: the North Management Area (NMA), the Central Management Area (CMA), and the South Management Area (SMA) (Figure 2). The management areas are utilized to monitor the status of SGMA parameters and measure the progress towards achieving sustainability goals. Subbasin monitoring wells are listed by management area in Table 2-1.

**Table 2-1
Monitoring Network**

Common Well Name ^a	State Well Identification (SWID)	Latitude	Longitude	Use	Groundwater Monitoring Type		
					Elevation	Quality	Production
North Management Area							
Horse Camp	009S006E31E003S	33.349264	-116.400345	Other	X	X	—
Private Well (Fortiner)	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	X	—	—

**Table 2-1
Monitoring Network**

Common Well Name ^a	State Well Identification (SWID)	Latitude	Longitude	Use	Groundwater Monitoring Type		
					Elevation	Quality	Production
				Supply			
MW-1	010S006E21A002S	33.300634	-116.349471	Observation	X	X	—
Evans	010S006E21E001S	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	—	—
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

**Table 2-1
Monitoring Network**

Common Well Name ^a	State Well Identification (SWID)	Latitude	Longitude	Use	Groundwater Monitoring Type		
					Elevation	Quality	Production
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
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	—
Outside Subbasin							
Nel Well	012S007E03L001S	33.160949006	-116.237237226	Observation	X	—	—
State Well	012S007E04R001S	33.156788	-116.243727	Observation	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.

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 incorporated all feasible wells in the Subbasin at the time of draft final GSP preparation; however, the network is expected to be further refined as access is gained to additional wells or new wells are drilled in the Subbasin and as the GMP is implemented.

2.2 Frequency of Monitoring

Groundwater levels, quality, and production data are collected at frequencies to provide data of sufficient accuracy and quantity to demonstrate short-term, seasonal, and long-term trends in groundwater conditions.

Groundwater level measurements are collected from wells in the groundwater level monitoring network established for the draft final GSP (Table 2-1, Figure 2). Manual groundwater level measurements are collected in the spring and fall of each year to track seasonal groundwater trends. On average, manual groundwater levels are measured in 46 wells during each semi-annual monitoring event. In addition, short-term trends are tracked by pressure transducers installed and maintained in 17 wells that record groundwater levels at intervals of 15 minutes to 1 hour (sub-daily). Long-term trends are tracked by analysis of data from key indicator wells monitored semi-annually and with data dating back to the mid-1950s.

Groundwater quality monitoring includes sampling, on average, 30 wells on a semi-annual basis to determine and track groundwater quality trends. Wells are monitored for potential contaminants of concern (COCs) that were previously identified in part by the USGS and DWR, and a review of the historical data by the GMP. The COCs include arsenic, fluoride, nitrate, sulfate and total dissolved solids (TDS). 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.

Groundwater production is recorded monthly for 11 active BWD wells and 12 golf course wells. Many private pumpers record groundwater production at monthly or annual intervals. Additionally, each Party to the Stipulated Judgment is to install a meter by March 31, 2020 for the purpose of accurately measuring water use and report to the Watermaster on an annual basis. The Interim Watermaster for the Subbasin approved the installations of various types of specific meters at its meeting of March 31, 2020.

3 Groundwater Conditions

3.1 Groundwater Elevations

The following sections provide a description of the Subbasin groundwater elevation contour maps and hydrographs developed using monitoring well groundwater elevation data for the period from 2015 through 2019 (Water Years 2016 – 2019).

3.1.1 Groundwater Elevation Contour Maps

Groundwater elevation data for wells in the monitoring network were compiled and reviewed for accuracy and completeness. Extraction wells were excluded from the dataset to ensure that the contours generated are generally representative of static conditions (i.e., not influenced by active pumping of a water well). Groundwater elevation data for a given year and season (i.e., spring or fall) were then selected for contouring. Groundwater elevation contours were generated in Surfer 17.1.288 (Golden Software, LLC) using the groundwater elevation data and inverse distance weighted interpolation. The triangulation with linear interpolation method uses Delaunay triangulation to compute a series of triangles from the data points and then interpolates the grid nodes from the slopes of the triangles. Groundwater elevation contours were generated to show the seasonal high (spring) and seasonal low (fall) groundwater conditions for the period from 2015 through 2019 (Figures 3 – 12).

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. In general, groundwater contours indicate that groundwater elevations over the period 2015 through 2019 ranged from a high of over 500 feet above mean sea level (amsl) in the extreme northern and southern portions of the Subbasin to a low of about 375 feet amsl in the CMA and southern portion of the NMA.

3.1.2 Groundwater Elevation Hydrographs

Groundwater elevation hydrographs were produced for each groundwater level monitoring well in the monitoring network. Available data for each well were plotted for the period from 2015 through 2019 (Appendix A).

Since the early 1950s, groundwater extraction in the Subbasin 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. Measured groundwater elevations for non-pumping wells measured in spring 2015 ranged from a high of 476.36 feet amsl in the SMA (SWID 011S006E23H001S (WWTP-1 Well)) to a low of 383.14 feet amsl in the NMA (SWID 010S006E21A002S (MW-1)). Measured groundwater elevations for non-pumping wells measured in fall 2019 ranged from a high of 499.71 feet amsl in the SMA (SWID 011S007E32Q001S (Hayden Well)) to a low of 375.01 feet amsl in the NMA (SWID 010S006E21A002S (MW-1)). Measured groundwater elevations over the 5-year period showed a similar spatial pattern of static groundwater level elevations. Comparison of groundwater elevations measured at the same monitoring wells over the 5-year period indicate that, on average, measured groundwater elevations were 6.74 feet lower in fall 2019 than spring 2015, with a maximum increase of 1.73 feet amsl (SWID 011S006E07Q003S (ID4-2)) and maximum decrease of -20.14 feet amsl (SWID 011S006E23J002S (MW-3)). However, it should be noted that 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.

3.1.3 Key Indicator Wells

Key indicator wells were established in the GMP to establish minimum thresholds and measurable objectives in each management area of the Subbasin as shown in Figure 15. A subset of key indicator wells were established for BWD wells to be protective of municipal use (see Table 3-4 of the GMP for details regarding BWD wells). Water Year 2019 groundwater elevations, minimum thresholds, measurable objectives, and interim milestones for key monitoring wells are presented in Table 3-1.

Table 3-1

Water Year 2019 Groundwater Elevations, Minimum Thresholds, Measurable Objectives, and Interim Milestones for Key Monitoring Wells

Well Number	Local Well Name	Management Area	Fall 2018 Groundwater Elevation (feet MSL)	Fall 2019 Groundwater Elevation (feet MSL)	Minimum Threshold ^a (feet MSL)	Measurable Objective (feet MSL)	2025 Interim Milestone (feet MSL)	Historical Groundwater Level Trend ^b (feet per year)
010S006E21A002S	MW-1	NMA	377.91	375.01	-39	363	367	-2.14
010S006E18R001S	ID4-3	NMA	381.40	377.96	-42	368	371	-2.09
010S006E09N001S	Fortiner	NMA	375.05	NM	-46	365	367	-2.48
010S006E18J001S	ID4-18	NMA	377.94	NM	-44	367	369	-2.31
010S006E32R001S	ID4-1	CMA	393.88	391.66	-33	370	381	-1.39
010S006E35N001S	Airport 2	CMA	407.51	405.58	-25	382	394	-1.67
011S006E16N001S	ID1-16	CMA	389.75	NM	-33	370	384	-0.95
011S007E07R001S	MW-5A	SMA	410.44	409.67	-14	384	400	-0.74
011S007E07R002S	MW-5B	SMA	410.49	409.87	-14	384	400	-0.74
011S006E23J002S	MW-3	SMA	454.38	450.86	-12	433	440	-5.84
011S007E30L001S	Air Ranch	SMA	465.47	470.85	-9	458	462	-0.5
011S006E25A001S	RH-1	SMA	468.13	468.03	-9	456	463	-0.94
010S006E29K002S	ID4-4	BWD	305.33	NM	NA	284	291	-2.73
010S006E32D001S	ID4-11	BWD	390.52	NM	NA	355	366	-2.29
011S006E16A002S	ID1-12	BWD	386.81	NM	NA	368	377	-1.51
011S006E09E001S	ID5-5	BWD	394.7	387.64	NA	377	384	-0.85

Notes: MSL = mean sea level; NMA = North Management Area; CMA = Central Management Area; SMA = South Management Area; BWD = Borrego Water District; NA = Not Applicable; NM = Not Measured

a. Minimum Threshold: Maximum allowable decline in groundwater levels as measured at the beginning of GSP Implementation through 2040.

b. Historical groundwater level trend based on pre-fall 2018 groundwater levels as reported in the GMP.

Methodologies: The 2025 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 estimated sustainable yield target of 5,700 acre-feet per year and the applied 2030 DWR climate change factors.

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4 Water Use

4.1 Groundwater Extractions

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.² 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 Borrego Springs Unified School District (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 acre-feet per year (AFY) are considered de minimis users under SGMA and the Physical Solution. There are an estimated 53 active de minimis users within the Subbasin. 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.

Groundwater extraction data provided by the various non-de minimis and de minimis users for the period from 2015 through 2019 were compiled and tabulated by calendar year. Aerial imagery analysis was performed in a geographic information system (GIS) for all agriculture, golf courses, and other non-de minimis users for which pumping records were not available. In addition, for the years 2015 and 2019 where high-resolution aerial imagery were not available to estimate groundwater extraction, data from the preceding year were used.³ Groundwater Extractions by sector and calendar year are provided in Table 4-1.

**Table 4-1
Groundwater Extractions**

Groundwater User Type	Annual Groundwater Extraction (Acre-Feet)				
	2015 ^a	2016	2017	2018	2019 ^a
Agricultural ^b	15,093.73	15,007.35	13,668.09	13,006.45	13,006.45
Golf Course	3,137.39	3,045.22	3,058.91	2,973.94	2,814.21
Municipal	1,719.91	1,610.42	1,568.04	1,593.74	1,466.48
Other Non-De Minimis	50.40	49.72	47.93	52.51	52.51
De Minimis ^c	26.50	26.50	26.50	26.50	26.50
Total Water Use	20,028	19,739	18,369	17,653	17,366

Source: Borrego Water District; Borrego Springs Resort; Rams Hill Golf Course.

Notes:

- ^a 2015 and 2019 pumping extrapolated from preceding year aerial imagery for all sites without metered production records.
- ^b Water credit sites assumed to have ceased irrigation either on date of issuance of water credits or based on review of mid-2014 aerial imagery.
- ^c Water use factor of 0.5 acre-feet per dwelling unit utilized to calculate de minimis groundwater use.

² The Borrego Springs Resort golf course ceased operation and irrigation of the course in 2019.
³ Most agriculture in the Borrego Valley consists of perennial crops such as citrus orchards and date farms that have fixed water demands from year to year.

As shown in Table 4-1, the total annual volume of groundwater extracted in the Subbasin steadily decreased over the 5-year period from 20,028 AFY in 2015 to 17,366 AFY in 2019. This is a reduction in groundwater extractions of 2,662 AFY. The observed reduction in groundwater extractions is a result of reduced pumping by the three primary sectors (agricultural, municipal, and recreational) that extract the majority of groundwater in the Subbasin.

4.2 Surface Water Use

Currently, there is no surface water supply used or available for use, for groundwater recharge or in-lieu, in the Subbasin.

4.3 Total Water Use

Given that there is no surface water use in the Subbasin, total water use is equivalent to the sum of all groundwater extractions (see Section 4—Groundwater Extractions).

5 Change in Groundwater Storage

Change in the volume of groundwater stored in the Subbasin alluvial deposits is not a parameter that can be directly measured; rather, change in storage can be estimated using aquifer properties and groundwater elevation data collected at monitoring wells. The annual difference in groundwater elevation measured at monitoring wells (e.g., spring of a given year to spring of the following year) and aquifer specific yield were used to estimate change in groundwater storage in the Subbasin for the period from 2015 through 2019.

A numerical groundwater model for the Subbasin, referred to as the Borrego Valley Hydrologic Model (BVHM), was produced by the USGS in 2015. The BVHM has a period of simulation of 1945 through 2010, with model updates through water year 2016. The BVHM 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. The total area simulated in the model is 73,876 acres, which is greater than the draft final GSP Plan Area, extending further southeast into the northwestern portion of the Ocotillo Wells Groundwater Subbasin. The USGS subdivided the groundwater system within the Borrego Springs Groundwater Subbasin into three layers, corresponding to the 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. 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 there are no regionally extensive aquitards, 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. Estimated specific yield values within the aquifer system range from 0.7 percent to 28 percent with the upper and middle aquifers having the highest specific yield and the lower aquifer having the lowest specific yield. The estimated average specific yield of the upper aquifer is 15 percent, the middle aquifer is 17.5 percent, and the lower aquifer is 3 percent (USGS 2015). Since the entire Subbasin behaves in a predominantly unconfined to semi-confined manner, specific yield values for the three aquifers developed for use in the BVHM were averaged by model grid cell for use in the calculation of change in groundwater storage.

A regular-spaced grid with each cell being 1,000 feet by 1,000 feet oriented in a north-south direction and of sufficient area to cover the entire Subbasin was generated in GIS. The grid domain included 103 rows and 72 columns with a total of 7,416 cells. The grid was then refined to only include cells that intersect the Subbasin for a total of 3,054 active cells (Figure 13). The BVHM grid, with an average specific yield assigned to each grid cell, was then overlain by the change in storage grid. A one-to-one spatial join using a closest match option was then performed to join the BVHM averaged specific yield values to the change in storage grid. Change in storage grid cells that were outside of the BVHM model domain were assigned a specific yield value of zero (0).

The calculation of change in storage using measured groundwater elevation data requires taking the difference between groundwater elevations. In this case, measurements taken during the spring months were used since the aquifer has had time to recover from the previous year's pumping and groundwater levels are closer to static conditions (i.e., not influenced by increased pumping that may be occurring during the fall measurements). To calculate the change in storage, measured groundwater elevations from a given year were subtracted from the previous year. The change in groundwater elevation (head) expressed in units of feet for an individual grid cell was multiplied by the cross-sectional area and specific yield of the grid cell to produce an estimate of the change in groundwater storage by grid cell. The sum of the change in groundwater storage by grid cell provides an estimate of the total storage change across the entire Subbasin.

Change in the volume of groundwater stored in the Subbasin for the period from 2015 through 2019 is shown spatially in Figures 14 through 17. In addition, total annual change in storage and cumulative change in groundwater storage, as well as total annual groundwater production, are provided in Table 5-1 and shown graphically in Figure 18.

Table 5-1
Change in Groundwater Storage, Groundwater Extraction, and Water Year Type

Year	Change in Storage (AF)	Cumulative Change in Storage (AF)	Annual Groundwater Extraction (AF)	Water Year Type
2016	-11,516.68	-11,516.68	19,739.21	Normal
2017	-5,544.31	-17,060.99	18,369.48	Normal
2018	-8,875.97	-25,936.96	17,653.14	Dry
2019	-4,545.19	-30,482.15	17,366.16	Normal

Notes: AF = acre-feet

As shown in Figures 14 through 17, the magnitude of change in storage varies spatially from year to year. In general, the areas of the Subbasin where the greatest changes in storage occur are the regions with the highest rates of groundwater withdrawal including in the vicinity of the golf courses and agricultural lands. Additionally, Figure 18 and Table 5-1 indicate that change in storage is influenced by water year type with significantly greater reductions in storage during dry years as compared to wet years. From 2016 to 2019, the total change in groundwater storage in the Subbasin was estimated to be approximately -30,482 AF.

6 GSP Implementation Progress

The GMP for the Subbasin was submitted to DWR in January 2020. This is the first annual report to be prepared since the GMP was submitted. The GMP implementation progress reported in this report covers work begun during development of the GSP as well as work conducted over the three months since the GMP was submitted. During development of the GSP and subsequent adoption of the GMP, several areas were identified where additional work needs to be conducted over the next 20 years. These areas include filling spatial and temporal data gaps, conducting basin optimization studies, developing project feasibility studies, updating the numerical groundwater model, and updating the existing data management system.

The Subbasin has made substantial implementation progress to date. The Subbasin has developed a “Physical Solution” through the proposed Stipulated Judgment including a GMP that addresses water rights and provides a path toward sustainable management of the Subbasin. Semi-annual monitoring of groundwater levels, stream flow and water quality has been completed for the monitoring network for events starting in the fall 2017 through fall 2019. Groundwater extraction monitoring has been ongoing for municipal wells, most golf course wells and select agricultural wells. The Stipulated Judgment requires installation of flow meters on all non-*de minimis* wells in 2020 and annual reporting of groundwater extraction to the Watermaster. Installation of flow meters has commenced and is expected to be completed in 2020.

Pursuant to Water Code sections 10733.6 and 10737.4, on January 30, 2020, BWD submitted to DWR a proposed Stipulated Judgment, including the GMP, constituting a “Physical Solution,” for DWR’s review and approval to serve as an alternative to a GSP for the Borrego Springs Subbasin in compliance with SGMA. Also on January 30, 2020, a complaint seeking a comprehensive adjudication of the groundwater rights of the Basin was filed by BWD in the Superior Court for San Diego County, pursuant to Code of Civil Procedure (CCP) sections 830, *et seq.* The comprehensive adjudication also seeks to sustainably manage the entirety of the Basin under SGMA. (*Borrego Water District v. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin, et al.*, San Diego Superior Court case no. 37-2020-00005776 CU-OR-CTL.). While the case remains officially designated in San Diego County Superior Court, on March 9, 2020, the California Judicial Council assigned Orange County Superior Court Judge Melissa R. McCormick to hear the case.

The final draft GSP was modified to conform its terms to the Stipulated Judgment proposed in the comprehensive adjudication and repurposed as a GMP, an integral part of the proposed Stipulated Judgment. Both the original draft GSP and modified GMP cover the entirety of the Basin as defined by DWR. BWD, together with the stipulating parties, intend that the GMP, together with the Physical Solution embodied in the Stipulated Judgment, fulfill all of the substantive requirements for sustainable management of the Basin prescribed by SGMA.

The complaint makes reference to the proposed Stipulated Judgment, GMP, and other documents described herein. Also, BWD submitted the following documents to DWR in support of the alternative submission:

1. Settlement Agreement – Agreement entered into by BWD, agricultural, and recreational interests in the Basin, collectively pumping more than 90% of Basin groundwater, to resolve disputes regarding water rights in the Basin and to agree to the Stipulated Judgment. Among other topics, the Settlement Agreement provides for the formation and funding of an interim Watermaster to manage the Basin during the pendency of the comprehensive adjudication, with court approval of such management via issuance of a preliminary injunction and other appropriate interlocutory orders. The GSA will continue to exist with BWD as the sole GSA, but will remain dormant during the pendency of the lawsuit and will be dissolved and replaced by

the Watermaster once final Judgment issues. The Settlement Agreement includes the following exhibits:

- A. Party List / Pumping volumes 2014 to 2018 (with 2018 being the last year when pumping data is currently available)
- B. Form Answer
- C. Stipulated Judgment (see below)
- D. Stipulation
- E. Interim Watermaster Budget
- F. Proposed Stipulated Judgment, to be approved as part of the comprehensive adjudication, including the following exhibits:
 1. Proposed GMP
 2. Stipulation
 3. Minimum Following Standards
 4. Baseline Pumping Allocations
 5. Watermaster Rules and Regulations
 6. Water Rights Restrictive Covenant Forms
 7. Processes for Selecting Watermaster Representatives
 8. Entry Agreement Form
- G. Elements Guide (Coordination Document) – Prepared to describe and cross-reference SGMA's regulatory requirements with the provisions of the Stipulated Judgment and GMP to assist DWR with its evaluation of these documents.
- H. Resolution No. 2020-01-01 – Executed by BWD's Board of Directors authorizing (1) the Board President to execute the Settlement Agreement; (2) legal counsel to file the complaint to initiate the comprehensive adjudication; and (3) BWD staff to submit this GSP alternative to DWR.
- I. CEQA Notice of Exemption for Resolution No. 2020-01-01.
- J. Complaint seeking a comprehensive adjudication of Basin groundwater rights.

As part of implementation of the GMP and Physical Solution, the stipulating parties held the first Interim Watermaster Board meeting on March 31, 2020. That meeting was conducted in compliance with the Brown Act and was open to the public, as all Watermaster Board meetings will be. At that meeting the Watermaster Board moved forward with a process to seek a permanent executive director for the Watermaster, the hiring of legal counsel to the Watermaster, the scheduling of the first meeting of the Technical Advisory Committee (TAC) to the Watermaster Board of Directors, Brown Act training for Watermaster Board meetings, discussion of the status of the adjudication litigation, installation of meters by all pumpers, and the timing for the collection of Watermaster administrative fees, the amount of which was previously approved by the settling parties.

In the coming months, the TAC and Watermaster are scheduled to undertake the variety of data collection, groundwater basin analyses, and other activities required by the GMP and Physical Solution. The TAC will also provide recommendations on the development of the groundwater monitoring program for the Subbasin, including water quality monitoring

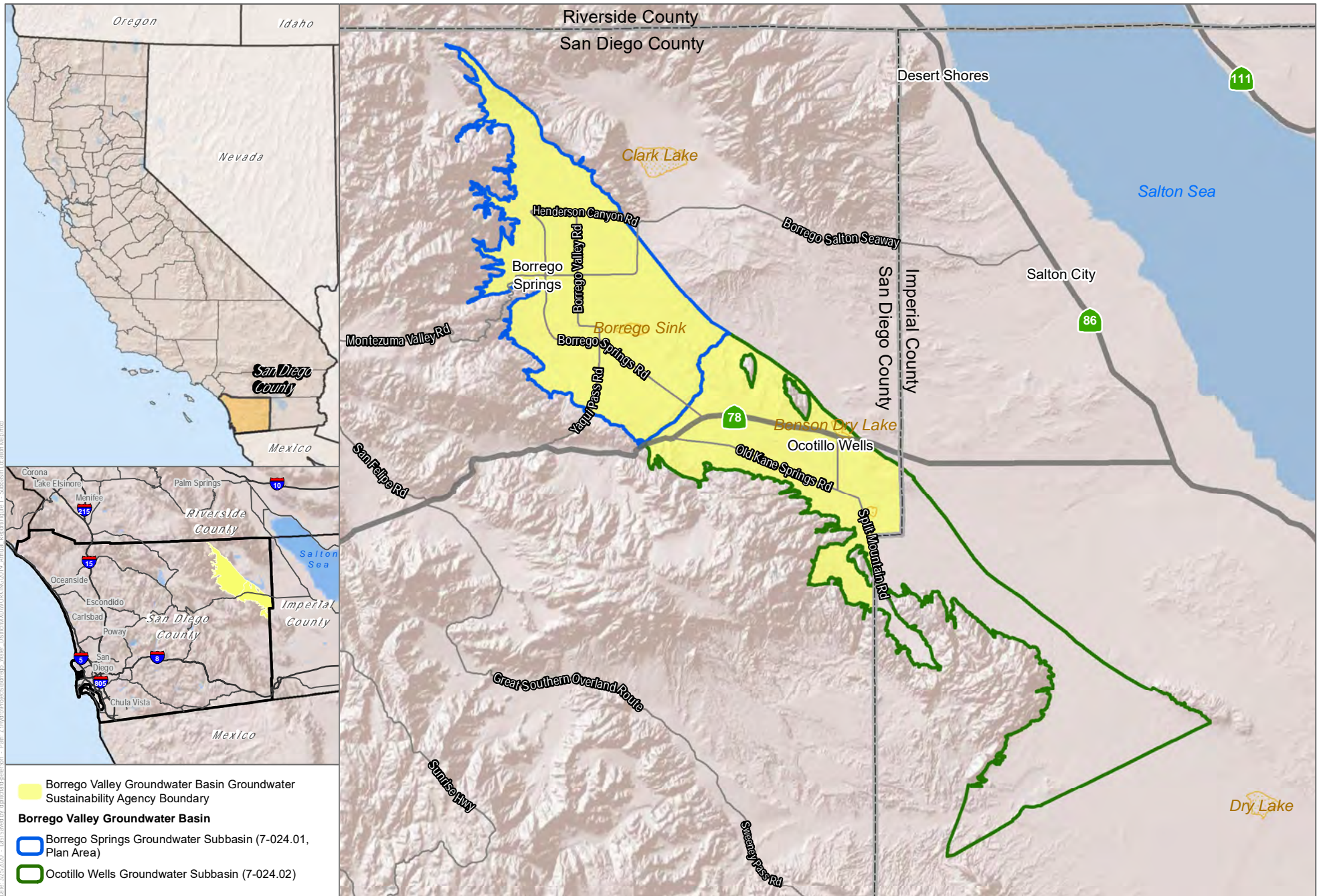
As part of the litigation, the settling parties also intend to file a motion for preliminary injunction to bring the entirety of the Subbasin and all Subbasin pumping formally within the management of the Superior Court and the Watermaster. The timing of the hearing and issuance of that injunction will be dependent upon court scheduling in light of the COVID-19 crisis and emergency declarations by the California Governor.

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7 References

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- County of San Diego. 2011. Borrego Springs Community Plan. Adopted August 3, 2011. Amended May 15, 2013.
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- USGS. 2020b. National Water Information System Web Interface. USGS 10255800 Coyote Creek Near Borrego Springs. Accessed at https://waterdata.usgs.gov/ca/nwis/inventory/?site_no=10255800. Accessed March 2020.
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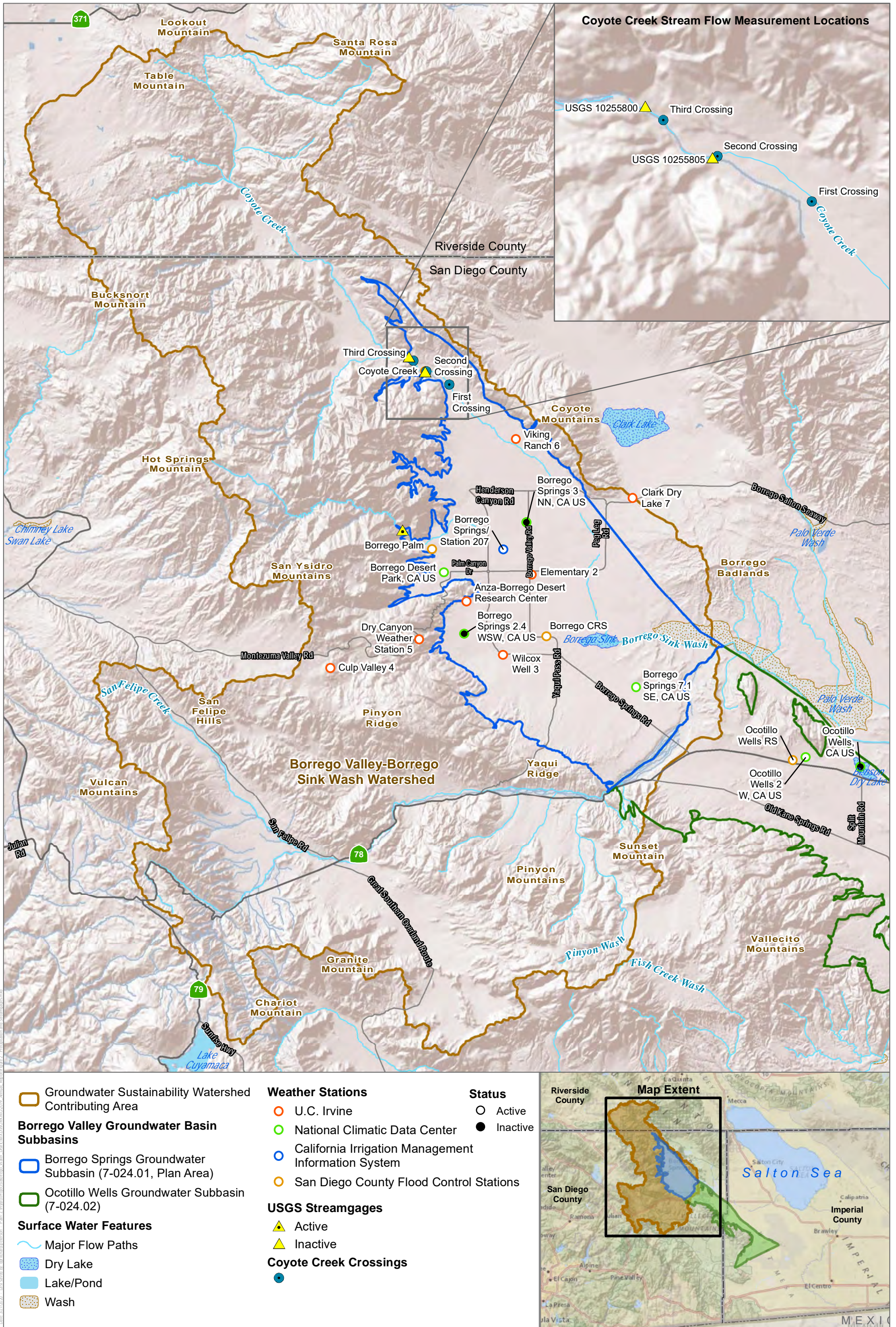
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 DATUM: NAD 1983. DATA SOURCE: DWR



FIGURE 1

Subbasin Location Map

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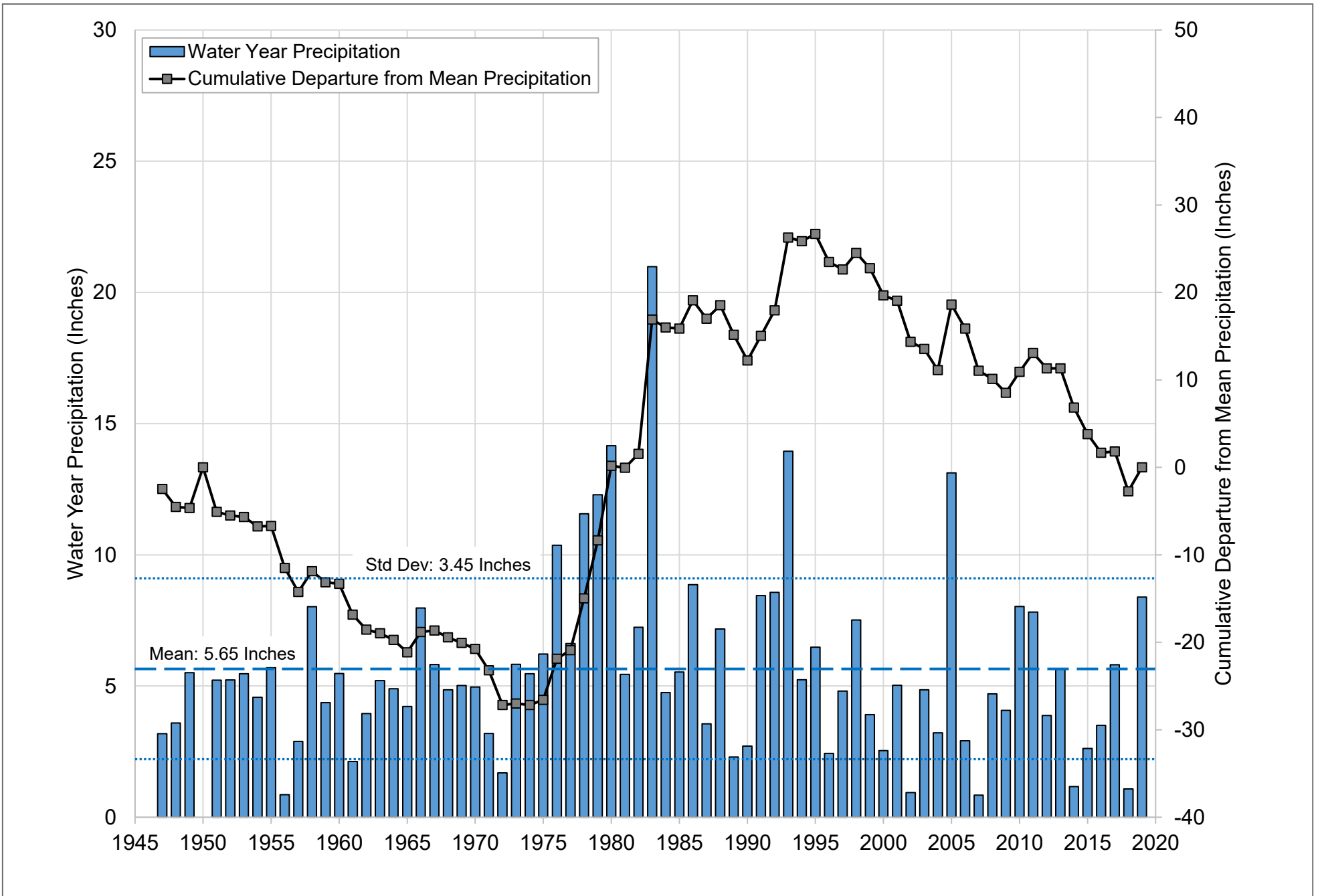
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DATUM: NAD 1983. DATA SOURCE: SanGIS; USGS; DWR

DUDEK 0 2 4 Miles

Figure 2
Precipitation and Streamgages
Annual Report for the Borrego Springs Subbasin

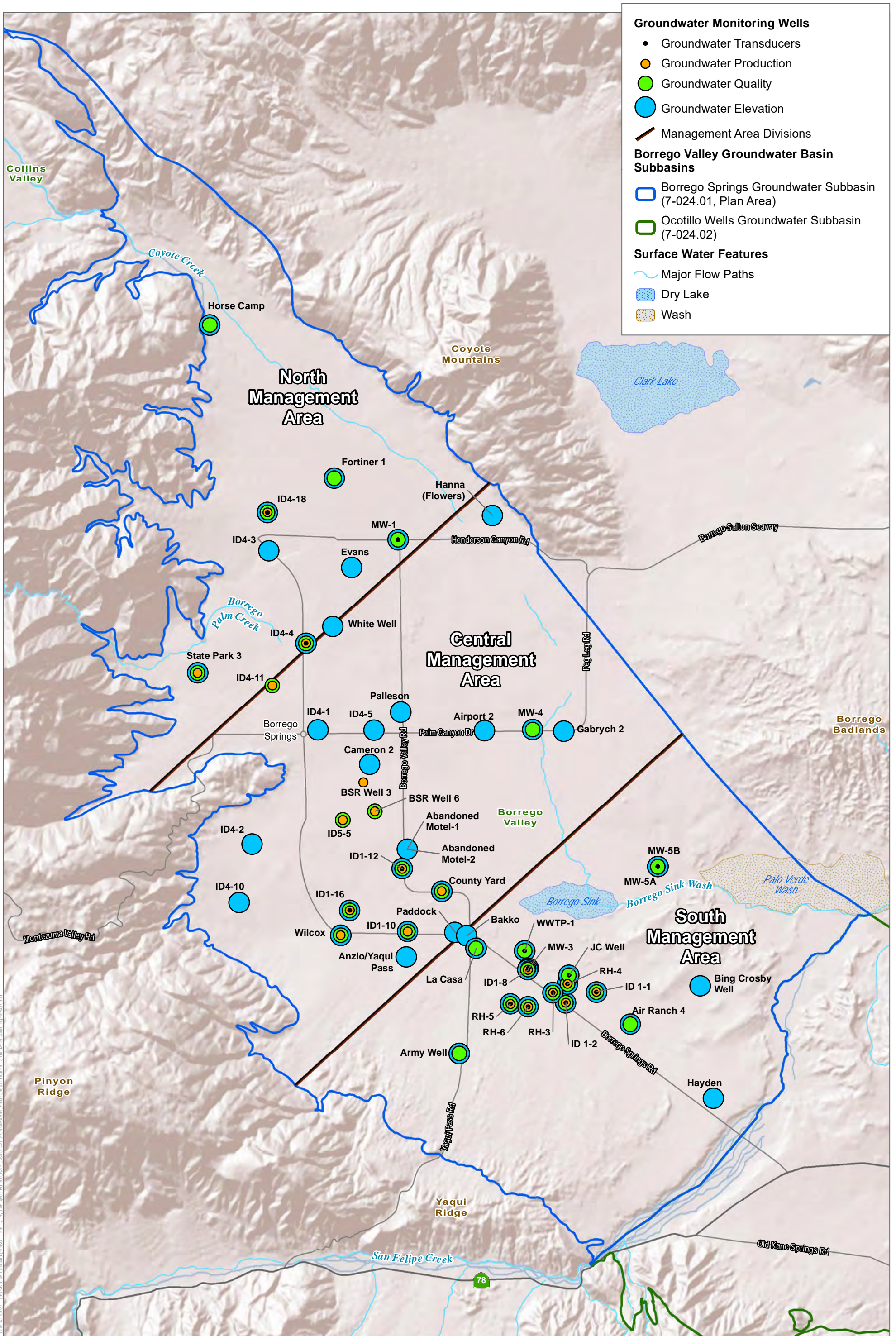
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SOURCE: NOAA (Borrego Desert Park Station)
 NOTE: Water year 1950 excluded due to insufficient data record

FIGURE 3
 Historical Water Year Precipitation and Cumulative Departure from Mean

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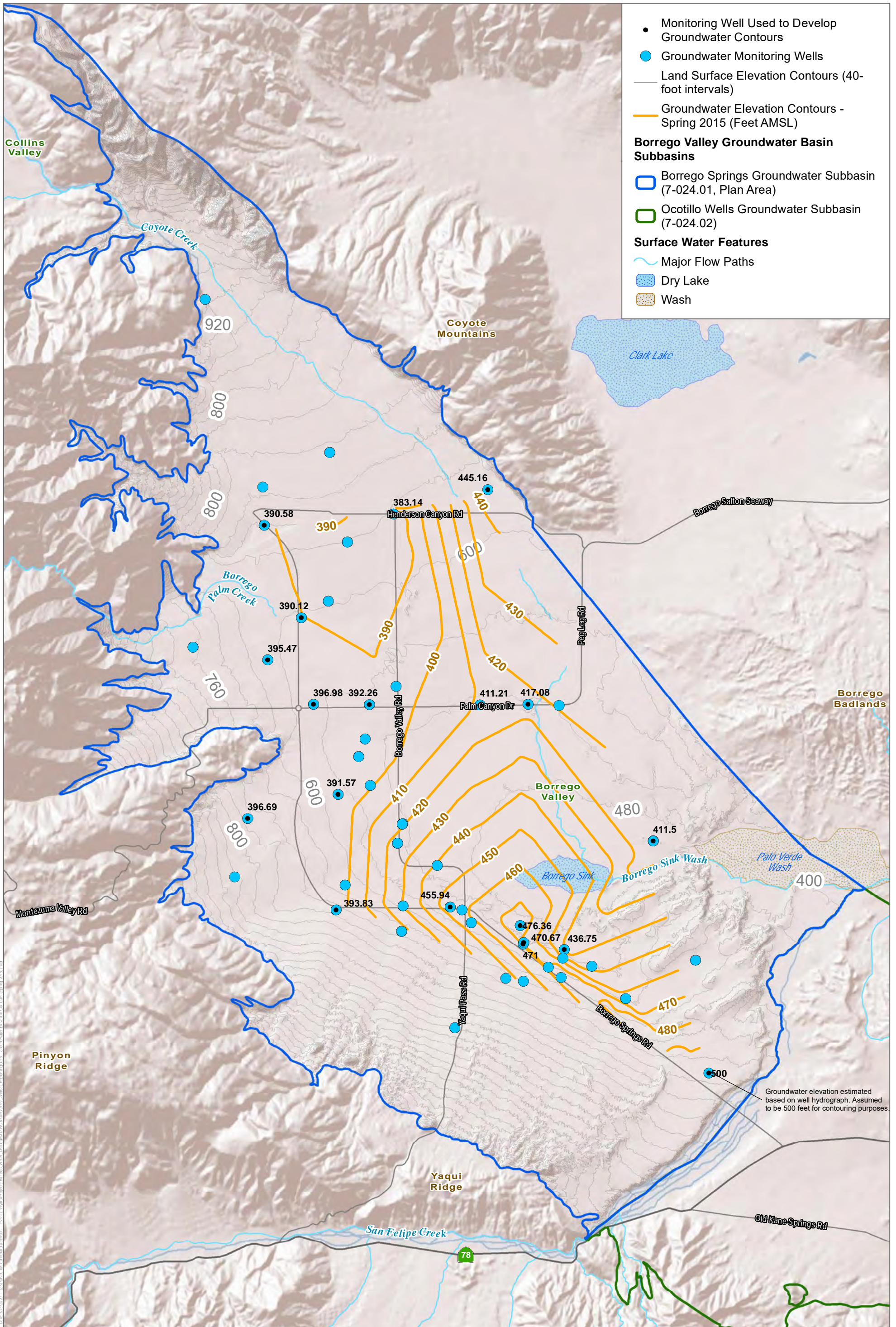
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DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 4
Groundwater Monitoring Network
Annual Report for the Borrego Springs Subbasin

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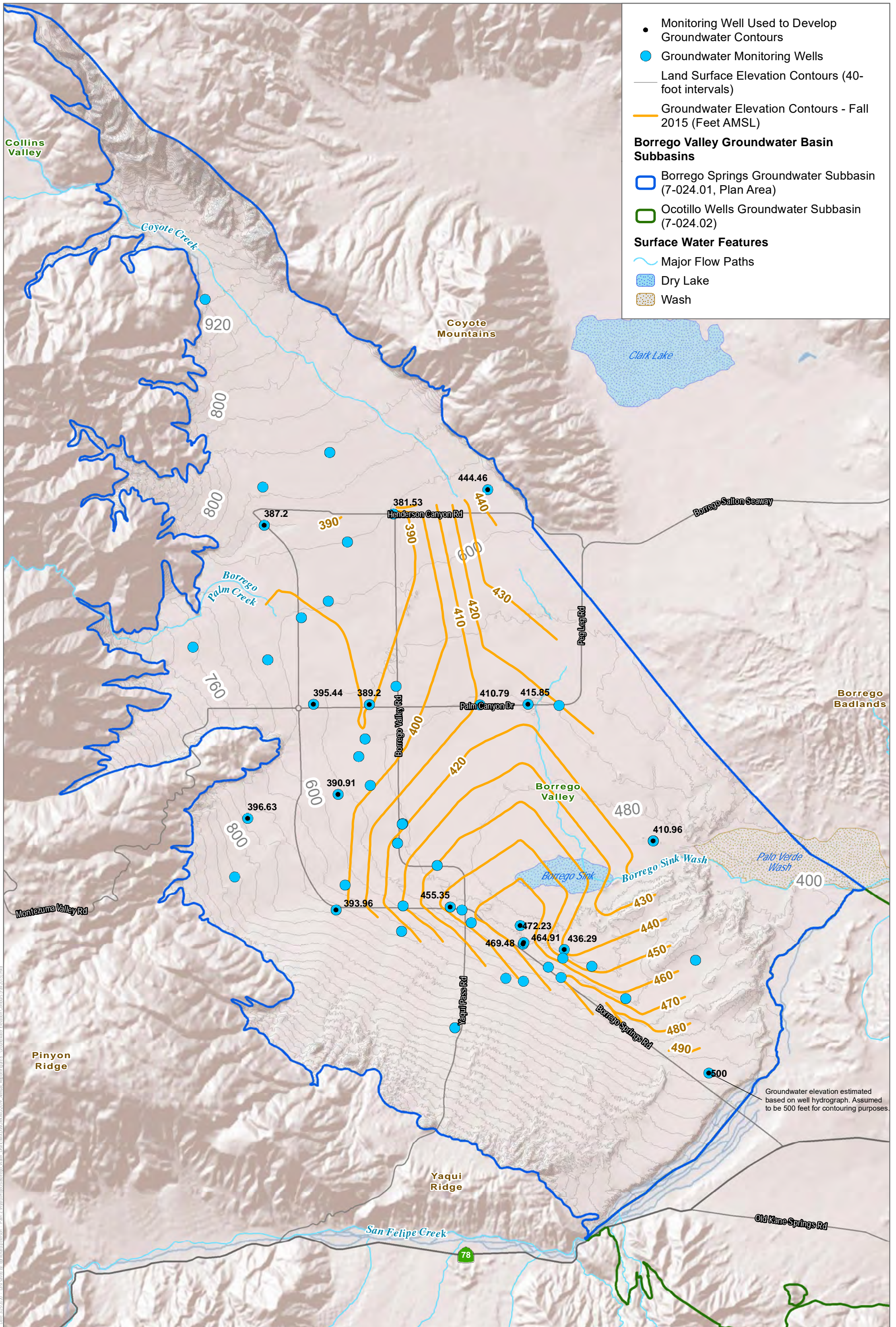


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 DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 5
 Groundwater Elevation Contours (Spring 2015)
 Annual Report for the Borrego Springs Subbasin

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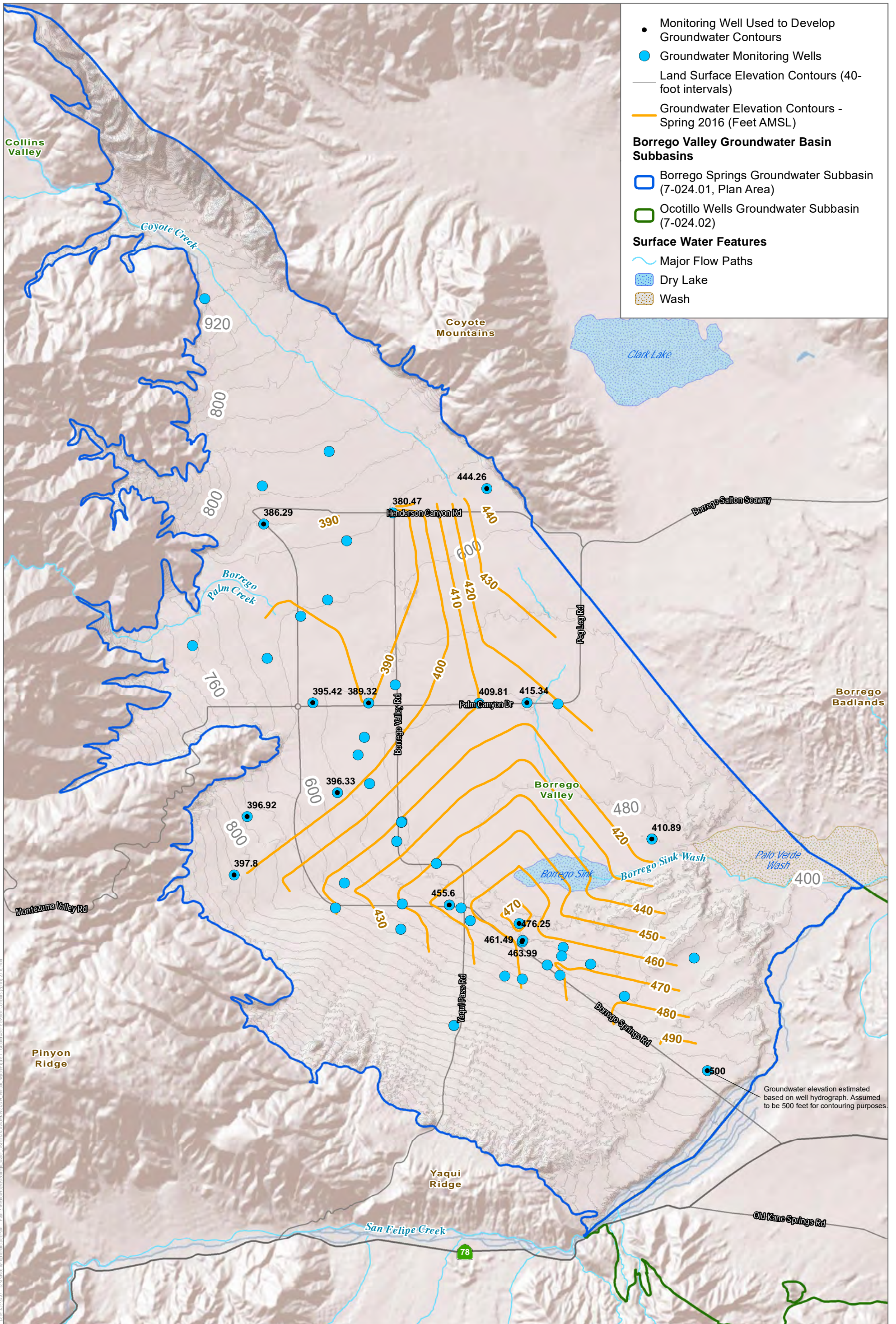
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DATUM: NAD 1983 DATA SOURCE: SanGIS

DUDEK 0 0.5 1 Miles

Figure 6
Groundwater Elevation Contours (Fall 2015)
Annual Report for the Borrego Springs Subbasin

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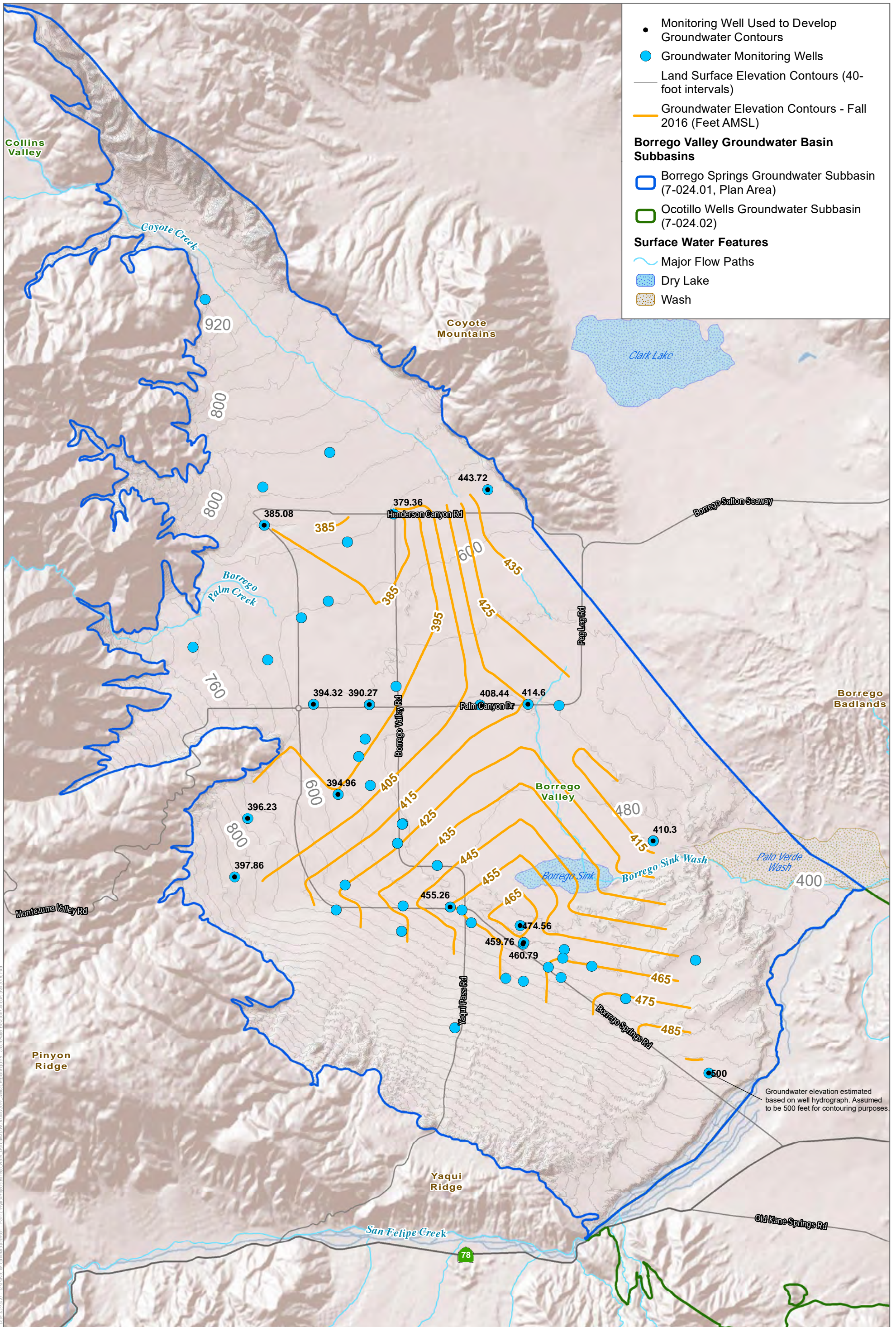


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 DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 7
 Groundwater Elevation Contours (Spring 2016)
 Annual Report for the Borrego Springs Subbasin

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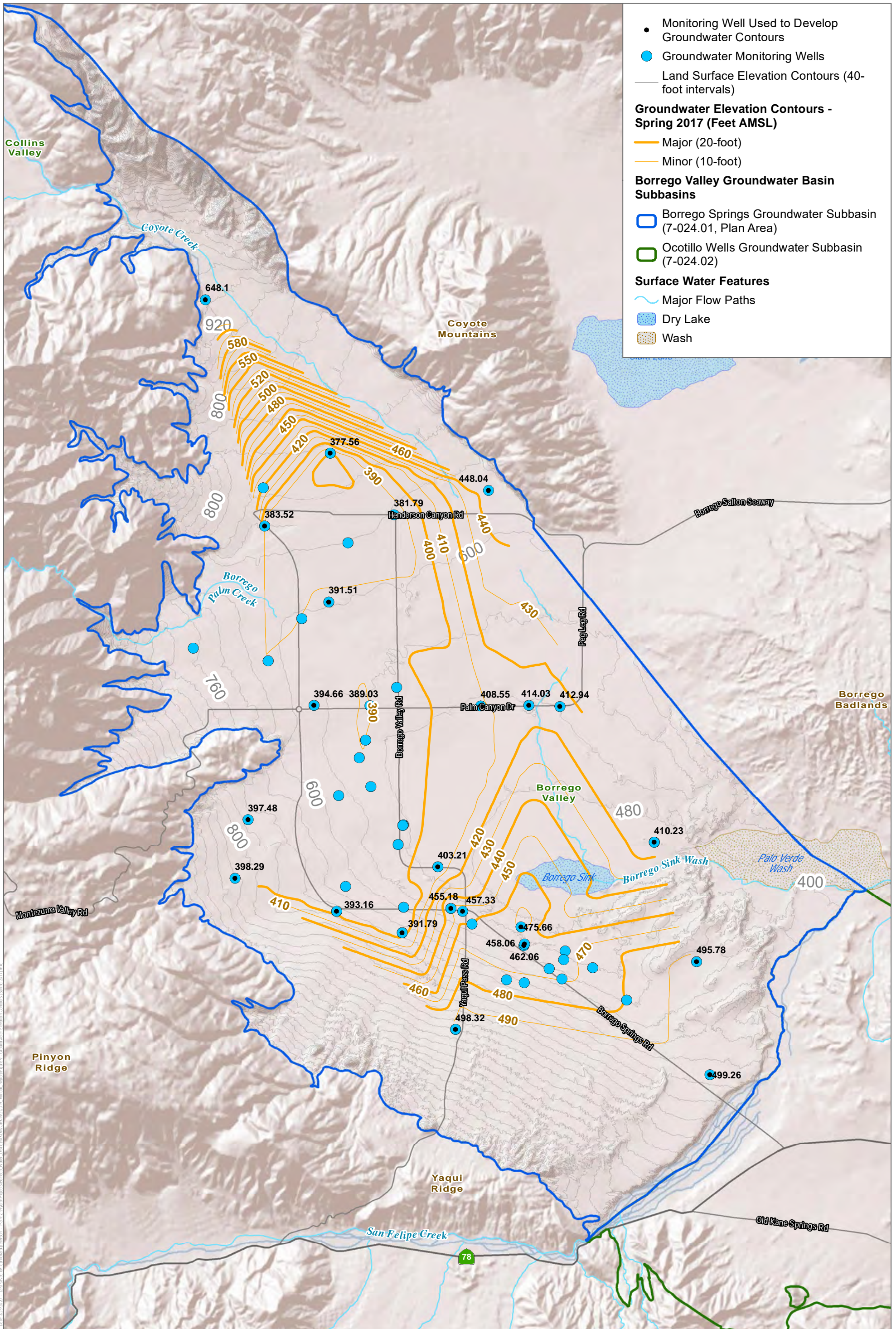


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 DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 8
 Groundwater Elevation Contours (Fall 2016)
 Annual Report for the Borrego Springs Subbasin

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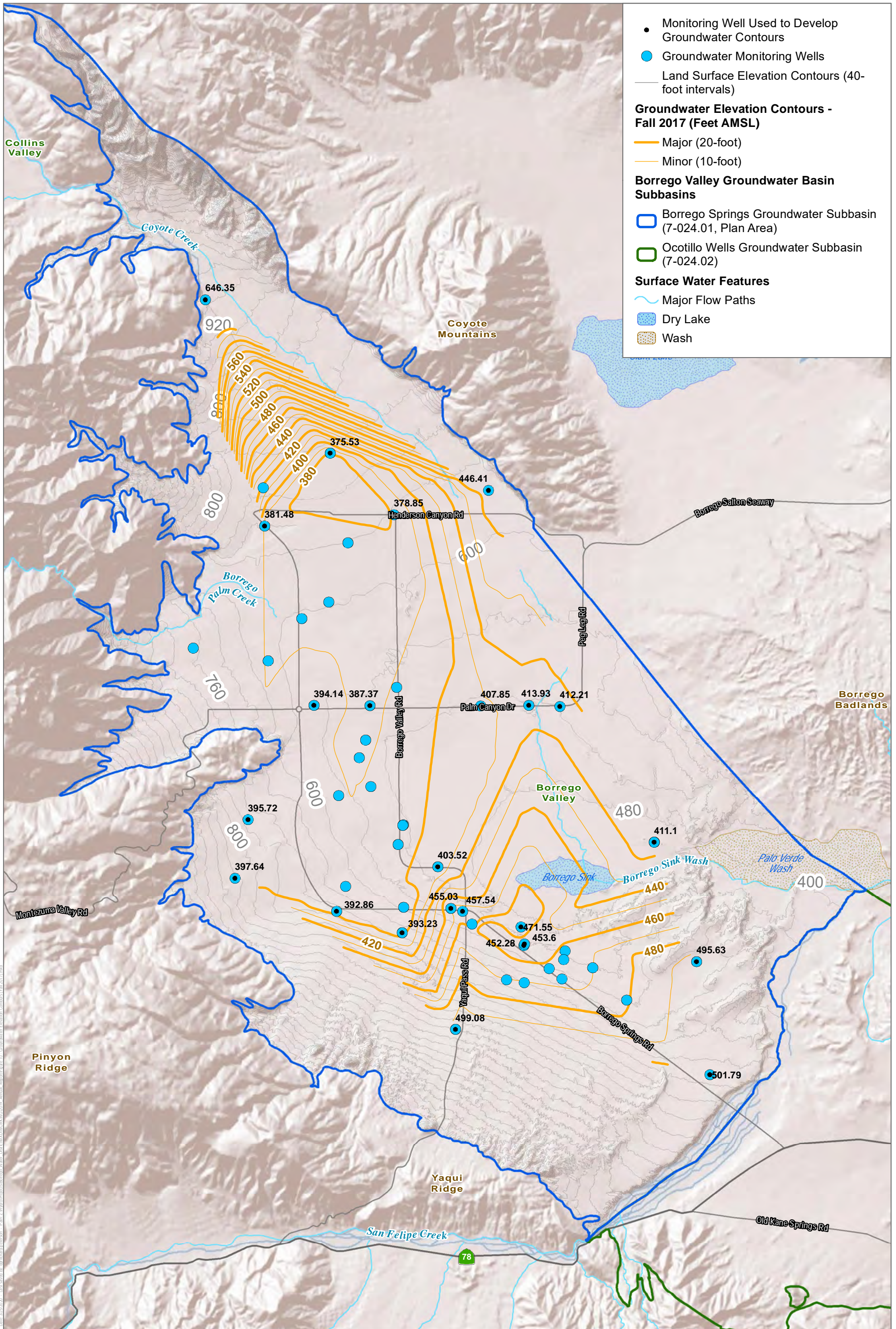
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DATUM: NAD 1983 DATA SOURCE: SanGIS

DUDEK 0 0.5 1 Miles

Figure 9
Groundwater Elevation Contours (Spring 2017)
Annual Report for the Borrego Springs Subbasin

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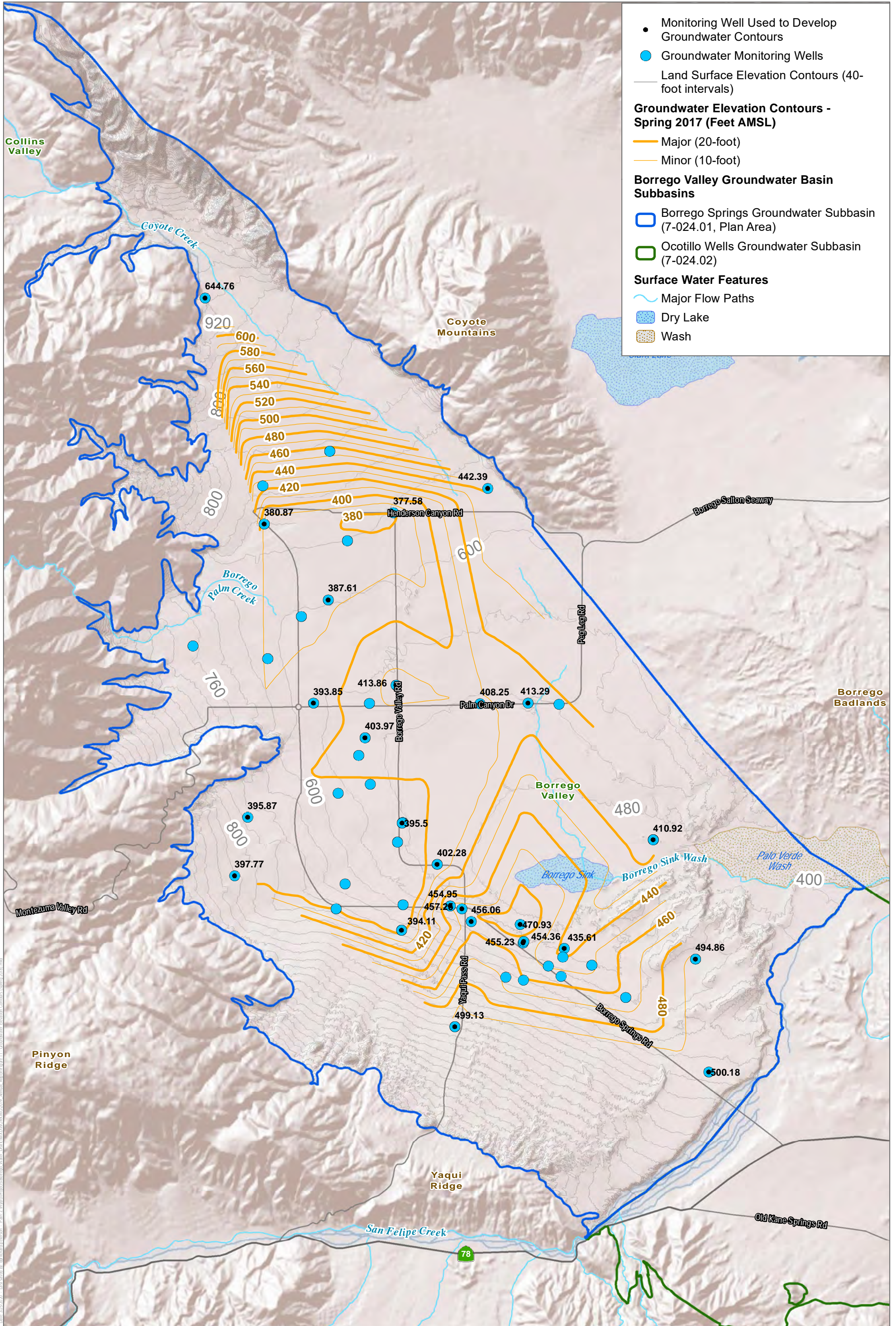
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DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 10
Groundwater Elevation Contours (Fall 2017)
Annual Report for the Borrego Springs Subbasin

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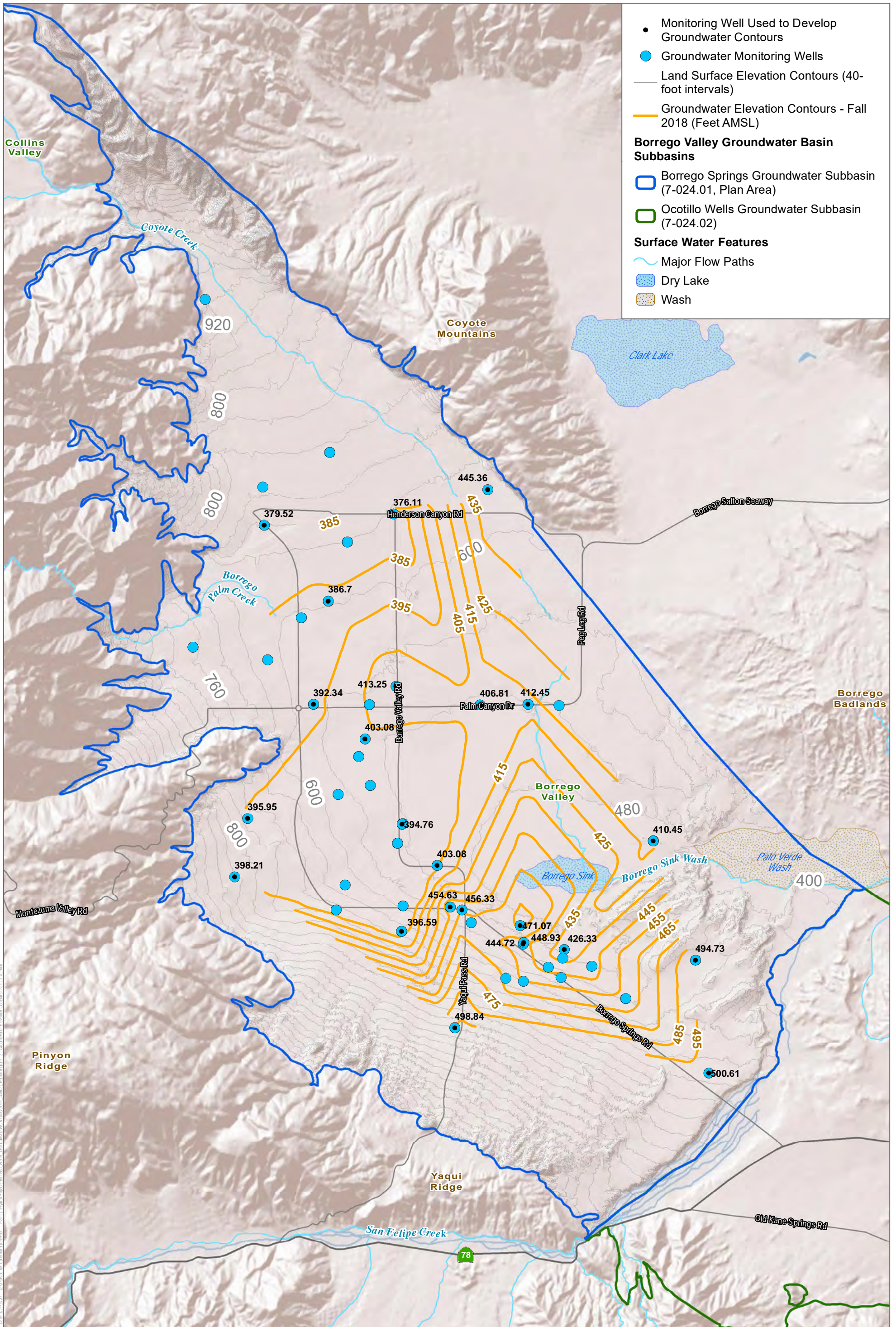
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DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 11
Groundwater Elevation Contours (Spring 2018)
Annual Report for the Borrego Springs Subbasin

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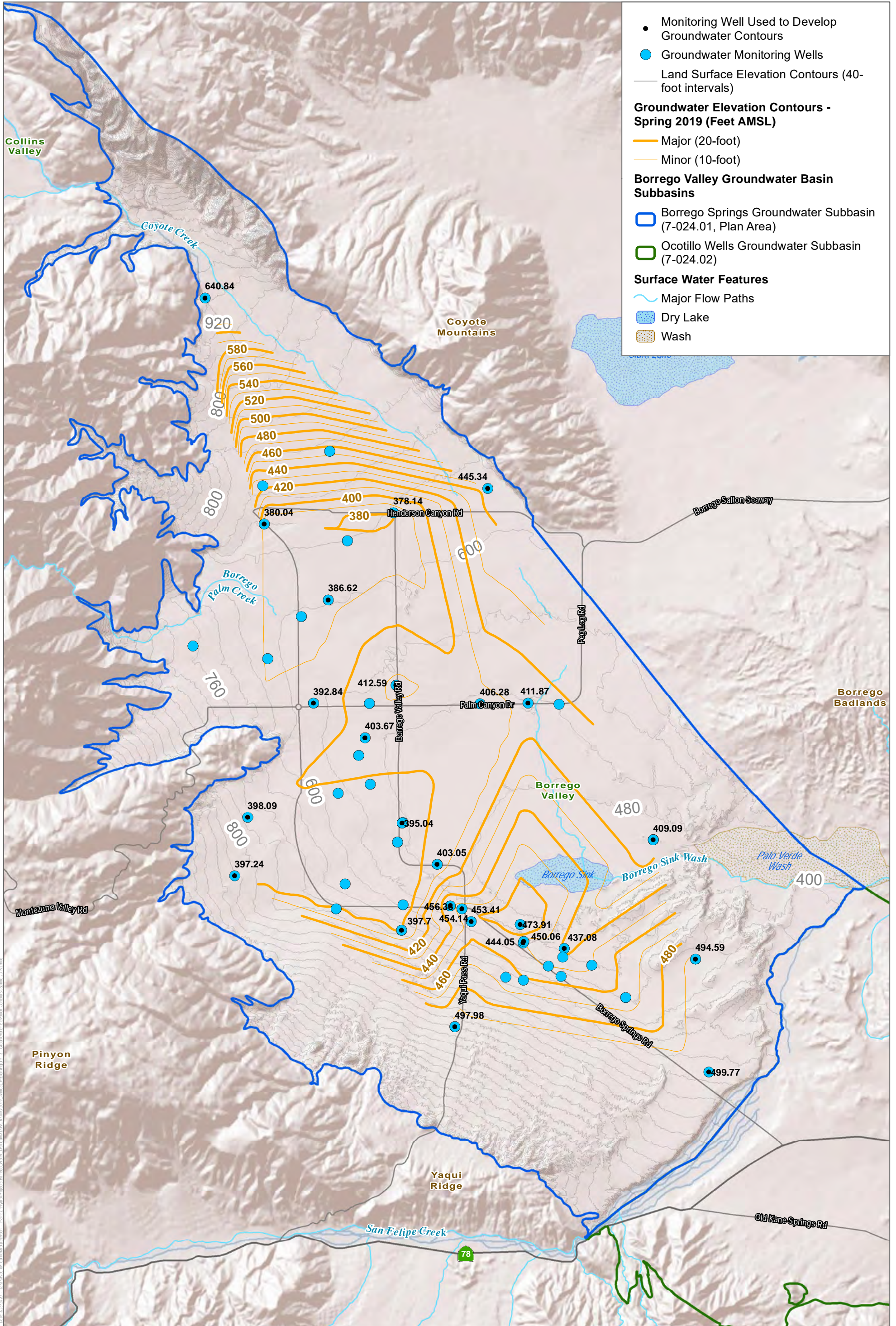
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DATUM: NAD 1983 DATA SOURCE: SanGIS

DUDEK 0 0.5 1 Miles

Figure 12
Groundwater Elevation Contours (Fall 2018)
Annual Report for the Borrego Springs Subbasin

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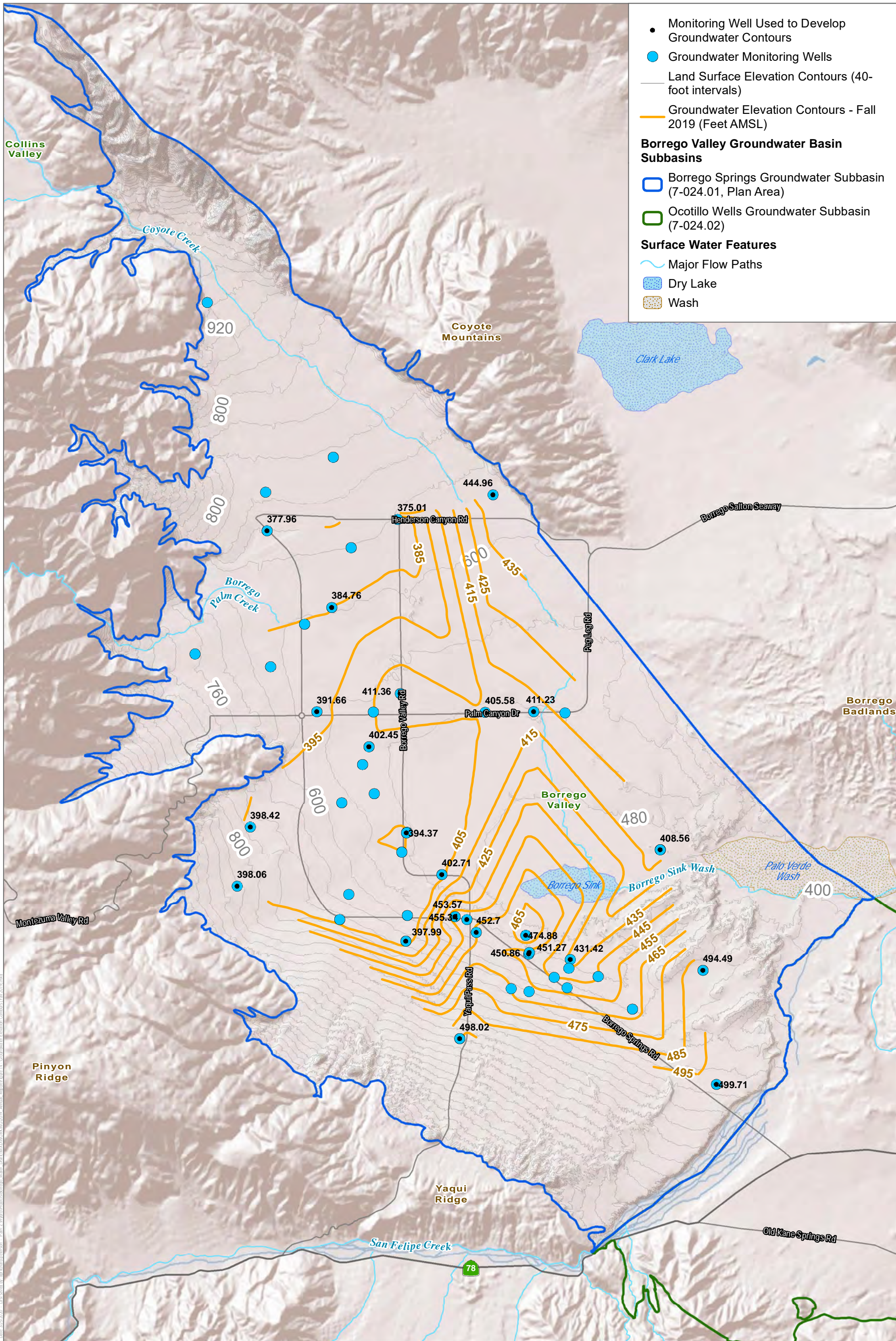
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DATUM: NAD 1983 DATA SOURCE: SanGIS

DUDEK 0 0.5 1 Miles

Figure 13
Groundwater Elevation Contours (Spring 2019)
Annual Report for the Borrego Springs Subbasin

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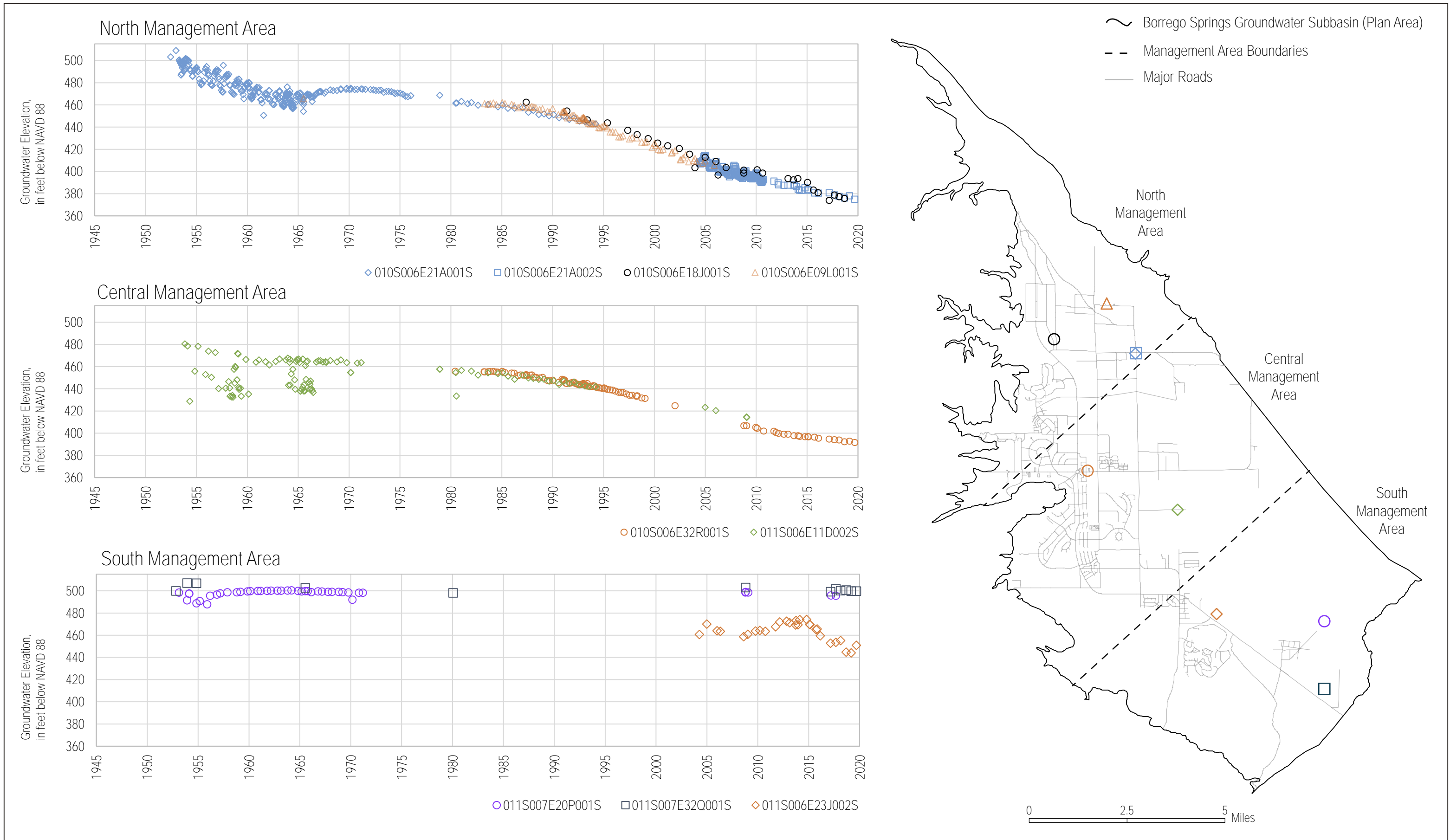
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Figure 14
Groundwater Elevation Contours (Fall 2019)
Annual Report for the Borrego Springs Subbasin

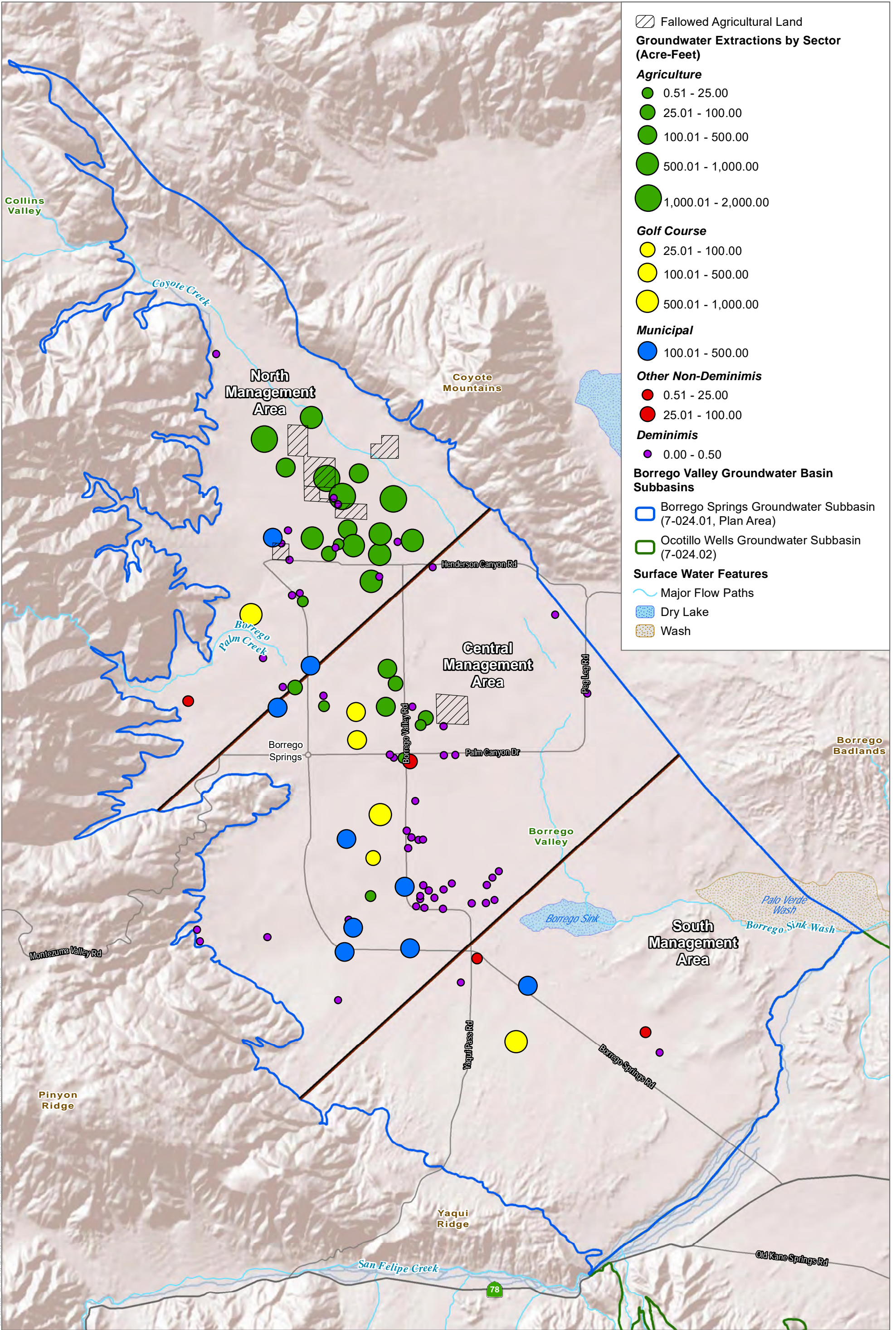
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SOURCE: USGS

FIGURE 15

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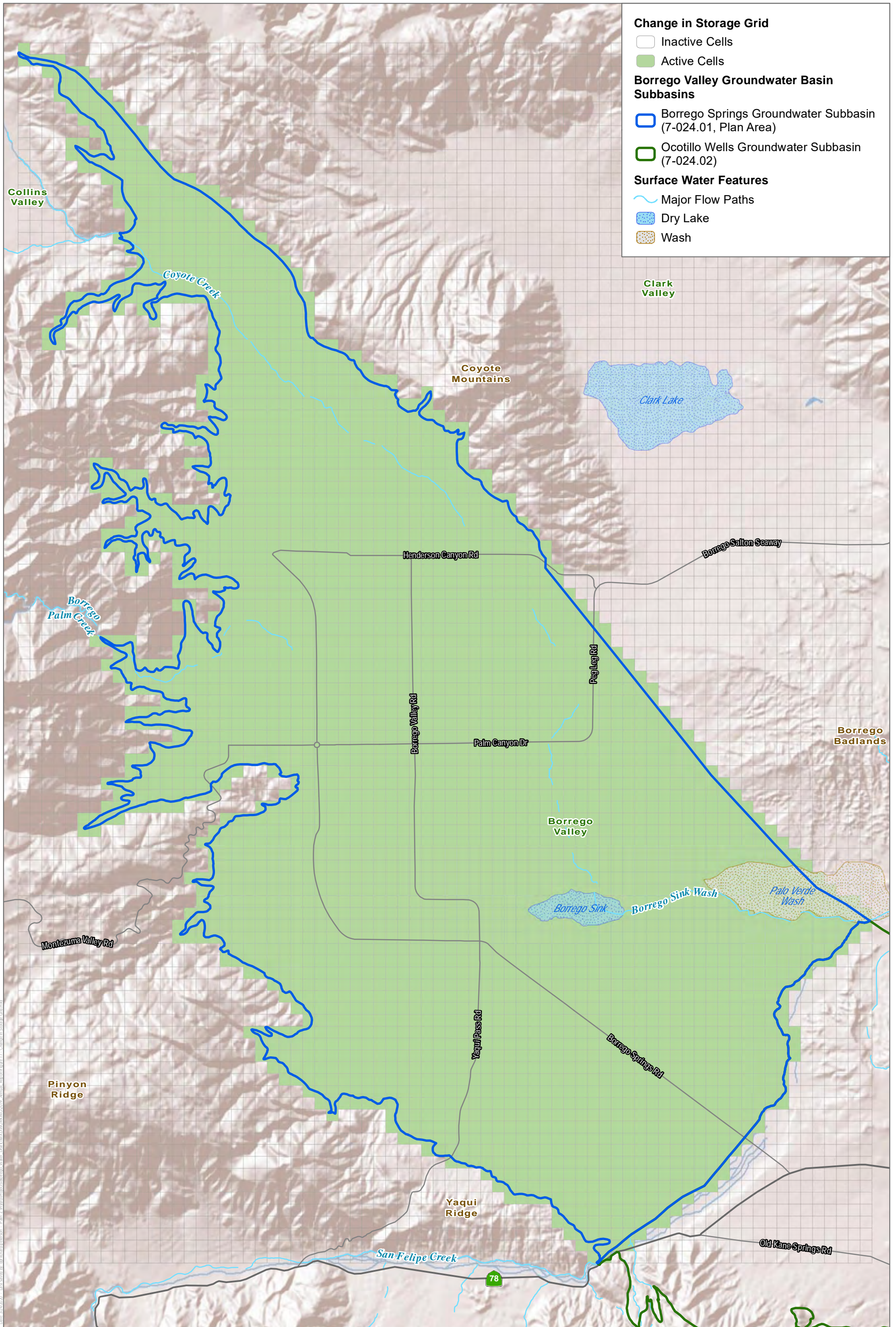
[Hatched Box] Fallowed Agricultural Land
Groundwater Extractions by Sector (Acre-Feet)
Agriculture
 ● 0.51 - 25.00
 ● 25.01 - 100.00
 ● 100.01 - 500.00
 ● 500.01 - 1,000.00
 ● 1,000.01 - 2,000.00
Golf Course
 ● 25.01 - 100.00
 ● 100.01 - 500.00
 ● 500.01 - 1,000.00
Municipal
 ● 100.01 - 500.00
Other Non-Deminimis
 ● 0.51 - 25.00
 ● 25.01 - 100.00
Deminimis
 ● 0.00 - 0.50
Borrego Valley Groundwater Basin Subbasins
 [Blue Outline] Borrego Springs Groundwater Subbasin (7-024.01, Plan Area)
 [Green Outline] Ocotillo Wells Groundwater Subbasin (7-024.02)
Surface Water Features
 [Blue Line] Major Flow Paths
 [Blue Stippled] Dry Lake
 [Orange Stippled] Wash

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 DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 16
 Groundwater Extractions by Sector (2019)
 Annual Report for the Borrego Springs Subbasin

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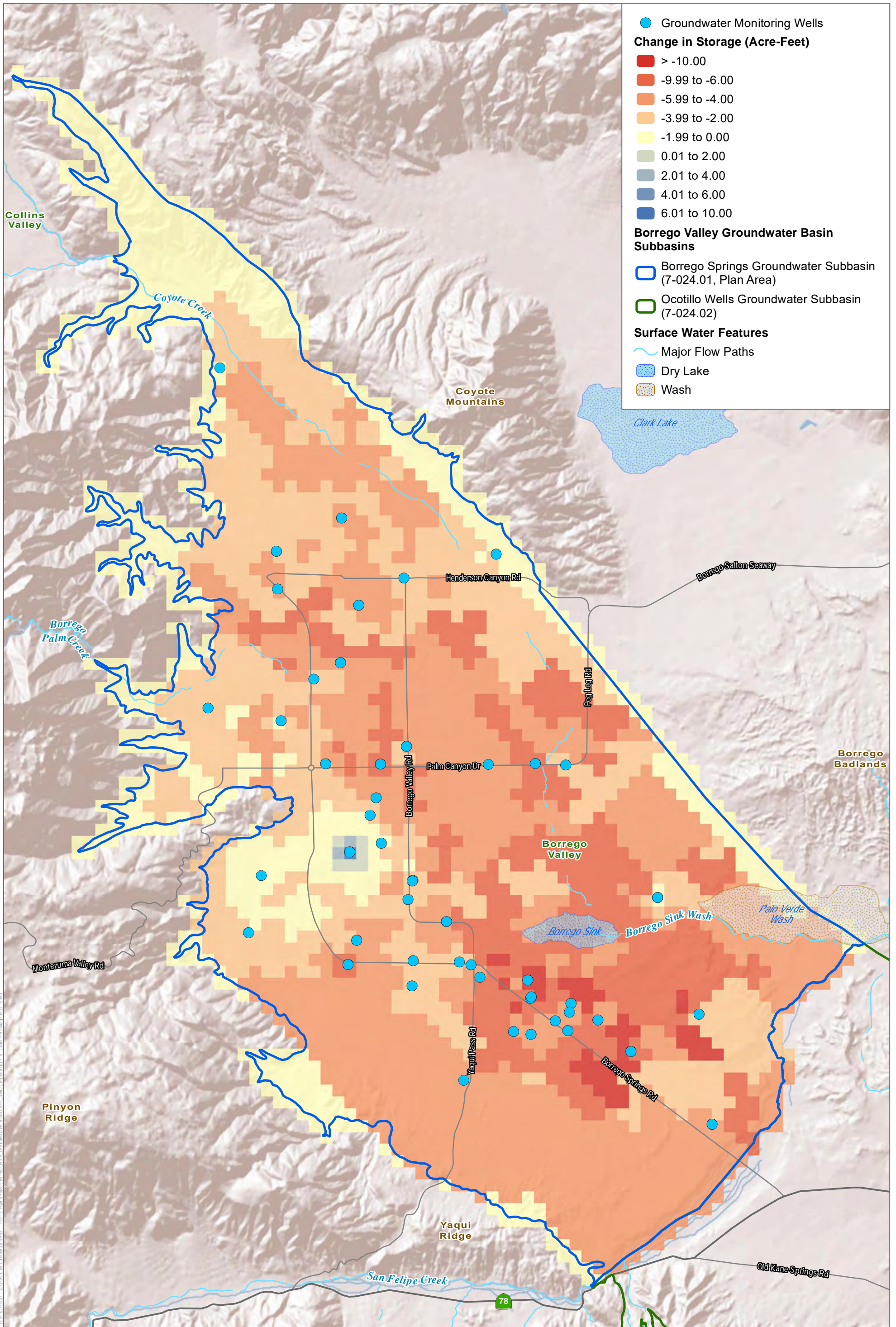
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DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 17
Change in Storage Grid

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Date: 02/20/20. Last saved by: agarcia@duke.com. Path: Z:\hydro\borrego\borrego_7\Annual_Report\Map\7-024\02402016_Annual_Report\Map_18_Change_in_Storage_18_18_16.mxd

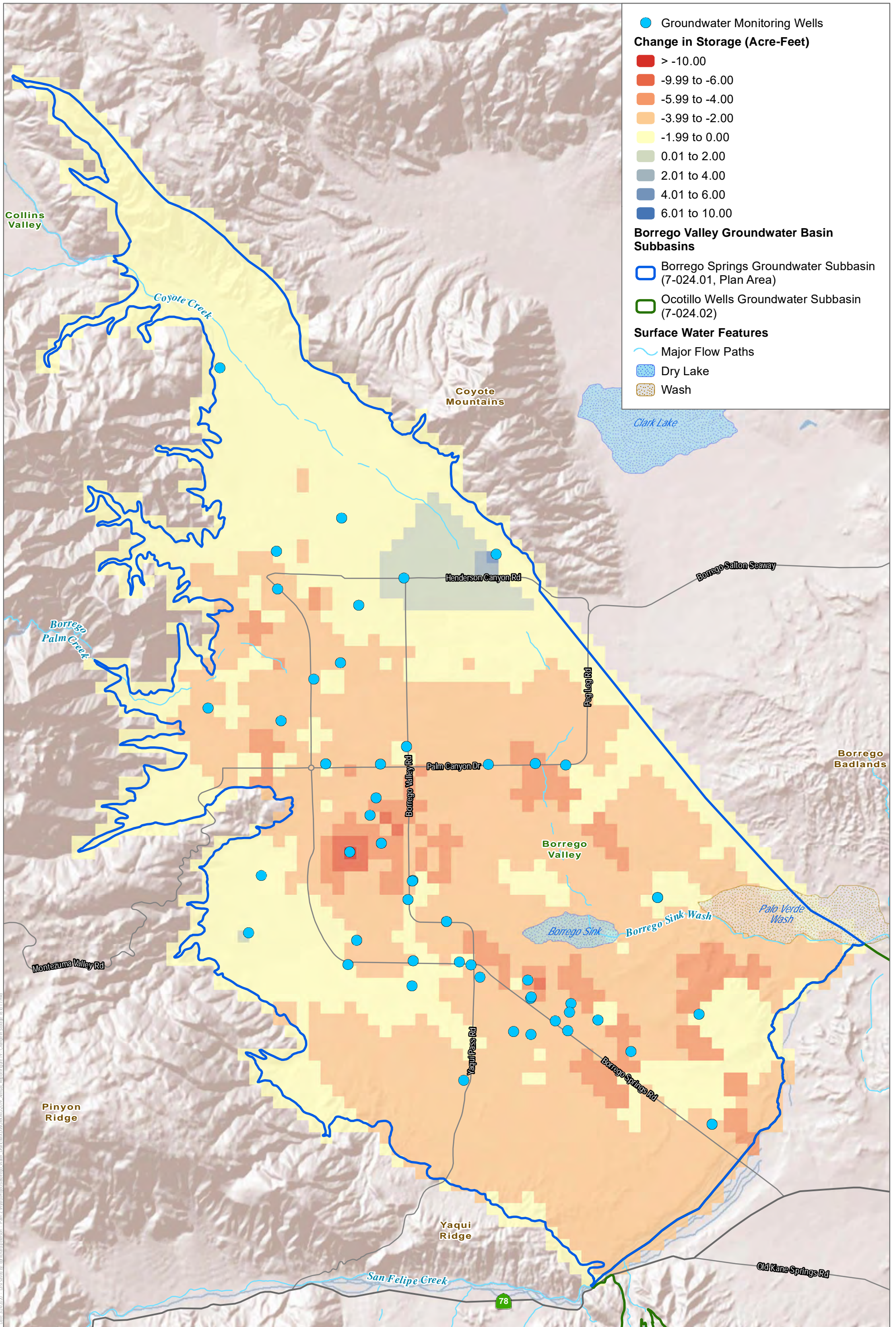
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DATUM: NAD 1983 DATA SOURCE: SanGIS

DUDEK 0 0.5 1 Miles

Figure 18
Change in Storage Spring 2015 to Spring 2016
Annual Report for the Borrego Springs Subbasin

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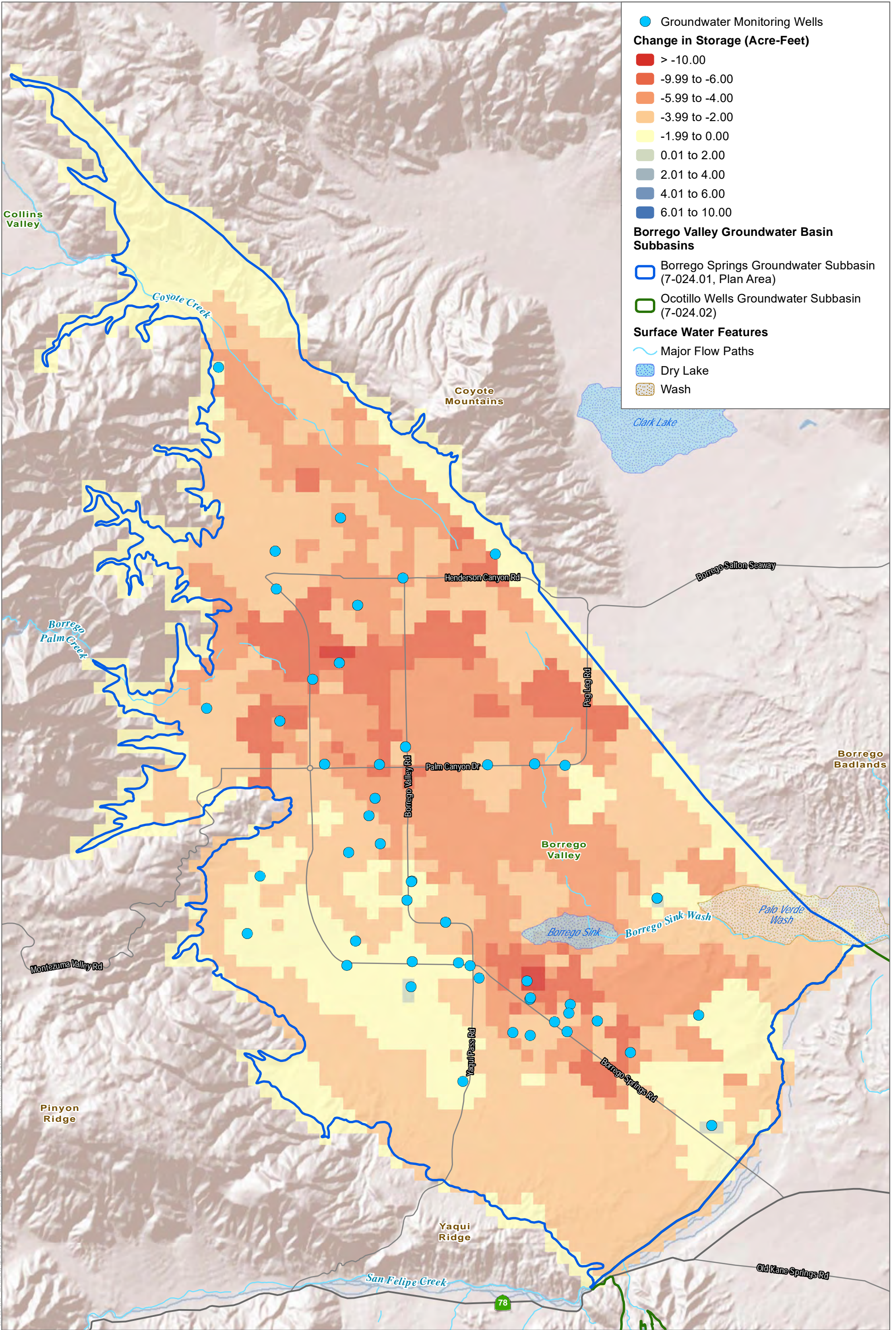
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DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 19
 Change in Storage Spring 2016 to Spring 2017
 Annual Report for the Borrego Springs Subbasin

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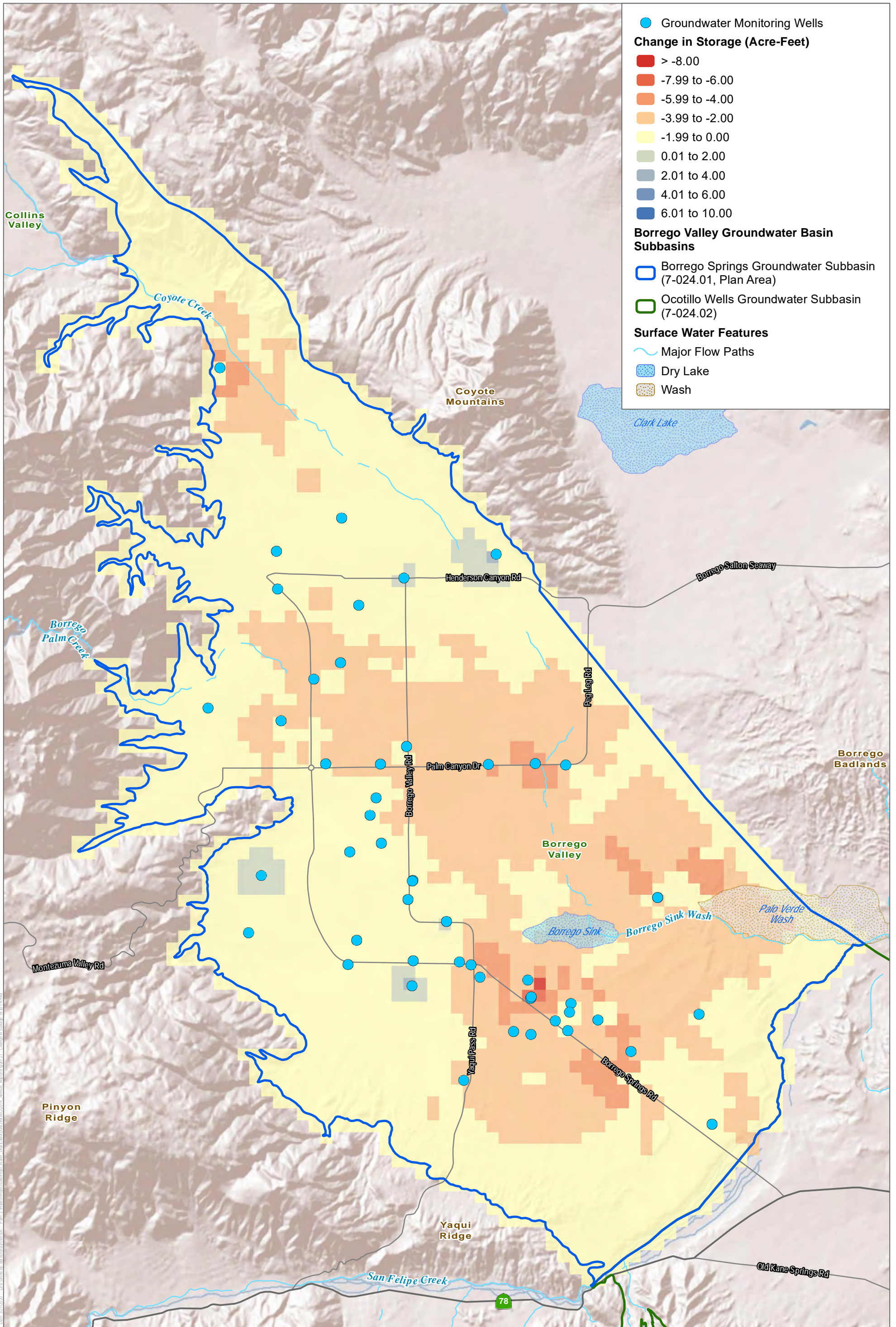
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DATUM: NAD 1983 DATA SOURCE: SanGIS



Figure 20
Change in Storage Spring 2017 to Spring 2018
Annual Report for the Borrego Springs Subbasin

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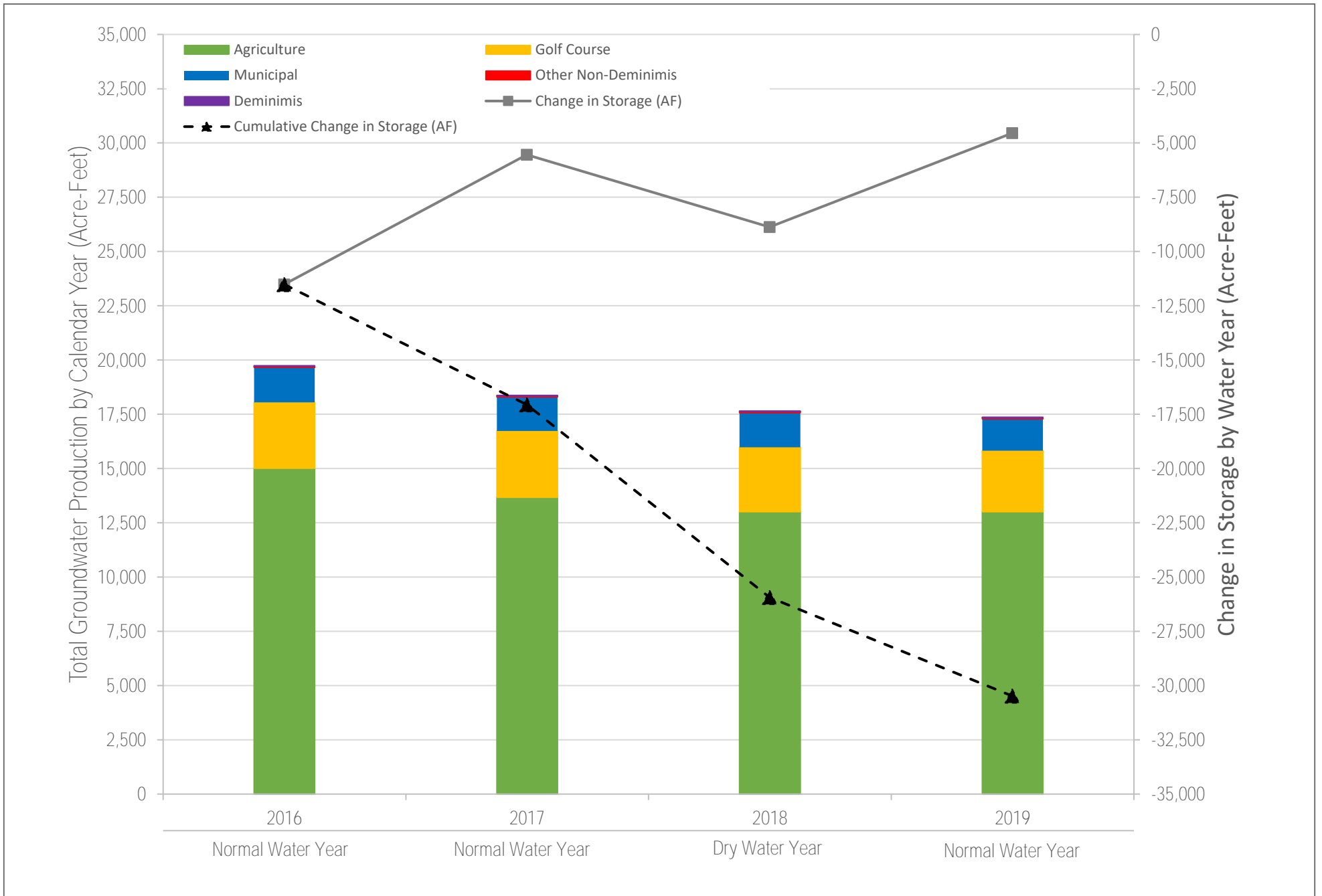
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DATUM: NAD 1983 DATA SOURCE: SanGIS

DUDEK 0 0.5 1 Miles

Figure 21
Change in Storage Spring 2018 to Spring 2019
Annual Report for the Borrego Springs Subbasin **77**

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NOTE: Water year type based on Borrego Desert Park Station data

FIGURE 22

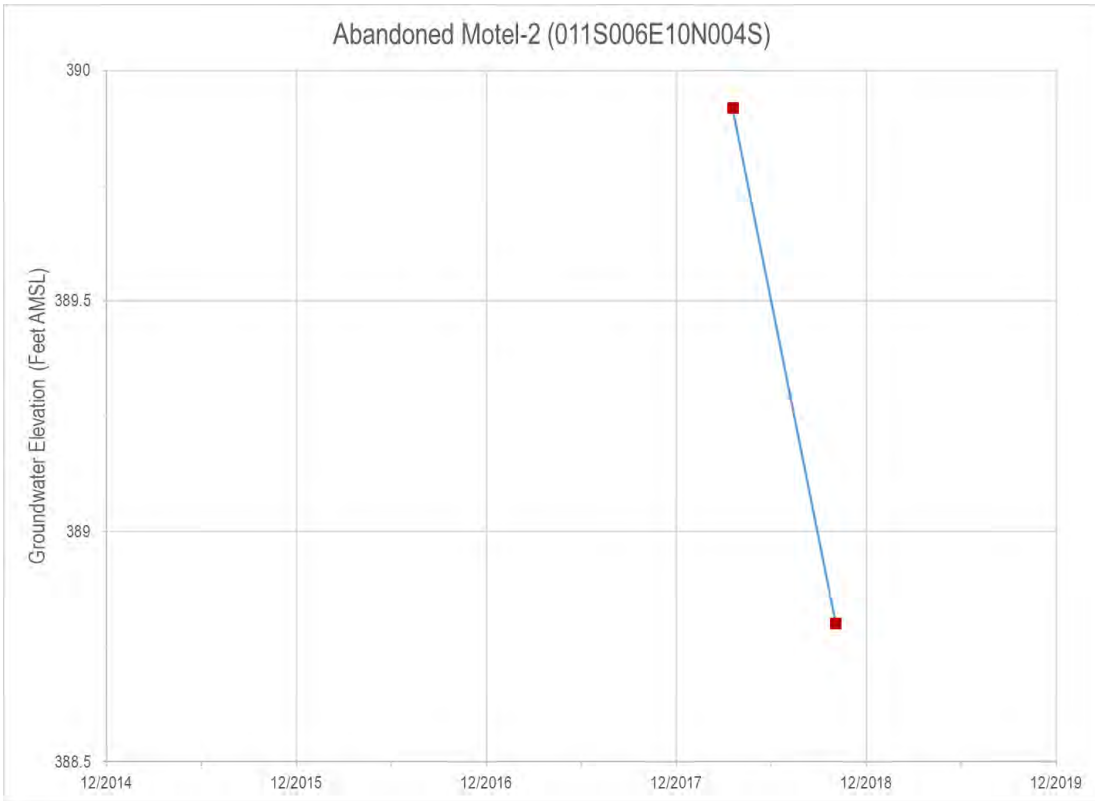
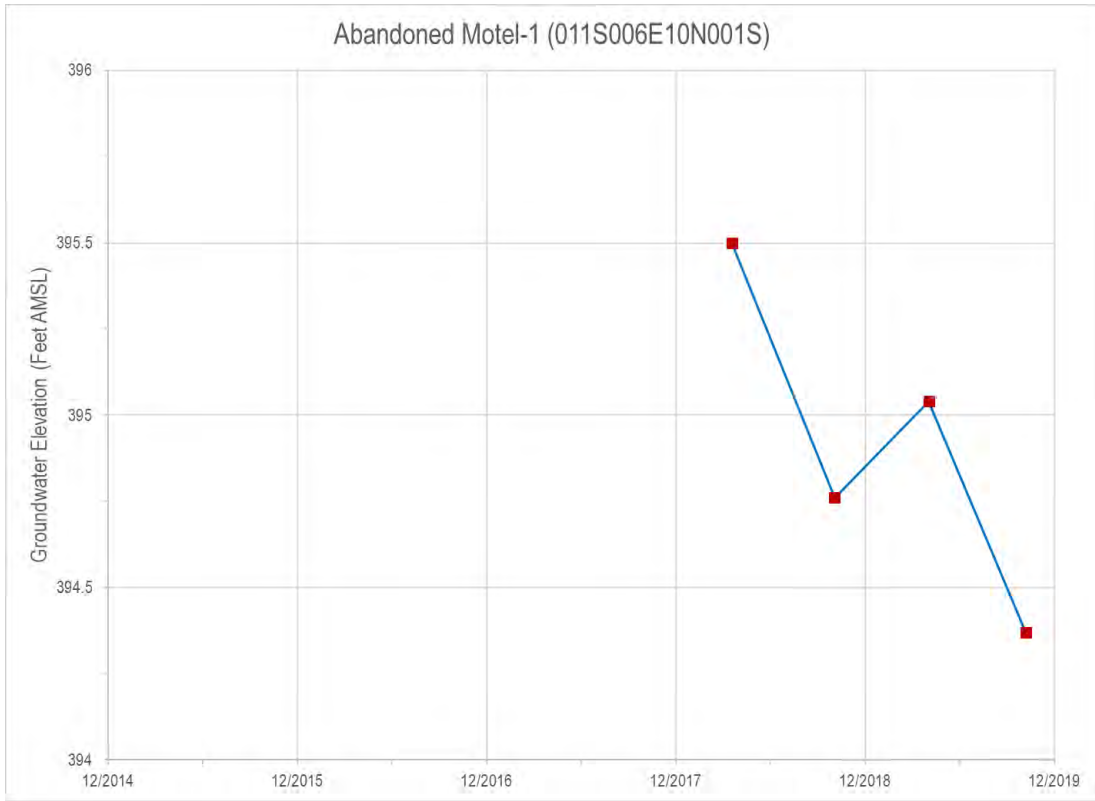
Annual and Cumulative Change in Storage

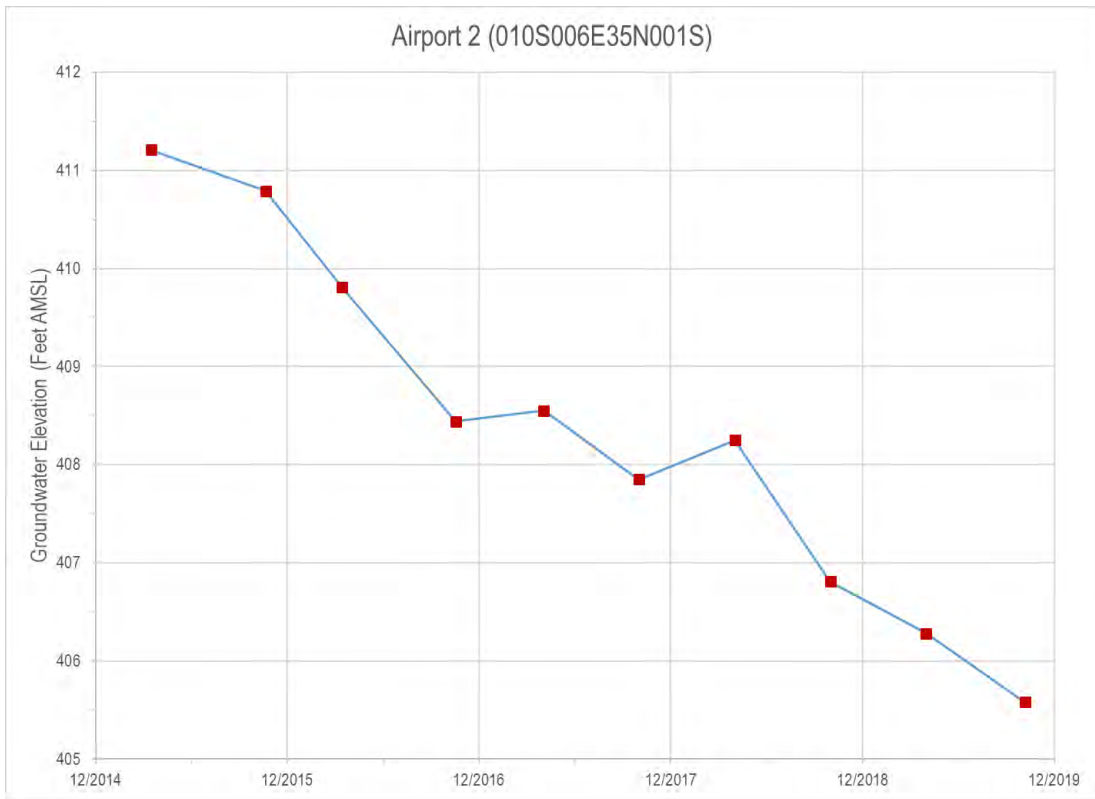
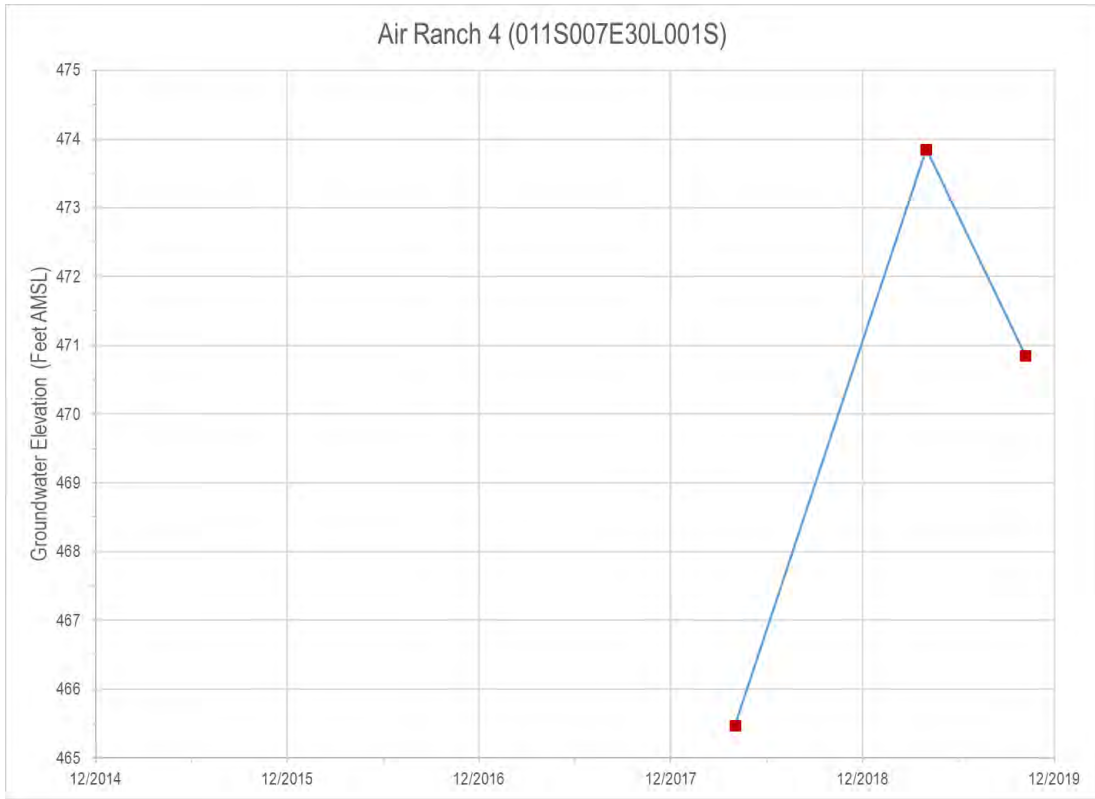
Annual Report for the Borrego Springs Subbasin

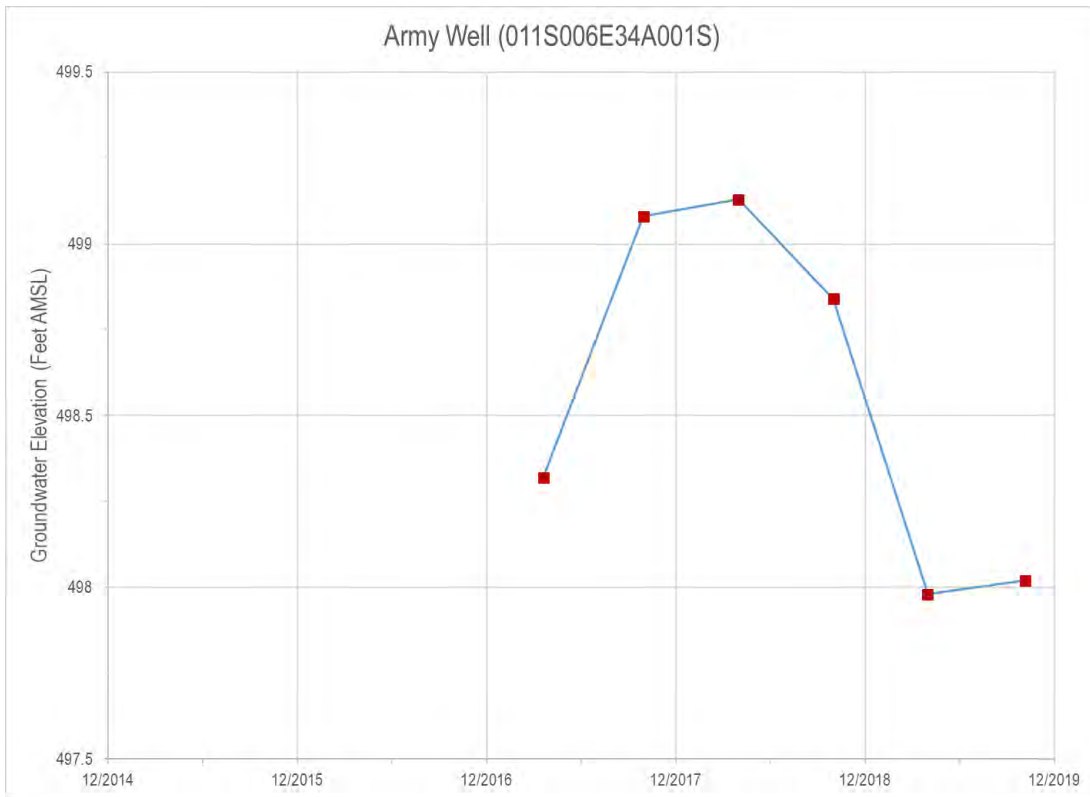
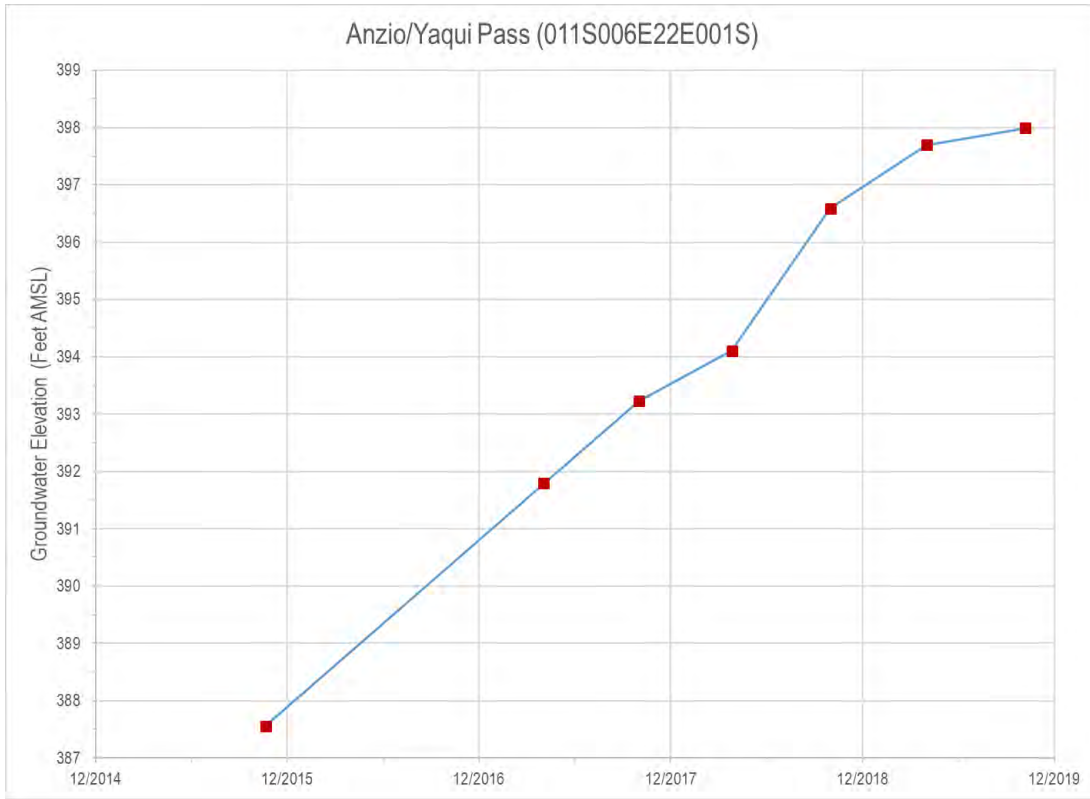
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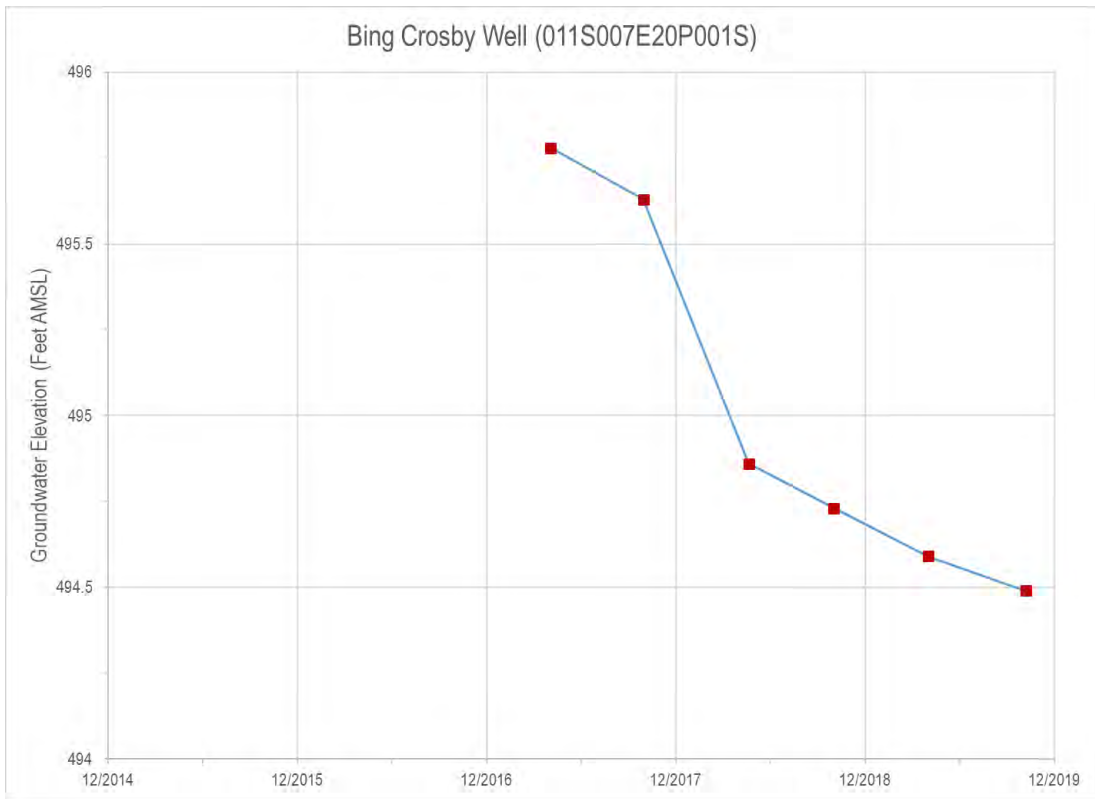
Appendix A

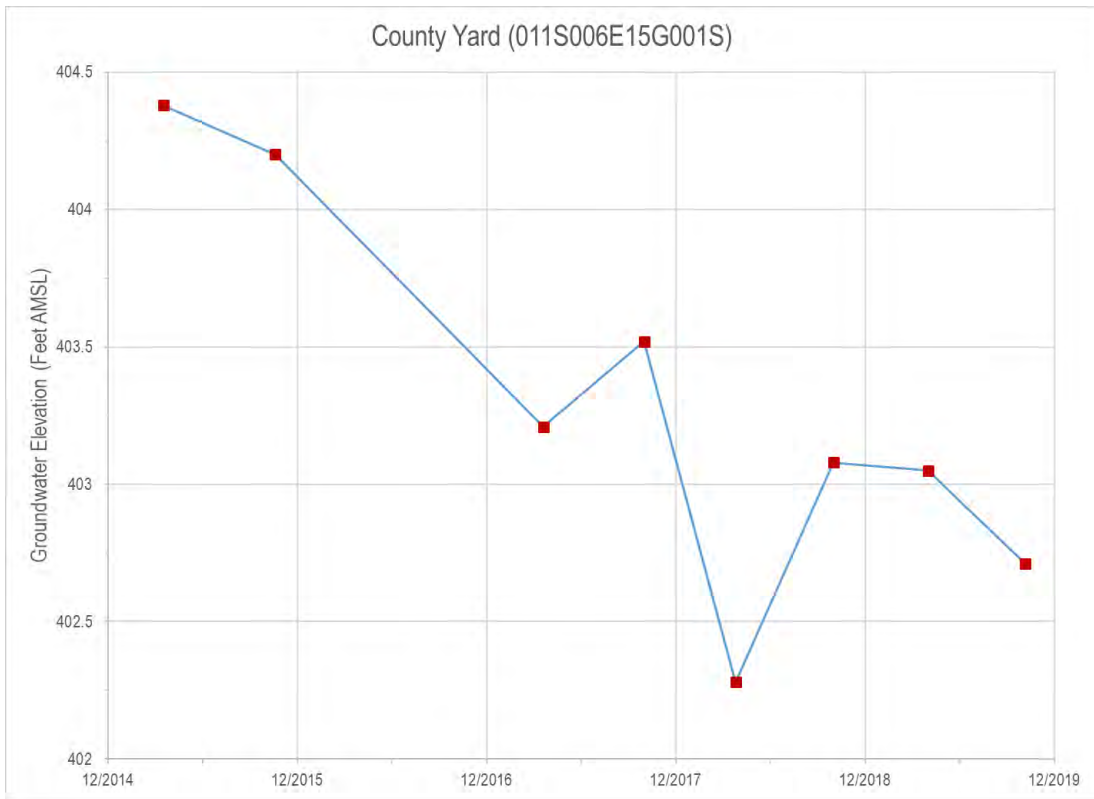
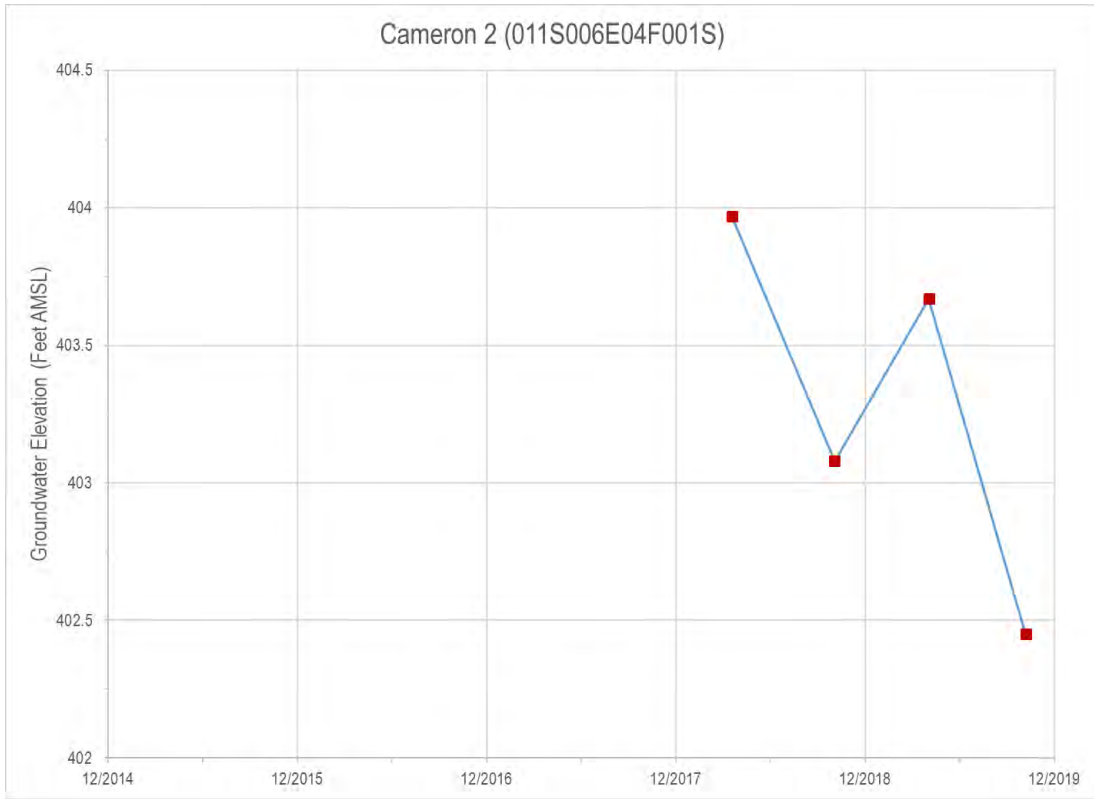
Monitoring Well Hydrographs

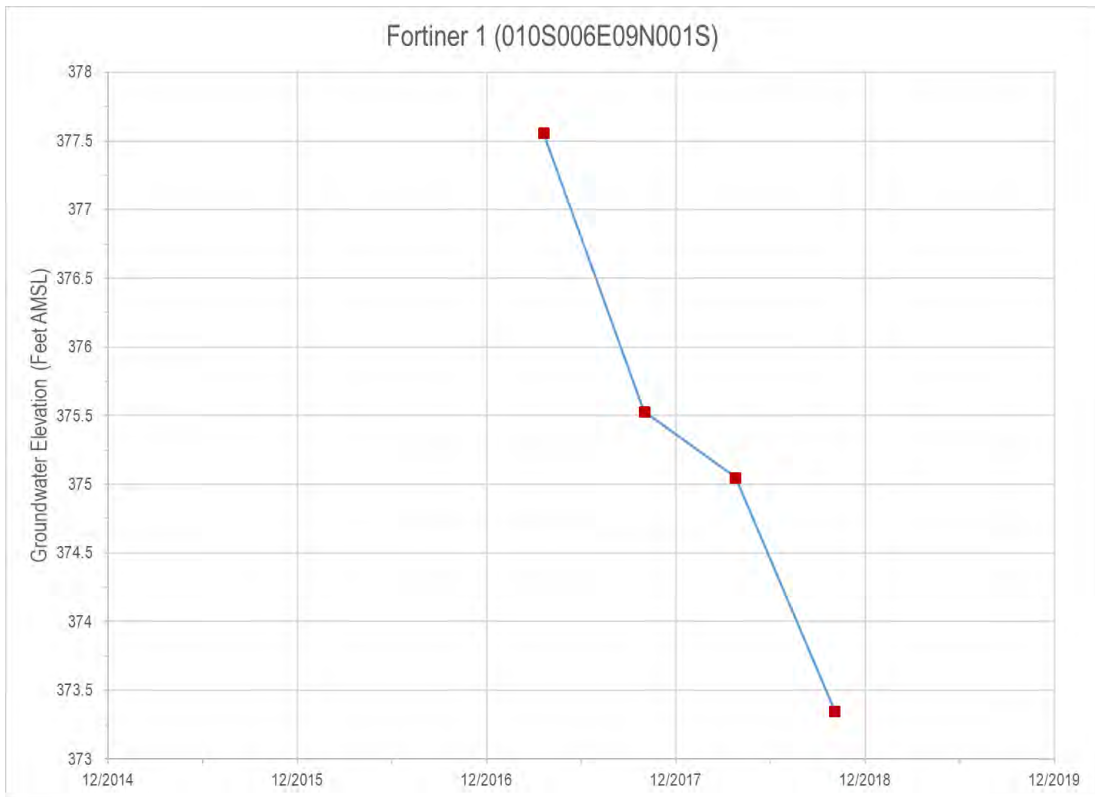
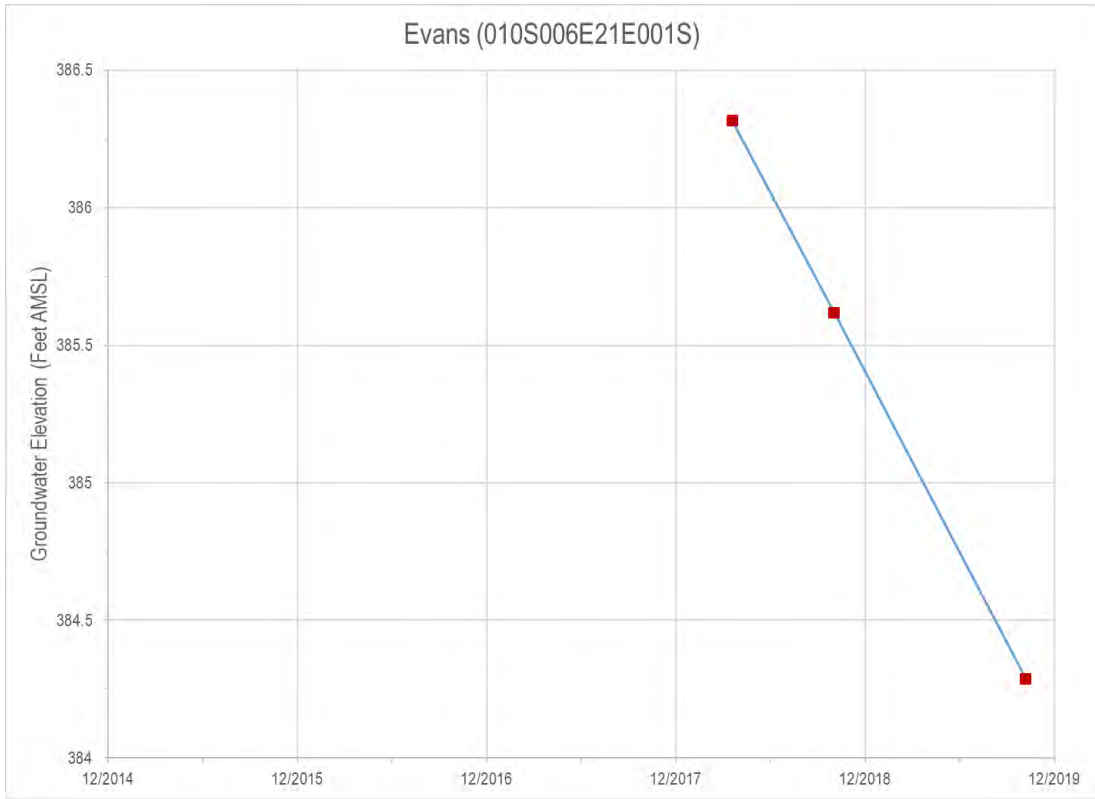


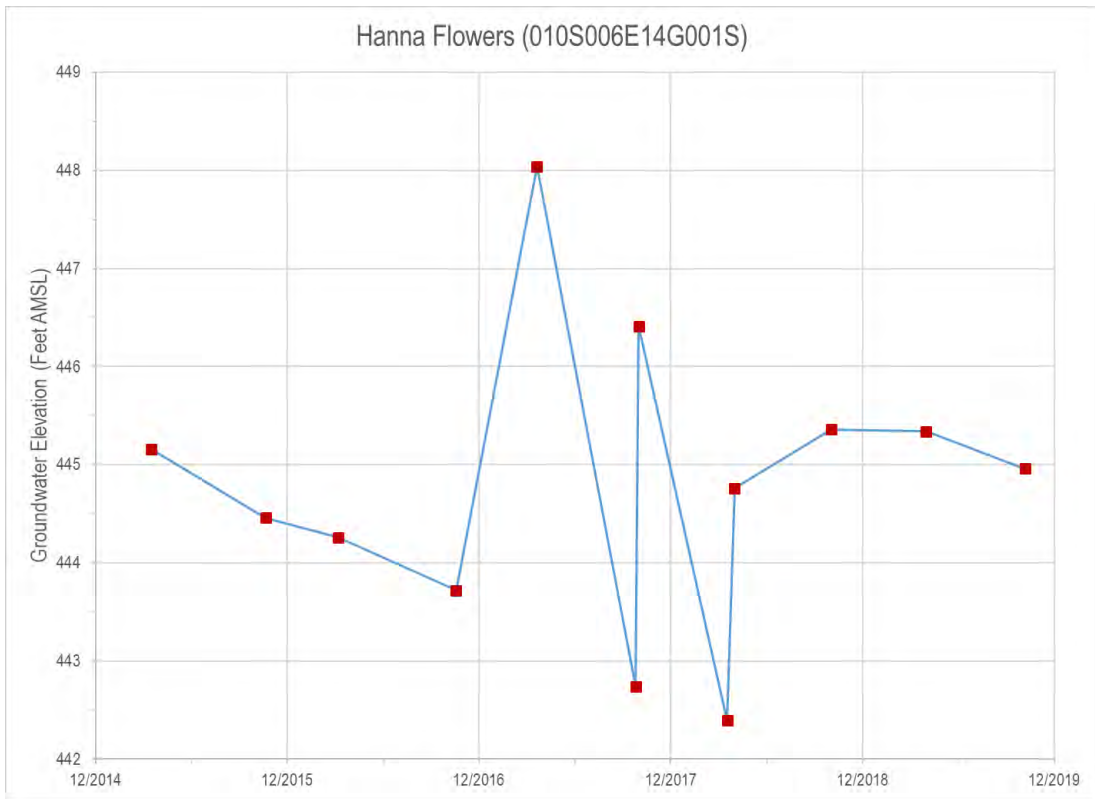
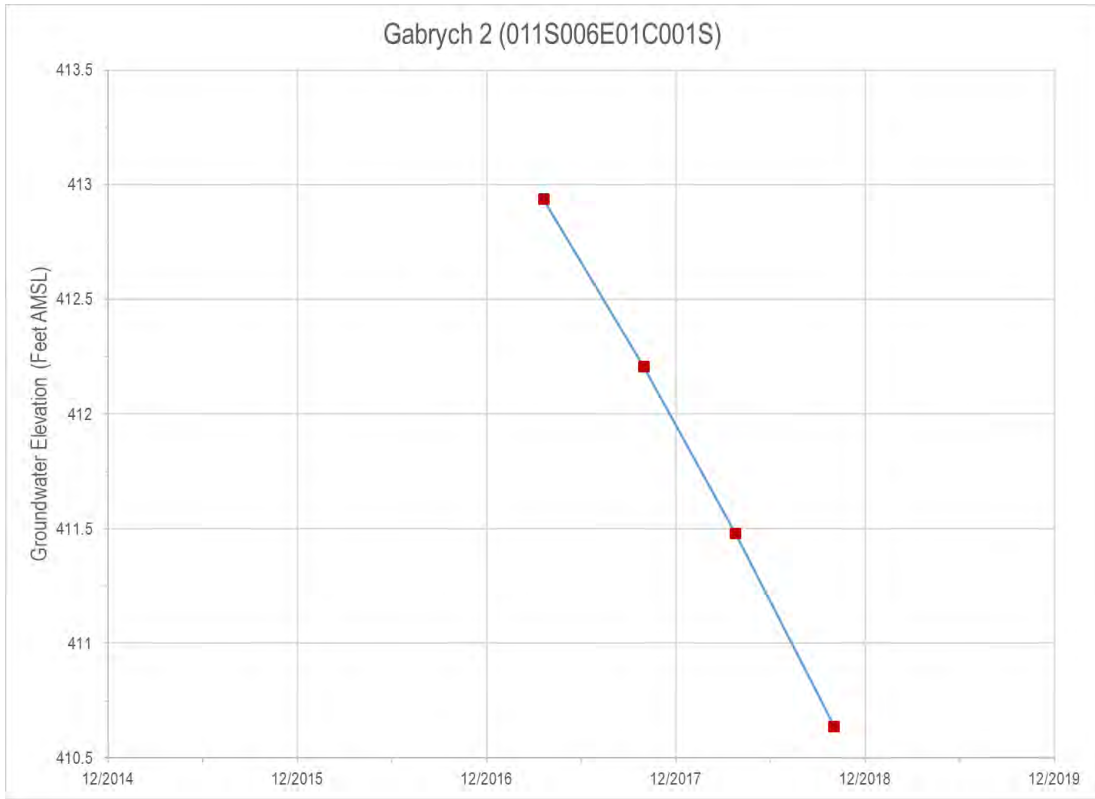


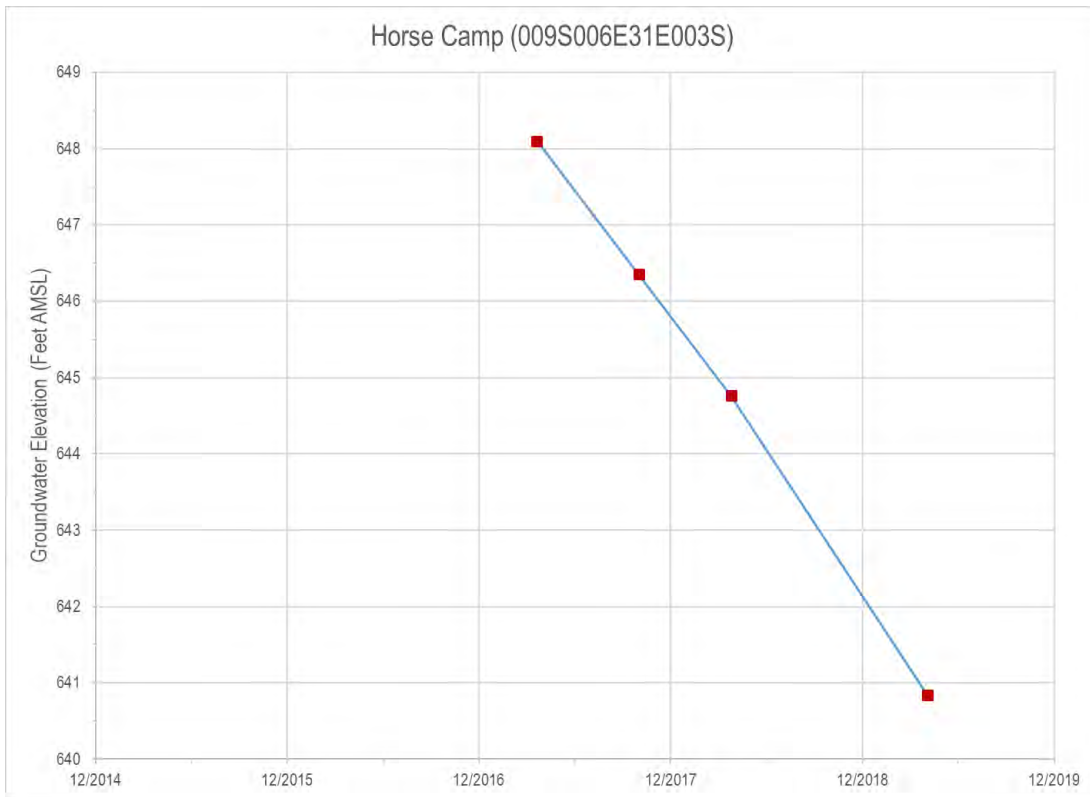
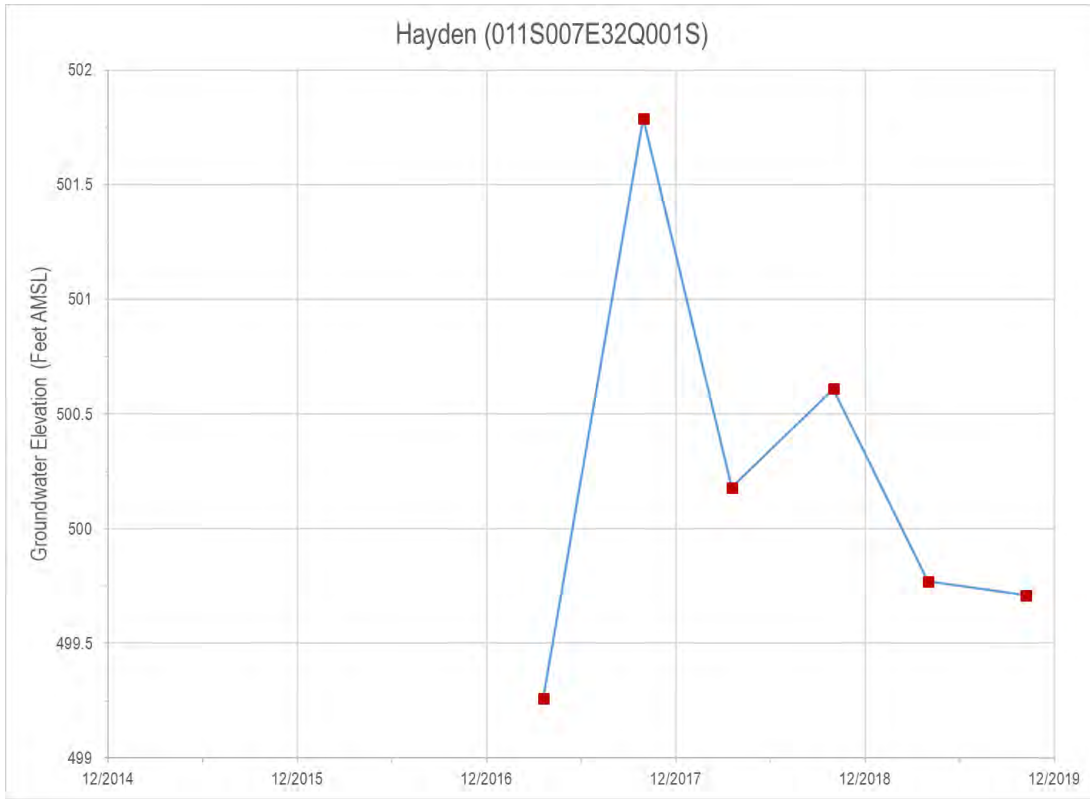


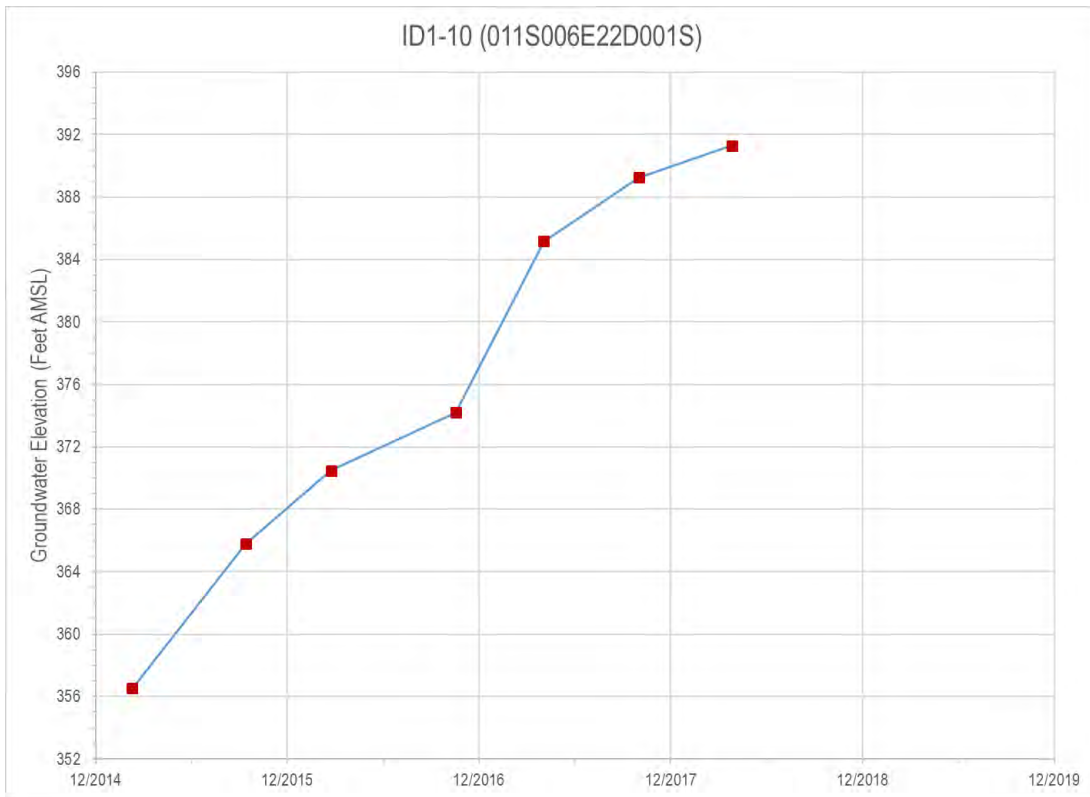
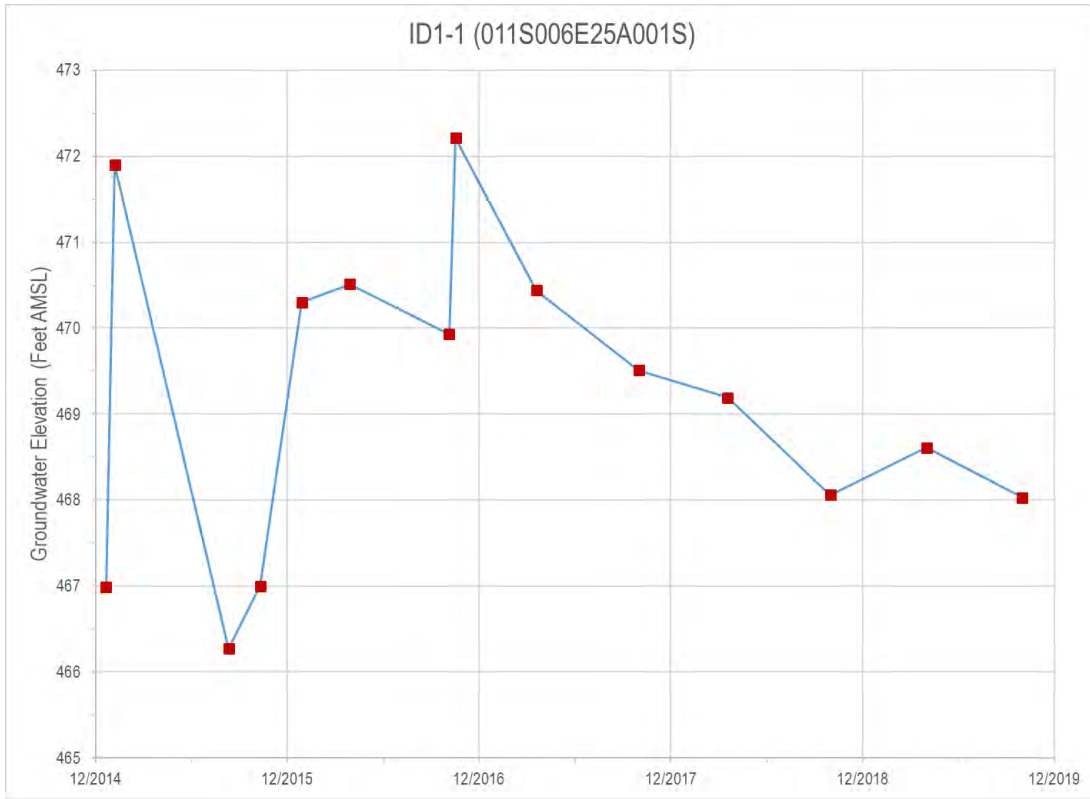


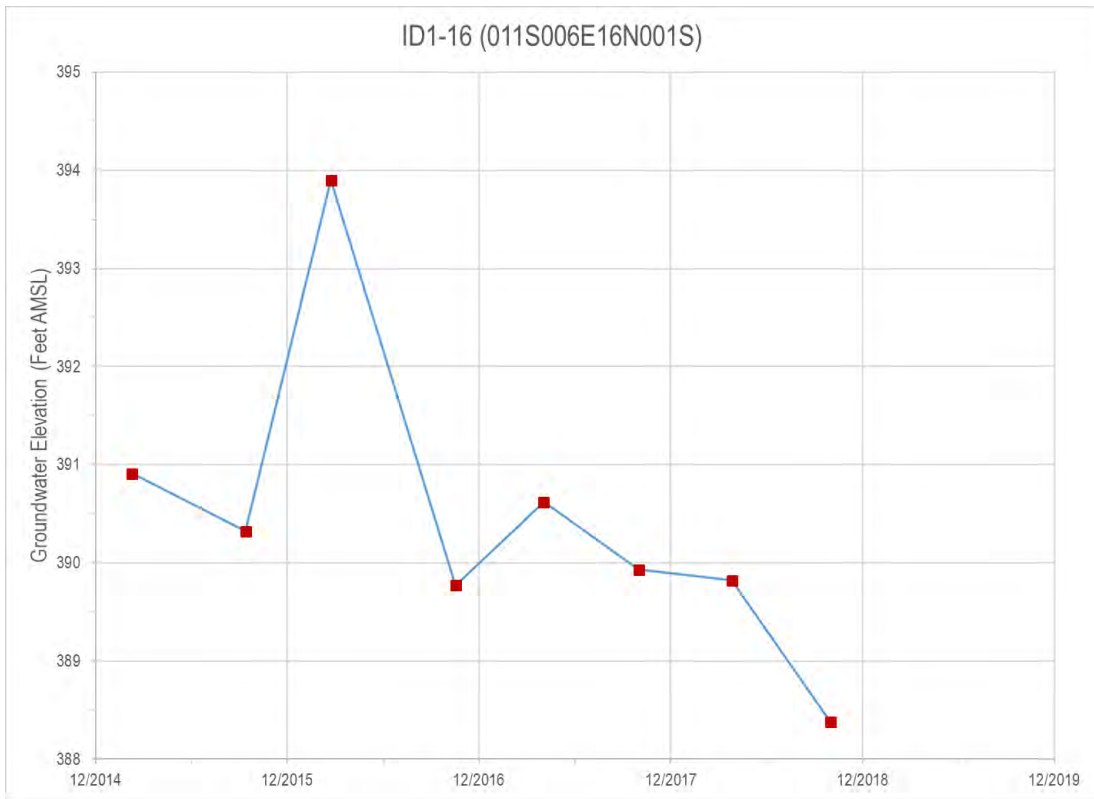
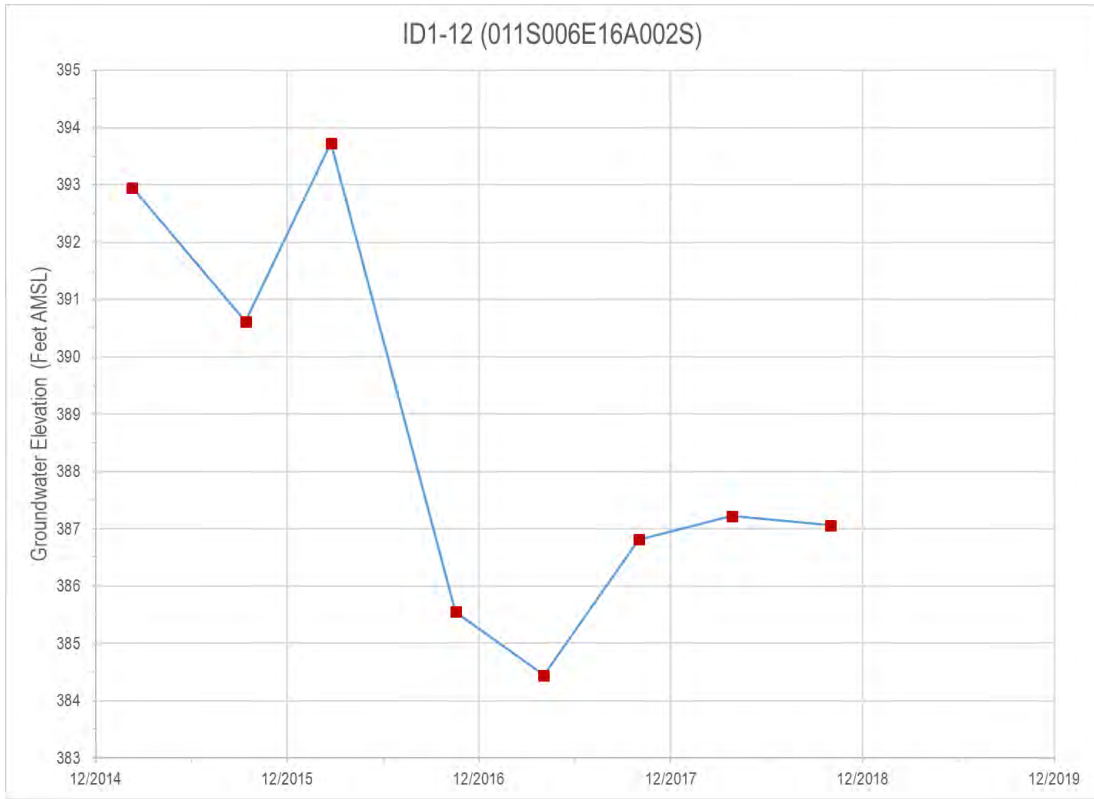


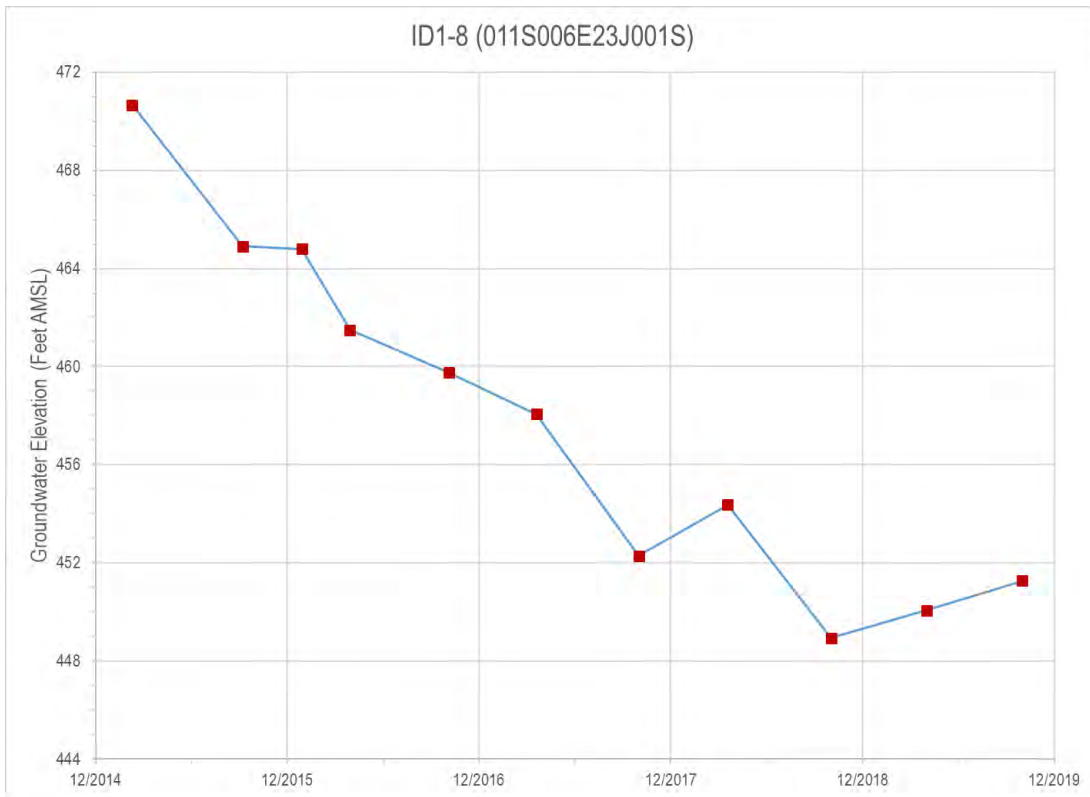
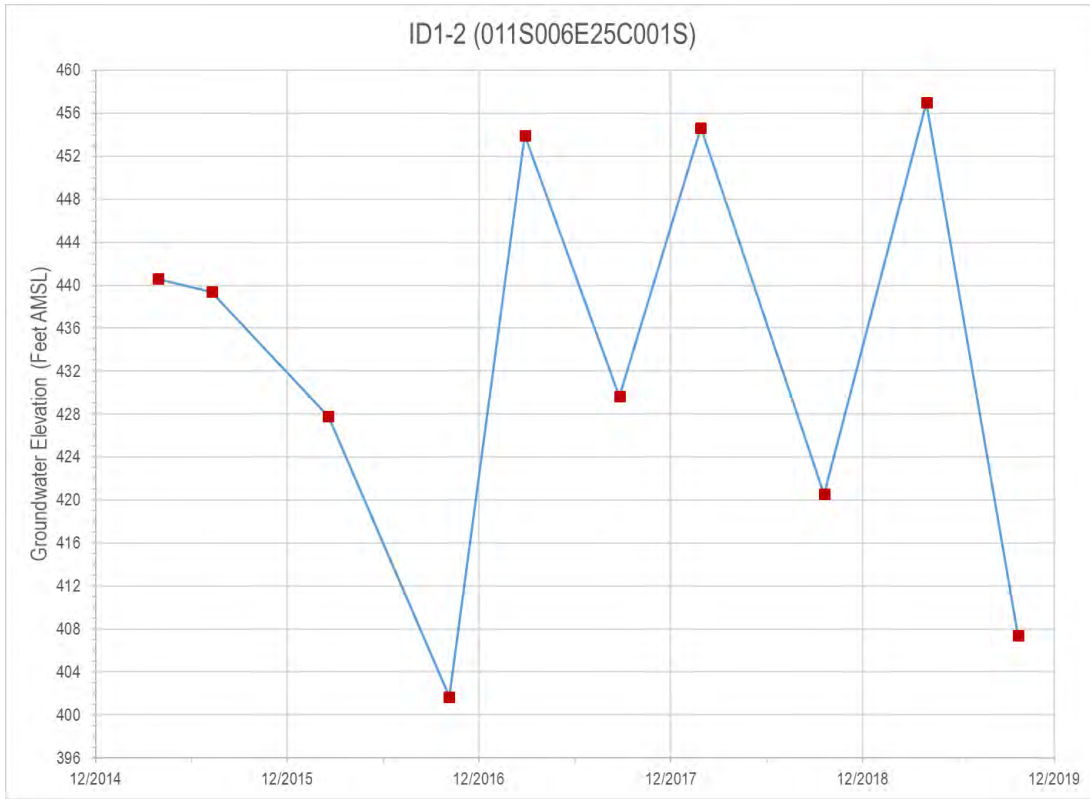


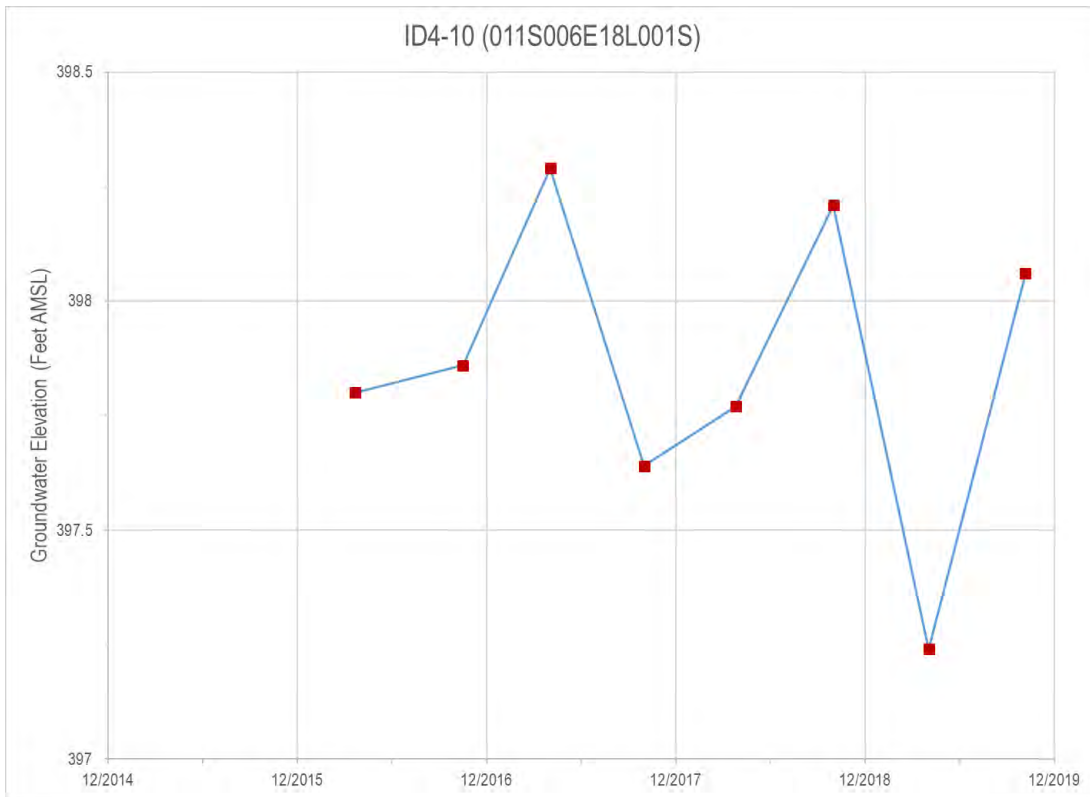
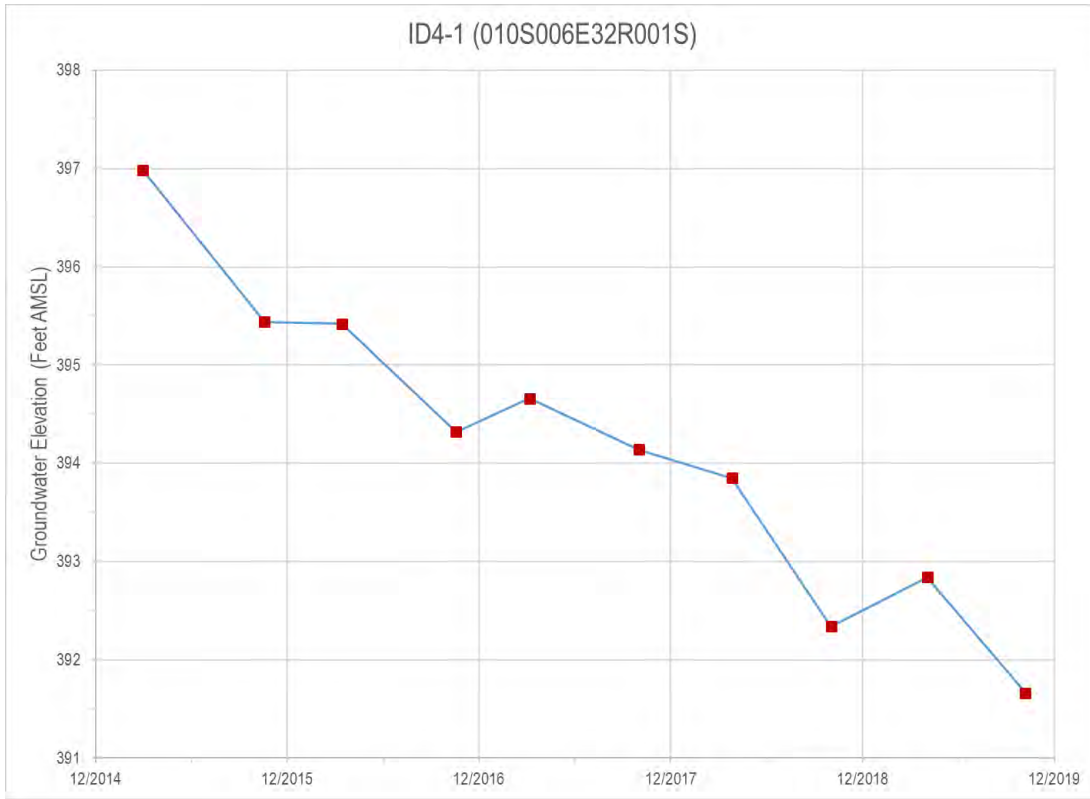


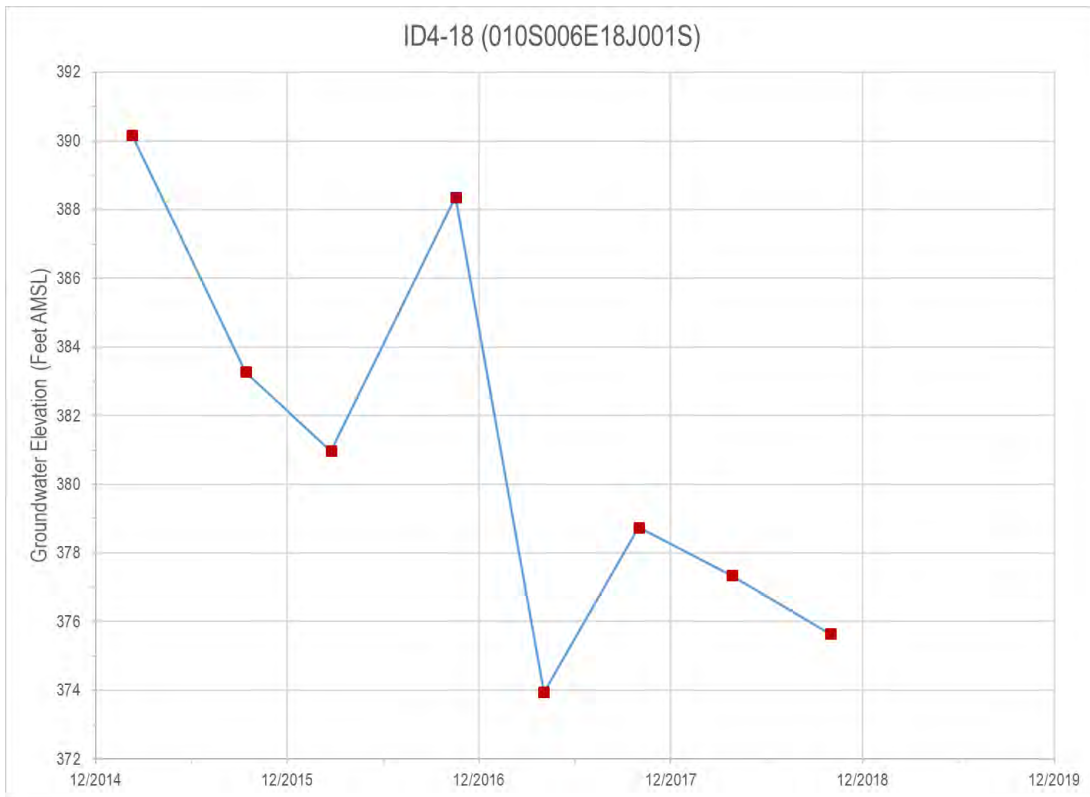
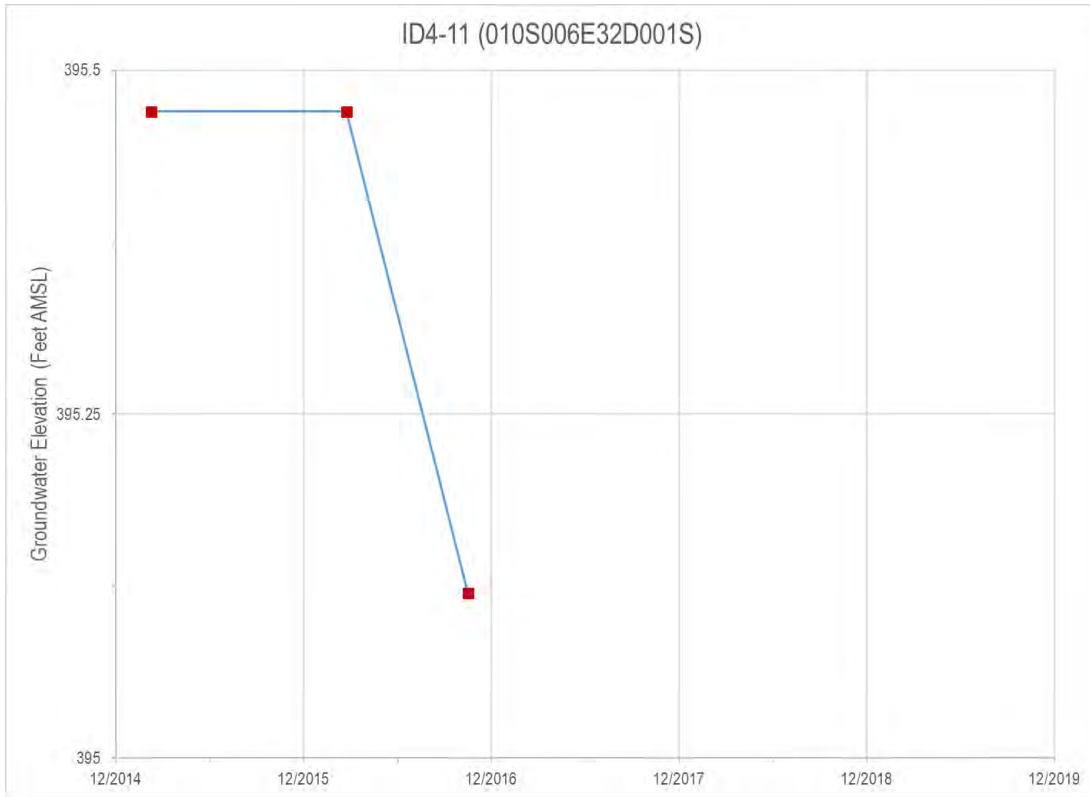


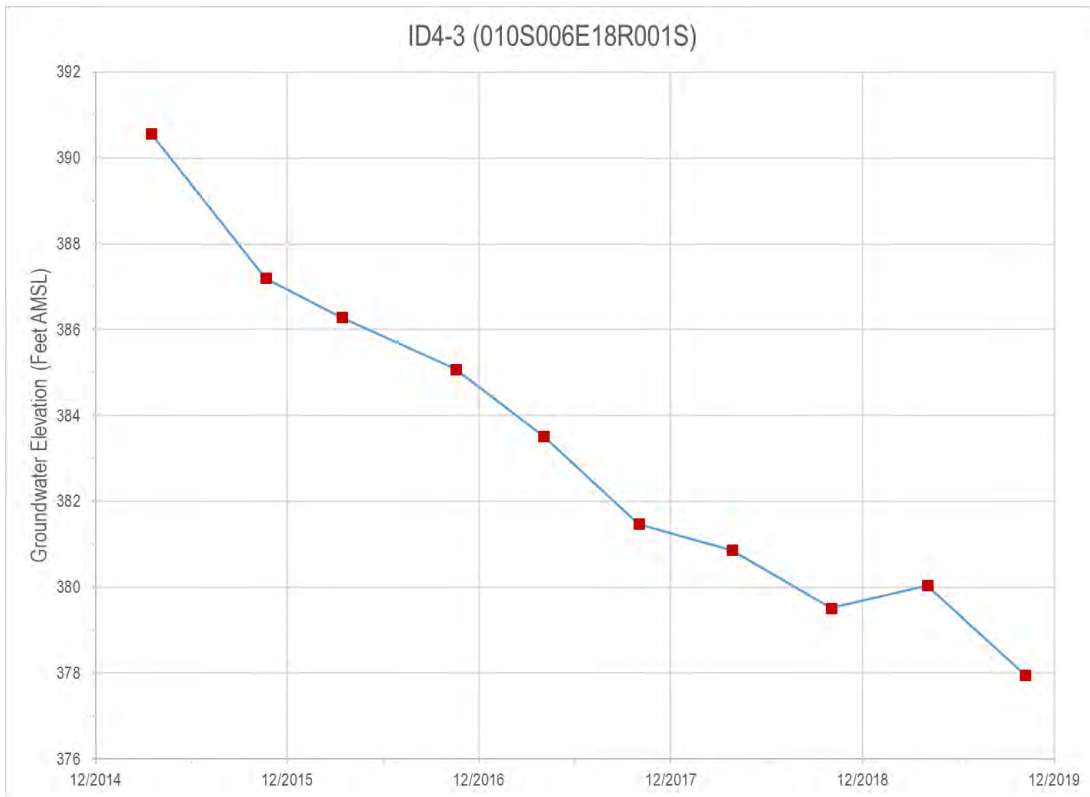
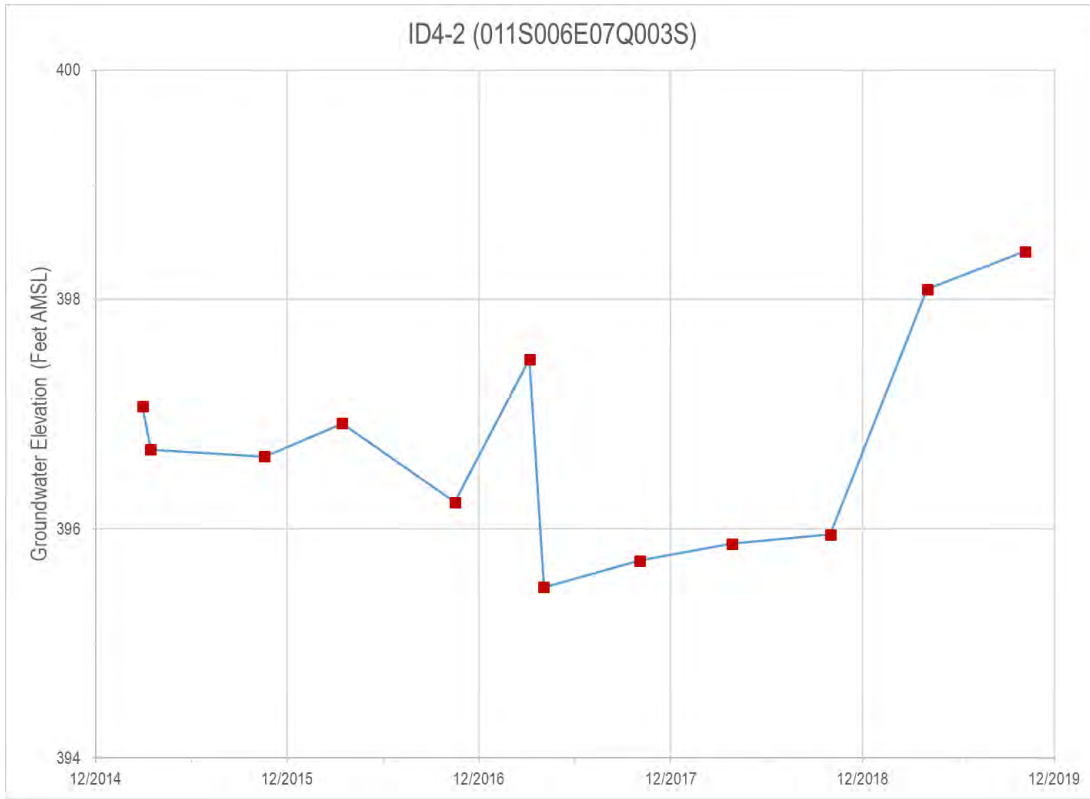


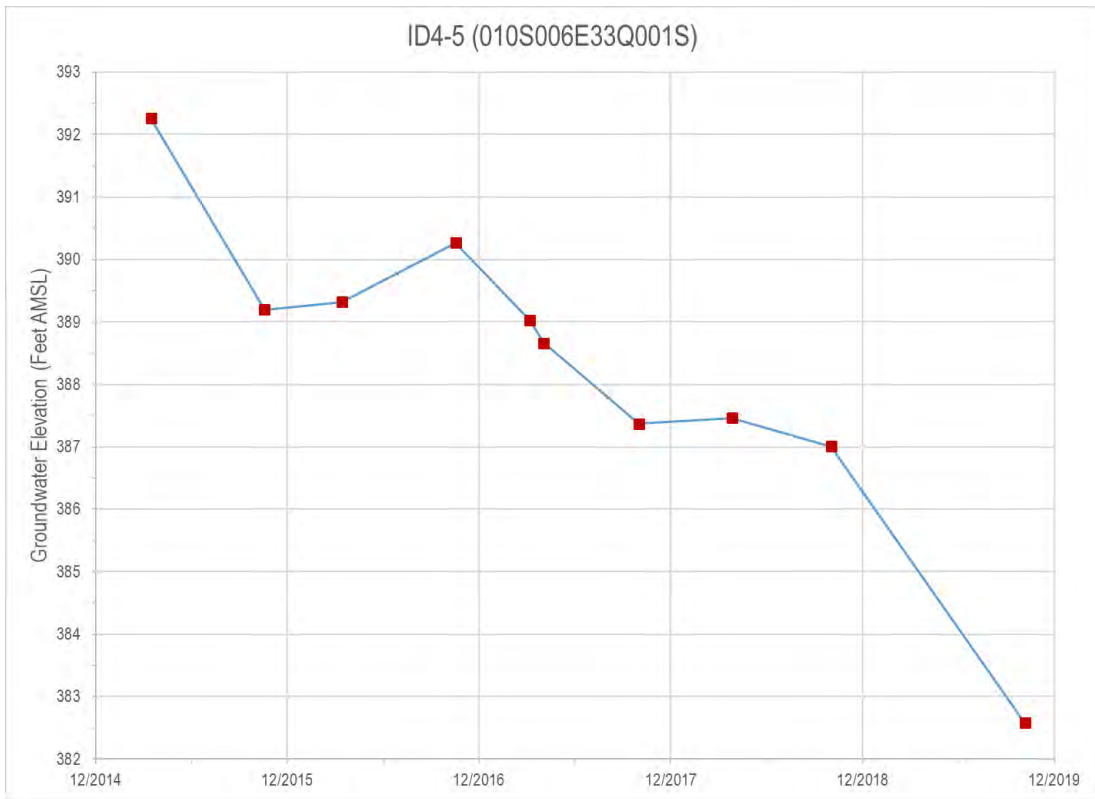


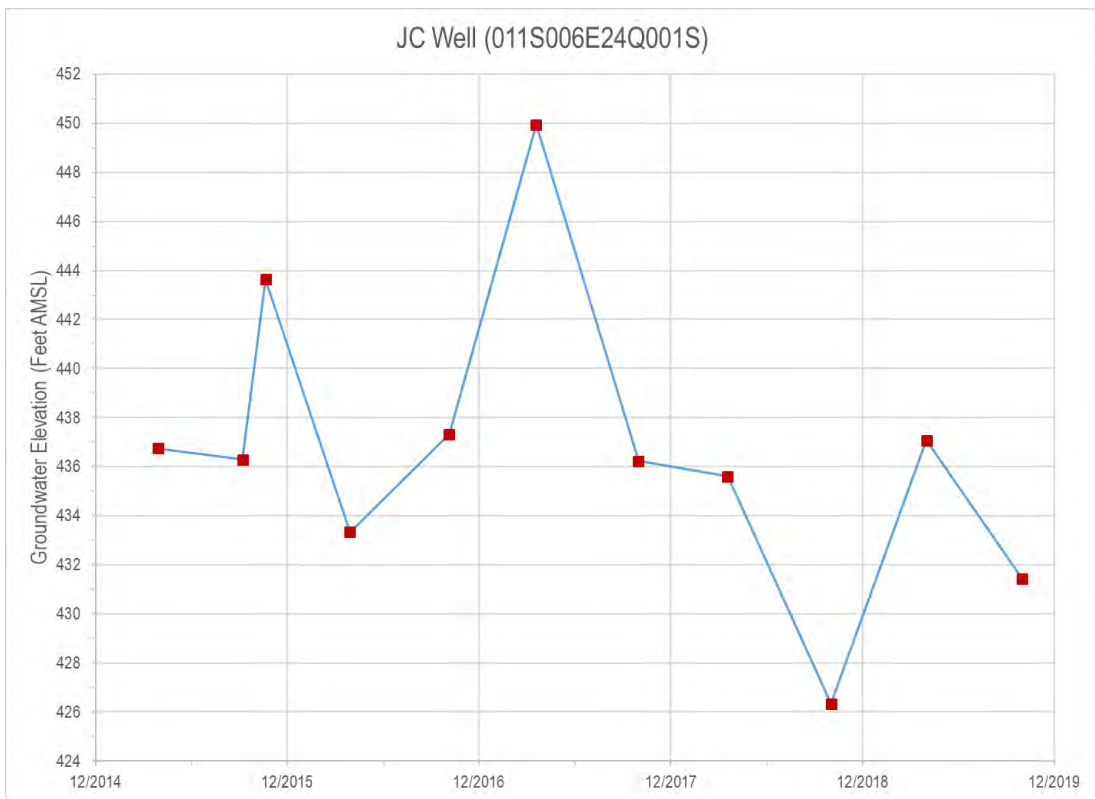
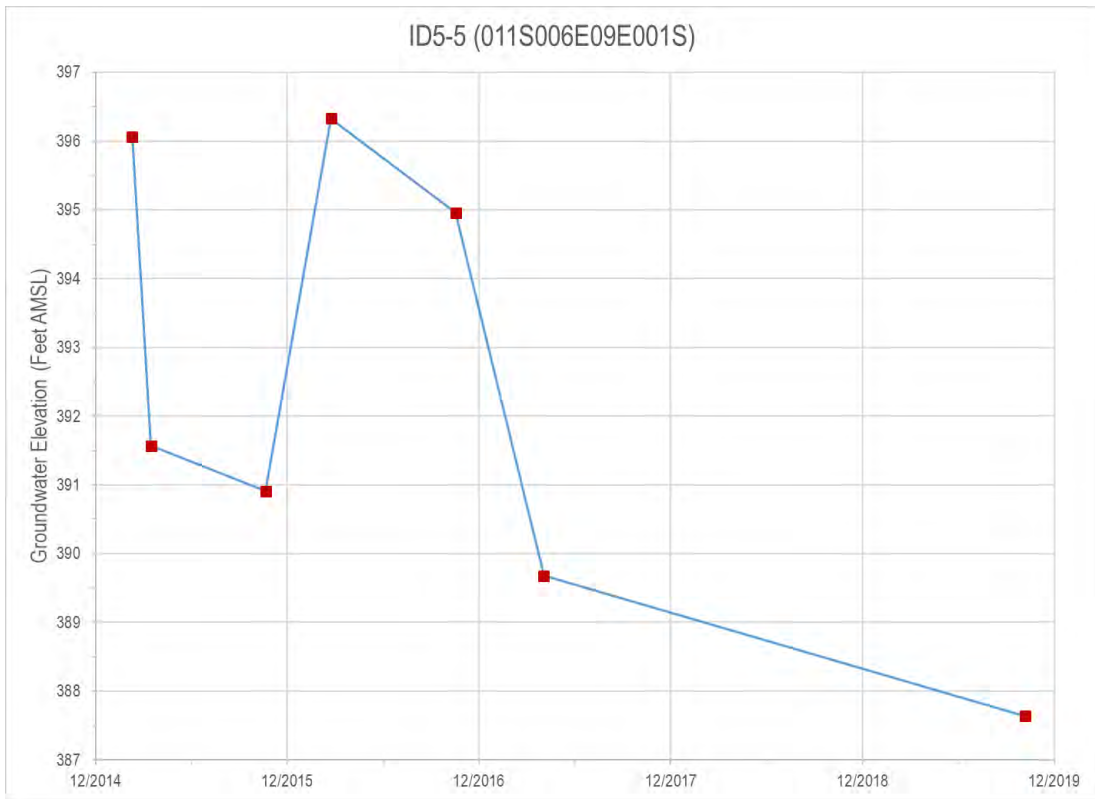


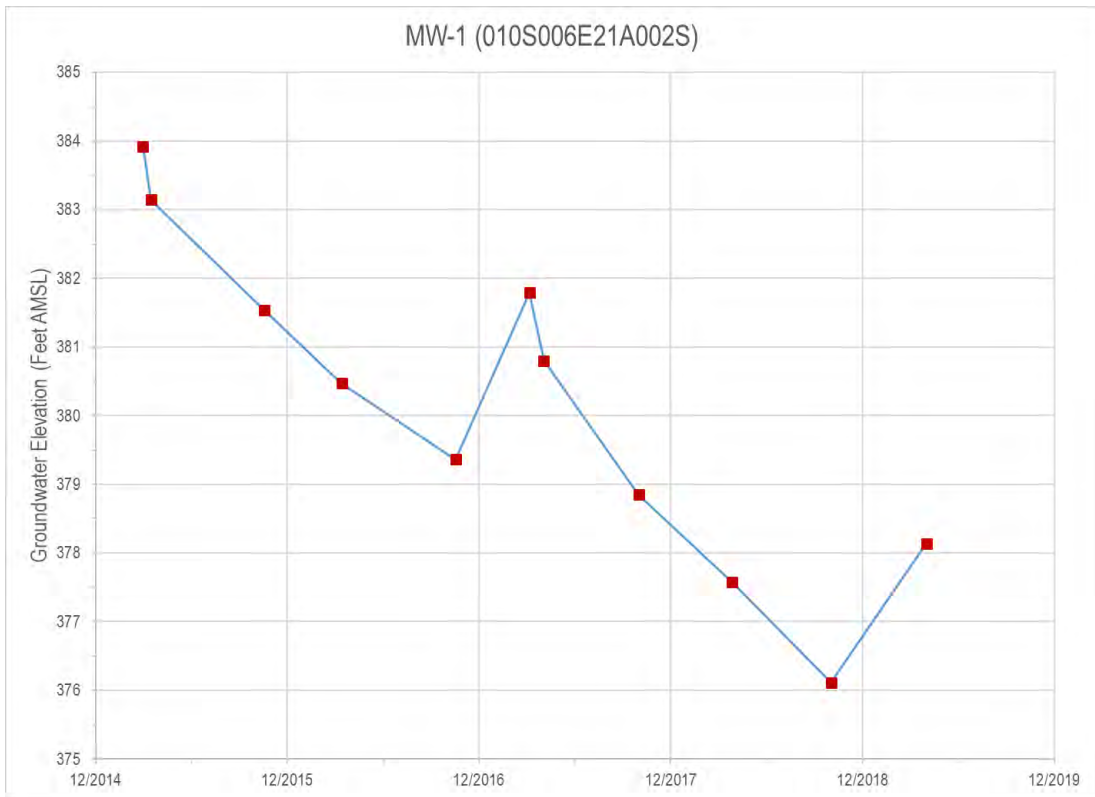
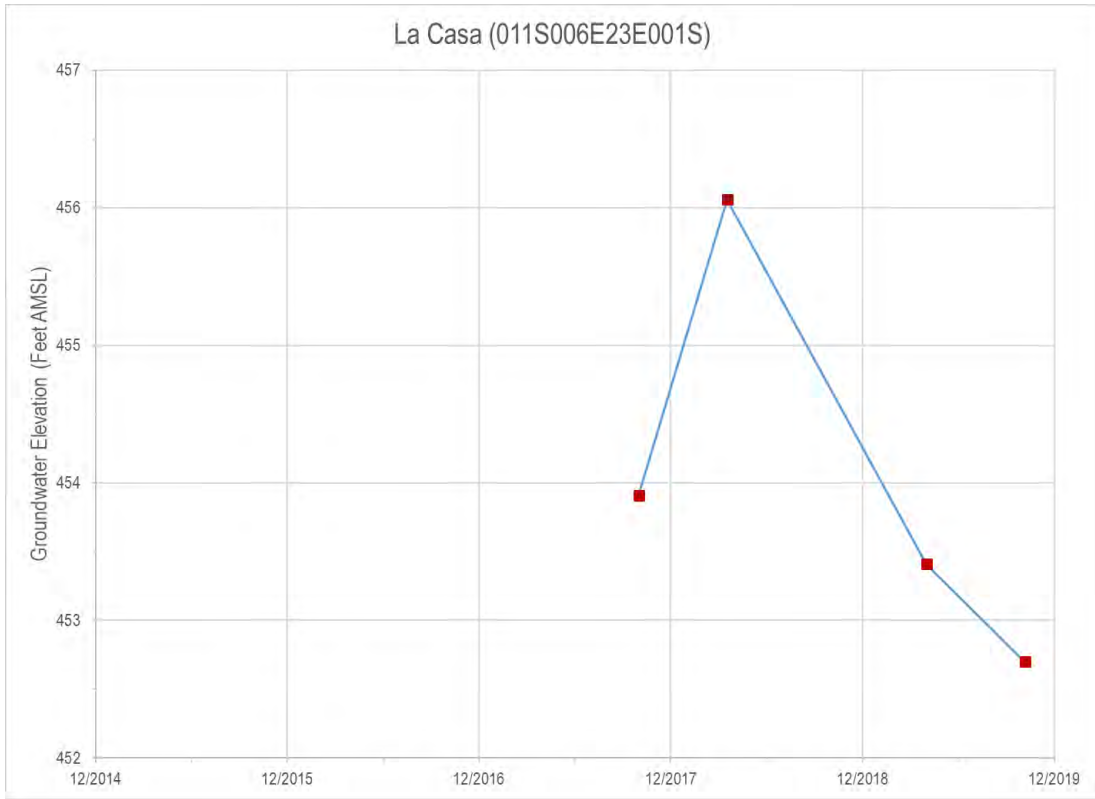


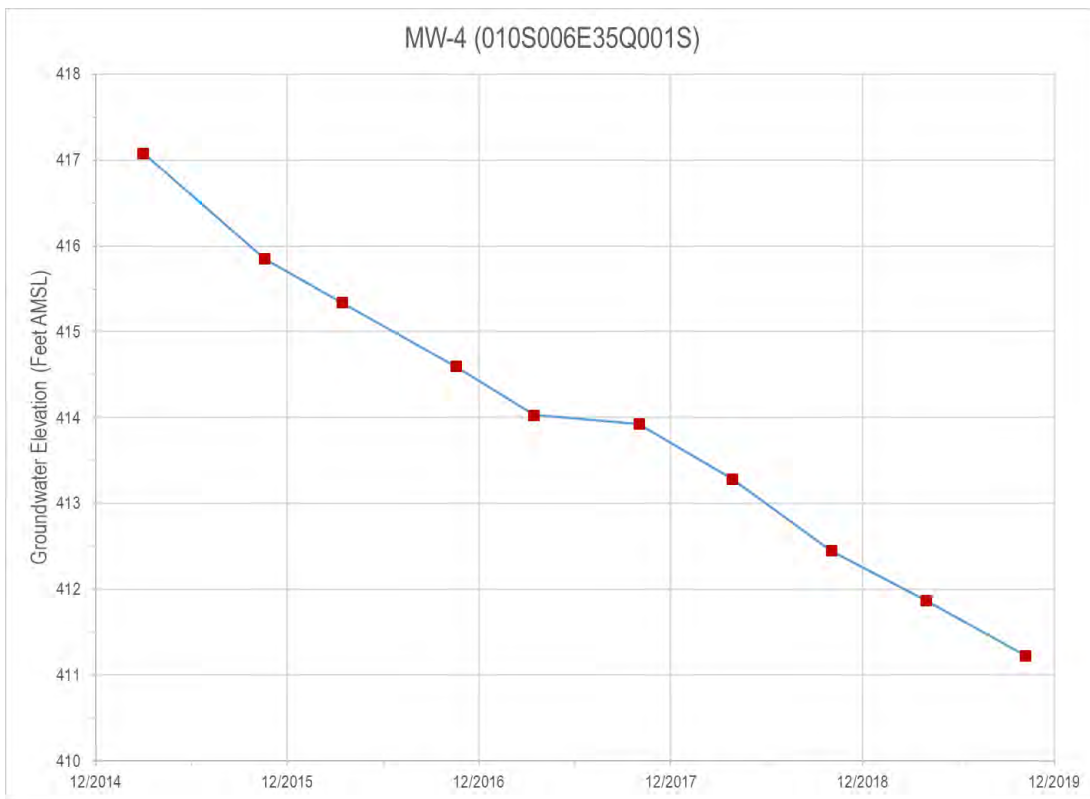
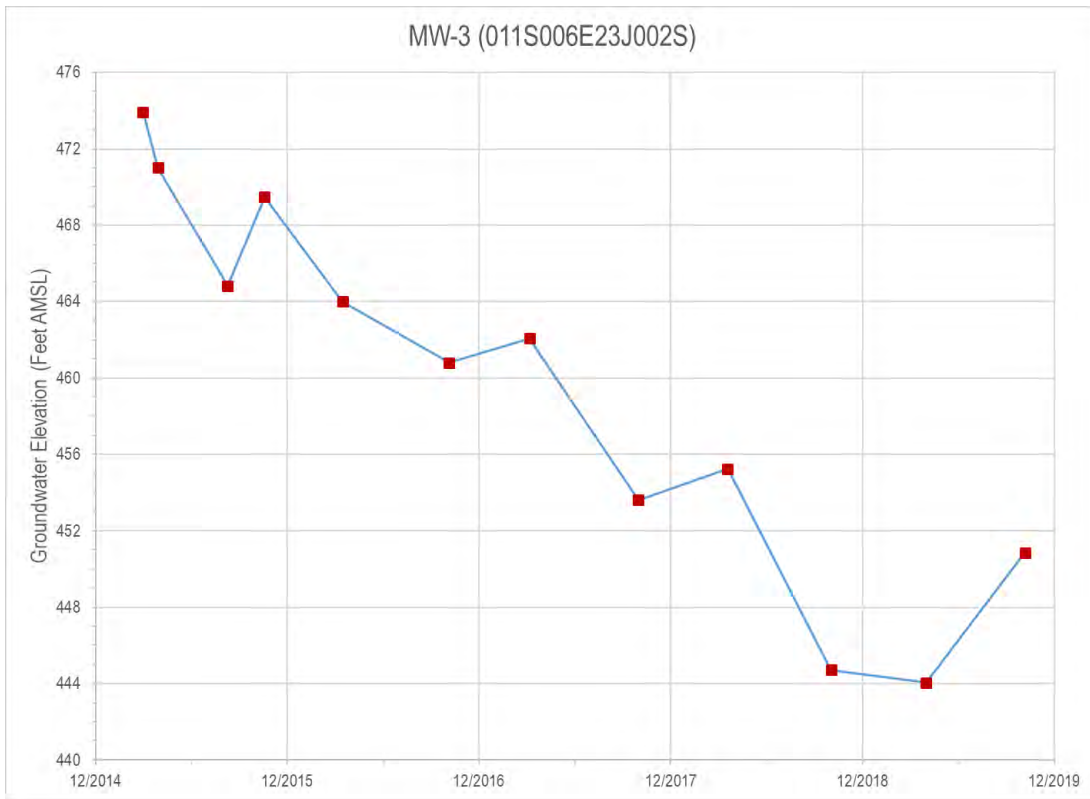


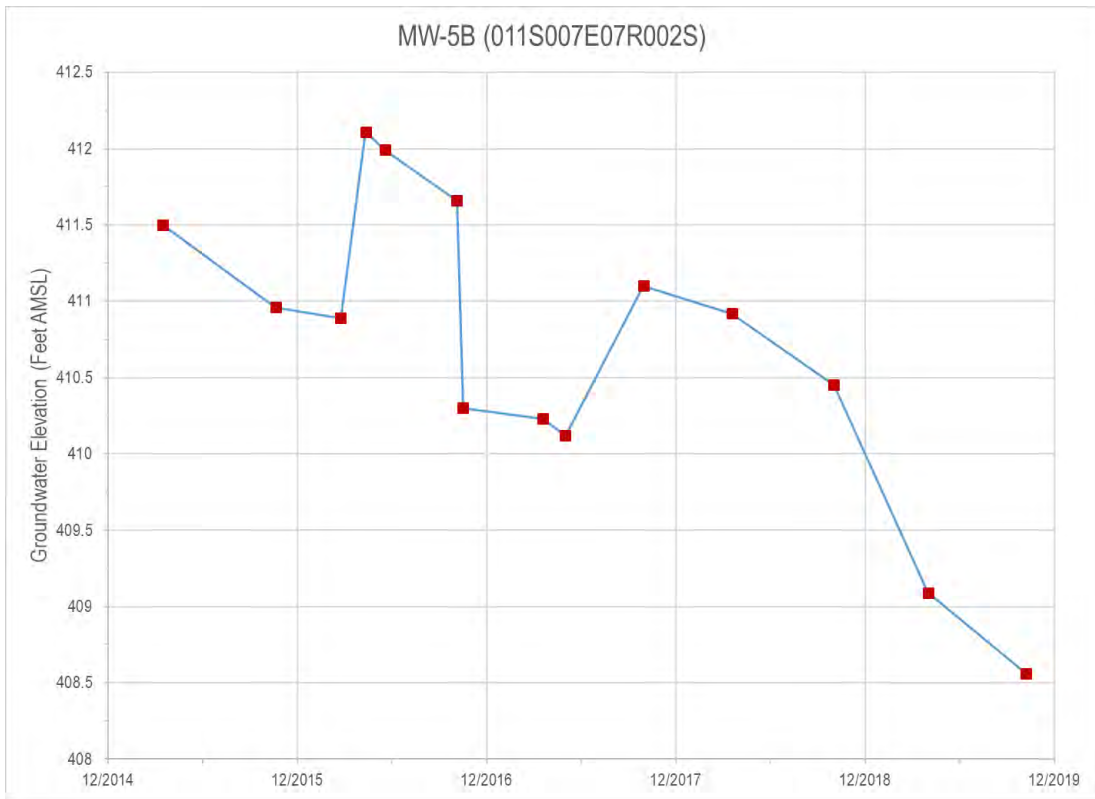
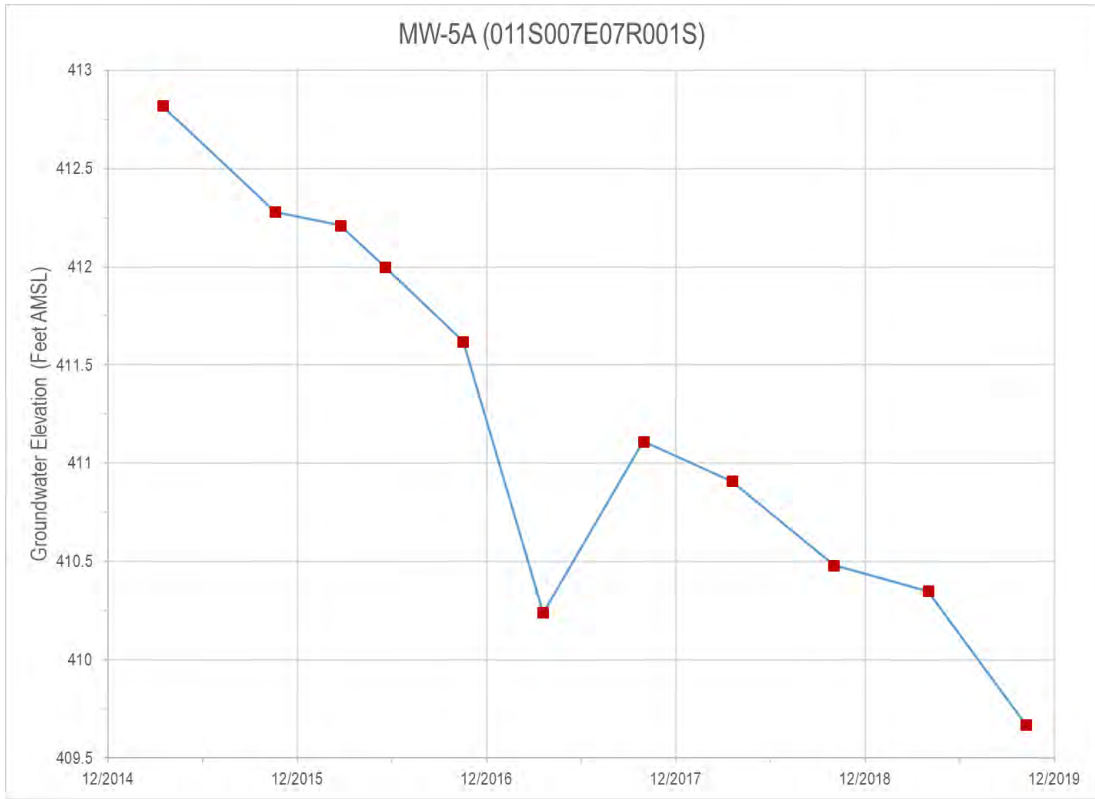


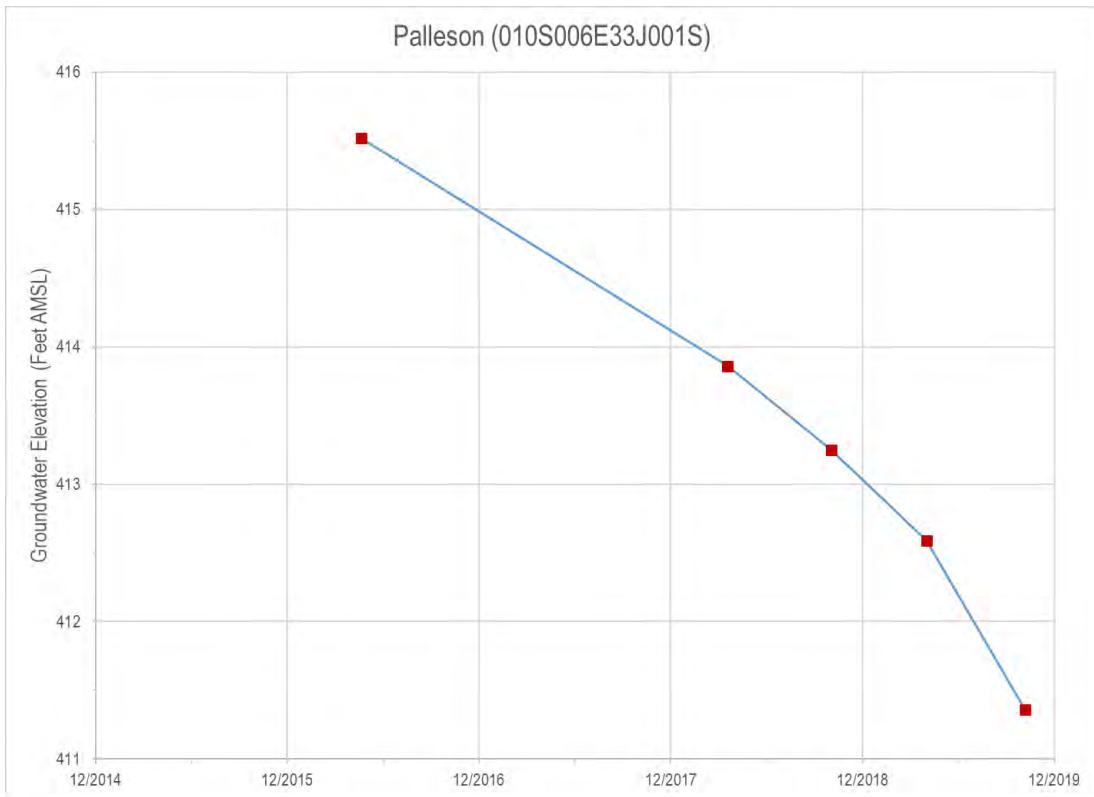
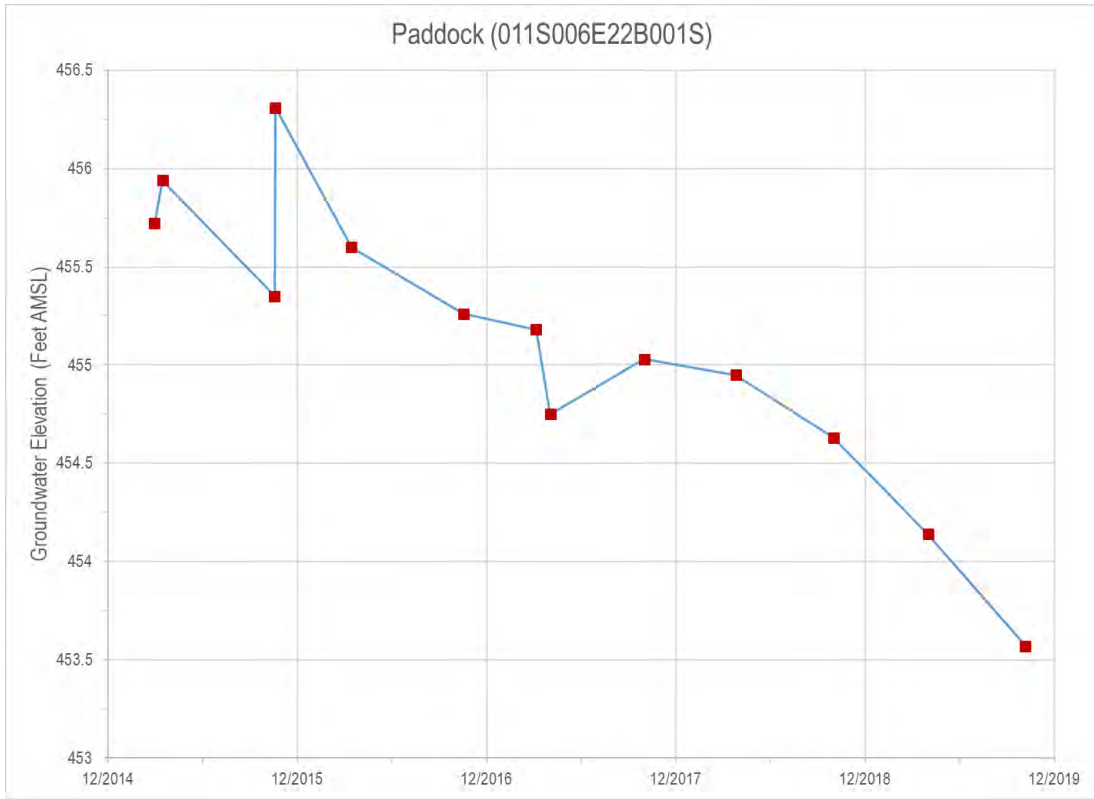


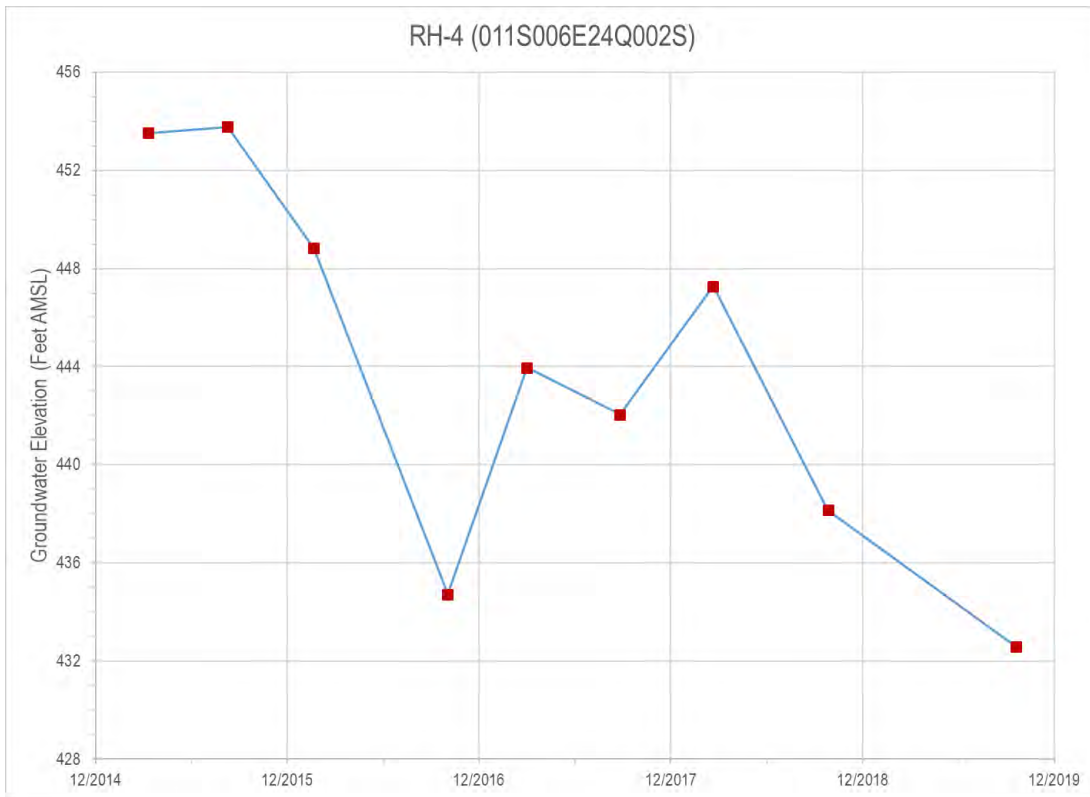
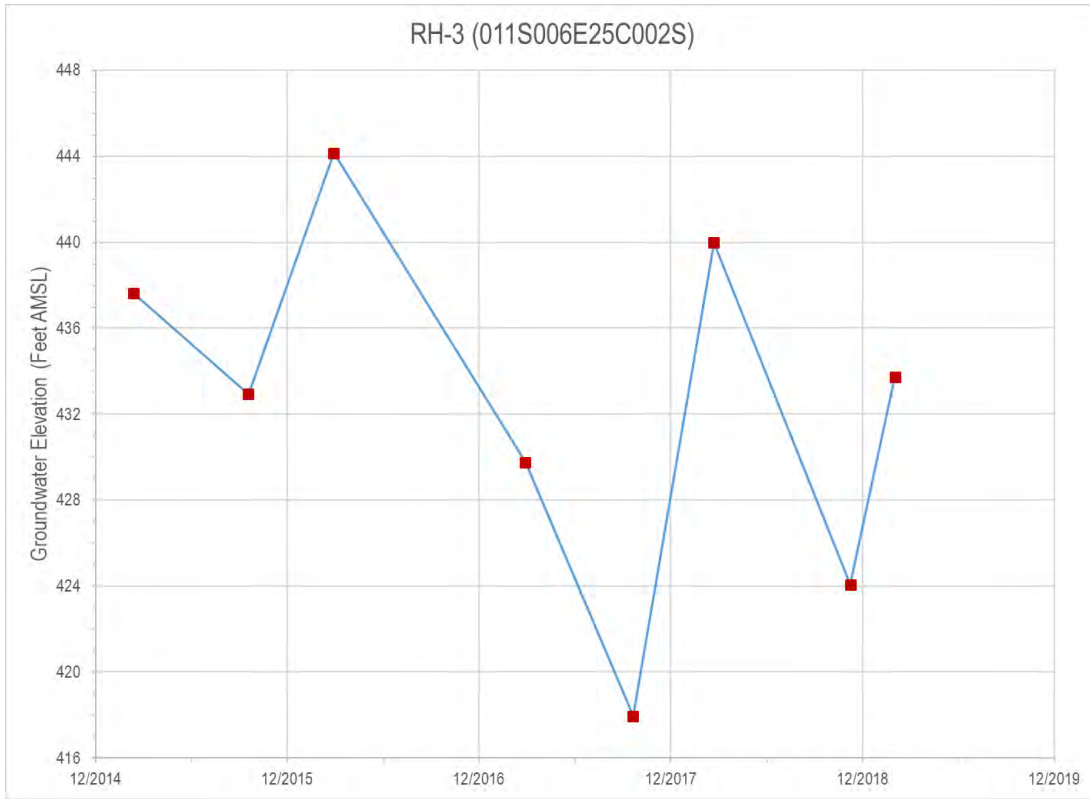


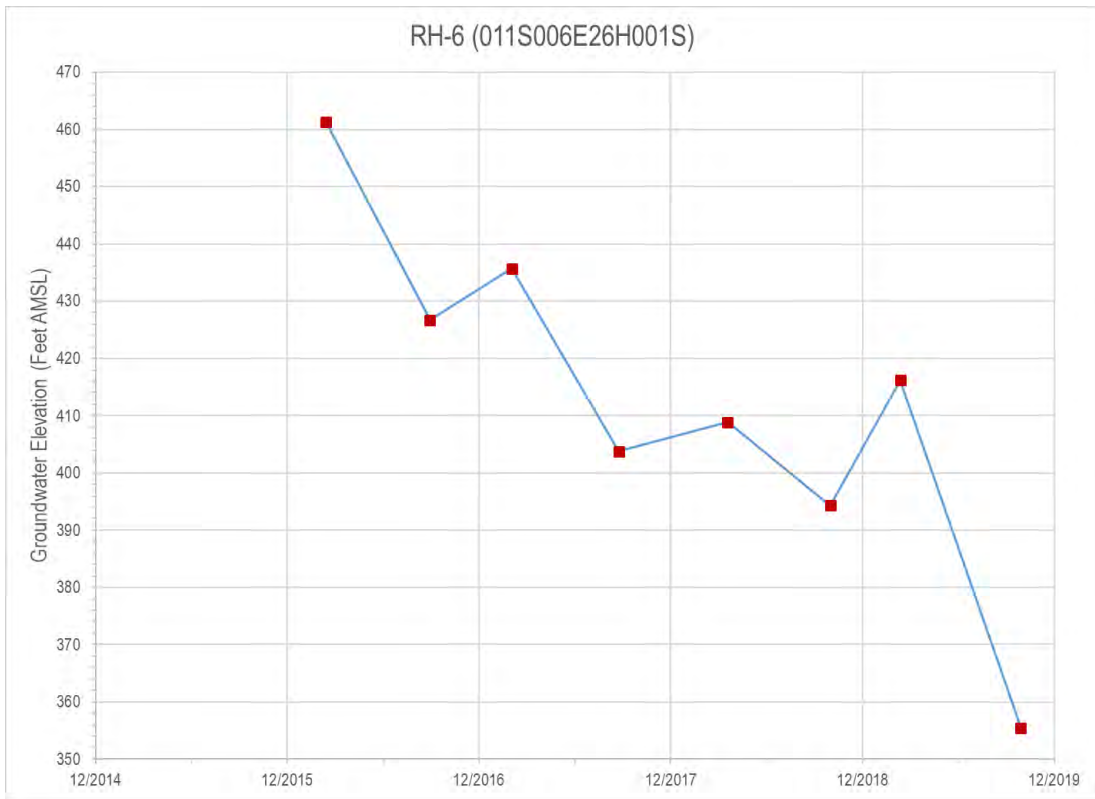
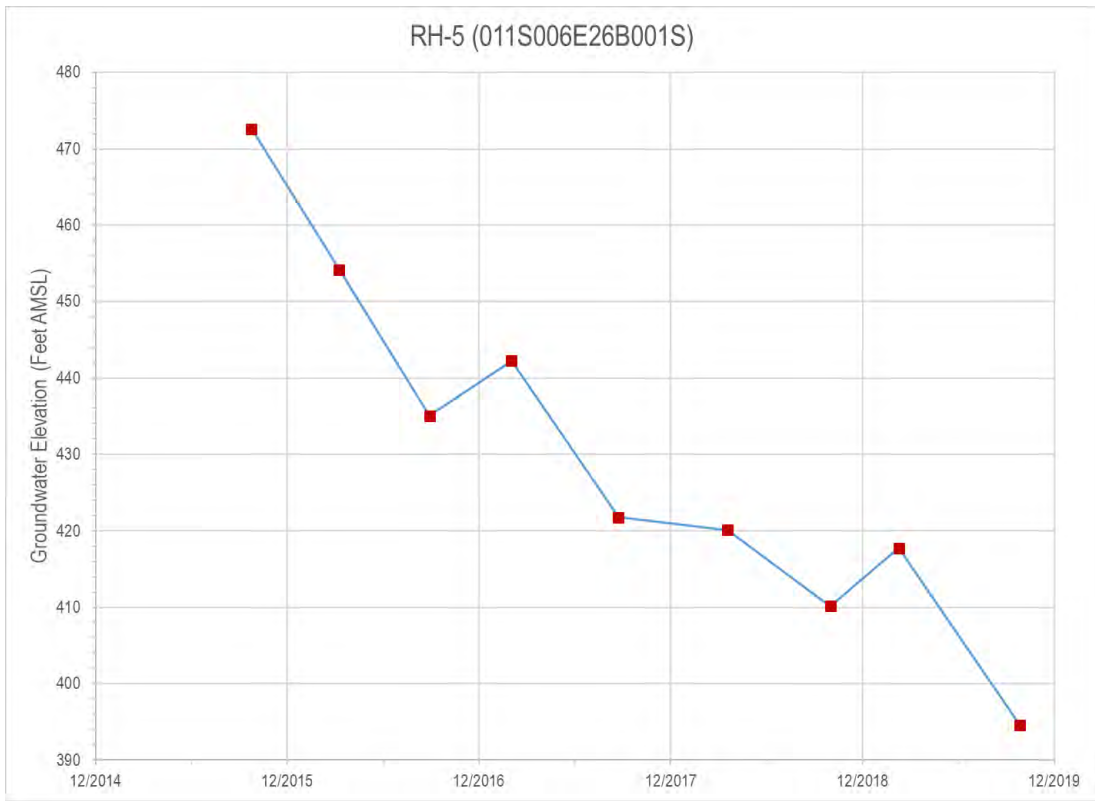


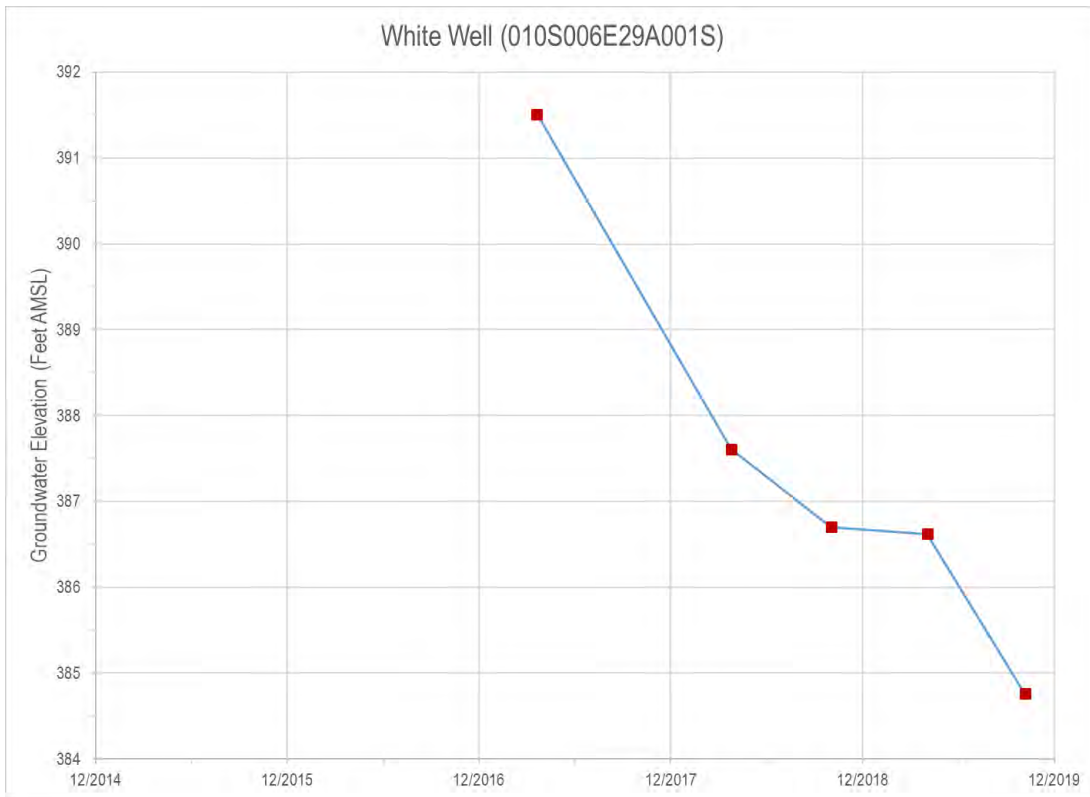
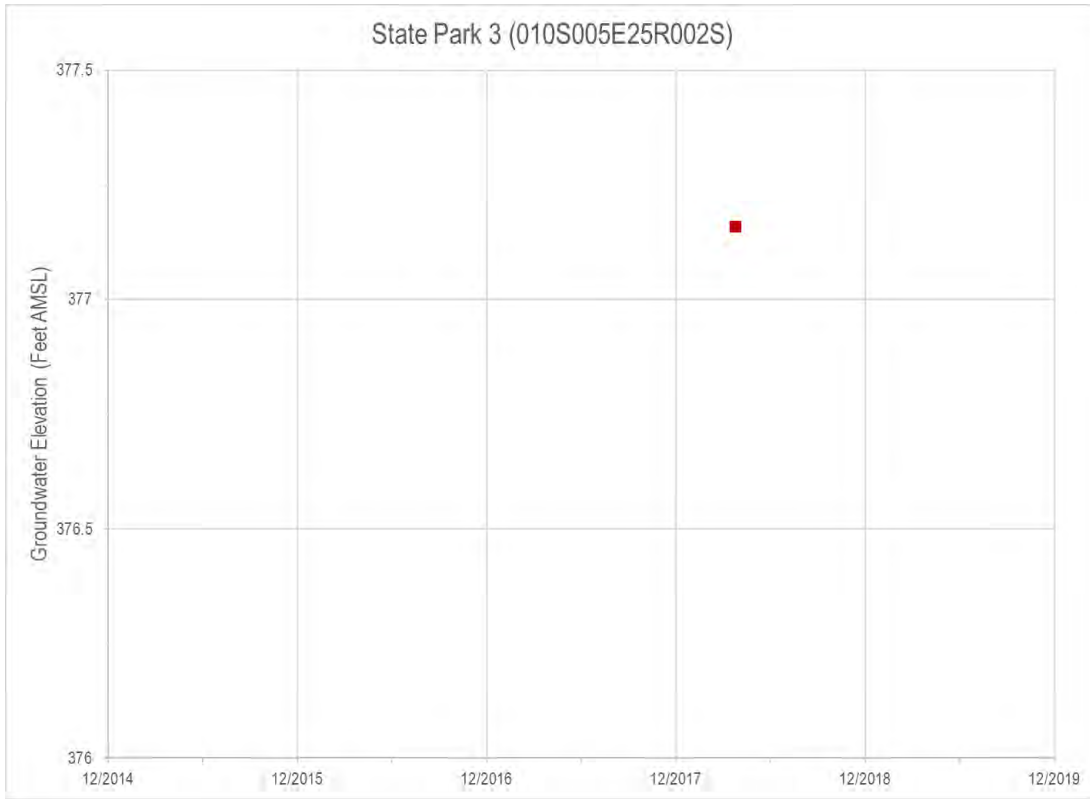


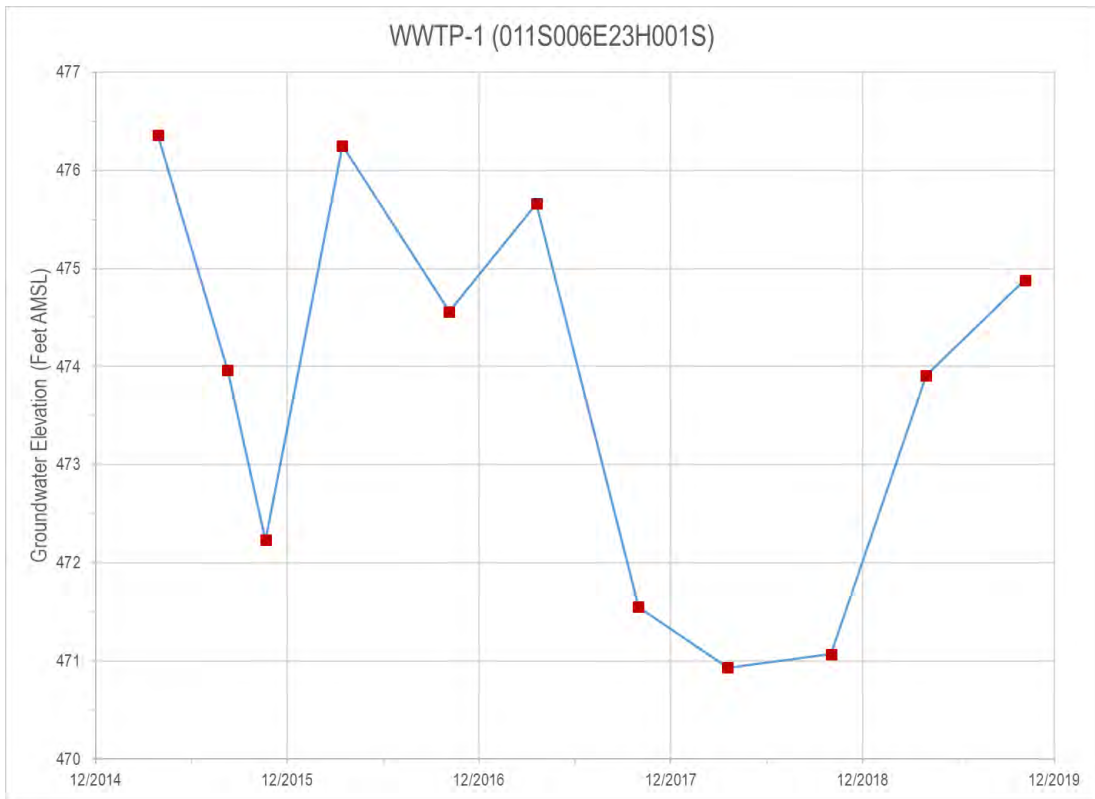












Read ME

This Alternative Elements Guide is developed directly from the Sustainable Groundwater Management Act (Act) and the Groundwater Sustainability Plan Emergency Regulations (GSP regulations). It is provided to support local agencies, Groundwater Sustainability Agencies (GSA), or other entities during preparation and submission of their Alternatives. The guide is organized according to the California Code of Regulation Sections of the GSP regulations that are applicable to Alternatives. In the event that information or recommendations in this guide are inconsistent with, conflicts with, or omits the requirements of the Act, applicable laws, or the GSP regulations, the Act, other laws, or the GSP regulations shall prevail.

Each entity submitting an Alternative can provide DWR with the location of the required element of the Alternative by completing the last two columns of the checklist or provide their own documentation of the locations of the Alternative elements. This will support DWR in its review of these Alternative.

If an element does not pertain to an entity, then briefly describe why that Alternative element does not apply to the entity

Alternative Annual Report Elements Guide

<i>California Code of Regulations - GSP Regulation Sections</i>	<i>Alternative Elements</i>	<i>Document which attachment(s) contains the applicable alternative element.</i>
Article 7	Annual Reports and Periodic Evaluations by the Agency	
§ 356.2	Annual Reports	
	<p>Each Agency shall submit an annual report to the Department 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:</p> <p>(a) General information, including an executive summary and a location map depicting the basin covered by the report.</p> <p>(b) A detailed description and graphical representation of the following conditions of the basin managed in the Plan:</p> <p>(1) Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:</p> <p>(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.</p> <p>(B) 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.</p> <p>(2) 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.</p> <p>(3) 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.</p>	<p>1st Annual Report - Borrego Springs Groundwater Subbasin</p> <p style="text-align: center;">Figures 5 - 14</p> <p style="text-align: center;">Appendix A - Monitoring Well Hydrographs</p> <p style="text-align: center;">Figures 16 and 22</p>

<p>California Code of Regulations - GSP Regulation Sections</p>	<p>Alternative Elements</p>	<p>Document which attachment(s) contains the applicable alternative element.</p>
	<p>(4) 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. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.</p> <p>(5) Change in groundwater in storage shall include the following:</p> <p>(A) Change in groundwater in storage maps for each principal aquifer in the basin.</p> <p>(B) 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.</p> <p>(c) A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.</p>	<p>Figures 18 -21</p> <p>Figure 22</p>

Document which section(s), page number(s), or briefly describe why that Alternative element does not apply to the entity.

Executive Summary and Section 1: Introduction (Pages 1 - 6); Figure 1 (Page 25)

Section 2: Groundwater Conditions (Pages 14 - 15) and Figures 5 - 14 (Pages 33 - 51)

Section 2: Groundwater Conditions (Pages 14 - 15) and Figure 15 (Page 53)

Section 4.1: Groundwater Extractions (Page 15) and Figures 16 (Page 55) and 22 (Page 67)

Section 4.2: Surface Water Use (Page 16)

Document which section(s), page number(s), or briefly describe why that Alternative element does not apply to the entity.

Section 4.3: Total Water Use (Page 16)

Section 5: Change in Groundwater Storage (Page 17)

Sections 4.1 and 5 (Pages 15 and 17); Figure 22 (Page 67)

Section 6: GSP Implementation Progress (Pages 19 - 21)

RESOLUTION NO 20-01 OF THE
BOARD OF DIRECTORS OF THE INTERIM BORREGO SPRINGS WATERMASTER
ENDORING SUBMISSION OF ANNUAL REPORT

WHEREAS, the Sustainable Groundwater Management Act (SGMA) requires the submission of annual reports regarding groundwater conditions for basins and subbasin subject to regulation (Water Code, § 10728).

WHEREAS, the Watermaster Board has reviewed and endorses the submission of the 2019 annual report for the Borrego Springs Subbasin attached to the staff report accompanying this Resolution (the “Annual Report”) to the California Department of Water Resources (DWR).

NOW, THEREFORE, be it resolved by the Board of Directors of the Interim Borrego Springs Watermaster, as follows:

1. The Board of Directors hereby endorses the submission of the Annual Report to the DWR SGMA portal.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Interim Borrego Springs Watermaster held on the 31st day of March 2020, by the following vote:

AYES:

NOES:

ABSENT:

President

Board of Directors

Secretary

ATTEST

INTERIM BORREGO SPRINGS WATERMASTER
BOARD OF DIRECTORS MEETING MARCH 31, 2020
AGENDA ITEMS II.B

March 27, 2020

TO: Board of Directors

FROM: Michele A. Staples, Esq., Jackson Tidus, Attorneys for Agricultural Alliance for Water and Resource Education (“AAWARE”)

SUBJECT: Selection Process and Direction re Request(s) for Proposal or Request for Qualifications for Selection of Executive Director and Technical Advisor

RECOMMENDED ACTION:

Provide direction regarding proposed selection process for Executive Director and Technical Advisor and approve schedule for approving and distributing Request(s) for Proposal or Request for Qualifications.

ITEM EXPLANATION:

The Stipulated Judgment authorizes the Watermaster to hire employees or contractors as needed, which may include one or more Technical Advisor(s) to provide input to the Technical Advisory Committee, Watermaster staff and Watermaster Board; and an Executive Director to prepare meeting notes, prepare an Annual Report to the Court, and administer the Judgment. In order to avoid a potential conflict of interest, any Technical Advisor and Executive Director must be independent (not under contract with any Party) and selected by the Watermaster through an arms-length RFP process unless otherwise agreed by a vote of 4 of the 5 Watermaster Board members. Additionally the Watermaster Technical Consultant must be selected by the Watermaster Board with input from the Technical Advisory Committee. (Stipulated Judgment, Section IV.C; Watermaster Rules & Regulations section 2.6.2.)

In some other adjudicated basins (San Jacinto, Seaside), one contractor serves as both the Technical Advisor and Executive Director. The Interim Watermaster Budget attached to the Settlement Agreement includes a total of \$462,000 for start-up administrative services through September 30, 2021, including but not limited to Technical Advisor and Executive Director services on an as-needed basis.

Attached is a sample RFP based on those used in the San Jacinto and Seaside adjudication matters. Watermaster is requested to provide direction for the process to be followed in selecting the Executive Director and Technical Consultant. The final RFP could be prepared for either a

single consultant to provide both Executive Director and Technical Advisor services to Watermaster on an as-needed basis, or two separate consultants, as directed by the Watermaster.

The Board is requested to consider whether to (1) Issue an RFP for an Executive Director only; (2) Issue an RFP for Executive Director/Technical Advisor; or (3) Issue a Request for Qualifications (RFQ), asking the consultant world that responds to tell the Watermaster Board what the preferred staffing approach might be. This third option means any proposer could propose for the Executive Director position, for the Technical Advisor, or both (or perhaps some other reasonable combination.)

Due to the importance of staffing the Watermaster and the logistic disruption resulting from the coronavirus restrictions, an alternative to formally convening the Technical Advisory Committee would be for each party to have their own technical expert review and provide input on the draft RFP/RFQ.

A Watermaster Board meeting or call would be convened mid-April to finalize the Scope of Work and solicit proposals.

The Watermaster Board would select the Executive Director/Technical Consultant from among the proposals.

NEXT STEPS:

Consider approving the proposed process to solicit proposals for an Executive Director and/or Technical Advisor, including:

- (1) March 31 Watermaster Board meeting – Board members provide direction on RFP/RFQ.
- (2) April 1 to 10 – Implement Board direction re any needed changes to draft RFP/RFQ. Individual parties may seek input from their own technical consultants on the RFP/RFQ language during the same period.
- (3) Mid April – hold a brief, second Watermaster meeting (call) to formally approve the RFP/RFQ(s) and circulate shortly thereafter.

FISCAL IMPACT:

To be determined based on responses to RFP/RFQ.

ATTACHMENTS:

1. Proposed form of RFP
2. Excerpts of Settlement Agreement, Stipulated Judgment and Rules & Regulations referenced above

Request For Proposal Executive Director/Technical Advisor to
Interim Borrego Springs Watermaster

The Interim Borrego Springs Watermaster (Watermaster) is soliciting proposals from a qualified individual or consulting firm to provide services to the Watermaster on an as-needed basis. The Watermaster is a board comprised of one representative and one alternate representing the Borrego Springs community, Borrego Water District, County of San Diego (currently vacant), agricultural sector and recreational sector. The Watermaster has been established by a Settlement Agreement among the following groundwater producers (Settling Parties) responsible for over 90% of the groundwater production in the Borrego Springs Subbasin (Basin):

LIST OF SETTLING PARTIES

1. David and Juli Bauer are co-trustees of the D&J Bauer Family Trust dated 11-18-04.
2. William M. Bauer.
3. Borrego Nazareth, LLC.
4. Borrego Springs Unified School District.
5. Borrego Water District
6. Roland J. Jensen is trustee of the Jensen Family Trust dated 08-05-83.
7. James Sommerville is trustee of the Sommerville Trust dated 11-22-83.
8. Roy Brisbois is trustee of the Conzelman Family Trust A dated 11-22-83.
9. Steven Mohler is trustee of the Conzelman Family Trust C dated 11-22-83.
10. CWC Casa Del Zorro, LLC.
11. John Doljanin is an individual and owner and operator of West Coast Trees LLC.
12. JM Roadrunner, LLC.
13. Lance Lundberg is trustee of the Lundberg Family Trust dated 10-01-98.
14. The Roadrunner Club at Borrego, LP.
15. Seley Ranches, L.P..
16. Shenandoah Growers, Inc.
17. The Springs RV and Golf Resort, LP.
18. T2 Borrego LLC.
19. T2 Farms LLC.
20. T2 Holding LLC and doing business as T2 B Holding LLC.

21. Trojan Citrus, LLC.

22. Gamini D. Weerasekera, an individual and owner and manager of Mountain Spring Organics LLC.

A groundwater rights adjudication is currently pending in the Orange County Superior Court (Borrego Water District v. All Persons Who Claim a Right to Extract Groundwater in the Borrego Valley Groundwater Subbasin No. 7.024-01, Orange County Superior Court Case No. _____).

As part of the Settlement Agreement, the Settling Parties have agreed to: (1) a proposed Stipulated Judgment that, if entered by the Court, will declare the individual rights of all groundwater producers in the Basin; (2) a Groundwater Management Plan; and (3) Watermaster Rules and Regulations (Watermaster Governing Documents, available at <https://sharefile.jacksontidus.law/wl/?id=2UjTx84w3AwXiBM7AbvbmtQRppOyavyu>). The Watermaster Governing Documents also provide for a Technical Advisory Committee (TAC) comprised of technical representatives from the individual parties, and an Environmental Working Group (EWG) to advise the Watermaster on groundwater dependent ecosystems and any other matters approved by the Watermaster. The Watermaster is seeking to retain an independent consulting firm or a qualified individual as an Executive Director and Technical Advisor to the Watermaster to evaluate and analyze the Basin data and the recommendations by the TAC and EWG Basin, develop conclusions based thereon, and make recommendations to the Watermaster, as well as communicating with the community by way of the Watermaster's website, emails and telephone calls; preparing Watermaster agenda reports, minutes and resolutions; levying, billing and collection of all assessments provided for under the Stipulated Judgment; record keeping; and reporting to the Court and state agencies. General The Executive Director/Technical Advisor provides leadership for the Watermaster and receives direction from and is responsible to the Watermaster Board of Directors on all matters pertaining to the administration and operation of the Basin under the provisions of the Settlement Agreement, Stipulated Judgment and Groundwater Management Plan. This person is directly responsible for overseeing all consultants and employees of the Watermaster and performing related duties as assigned.

Essential Duties and Responsibilities The duties listed below are intended only as illustrations of the various types of work that may be performed. The omission of specific statements of duties does not exclude them from the position if the work is similar or related.

Ensuring compliance with the Settlement Agreement, Stipulated Judgment, Groundwater Management Plan, Watermaster Rules and Regulations, and any court orders.

Develop and manage the Watermaster financial budget; understand and explain budgetary issues to the Watermaster Board, TAC, EWG, staff and the community.

Build positive and cooperative relationships with Watermaster staff, TAC, EWG, Basin pumpers, community, the overseeing Court and state and local agencies.

Ensure Watermaster contractors and employees accomplish activities in a safe, efficient, friendly and courteous manner; resolve all community and staff complaints quickly and reasonably while encouraging citizen participation.

Develop and administer personnel policies and procedures including recruitment, selection, termination, employee relations, training, evaluation, and compensation programs.

Manage work in regional and inter-agency affairs and work on Basin-wide and Statewide water issues.

Remain current on local and regional plans affecting the Basin, legislative issues related to water industry activities, and continually educate the Watermaster Board, TAC, EWG and staff on developing issues.

Carry out policies set by the Watermaster Board.

Perform related duties as assigned. Using a Consultant or in-house resources, administer and ensure the integrity of the Basin's Data Management System.

Desired Minimum Qualifications: The following are minimum qualifications desired by the Watermaster:

Knowledge of Sustainable Groundwater Management Act; Brown Act; groundwater adjudications and watermasters; California water policies and issues; principles of groundwater resource management; hydrology and groundwater modeling; principles and practices of effective consultant and human resource management; demonstrated experience in inter-agency and Statewide water issues; regulations regarding water quality; project management; business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership techniques, production methods, and coordination of people and resources; finance and budgeting; grant writing.

Demonstrated ability to Keep the Watermaster Board, TAC, and EWG fully informed in a timely and complete manner; stay abreast of legislation that might impact the Basin; address and solve problems; exercise tact and diplomacy in dealing with sensitive and complex issues and situations; exercise sound initiative and independent judgment; make technical presentations; communicate clearly and concisely, orally and in writing; track grant proposals and reporting; establish and maintain effective working relationships with all levels of management and staff; problem solve and put ideas into action.

Training and Experience: A typical way of obtaining the knowledge, skills and abilities outlined above is graduation from an accredited college or university with a bachelor's degree in business administration, public administration, engineering, hydrology, geology, or a closely related field (an advanced degree is desired); and five years of progressively responsible senior management and experience in or as consultant to a public or private water supply or management agency; or an equivalent combination of training and experience.

Licenses; Certificates: Special Requirements Possession of a valid California driver's license is required, as well as automobile liability insurance covering all personal vehicles that are operated in connection with the performance of services as Executive Director/Technical Advisor.

Possession of a certificate of registration as a Professional Engineer, Hydrgeologist or related certificate of professional registration, issued by the State of California is preferred.

Conflicts of Interest The Watermaster Governing Documents prohibit hiring an individual/consulting firm that has a contractual relationship or business affiliation with the Settling Parties listed above unless 4 of the 5 Watermaster Board members vote otherwise. Please disclose any potential disqualifying conflicts of interests in the proposed project or with involved parties. Also provide statement(s) identifying any potential conflicts of interest with other clients or interests of the responding firm or individual.

Advisor Selection Schedule The various tasks and the corresponding target completion dates associated with the selection of a qualified firm or individual for Advisor to Watermaster services are outlined below:

[DATE] Deadline to submit proposals in response to Watermaster's RFP

[DATE] TAC Review and short list candidates to Watermaster Ad Hoc Committee

[DATE] Watermaster Ad Hoc Committee to review proposals and interview candidates

[DATE] Watermaster approves hiring of a qualified firm/individual for Advisor to Watermaster September 23, 2013

Elements of Proposal Please include the following required information in your proposal:

1. Cover Letter: Provide a Cover letter that summarizes your proposal.

2. Scope of Services: Provide a detailed scope of services including any additional and necessary duties not listed above. Provide a description of your firm's capabilities and understanding of the services to be performed for the Watermaster and familiarity with Watermaster activities as described in the "Essential Duties and Responsibilities" section of this RFP.

3. Experience: Identify the lead individual designated as the Executive Director/Technical Advisor to Watermaster and, for a firm, a description of any supporting team (with all resumes at the back of the proposal), emphasizing professional experience, qualifications, reputation, accessibility, and capabilities of the Executive Director/Technical Advisor and other key staff, if any.

4. Resumes: Provide resumes, reference contacts and previous experience in the water industry.

5. Fee Proposal: While your proposal does not have to reflect exact work hours, the Watermaster estimates ___ to ___ hours per month of Advisor's time may be required. The Watermaster is open to lump sum or hourly-rate fee schedules or some combination thereof. The fee proposal shall show a compensation schedule for services for the entire team. If a lump sum

is offered, provide a statement of methods of determining the lump sum fee. For hourly-rate fees, provide a detailed statement for all personnel who would perform services for the Watermaster.

Proposal requirements: Maximum length of proposal shall not exceed 10 pages, excluding front and rear cover, divider pages, resumes, reference contacts and previous experience.

Selection Process: The Watermaster will consider the recommendations of the Ad Hoc Committee and TAC, and select a qualified individual and/or firm to serve as Executive Director/Technical Advisor to Watermaster based on the review of the proposals and results of the interviews. The key selection criteria will include: job-related knowledge and understanding (Basin, Settlement Agreement, Stipulated Judgment, Groundwater Management Plan, Rules & Regulations, adjudications and watermasters); knowledge of hydrology and groundwater modeling; communication and presentation skills; finance/budgeting management experience; leadership skills; accessibility; and computer skills.

The minimum insurance requirements are automobile liability insurance of \$1,000,000 in a combined single limit; and professional liability insurance in the amount of \$1,000,000 per claim and annual aggregate.

Watermaster reserves the right to reject any and all submittals, waive any proposal formalities, modify, postpone or cancel the proposed selection procedure at its sole discretion.

Proposal Submittal

Any interested individual/consulting firm shall submit a proposal no later than 5:00 pm on [DATE] at the address listed below. Please provide 15 copies of the proposal document.

Geoff Poole, 806 Palm Canyon Drive, Borrego Springs, CA 92004

ATTACHMENTS: 2 Excerpts of Settlement Agreement, Stipulated Judgment and Rules & Regulations

JUDGMENT

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

Stipulated Judgment, Section IV.C

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.

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.

2.5 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.

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.

Watermaster Rules & Regulations section 2.6.2

INTERIM BORREGO SPRINGS WATERMASTER

BOARD OF DIRECTORS MEETING

MARCH 31, 2020

AGENDA ITEM II.C

March 24, 2020

TO: Board of Directors

FROM: Russell McGlothlin, O'Melveny & Myers, Attorneys for T2 Borrego LLC

SUBJECT: Selection Process and Approval/Direction re Request for Proposal for Selection of Legal Counsel

RECOMMENDED ACTION:

Approve request for proposal and selection process for legal counsel, and solicit proposals from qualified law firms to provide legal services to the Watermaster on an as-needed basis.

ITEM EXPLANATION:

Section IV.C of the Stipulated Judgment authorizes the Watermaster to hire legal counsel to advise and represent Watermaster. The Interim Watermaster Budget attached to the Settlement Agreement includes a total of \$47,250 for the initial transitional Water Year and \$63,000 for Water Year 2020-2021. In order to avoid a potential conflict of interest, the attorney must be independent (not under contract with any Party) and selected by the Watermaster through an arms-length RFP process, unless otherwise agreed to by a vote of 4 of the 5 Watermaster Board members.

Attached is a draft RFP for solicitation of proposals from qualified law firms to serve as legal counsel to Watermaster. Watermaster is requested to approve the RFP and establish a process and schedule for the selection of legal counsel.

NEXT STEPS:

Consider approving the proposed process to solicit proposals for an attorney, including:

- (1) March 31 Watermaster Board meeting – Board members provide direction on RFP.
- (2) April 1 to 10 – Implement Board direction re any needed changes to draft RFP.
- (3) Mid April – hold a brief, second Watermaster meeting (call) to formally approve the RFP and circulate shortly thereafter.

FISCAL IMPACT:

To be determined based on responses to RFP.

ATTACHMENTS:

1. Proposed RFP.

**Request for Proposal for Legal Counsel to
Interim Borrego Springs Watermaster**

Proposals Due by [Date]

Issued by:

Borrego Basin Watermaster
c/o Borrego Water District
806 Palm Canyon Dr.
Borrego Springs, CA 92004

Direct Questions to:

[Fill in contact and contact information]

1. Introduction

The Interim Borrego Springs Watermaster (“Watermaster”) is soliciting proposals from qualified law firms to serve as legal counsel to the Watermaster on an as-needed basis. The Watermaster’s Board of Directors is comprised of one representative and one alternate representing the Borrego Springs community, Borrego Water District, County of San Diego (“currently vacant”), the Borrego Springs agricultural sector, and the Borrego Springs recreational sector. The Watermaster has been established by a Settlement Agreement among the groundwater producers listed in the Attachment (“Settling Parties”). The Settling Parties are responsible for over 90% of the groundwater production in the Borrego Springs Subbasin (“Basin”).

(“Settling Parties”). A groundwater rights adjudication is currently pending in the Orange County Superior Court (*Borrego Water District v. 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-CU-TT-CTL) (“Adjudication”). As part of the Settlement Agreement, the Settling Parties have agreed to: (1) a proposed Stipulated Judgment that, if entered by the Court, will declare the individual rights of all groundwater producers in the Basin; (2) a Groundwater Management Plan; and (3) Watermaster Rules and Regulations (“Watermaster Governing Documents,” available at <http://www.bvgsp.org/judgment.html>). The Watermaster Governing Documents also provide for a Technical Advisory Committee (“TAC”) comprised of technical representatives from the individual parties, and an Environmental Working Group (“EWG”) to advise the Watermaster on groundwater dependent ecosystems and any other matters approved by the Watermaster.

2. Essential Duties and Responsibilities

The law firm selected will perform all legal services that are commonly performed for Watermasters or local governmental entities on an as-needed basis. Anticipated duties include:

- Assist in the processing of the Adjudication, as directed by the Watermaster’s Board of Directors.

- Review and drafting of documents pertinent to the operation and functions of the Watermaster.
- Advise and consult on matters of concern regarding enforcement of the implementation of the judgment resulting from the Adjudication and all other Watermaster Governing Documents.
- Attend Watermaster meetings and advise on matters arising from same as directed by the Watermaster’s Board of Directors. Note that this will require regular attendance of meetings in Borrego Springs.
- Attend committee and working group meetings as directed by the Watermaster Executive Director or Board of Directors.
- Interpret laws, legislation, rulings and regulations for the Watermaster.
- Assist in the preparing any amendments to the Watermaster Governing Documents when and if directed to do so by the Watermaster’s Board of Directors.
- Represent the Watermaster in administrative and legal proceedings related to enforcement and implementation of the judgment resulting from the Adjudication and compliance with the Sustainable Groundwater Management Act (“SGMA”).
- Serve as the Watermaster’s ethics officer.
- Perform related duties as assigned.

Since no reliable effort can be provided at this time as to the level of effort required for this miscellaneous work, proposing law firms are asked to submit their hourly rate schedules for personnel anticipated to work for the Watermaster. These schedules will be used for billing to Watermaster for said services and will be considered by Watermaster during the selection process upon receipt of proposals.

3. Qualifications

Proposals should describe the qualifications of the key staff that will perform desired services for the Watermaster. The following qualifications are desirable:

- Ability to represent the Watermaster in the Superior Court of Orange County;
- Knowledge of the Basin, Stipulated Judgment, and the other Watermaster Governing Documents;
- Extensive knowledge of the California Water Code, SGMA, and expertise in the area of water law, particularly dealing with groundwater and adjudicated water rights; and
- Expertise concerning
 - California water policies and issues;
 - Principles of groundwater resource management, hydrology, and groundwater modeling;
 - The Ralph M. Brown Act;

- The Public Records Act;
- The Political Reform Act; and
- Other laws applicable to public agencies.

4. Conflicts of Interest

Proposals should address any existing or potential legal or business conflicts of interests, including any potential conflicts of interest with other clients or interests of the firm. The firm should identify and disclose any business relationship, direct or indirect, with any of the Settling Parties listed in the Attachment and any other party in the Judgment.

5. Proposal

Please include the following required information in your proposal:

- A description of your firm, including the number of attorneys and areas of specialization.
- The name, address, phone number, fax number, and email address of the key person in your firm for this Request for Proposal.
- The expertise of the partner-in-charge who will conduct the representation and specifically how that expertise matches the qualifications listed above in Section 3.
- The names and experience of each individual that you anticipate would be assigned to the representation and the hourly rate charged for each such individual.
- The names, addresses and telephone numbers of at least three references. This list should include organizations for which your firm has performed similar services as outlined in the essential duties and responsibilities listed in Section 2 above.
- Any existing or potential conflicts of interest for this assignment as described in Section 4 above.

Your proposal should not exceed 10 pages, excluding front and rear cover, divider pages, resumes, reference contacts and previous experience.

6. Selection Process and Retention Requirements

Watermaster anticipates that its selection process will proceed as follows:

[DATE] Deadline to submit proposals in response to Watermaster’s RFP.

[DATE] Watermaster Ad Hoc Committee to review proposals and interview candidates.

[DATE] Watermaster approves hiring of legal counsel.

Watermaster will select a qualified individual and/or firm to serve as the legal counsel to Watermaster based on the review of the proposals and results of the interviews. Watermaster may reject any and all submittals, waive any proposal formalities, and modify, postpone or cancel the proposed selection procedure at its sole discretion

The selected firm must maintain minimum insurance as follows:

- Workers' compensation insurance as required by law in the State of California;
- General liability insurance naming Watermaster as an additional insured with policy limits of not less than \$1,000,000.00 per occurrence, combined single limit for bodily injury and property damage; and
- Professional liability insurance with coverage for wrongful acts, errors, or omissions committed by the firm in the course of work performed for the Watermaster with policy limits of not less than \$1,000,000.00 per claim.

The selected firm must also agree to hold harmless, defend at its own expense, and indemnify the Watermaster, its officers, employees, and agents against any and all liability, claims, losses, damages or expenses, including reasonable attorneys' fees, arising from all negligent or reckless acts or omissions, or acts of willful misconduct of the firm or its officers, agents, or employees in rendering services to Watermaster; excluding, however such liability, claims, losses, damages, or expenses arising solely from Watermaster's gross negligence or willful acts. .

7. Proposal Submittal

Any interested law firm shall submit a proposal no later than **5:00 pm** on [DATE] at the address listed below. Please submit electronically to Geoff@BorregoWD.org (Geoff Poole, BWD General Manager).

LIST OF SETTLING PARTIES

1. David and Juli Bauer are co-trustees of the D&J Bauer Family Trust dated 11-18-04.
2. William M. Bauer.
3. Borrego Nazareth, LLC.
4. Borrego Springs Unified School District.
5. Borrego Water District
6. Roland J. Jensen is trustee of the Jensen Family Trust dated 08-05-83.
7. James Sommerville is trustee of the Sommerville Trust dated 11-22-83.
8. Roy Brisbois is trustee of the Conzelman Family Trust A dated 11-22-83.
9. Steven Mohler is trustee of the Conzelman Family Trust C dated 11-22-83.
10. CWC Casa Del Zorro, LLC.
11. John Doljanin is an individual and owner and operator of West Coast Trees LLC.
12. JM Roadrunner, LLC.
13. Lance Lundberg is trustee of the Lundberg Family Trust dated 10-01-98.
14. The Roadrunner Club at Borrego, LP.
15. Seley Ranches, L.P..
16. Shenandoah Growers, Inc.
17. The Springs RV and Golf Resort, LP.
18. T2 Borrego LLC.
19. T2 Farms LLC.
20. T2 Holding LLC and doing business as T2 B Holding LLC.
21. Trojan Citrus, LLC.
22. Gamini D. Weerasekera, an individual and owner and manager of Mountain Spring Organics LLC.

INTERIM BORREGO SPRINGS WATERMASTER
BOARD OF DIRECTORS MEETING
MARCH 31, 2020
AGENDA ITEM II.D

March 27, 2020

TO: Board of Directors

FROM: Michele A. Staples, Esq., Jackson Tidus, Attorneys for Agricultural Alliance for Water and Resource Education (“AAWARE”)

SUBJECT: Watermaster Approved Water Meters

RECOMMENDED ACTION:

Approve water meters

ITEM EXPLANATION:

By March 31, 2020, pumpers who are allocated a Baseline Pumping Allocation (BPA) are to install meters approved by the Watermaster on active production wells. (Settlement Agreement section 4.2; Stipulated Judgment section VI.A; Rules & Regulations section 5.1.) Meters can be either the type that can electronically transmit water pumping and other data to the Watermaster in real time, or manual-read meters to be read by the Watermaster. If a Party chooses to install manual-read meters, the Party must pay all costs associated with the Watermaster’s reading, accounting and reporting related to such meters. Due to the later-than-anticipated timing of the Watermaster Board’s first meeting, the settling parties installed or are in the process of installing state-of-the-art meters before the Watermaster held its first meeting and established a list of approved meters.

Each pumper with BPA is to provide the Watermaster, upon meter installation and on an annual basis, written verification certifying the accuracy of the meter readings and meter calibration, and 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. (Stipulated Judgment sections IV.E(6), VI.A; Rules & Regulations section 5.2.) The settling parties will be given instructions or a form by the Watermaster for providing the following meter information for the Watermaster’s records: installation date, meter type, size, model, serial number, calibration

record and confirmation that 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 Board is requested to establish Watermaster approved meters including the following meters currently used and installed by the settling parties:

Borrego Water District installed Octave Ultrasonic meters on all of its wells.

Private well owners (agricultural, recreational, Borrego Air Ranch) and Borrego Springs Elementary School either have installed meters or are in the process of installing new meters or retrofitting existing meters, as well as calibration, including the following:

- McCrometer manual-read meters;
- McCrometer telemetric meters;
- McCrometer MW503 water meters;
- M2-030-P1 Badger Meter M2000 Electromagnetic Flow meters; and
- SWIIM telemetric meter systems.

(Note: The manufacturers will be unable to complete all installations, retrofits and calibrations for the agricultural and recreational sector production wells by March 31, 2020, due to the large number of meter installations and logistic difficulties including those resulting from the novel coronavirus restrictions. An update will be provided at this Watermaster meeting.)

SWIIM meter systems are already included as approved meters in the Watermaster Rules and Regulations (Section 5.2). Therefore, Watermaster is asked to add Octave Ultrasonic meters, McCrometer manual-read meters, McCrometer telemetric meters, McCrometer MW503 water meters, and M2-030-P1 Badger Meter M2000 Electromagnetic Flow meters to the list of Watermaster approved meters.

NEXT STEPS:

Consider approving Resolution No. 20-02 of the Borrego Springs Watermaster Establishing Watermaster Approved Meters

FISCAL IMPACT:

N/A

ATTACHMENTS:

1. Proposed Resolution No. 20-02 of the Borrego Springs Watermaster Establishing Watermaster Approved Meters
2. Excerpts of Settlement Agreement, Stipulated Judgment and Rules & Regulations related to meters referenced above
3. Specifications for some of the meters referenced above

Attachment 1

Proposed Resolution No. 20-02 of the Borrego Springs
Watermaster Establishing Watermaster Approved Meters

RESOLUTION NO 20-02 OF THE
BOARD OF DIRECTORS OF THE INTERIM BORREGO SPRINGS WATERMASTER ESTABLISHING APPROVED
METERS

WHEREAS, the Settlement Agreement, Stipulated Judgment and Rules & Regulations of the Interim Borrego Springs Watermaster (“Watermaster”) require pumpers with Baseline Pumping Allocations to install Watermaster approved meters.

WHEREAS, meters can be either the type that can electronically transmit water pumping and other data to the Watermaster in real time, or manual-read meters to be read by the Watermaster.

WHEREAS, SWIIM meter systems that can telemetrically or electronically transmit data have been pre-approved per Section 5.2 of the Watermaster Rules & Regulations.

WHEREAS, the Watermaster Board has received information on the following meters, including specifications for some of them: Octave Ultrasonic Meters, McCrometer manual-read flow meters, McCrometer telemetric flow meters, McCrometer MW503 water meters and M2-030-P1 Badger Meter M2000 electromagnetic flow meters.

NOW, THEREFORE, be it resolved by the Board of Directors of the Interim Borrego Springs Watermaster, as follows:

1. The Board of Directors hereby approves the following types of meters for installation, use, and data reporting in the Basin:

- 1) Octave Ultrasonic Meters
- 2) McCrometer manual-read flow meters
- 3) McCrometer telemetric flow meters
- 4) McCrometer MW503 water meters
- 5) M2-030-P1 Badger Meter M2000 electromagnetic flow meters
- 6) SWIIM meters with electronic transmission of data

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Interim Borrego Springs Watermaster held on the 31st day of March 2020, by the following vote:

AYES:

NOES:

ABSENT:

President

Board of Directors

Secretary

ATTEST

Attachment 2

Excerpts of Settlement Agreement, Stipulated Judgment
and Rules & Regulations related to meters

Parties shall sign the Stipulation attached hereto as Exhibit D and submit a request to the Court for entry of the Judgment pursuant to the procedures set forth in Code of Civil Procedure sections 830 et seq. Prior to entry of the Judgment, the Parties agree to submit the proposed Stipulated Judgment to the Department for review and approval to serve as an alternative to a Groundwater Sustainability Plan pursuant to SGMA (Alternative Plan). (Water Code, §§10733.6; 10737.4.) The Parties shall submit the Alternative Plan to DWR prior to January 31, 2020.

4. **Actions Pending Entry of Judgment.** The Parties agree to be bound by and operate under the provisions of the Judgment on an interim basis pending entry of Judgment commencing on January 31, 2020, except as provided in Section 4.1 below.

4.1 **Interim Watermaster.** No later than February 15, 2020, the Parties shall establish an interim Watermaster pending entry of the Judgment. The interim Watermaster will be constituted and operate pursuant to the terms of Section IV.B of the Judgment except that, for purposes of selecting the interim Watermaster representatives and alternates for the recreational sector and agricultural sector, respectively, subsection (1) of the definitions of GC Owners and AG Parties in Exhibit "7" to the Judgment shall be restricted to Parties to this Agreement. The Parties agree to fund the interim Watermaster budget attached hereto as Exhibit E in accordance with Section 4.4, below in two equal payments; the first half to be paid within 30 days after Court issuance of the preliminary injunction discussed in Section 2.2 above, and the second half to be paid by September 1, 2020. The interim Watermaster will have the power to enforce the terms of this Agreement and the Judgment as against the Parties and all other Persons that are a party to the Adjudication Action to the greatest extent allowed by law and to the extent authorized by the Court. 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 attached Judgment, including without limitation enforcement of rampdown, issuing annual reports, collecting assessments, issuing status and eligibility letters, contracting for technical work, and following its rules, among other items. During this time, the GSA will be dormant, and thus the GSA will not perform any groundwater management actions or assess any fees or assessments. In the event that any matter develops in advance of the entry of the final Judgment by the Court that threatens to cause a material and imminent adverse impact to the Basin, or threatens to adversely affect implementation of this Agreement or the proposed Judgment, the Parties agree to promptly file a motion with the Court to obtain an order and instruction from the Court to address and remedy the adverse development. Within 60 days of entry of the Judgment, BWD will withdraw as the GSA by notice to the Department in accordance with Water Code section 10723.8.

4.2 **Meter Installation.** No later than March 31, 2020, each Party shall install, at its own expense, meters in conformance with Section VI.A of the Judgment.

4.3 **Water Quality Monitoring Plan.** The Parties agree to fund the continuation of the County-initiated program of water quality monitoring in the Basin that is funded through March 2020 as part of GSP development until the Court approves the formation of the permanent Watermaster and the TAC agrees to a new or modified water quality monitoring program.

1 the Court must be made within ten (10) days following the Court order on appeal. If payment is
2 not made on or before the applicable due date, the Watermaster will add a penalty of one percent
3 (1%) per month thereof to such Party's statement.

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

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

22 **VI. WELL METERING AND WATER QUALITY TESTING**

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

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

7 **B. Water Quality Monitoring Plan**

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

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

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.

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

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

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

26 7. Meetings with the Technical Advisory Committee. The Watermaster shall
27 meet on a regular basis and at least semi-annually with the Technical Advisory Committee to
28 review Watermaster activities pursuant to this Judgment and to receive advisory

Attachment 3
Specifications for meters



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 Mag³⁰⁰⁰, battery operated mag meter with a 5 year Guaranteed Battery Life.

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.

Request a quote or more information on products designed for Agriculture & Irrigation



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!
144



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.





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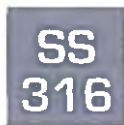
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Water engineers and technicians will find McCrometer has a versatile Smart Output mag meter solution that is Sensus or Itron system compatible for nearly every type of AMR and AMI application. These accurate, reliable and cost-effective mag meters are available for line sizes from 4 to 138 inches in hot tap insertion 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.

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.



Octave brings the latest in ultrasonic metering technology to Commercial/Industrial (C&I) water meters and puts precise measurement where the real flows exist. An excellent alternative to mechanical compound, single-jet, floating ball, fire-service type and turbine meters, Octave excels at maintaining sustained accuracy for the life of the meter while providing smart AMR capabilities.

Technical Specifications:

Working Pressure - 175 PSI

Liquid Temperature - 32° - 122 °F

Metrological Characteristics - Meets ANSI/AWWA Standard C750-10, ISO 4064 rev. 2005

Configuration - Compact-Display built into unit

Power Source - 2 x D Size Lithium Thionyl Chloride batteries - 10 year warranted life time

Environmental Protection - NEMA 6P+ (IP68+), Ambient operation temp. -13 °F / +131 °F for the display

Display Units - Multi line 9 digit LCD (Programmable USG, Cubic Feet, Cubic Meters, Acre Feet for volume and GPM, Lt/s, or M³/h for rate of flow)

Output - Programmable single/dual open drain digital pulse, dry contact digital pulse, encoder OR externally powered loop 4-20 mA

Features & Benefits:

- Flow sensitivity starting as low as 1/16 GPM
- Grade 316 Stainless Steel or Epoxy Coated Ductile Iron body design provides full compliance with ANSI/NSF 372 (AB1953 or NSF61G)
- No moving parts, Minimal flow intrusion, Enduring accuracy.
- No required strainer
- Wide beam ultrasonic measurement sensors for high accuracy and reliable operation
- Industry standard communication protocol for integration with most third-party AMR/AMI systems
- Active leak, theft, backflow, meter damage/tamper, rate of flow, and battery life indication
- Detailed LCD display features immediate reporting and visual indicators for 8 critical conditions
- Ruggedized NEMA 6P/IP-68+ construction, fully submersible design
- Designed to meet standards for both North American and international C&I water meters
- Optional flow measurements; Forward Only, Net Volume or Alternating Display (Forward and Reverse Consumption displayed separately)



Performance Data

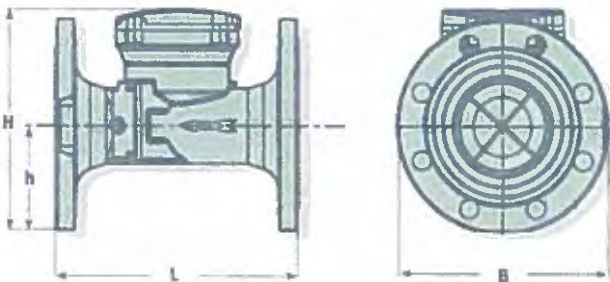
Nominal Size inch (mm)	↑ Typical Starting Flow GPM (L/s)	Extended Low Flow 95% - 115% Accuracy GPM (L/s)	Normal Flow Range 96.5% - 101.5% Accuracy GPM (L/s)	± Continuous Safe Max. Flow GPM (L/s)	Linearity Range ± 0.5% Maximum Deviation GPM (L/s)
2" (50mm)	1/16 (.004)	1/4 (.016)	1/2 - 250 (.032 - 15.77)	250 (15.77)	4 - 200 (.25 - 12.67)
3" (80mm)	1/16 (.004)	1/2 (.032)	1 - 500 (.06 - 31.54)	500 (31.54)	5 - 350 (.32 - 22.08)
4" (100mm)	1/16 (.004)	3/4 (.047)	1-1/2 - 1,000 (.09 - 63.33)	1,000 (63.09)	15 - 700 (.94 - 44.16)
6" (150mm)	3/4 (.047)	2 (.13)	3 - 1,600 (.19 - 100.94)	1,600 (100.94)	25 - 1,150 (1.26 - 72.55)
8" (200mm)	3/4 (.047)	4 (.25)	5 - 2,800 (.32 - 178.65)	2,800 (178.65)	50 - 2,000 (3.15 - 128.18)
10" (250mm)	2.5 (.16)	8 (.50)	14 - 5,500 (.88 - 346.99)	5,500 (346.99)	400 - 4,000 (25.24 - 252.36)
12" (300mm)	2.5 (.16)	8 (.50)	14 - 5,500 (.88 - 346.99)	5,500 (346.99)	400 - 4,000 (25.24 - 252.36)

↑ Starting flows vary per model but can go as low as the above listed flow rates.

± Continuous Safe Max. Flow ratings listed for the Octave are for accurate flow measurement only and do not limit the Octave from meeting the Short-Term Delayed Flow for the service.

Dimensions

Model	Octave							
	2" SS (50 mm)	2" DI (50 mm)	3" (80 mm)	4" (100 mm)	6" (150 mm)	8" (200 mm)	10" (250 mm)	12" (300 mm)
L - Length	10" (250 mm)	17" (432 mm)	12" (305 mm)	14" (356 mm)	18" (457 mm)	20" (508 mm)	17 3/4" (451 mm)	19 3/4" (502 mm)
B - Width	5 3/4" (146 mm)	5 3/4" (146 mm)	7 1/2" (190 mm)	9" (229 mm)	11" (280 mm)	13 1/2" (343 mm)	16" (406 mm)	19 3/4" (502 mm)
H - Height	6 3/4" (172 mm)	6 3/4" (172 mm)	8 1/2" (216 mm)	9 7/8" (250 mm)	10 7/8" (276 mm)	12 7/8" (327 mm)	16 1/2" (419 mm)	19 3/4" (502 mm)
h - Height	2 1/8" (54 mm)	2 1/8" (54 mm)	3 1/2" (90 mm)	4 1/2" (115 mm)	5 1/8" (130 mm)	6 3/8" (162 mm)	8" (203 mm)	9 7/8" (251 mm)
Weight - Ductile Iron	N/A	24 lbs. (11 kg)	36 lbs. (16 kg)	48.5 lbs. (22 kg)	76 lbs. (34 kg)	108 lbs. (49 kg)	150 lbs. (68 kg)	210 lbs. (96 kg)
Weight - Stainless Steel	15 lbs. (7 kg)	N/A	28 lbs. (13 kg)	40 lbs. (18 kg)	62 lbs. (28 kg)	88 lbs. (40 kg)	N/A	N/A



Master Meter, Inc.

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innovate@mastermeter.com

NOTE -

M2000

Electromagnetic Flow Meter





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SAFETY PRECAUTIONS AND INSTRUCTIONS

Some procedures in this manual require special safety considerations. In such cases, the text is emphasized with the following symbols:

Symbol	Explanation
	Warning indicates the potential for severe personal injury, death or substantial property damage. Comply with the instructions and proceed with care.
	Caution indicates the potential for minor personal injury or property damage. Comply with the instructions and proceed with care.

SYSTEM DESCRIPTION

The Badger Meter M-Series® model M2000 electromagnetic flow meter is intended for fluid metering in most industries including water, wastewater, food and beverage, pharmaceutical and chemical.

The basic components of an electromagnetic flow meter are:

- The **detector**, which includes the flow tube, isolating liner and measuring electrodes.
- The **amplifier**, which is the electronic device responsible for the signal processing, flow calculation, display and output signals.

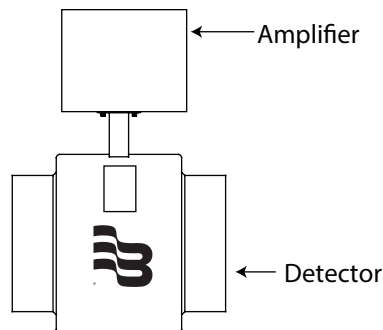


Figure 1: Amplifier and detector

The construction materials of the wetted parts (liner and electrodes) should be appropriate for the specifications on the intended type of service. We recommend that you review all of the compatibilities consistent with the specifications.

Each meter is factory tested and calibrated. A calibration certificate is included with each meter.

UNPACKING AND INSPECTION

Follow these guidelines when unpacking the M-Series equipment.

- If a shipping container shows any sign of damage, have the shipper present when you unpack the meter.
- Follow all unpacking, lifting and moving instructions associated with the shipping container.
- Open the container and remove all packing materials. Store the shipping container and packing materials in the event the unit needs to be shipped for service.
- Verify that the shipment matches the packing list and your order form.
- Inspect the meter for any signs of shipping damage, scratches, or loose or broken parts.

NOTE: If the unit was damaged in transit, it is your responsibility to request an inspection report from the carrier within 48 hours. You must then file a claim with the carrier and contact Badger Meter for appropriate repairs or replacement.

- All detectors with polytetrafluoroethylene (PTFE) liners are shipped with a liner protector on each end to maintain proper form of the PTFE material during shipping and storage.

NOTE: Do not remove the liner protectors until you are ready to install.

- Storage: If the meter is to be stored, place it in its original container in a dry, sheltered location. Storage temperature ranges are: -40...160° F (-40...70° C).

Rigging, Lifting and Moving Large Units

CAUTION

WHEN RIGGING, LIFTING OR MOVING LARGE UNITS, FOLLOW THESE GUIDELINES:

- DO NOT lift or move a meter by its amplifier, junction box or cables.
- Use a crane rigged with soft straps to lift and move meters with flow tubes that are between two inches and eight inches (50 mm and 200 mm). Place the straps around the detector body, between the flanges, on each side of the detector.
- Use the lifting lugs when lifting meter flow tubes that are 10 inches (250 mm) in diameter or larger.

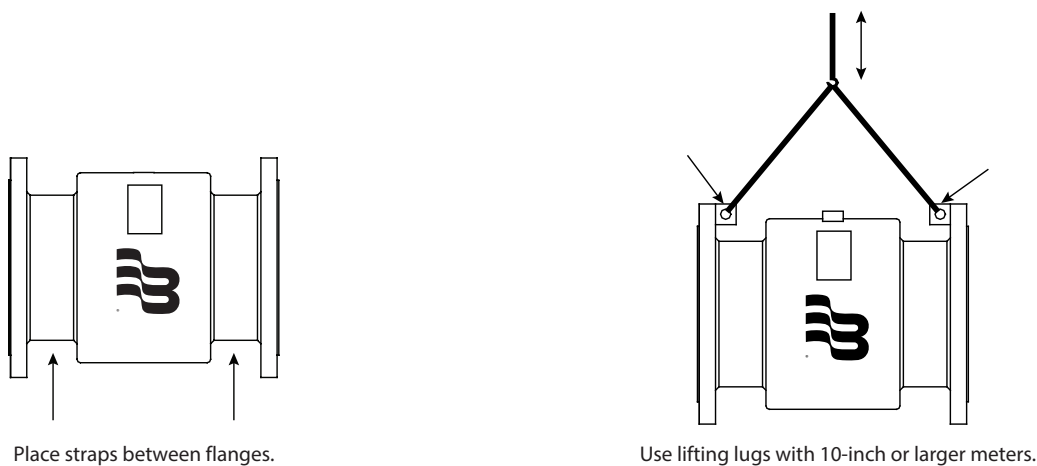


Figure 2: Rigging large units

- Use the sling-rigged method to lift large detectors into a vertical position while they are still crated. Use this method to position large detectors vertically into pipelines.

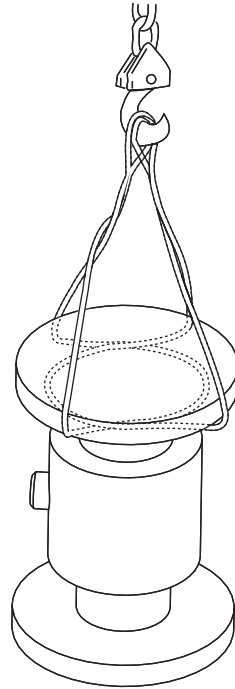
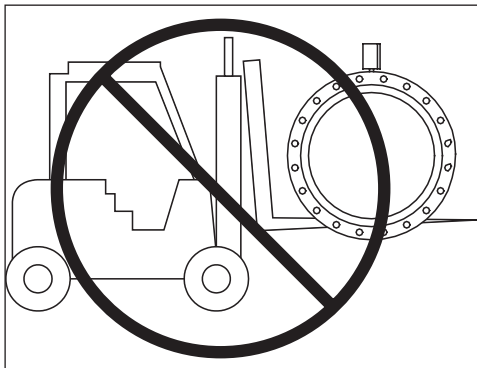
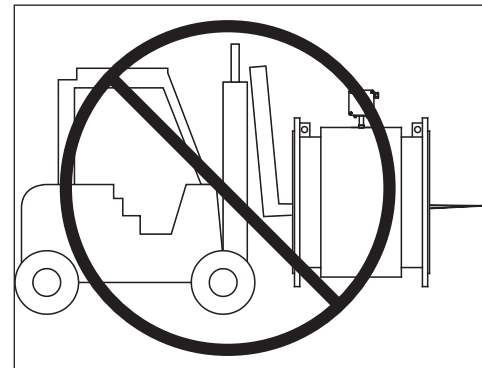


Figure 3: Sling-Rigged lifting methods

- Do not lift a detector with a forklift by positioning the detector body on the forks, with the flanges extending beyond the lift. This could dent the housing or damage the internal coil assemblies.
- Never place forklift forks, rigging chains, straps, slings, hooks or other lifting devices inside or through the detector's flow tube to hoist the unit. This could damage the isolating liner.



Do not lift detector with forklift.



Do not lift or rig lifting devices through detector.

Figure 4: Lifting and rigging cautions

METER LOCATION, ORIENTATION AND APPLICATIONS

Gasket and grounding requirements must be considered when determining the meter location, orientation and application. See "Meter Gaskets and Grounding" on page 12. The M2000 meter provides two amplifier mounting options: a meter mount option and a remote mount option.

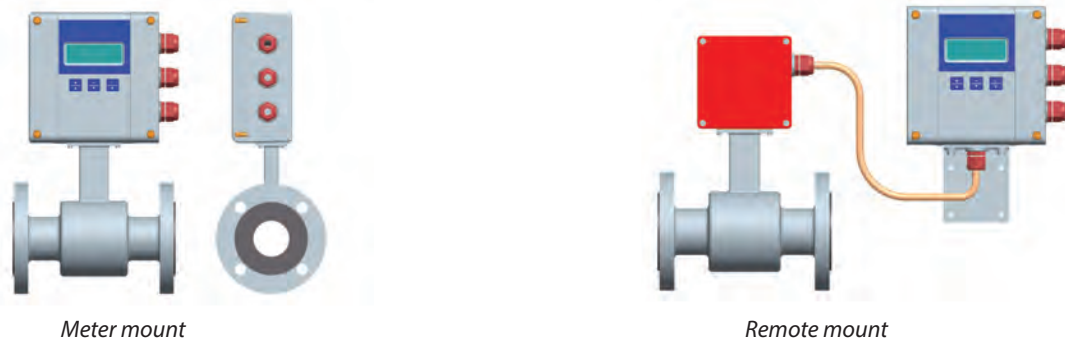


Figure 5: Amplifier mounting options

Temperature Ranges

CAUTION

TO PREVENT DAMAGE TO THE METER, STRICTLY OBSERVE THE AMPLIFIER'S AND DETECTOR'S MAXIMUM TEMPERATURE RANGES.

- In regions with extremely high ambient temperatures, protect the detector.
- In cases where fluid temperature exceeds 212° F (100° C), use the remote version.

Amplifier	Ambient temperature		- 4...140° F (-20...60° C)
Detector	Fluid temperature	PTFE / PFA	- 40...302° F (- 40...150° C)
		Hard rubber	32...176° F (0...80° C)

Remote Amplifier Outdoor Location

The amplifier can be installed and operated outdoors. However, it must be protected from the elements, as follows:

- The ambient environment/temperature rating for the unit is -4...140° F (-20...60° C).
- If an indoor location is within 500 feet (152 meters) of the detector, consider increasing the cable length and mounting the amplifier indoors.
- At minimum, fabricate a roof or shield over and/or around the amplifier to protect the LCD screen from direct sunlight.

Pipelines and Fluid Flow

Take the following precautions during installation:

- Do not install the meter on pipes with extreme vibrations. If pipes are vibrating, secure the piping with appropriate pipe supports in front of and behind the meter. If vibrations cannot be restrained, mount the amplifier in a remote location.
- Do not install the detector close to pipeline valves, fittings or impediments that can cause flow disturbances.
- For detectors with PTFE liners, do not install the detector on suction sides of pumps.
- Do not install the detector on outlet sides of piston or diaphragm pumps. Pulsating flow can affect meter performance.
- Avoid installing the detector near equipment that produces electrical interference such as electric motors, transformers, variable frequency, and power cables.
- Verify that both ends of the signal cables are securely fastened.
- Place power cables and signal cables in separate conduits.
- Place the meter where there is enough access for installation and maintenance tasks.

Meter Orientation

Mag meters can operate accurately in any pipeline orientation and can measure volumetric flow in forward and reverse directions as long as the pipe is completely full.

NOTE: A "Forward Flow" direction arrow is printed on the detector label.

Vertical Placement

Mag meters perform best when placed vertically, with liquid flowing upward and meter electrodes in a closed, full pipe.

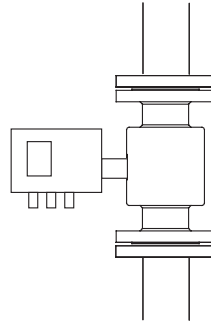


Figure 6: Vertical placement

Vertical placement allows the pipe to remain completely full, even in low flow, low pressure applications, and it prevents solids build-up, sediment deposit and accumulation on the liner and electrodes.

NOTE: Carefully observe the "Forward Flow" label on the meter body and install the meter accordingly. When installed vertically, rotate amplifier so that cable glands are facing down.

Horizontal Placement

M2000 meters are equipped with an *Empty Pipe Detection* feature. If an electrode mounted in the pipe is not covered by fluid for five seconds, the meter will display an Empty Pipe Detection condition. The meter will send out an error message and stop measuring flow. When the electrode is again covered with fluid, the error message disappears and the meter will begin measuring.

When installing the meter on a horizontal pipe, mount the detector to the pipe with the flow-measuring electrode axis in a horizontal plane (three and nine o'clock). This placement helps prevent solids build-up, sediment deposit and accumulation on the electrodes.

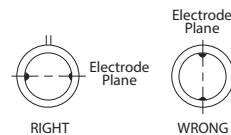


Figure 7: Horizontal placement

Straight Pipe Requirements

Sufficient straight-pipe runs are required at the detector inlet and outlet for optimum meter accuracy and performance. An equivalent of 3...7 diameters of straight pipe is required on the inlet (upstream) side to provide a stable flow profile. Two diameters are required on the outlet (downstream) side.

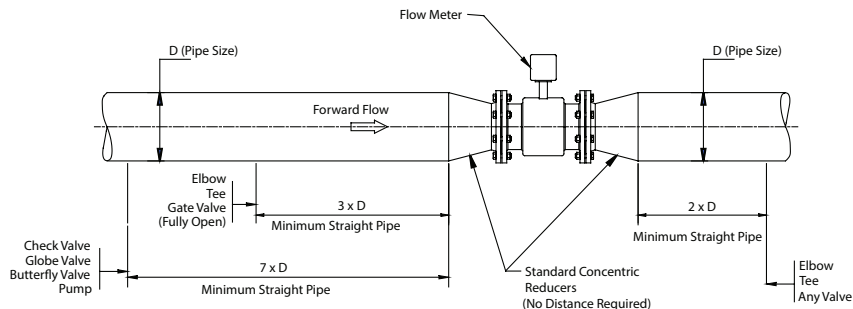


Figure 8: Minimum straight pipe requirements

Pipe Reducer Requirements

With pipe reducers, a smaller meter can be mounted in larger pipelines. This arrangement may increase low-flow accuracy. There are no special requirements for standard, concentric, pipe reducers.

Custom fabricated pipe reducers must have an approximate slope angle of 15 degrees to minimize flow disturbances and excessive loss of head. If this is not possible, install the custom pipe reducers as if they were fittings and install the required amount of straight pipe.

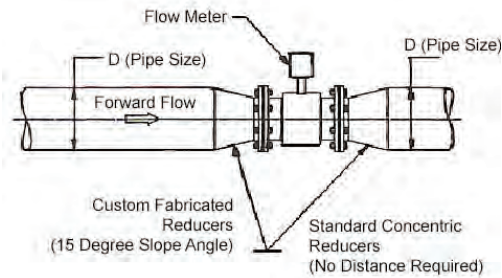


Figure 9: Pipe reducer requirements

Chemical Injection Applications

For water line applications with a chemical injection point, install the meter upstream of the injection point. This eliminates any meter performance issues.

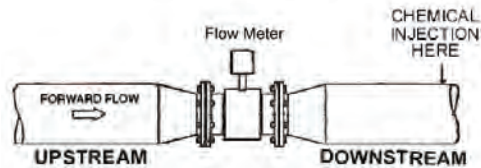


Figure 10: Chemical injection point downstream of meter

If a meter must be installed downstream of a chemical injection connection, the distance between the flange and the injection point should be between 50 and 100 feet (15 and 30 meters). The distance must be long enough to allow the water/chemical solution to reach the meter in a complete, homogeneous mixture. If the injection point is too close, the meter senses the two conductivities for each liquid. This will likely result in inaccurate measurements. The injection method—spaced bursts, continuous stream of drips or liquid or gas—can also affect downstream readings by the meter.

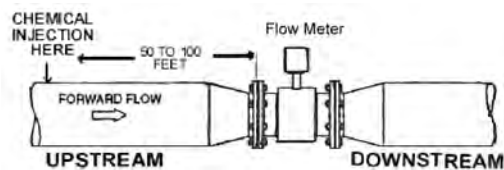


Figure 11: Chemical injection point upstream of meter

Sometimes, due to circumstances, it is difficult to specify the exact downstream placement distances. Contact Badger Meter Technical Support to review your application if necessary.

Partially-Filled Pipe Situations

In some locations, the process pipe may be momentarily only partially filled. Examples include: lack of back pressure, insufficient line pressure and gravity flow applications.

To eliminate these situations:

- Do not install the meter at the highest point of the pipeline.
- Do not install the meter in a vertical, downward flow section of pipe.
- Always position the ON/OFF valves on the downstream side of the meter.

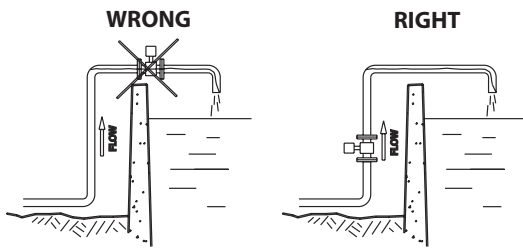
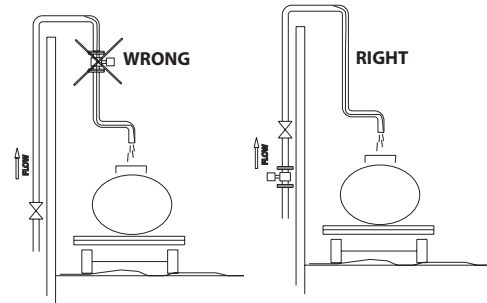


Figure 12: Incorrect meter placement



Do not install in a vertical, downward position.

Position "On/Off" valves on downstream side.

Figure 13: Position valves on downstream side

To minimize the possibility of partially-full pipe flows in horizontal, gravity or low pressure applications, create a pipe arrangement that ensures the detector remains full of liquid at all times.

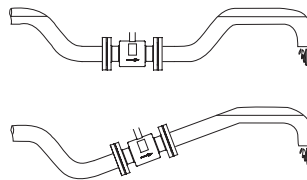


Figure 14: Pipe positioned to keep water in detector

METER GASKETS AND GROUNDING

Gaskets and grounding are required for proper mag meter installation.

IMPORTANT

If you received grounding rings with your meter, install them. Electromagnetic meters require a good ground for proper operation. Grounding rings also help protect the edge of the liner from debris that may flow from the pipe.

Meter/Pipeline Connection Gaskets

IMPORTANT

It is essential that the mag meter amplifier's input ground (zero voltage reference) be electrically connected to the liquid media and to a good, solid earth ground reference.

You must install gaskets (not provided) between the detector's isolating liner, grounding rings and the pipeline flange to provide a proper and secure hydraulic seal. Use gaskets that are compatible with the fluid. Center each gasket on the flange to avoid flow restrictions or turbulence in the line.

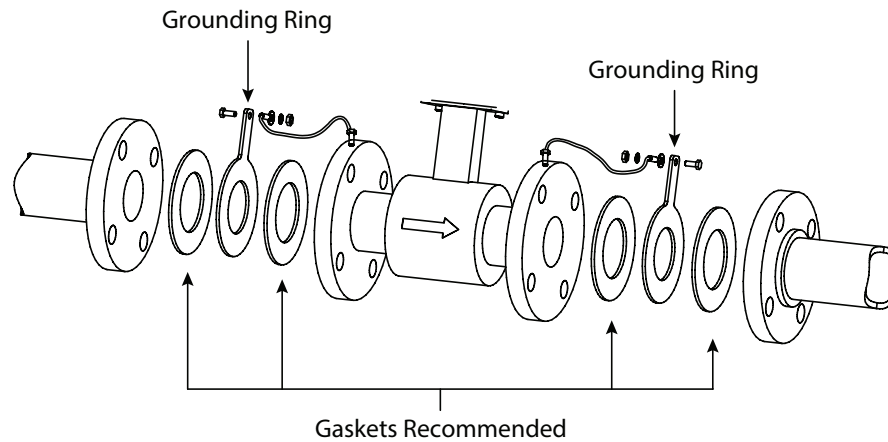


Figure 15: Meter/pipeline connection gaskets and grounding rings

During installation, do not use graphite or any electrically conductive sealing compound to hold the gaskets. This could compromise the accuracy of the measuring signal.

If you are using a grounding ring in the detector/pipeline connection, place the ring between two gaskets. (See "Recommended Installation with Grounding Rings".)

Meter Grounding

Process pipeline material can be either electrically conductive (metal) or not electrically conductive (made of or lined with PVC, fiberglass or concrete).

Recommended Installation with Grounding Rings

IMPORTANT

Badger Meter recommends the installation of a pair of grounding rings between the mating flanges at both ends of the meter. See Figure 15.

Connect the grounding straps to both of the grounding rings and to a good, solid earth ground. Grounding rings are available in stainless steel. If your fluid is too aggressive for stainless steel, order a meter with the optional grounding electrode in a material compatible with the fluid.

AMPLIFIER MOUNTING CONFIGURATION OPTIONS

There are two configuration options for mounting the amplifier. There are many options to accommodate a variety of meter-placement and environmental conditions.

Meter Mount Configuration

The meter mount configuration has the amplifier mounted directly on the detector. This compact, self-contained configuration minimizes installation wiring.

Remote Mount Configuration

The remote mount configuration places the amplifier at a location away from the fluid flow and detector. This is necessary in situations where process fluid temperature or the environment exceeds amplifier ratings.

The detector and amplifier are connected by wires, run through conduit, between junction boxes on the detector and the amplifier. The distance between the detector junction box and amplifier junction box can be up to 500 feet (152 meters). A remote mounting bracket is supplied.

Submersible Option

If you are installing the meter in a vault, you should order the remote amplifier option. You must not install the amplifier inside a vault. We also recommend ordering the remote meter package with the submersible option (NEMA 6P). This will eliminate any potential problems resulting from humidity or temporary flooding in the vault.

NOTE: The National Electronics Manufacturer's Association (NEMA) 6P enclosures are constructed for indoor or outdoor use to provide protection against access to hazardous parts; to provide a degree of protection against ingress of solid foreign objects and water (hose directed water and the entry of water during prolonged submersion at a limited depth); that provide an additional level of protection against corrosion and that will be undamaged by the external formation of ice on the enclosure.

WIRING

Wiring Safety

⚠ WARNING

AT INSTALLATION, BE SURE TO COMPLY WITH THE FOLLOWING REQUIREMENTS:

- Disconnect power to the unit before attempting any connection or service to the unit.
- Do not bundle or route signal lines with power lines.
- Keep all lines as short as possible.
- Use twisted pair shielded wire for all output wiring.
- Observe all applicable, local electrical codes.

Opening the M2000 Meter Cover

The M2000 amplifier's design lets you open the cover without completely removing it.

⚠ WARNING

COVER IS ATTACHED WITH DISPLAY RIBBON CABLE.

To open the cover you will need a blade screwdriver.

Follow these steps:

1. Disconnect power to the unit.
2. Completely remove the two screws from either the left or the right side of the amplifier.

3. Loosen each of the remaining screws so that the round head of the screw clears the top edge of the cover.
4. Lift and pivot the cover into the open position.



Figure 16: Open cover

Power Connections

External Disconnect

⚠ CAUTION

- Install an external disconnect switch or circuit breaker that meets local standards.
- Position the M2000 meter in an accessible location.
- Position and identify the disconnect device so as to provide safe and easy operation.
- Label the disconnect device as being for the mag meter.

AC Power Wiring

For the AC power connections, use three wire-sheathed cable with an overall cable diameter of 0.2...0.45 inch (5...12 mm). For signal output, use 18...22 gauge (0.25...0.75 mm²) shielded wire. Overall cable diameter between 0.12...0.35 inch (3...9 mm).

⚠ CAUTION

TO PREVENT ACCIDENTS, CONNECT MAIN POWER ONLY AFTER ALL OTHER WIRING HAS BEEN COMPLETED.

The amplifier is a microprocessor device. It is important that the power supply be as “clean” as possible. Avoid using power lines that feed heavy loads: pumps, motors, etc. If dedicated lines are not available, a filtering or isolation system may be required.

Power wiring is the same for meter mount and remote mount amplifiers.

Remote Mount Installation

If you are installing the M2000 amplifier in a remote location, review the procedures in this section.

Mount Bracket to Amplifier

1. Align bracket-mounting holes with amplifier mounting holes.
2. Attach bracket to amplifier with supplied screws. Torque screws to 80 inch pounds.

Wiring Configuration

Wiring between the detector and the M2000 amplifier comes complete from the factory. If your installation requires the use of conduit, we recommend that you follow these steps when wiring the detector to the amplifier.

1. Remove the junction box lid. Carefully remove the wires connected to the terminal blocks that run to the M2000 amplifier. See the chart below for a reference of wire color to terminal connection.
2. Run cable through the conduit from the amplifier location while retaining the wiring of the cable to the amplifier, as supplied.
3. Complete conduit assembly on both ends and rewire the cable into the junction box as it was previously wired.

Wiring for Remote Configuration

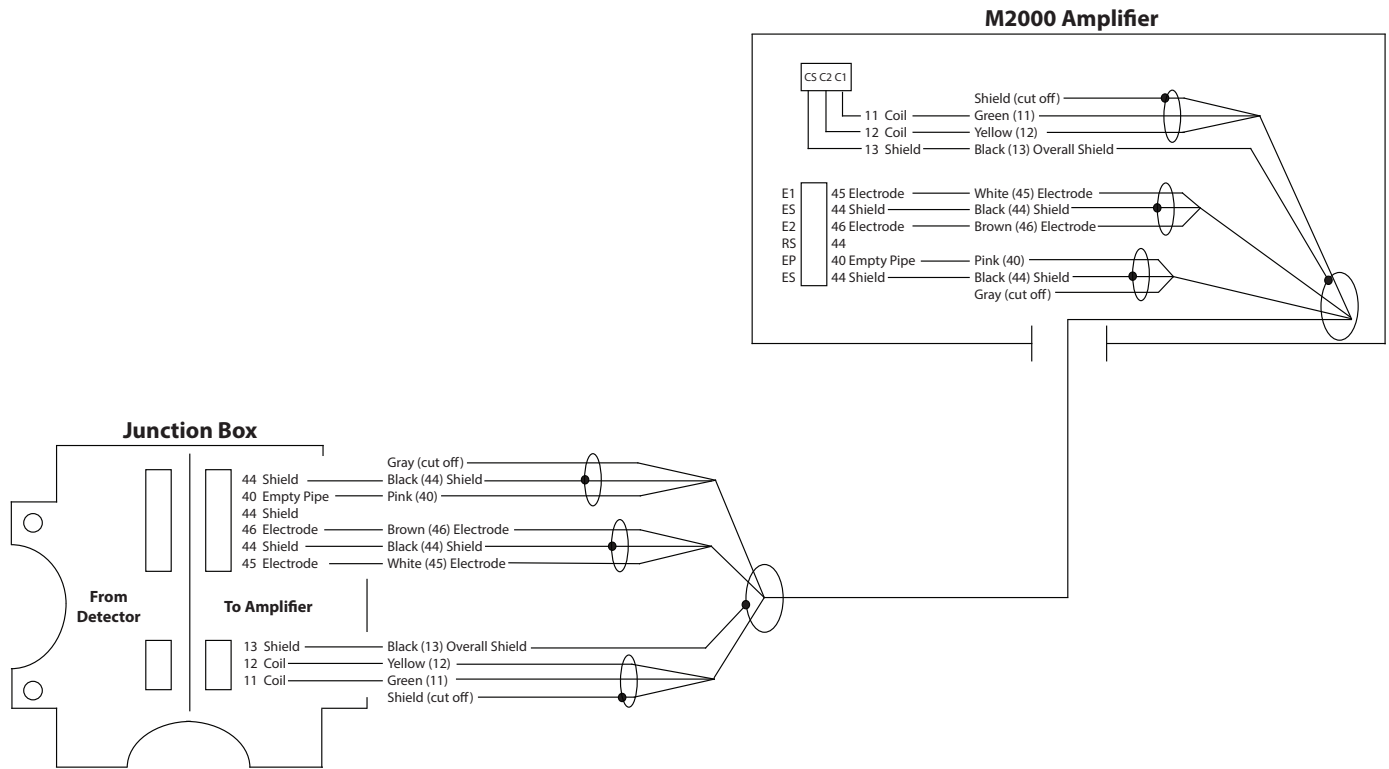


Figure 17: Wiring for remote configuration

Remote style M2000 amplifier models can be ordered with standard cables measuring 15, 30, 50,100 and 150 feet. In addition, cables up to 500 feet are available.

From Junction Box			To M2000 Amplifier
Connection No.	Description	Wire Color	Connection Label
11	Coil	Green	C1
12	Coil	Yellow	C2
13	Main Shield	Black (Red Ferrule)	CS
45	Electrode	White	E1
44*	Electrode Shield	Black	ES
46	Electrode	Brown	E2
40	Empty Pipe	Pink	EP
44*	Empty Pipe Shield	Black	ES

*Connections with the No. 44 are lying on the same potential.

Empty Pipe Detection Considerations

Take into account the following cable length and conductivity requirements, if you will be using empty pipe detection.

Cable Length (Feet)	Minimum Conductivity Required (µS/cm)
0*	5
100	20
500	100

* Meter Mount

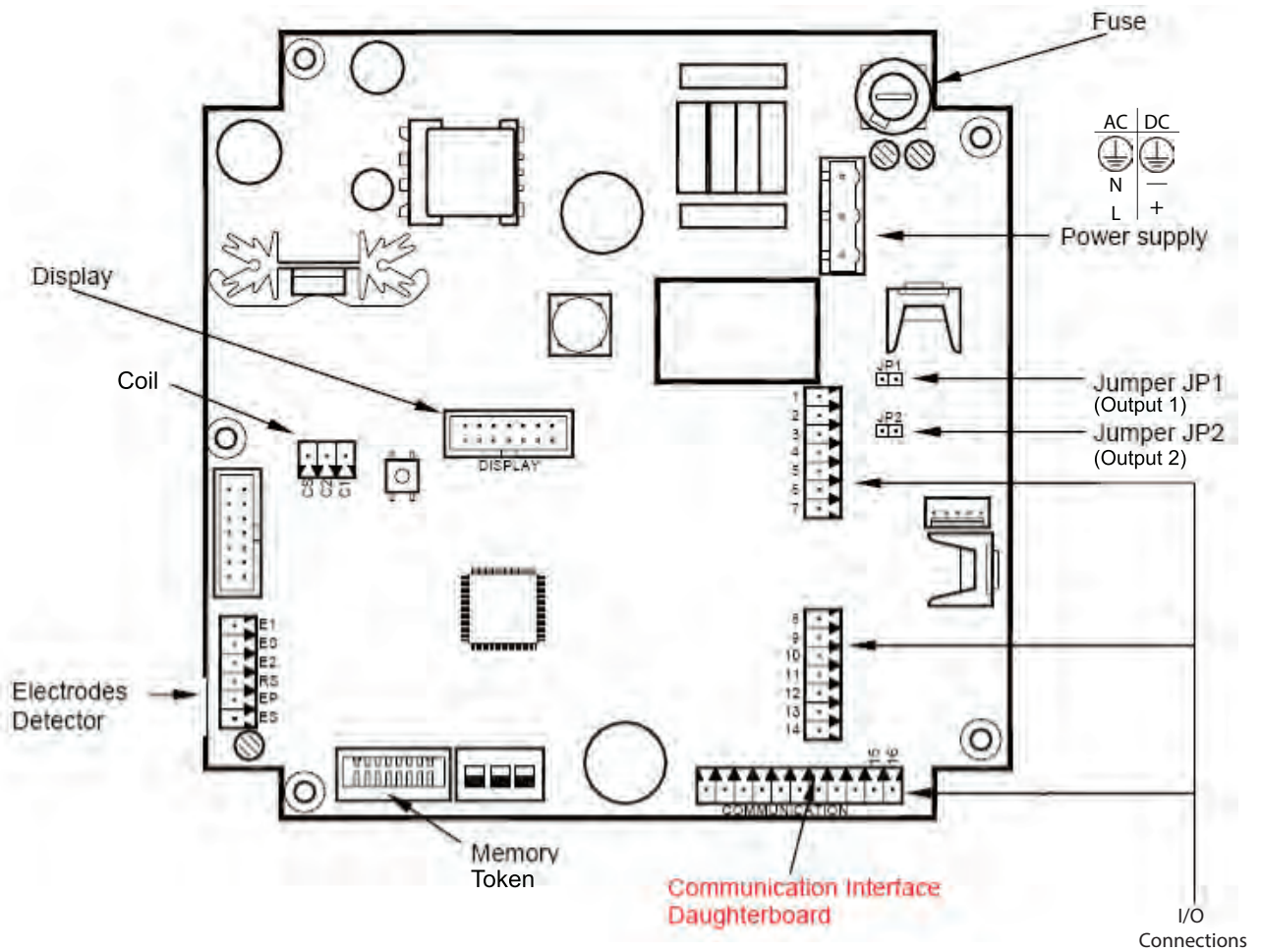
CONFIGURING INPUT/OUTPUT (I/O)

This section describes wiring the following M2000 meter inputs/outputs:

- Analog output
- Digital input
- Digital outputs
- Communication

Once the sensor and the amplifier have been wired, wire any inputs and outputs to the M2000 amplifier.

Do not connect the main power connection until you have made all other wiring connections. Follow all of the safety precautions and local code to prevent electrical shock and damage to the electronic components.



Supported protocols include:
 RS485 MODBUS RTU
 PROFIBUS DP
 HART

Figure 18: Configuring input/output

Input/Output	Description	Terminal
Analog Output	0...20 mA Resistive Load < 800 ohms 4...20 mA Resistive Load < 800 ohms 0...10 mA Resistive Load < 800 ohms 2...10 mA Resistive Load < 800 ohms	16 (+) 15 (-)
Digital Output 1	Passive max. 30V DC, 100 mA Active 24V DC, 50 mA (set Jumper JP1) Max. Frequency 10 kHz	1 (+) and 2 (-)
Digital Output 2	Passive max. 30V DC, 100 mA Active 24V DC, 50 mA (set Jumper JP2) Max. Frequency 10 kHz	3 (+) and 4 (-)
Digital Output 3	Passive Max 30V DC, 100 mA, 10 kHz Solid State Relay 48V AC, 500 mA, 1 kHz * Software configurable	10 (+) and 9 (-) 10 (+) and 11 (-)
Digital Output 4	Passive Max 30V DC, 100 mA, 10 kHz Solid State Relay 48V AC, 500 mA, 1 kHz * Software configurable	13 (+) and 12 (-) 13 (+) and 14 (-)
Digital Input	5...30V DC	8 (+) and 9 (-)
Communications (Port A)	RS232, configurable, MODBUS RTU, Remote Menu, or Primo 3.1 Emulation.	7 GND 6 Rx 5 Tx

Analog Output Wiring Diagram

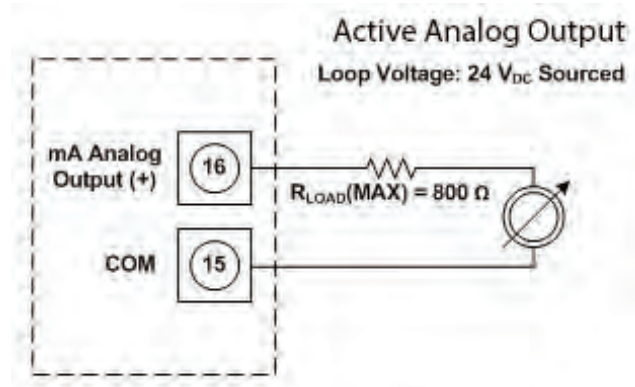


Figure 19: Analog output wiring diagram

Digital Output Wiring Diagrams

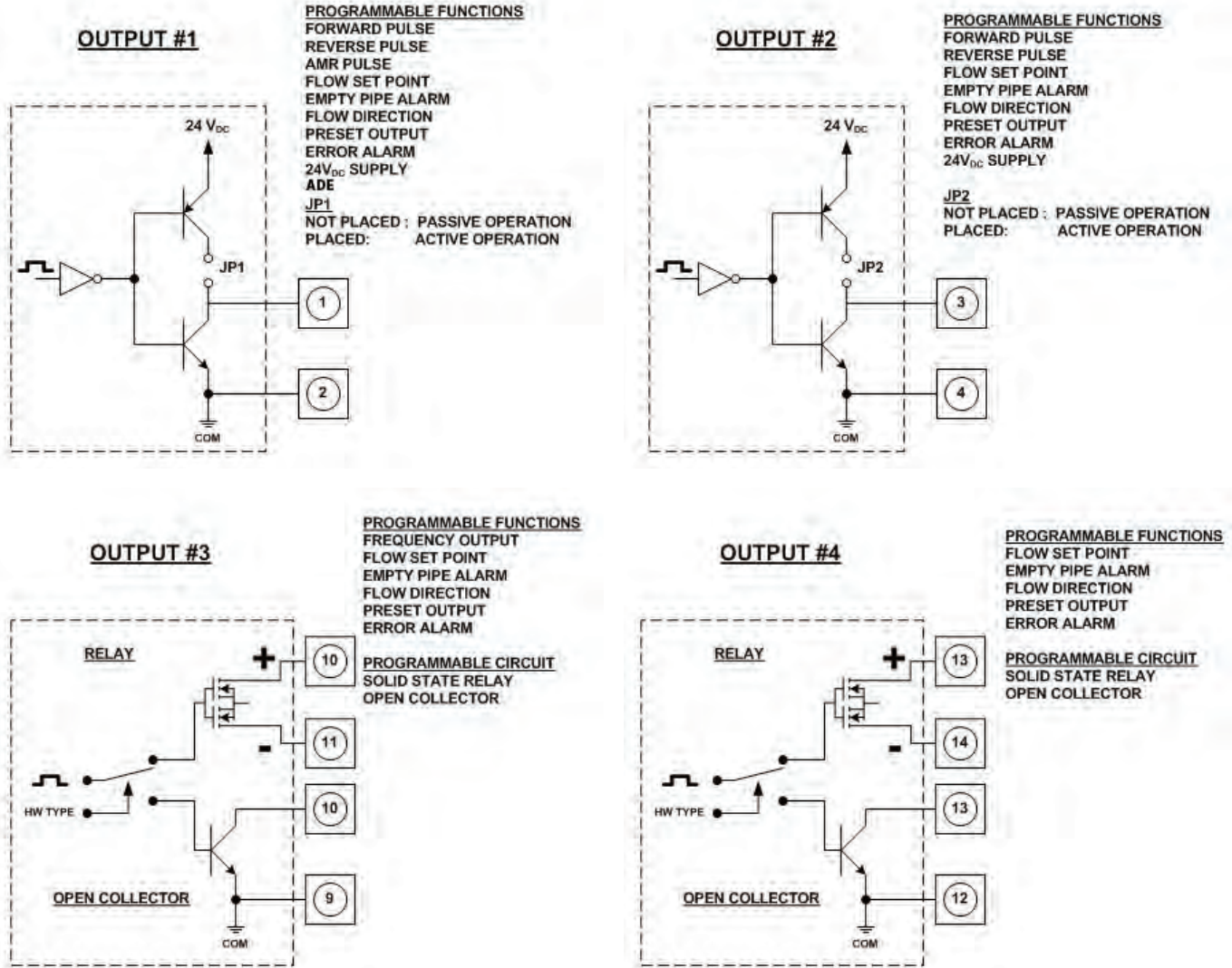


Figure 20: Digital output wiring diagrams

Digital Input Wiring Diagram

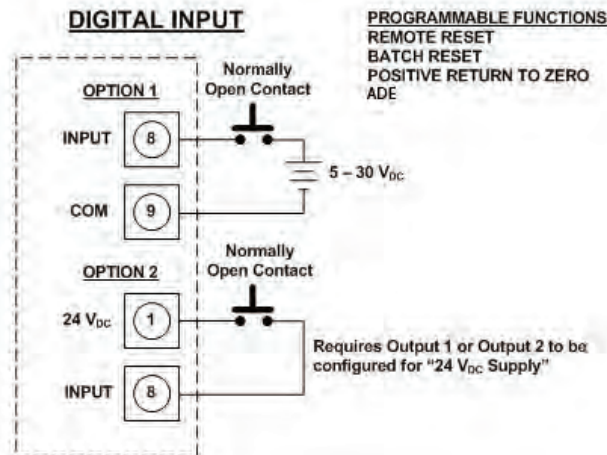


Figure 21: Digital input wiring diagram

PROGRAMMING THE M2000 METER

The M2000 amplifier comes pre-programmed from the factory. Typically, you will not need to do any additional programming. However, to take advantage of special features, you can program the meter for your specific needs. If you will be programming the meter, familiarize yourself with the M2000 meter's Function Buttons and follow the procedures outlined below.

Displays

There are two types of displays on the M2000 meter:

- Menu Selection
- Numeric Entry

Menu Selection Display

Menu selection displays will appear in the following format:

```

DISPLAY TITLE
>Menu Selection 1
  Menu Selection 2
DIRECTIONS LINE
  
```

Display format

```

START MENU
>Exit this Menu
  Main Menu
MORE: ↑,↓      ENTER:>
  
```

Example menu

Figure 22: Menu selection displays

The top line shows the title of the display screen. Below that are two visible menu selections. The bottom line provides directions for user input.

Typically, a menu contains more options than will fit in the two menu selection lines. Press the [↑] and [↓] buttons to scroll the display text up and down one line at a time. When the arrow is pointed to your desired menu option, press [E] to select the item and open its display.

Numeric Entry Display

Numeric entry displays will appear in the following format:

```

DISPLAY TITLE
  Description Line
  Numeric Value
DIRECTIONS LINE
  
```

Display format

```

LOW FLOW CUTOFF
% of      300.000 GPM
          2.00%
CHG: +, -      NEXT:E
  
```

Example numeric entry display

Figure 23: Numeric entry displays

The top line shows the title of the display screen. The second line is a description of the value. The third line shows the current value. The bottom line provides directions for user input.

NOTE: The bottom line of a numeric-value display provides prompts regarding the function of each button. The [+] or [-] button will change the value of the numeral. The [E] button will move the cursor one digit to the right. When the cursor is at the final, right-most digit, pressing [E] will reposition the cursor at the left-most digit. The bottom line display will change to reflect the new function of the [E] button. Press [E] to save the current entry. Press [+] to edit the current entry.

```

LOW FLOW CUTOFF
% of      300.000 GPM
          3.00%
EDIT:+      SAVE:E
  
```

Figure 24: Title, value description, current value, directions to user

Details on how to change and set numeric values are described in "Function Buttons" on page 20.

Function Buttons

All M2000 meter programming is accomplished using the three function buttons located on the front of the amplifier:



Figure 25: Function buttons

NOTE: Throughout this manual, the buttons will be referred to as: [↑] or [+] and [↓] or [-], depending on the context. The "Enter" button will be referred to as [E].



Consider the [+ | ↑] button as the "next step" or "scroll text up" button. During programming, pressing this button will go to the next menu selection, or increment a numeral.

Example 1: The illustration below shows the M2000 meter's *Main Menu*. The selection arrow is pointing to the Exit this Menu selection.

To scroll up to the menu's next selection, press [↑] once. The menu text scrolls up to the next menu selection, *Main Menu*.



Figure 26: Scroll up

Example 2: Some procedures require you to enter a numeric value. The [+] button is used to increment the selected numeral. The illustration below shows the *Low Flow Cutoff* parameter display. Notice the cursor under the 2 in the ones' place. In this case, press [+] once to increment the numeral to the value of 3.00%.

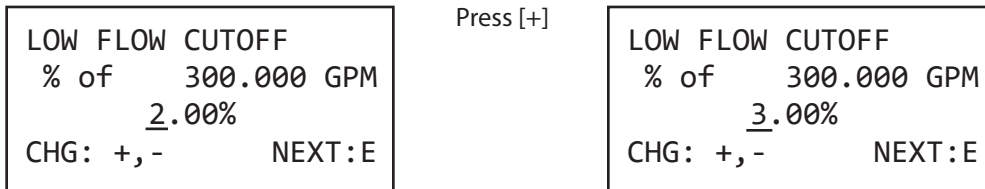


Figure 27: Enter a numeric value



Consider the Down Arrow [- | ↓] button as the "previous step" button. During a procedure, pressing this button will go to the menu's previous selection or decrement a numeral.

Example 1: The illustration below shows the M2000 meter's *Main Menu*. The selection arrow is pointing to the Meter Setup selection. To scroll the text down to the menu's previous selection, Exit this Menu (which is not visible on the display), press [↓] once.



Figure 28: Go to previous step

Example 2: For procedures that require you to enter a numeric value, the [-] button is used to decrement the selected numeral. The illustration below shows the *Low Flow Cutoff* parameter display. Notice the cursor under the 3 in the ones' place. In this case, press the [-] once to decrement the numeral to the value of 2.00 %.

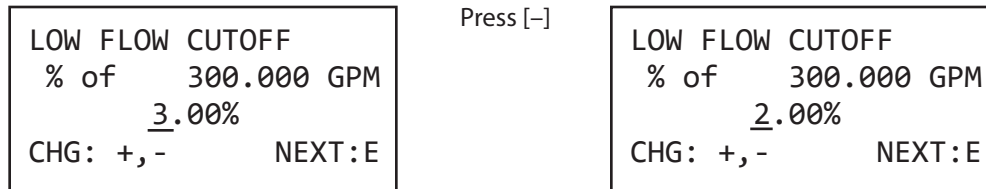


Figure 29: Decrease a value



The [E] button functions as an "Enter" button, or "cursor right" button.

Example 1: The illustration below shows the M2000 meter's *Main Menu*. The selection arrow is pointing to the Meter Setup selection. Press [E] to select Meter Setup, and open the *Meter Setup* display.

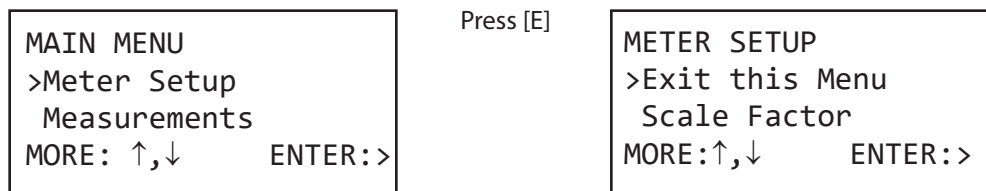


Figure 30: Go to meter setup

In cases where you are entering a numeric value, the [E] button does not function as the "Enter" button, but rather, will move the cursor to the right. When the cursor is at the right-most position, the [E] will now serve as the Enter key.

Example 2: The illustration below shows the *Low Flow Cutoff* display. The cursor is under the 3 in the ones' place. In this case, press [E] to move the cursor to the right one digit.

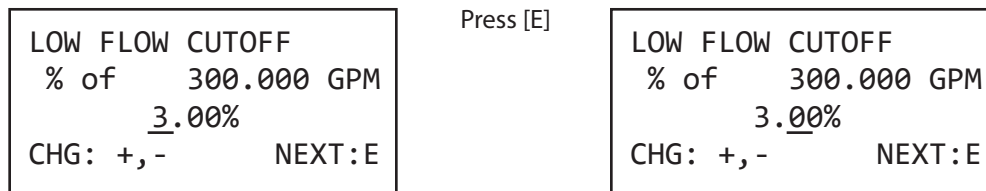


Figure 31: Move the cursor to the right

SECURITY

The M2000 meter's security feature gives you the option to restrict access to the meter by way of a five-digit Personal Identification Number (PIN). The system administrator can set up a single PIN for each of the three levels of access:

- **Administration** – allows access to all M2000 meter menu configuration screens.
- **Service** – allows access to service-level and user-level menu configuration screens.
- **User** – allows access only to user-level menu configuration screens.

Not all levels of access need to be set. If no PINs are set up, any M2000 meter user will have access to all functions.

NOTE: The security settings will also apply to remote access. All remote writes to the meter will be blocked unless the user is remotely logged in.

Setting the Administration PIN

Users logged in with the Administration PIN have access to all M2000 meter menu configuration screens.

To set the administrator's PIN, follow these steps from the *Advanced* menu:

1. Select **Security** to view the *Security* menu.
2. Select **Set Admin PIN** to view the *Admin PIN* display.
3. Set the five-digit PIN number to the desired value.
4. Press **[E]** to save the PIN and to return to the *Security* menu.

Setting the Service PIN

Users logged in with the Service PIN have access to service level menu configuration screens. Service users will not have access to administrative screens.

NOTE: In order to set a service-level PIN, you must first set up an administration PIN.

To set the service PIN, follow these steps from the *Advanced* menu:

1. Select **Security** to view the *Security* menu.
2. Select **Set Service PIN** to view the *Service PIN* display.
3. Set the five-digit PIN number to the desired value.
4. Press **[E]** to save the PIN and to return to the *Security* menu.

Setting the User PIN

Users logged in with this User PIN have access to user-level procedures. Users will not have access to administrative or service screens.

NOTE: In order to set a user-level PIN, you must first set up an administration PIN and a service PIN.

To set the user's PIN, follow these steps from the *Advanced* menu:

1. Select **Security** to view the *Security* menu.
2. Select **Set User PIN** to view the *User PIN* display.
3. Set the five-digit PIN number to the desired value.
4. Press **[E]** to save the PIN and to return to the *Security* menu.

Entering Your Personal Identification Number (PIN)

If your system has been set up with PIN security, you need to enter a PIN to access programming functions. There are three access levels, each with its own unique PIN: User, Service and Administration. Your system administrator will provide you with the appropriate PIN.

NOTE: All PINs are factory set to 00000. At this setting, you will not be required to enter a PIN. If the system administrator has not set the PIN, pressing [E] from the *Start Screen* opens the *Main Menu*.

If you forget or misplace your PIN, call Badger Meter Customer Service to get a master password. When you call, have the security code that appears in the upper right corner of the *PIN Request* display.

Follow these steps to enter your PIN in the M2000 meter:

1. At the *Main Menu*, press [E]. The *PIN Request* display opens.

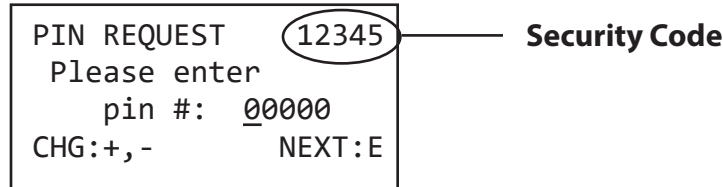


Figure 32: PIN request

2. Press [+] to increment the numeral.
3. Press [E] to move the cursor to the next digit.
4. Repeat the steps to set each of the five digits to match your PIN.
5. Press [E]. If you entered a valid PIN, the *Main Menu* opens indicating your level of access.

If you entered the wrong PIN, you will see the following display:



Figure 33: Wrong PIN entered

- Press [E] to return to the *PIN Request* display.
- Repeat Steps 1 through 5.

NOTE: Be sure to log off when you have completed work with the M2000 meter. Otherwise, there will be a five-minute delay between your last activity and the time when the M2000 meter will automatically log you off.

SETTING UP THE M2000 METER WITH QUICK SETUP

The M2000 meter provides you with a Quick Setup utility that allows you to set or change your Flow Units, Totalizer Units, Full Scale Flow and Low Flow Cutoff settings. To open the Quick Setup, select **Quick Setup** from the *Start Menu*.

Quick Setup																																													
<p>Flow Unit [GPM]</p>	<p>Flow Unit lets you set the unit of measure for the flow rate and full scale flow. To change the Flow Unit value, follow these steps from the <i>Quick Setup</i> menu.</p> <ol style="list-style-type: none"> 1. Select Flow Unit to view the <i>Flow Unit</i> display. 2. Press [↑] or [↓] to position the arrow next to one of the following Flow Units: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Code</th> <th>Flow Unit</th> <th>Code</th> <th>Flow Unit</th> </tr> </thead> <tbody> <tr> <td>LPS</td> <td>Liters/Second</td> <td>GPM</td> <td>Gallons/Minute</td> </tr> <tr> <td>LPM</td> <td>Liters/Minute</td> <td>GPH</td> <td>Gallons/Hour</td> </tr> <tr> <td>LPH</td> <td>Liters/Hour</td> <td>MGD</td> <td>Mega Gallons/Day</td> </tr> <tr> <td>M³S</td> <td>Cubic Meters/Second</td> <td>IGS</td> <td>UKG/Second</td> </tr> <tr> <td>M³M</td> <td>Cubic Meters/Minute</td> <td>IGM</td> <td>UKG/Minute</td> </tr> <tr> <td>M³H</td> <td>Cubic Meters/Hour</td> <td>IGH</td> <td>UKG/Hour</td> </tr> <tr> <td>F³S</td> <td>Cubic Feet/Second</td> <td>LbM</td> <td>Pounds/Minute</td> </tr> <tr> <td>F³M</td> <td>Cubic Feet/Minute</td> <td>OPM</td> <td>Ounces/Minute</td> </tr> <tr> <td>F³H</td> <td>Cubic Feet/Hour</td> <td>BPM</td> <td>Barrels/Minute</td> </tr> <tr> <td>GPS</td> <td>Gallons/Second</td> <td></td> <td></td> </tr> </tbody> </table> 3. Press [E] to save the Flow Units setting. 	Code	Flow Unit	Code	Flow Unit	LPS	Liters/Second	GPM	Gallons/Minute	LPM	Liters/Minute	GPH	Gallons/Hour	LPH	Liters/Hour	MGD	Mega Gallons/Day	M ³ S	Cubic Meters/Second	IGS	UKG/Second	M ³ M	Cubic Meters/Minute	IGM	UKG/Minute	M ³ H	Cubic Meters/Hour	IGH	UKG/Hour	F ³ S	Cubic Feet/Second	LbM	Pounds/Minute	F ³ M	Cubic Feet/Minute	OPM	Ounces/Minute	F ³ H	Cubic Feet/Hour	BPM	Barrels/Minute	GPS	Gallons/Second		
Code	Flow Unit	Code	Flow Unit																																										
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M ³ H	Cubic Meters/Hour	IGH	UKG/Hour																																										
F ³ S	Cubic Feet/Second	LbM	Pounds/Minute																																										
F ³ M	Cubic Feet/Minute	OPM	Ounces/Minute																																										
F ³ H	Cubic Feet/Hour	BPM	Barrels/Minute																																										
GPS	Gallons/Second																																												
<p>Totalizer Unit [USG]</p>	<p>Totalizer Unit establishes the units of measure for the totalizers. To change the Totalizer Unit value, follow these steps from the <i>Totalizer Unit</i> display.</p> <ol style="list-style-type: none"> 1. Press [↑] or [↓] to position the arrow next to one of the following Totalizer Units: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Code</th> <th>Totalizer Unit</th> <th>Code</th> <th>Totalizer Unit</th> </tr> </thead> <tbody> <tr> <td>L</td> <td>Liter</td> <td>UKG</td> <td>Imperial Gallon</td> </tr> <tr> <td>HL</td> <td>Hectoliter</td> <td>Lb</td> <td>Pound</td> </tr> <tr> <td>M³</td> <td>Cubic Meter</td> <td>Oz</td> <td>Fluid Ounce</td> </tr> <tr> <td>CFt</td> <td>Cubic Feet</td> <td>Aft</td> <td>Acre Feet</td> </tr> <tr> <td>USG</td> <td>U.S. Gallon</td> <td>BBL</td> <td>Barrel</td> </tr> <tr> <td>MG</td> <td>Mega Gallon</td> <td></td> <td></td> </tr> </tbody> </table> 2. Press [E] to save the Totalizer Units setting. 	Code	Totalizer Unit	Code	Totalizer Unit	L	Liter	UKG	Imperial Gallon	HL	Hectoliter	Lb	Pound	M ³	Cubic Meter	Oz	Fluid Ounce	CFt	Cubic Feet	Aft	Acre Feet	USG	U.S. Gallon	BBL	Barrel	MG	Mega Gallon																		
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CFt	Cubic Feet	Aft	Acre Feet																																										
USG	U.S. Gallon	BBL	Barrel																																										
MG	Mega Gallon																																												

Quick Setup	
Full Scale Flow	<p>Full Scale Flow sets the maximum flow the system is expected to measure. This parameter has influence on other system parameters. These parameters include:</p> <ul style="list-style-type: none"> • Frequency Output – Full scale frequency is observed at full scale flow • Low Flow Cutoff – Changes to full scale flow affect the measuring cut-off threshold of the meter • Alarm Outputs – Changes to full scale flow adjusts the thresholds for generating set point alarms • Pulse Outputs – Changes to full scale flow adjusts the pulse frequency and duty cycle • Analog Outputs – Changes to full scale flow adjusts the interpretation of the analog output signal <p>Change the full scale flow based on the meter size and the application's requirements. Verify that the full scale flow falls within the meter's suggested flow range limits. In terms of flow velocity, the meter's limits are from 0.1 to 39.4 feet/second.</p> <p>The full scale flow is valid for both flow directions.</p> <p>NOTE: If the flow rate exceeds the full scale setting, an error message indicates that the configured full scale range has been exceeded. However, the meter will continue to measure. This will affect the latency of the pulse outputs and possibly cause overflow. Furthermore, the analog output may also be placed in alarm mode.</p> <p>To set or change the Full Scale Flow, follow these steps from the <i>Quick Setup</i> menu:</p> <ol style="list-style-type: none"> 1. Select Full Scale Flow to view the <i>Full Scale Flow</i> display. 2. Set the full scale flow value to the desired setting. 3. Press [E] to save the full scale flow value and return to the <i>Measurements</i> menu.
Low Flow Cutoff	<p>Low Flow Cutoff defines the threshold at which flow measurement will be forced to zero. The cutoff value can be set from 0% to 10% of the full scale flow. Increasing this threshold will help prevent false readings during "no flow" conditions possibly caused by pipe vibration or inherent system noise.</p> <p>To change Low Flow Cutoff, follow these steps from the <i>Low Flow Cutoff</i> display.</p> <ol style="list-style-type: none"> 1. Set the Low Flow Cutoff value to the desired setting, between 0% and 10%. 2. Press [E] to save the value.

QUICK REFERENCE

Main Menu	→ Meter Setup	→ Scale Factor
		→ Empty Pipe Detect
		→ Power Line Freq
		→ Excitation Freq
		→ Pipe Diameter
		→ Detector Factor
		→ Detector Offset
	→ Measurements	→ Velocity Unit
		→ Flow Unit
		→ Totalizer Unit
		→ Full Scale Flow
		→ Low Flow Cutoff
		→ Flow Direction
		→ Damping Factor
	→ Inputs/Outputs	→ Analog Output
		→ Digital Input
		→ Digital Output 1
		→ Digital Output 2
		→ Digital Output 3
		→ Digital Output 4
		→ Flow Simulation
	→ Clear Totals	→ TN
		→ T+
		→ T-
		→ PS
		→ Tpwroff
	→ Communications	→ Port A Settings
		→ Port B Settings
		→ Diagnostics
	→ Advanced	→ Data Logger
		→ Token Copy
		→ Encoder Protocol
		→ Totalizer Dials
		→ Totalizer Resolution
		→ Backlight Control
		→ Analog Calibrate
		→ Software Filter
		→ Empty Pipe Cal.
		→ Security
	→ Info/Help	→ Error Counts
		→ Power Up Counter
		→ Power Off Totalizer
		→ Version Info
		→ Serial Number
		→ Meter Tag Name
		→ Daughterboard Info
		→ Polarization Volt
		→ Restore Defaults
	→ Language Select	→ English
		→ Espanol

USING THE M2000 METER MAIN MENU PROGRAMMING OPTIONS

The following M2000 meter programming options are available from the *Main Menu*:

- *Meter Setup*
- *Measurements*
- *Inputs/Outputs*
- *Clear Totals*
- *Communications*
- *Advanced*
- *Info/Help*
- *Language Select*

In the section that follows, the applicable security level for each menu option is indicated as follows:



Administrative



Service






User





Options that can be set at *Quick Setup* are indicated with:











The factory default values are shown, enclosed in brackets.




NOTE: Options that are listed [Factory Set] should not be changed without specific directions from authorized Badger Meter personnel.



Meter Setup	
<p>Scale Factor [0.0%]</p> 	<p>Changing the scale factor lets you adjust the meter's accuracy without disturbing factory-set parameters. You can tune the meter to meet changing application requirements. For example, if the meter is under registering by 0.5 percent then set the scale factor to +0.5%. If the meter is over registering by 0.5 percent then set the scale factor to -0.5%.</p> <p>To set the Scale Factor, follow these steps from the <i>Meter Setup</i> menu:</p> <ol style="list-style-type: none"> 1. Select Scale Factor, to open the <i>Scale Factor</i> display. 2. Set the Scale Factor value to the desired setting. 3. Press [E], to save the new value and return to the <i>Meter Setup</i> menu.
<p>Empty Pipe Detect [Off]</p> 	<p>When set to On, Empty Pipe Detect indicates to the outputs and the display that the meter is not completely filled. When set to Off, empty pipe detect is disabled.</p> <p>Enabling empty pipe detect requires a one-time calibration. Calibration is described in the <i>Advanced</i> menu section under Empty Pipe Cal.</p> <p>To set Empty Pipe Detect, follow these steps from the <i>Meter Setup</i> menu:</p> <ol style="list-style-type: none"> 1. Select Empty Pipe Detect to view the <i>Empty Pipe Detect</i> display. 2. Position the arrow next to On or Off. 3. Press [E] to save the Empty Pipe Detect On or Off and return to the <i>Meter Setup</i> menu.
<p>Power Line Freq [60 Hz]</p> 	<p>Power Line Freq provides measuring immunity to industrial noise from a power supply feed.</p> <p>To set Power Line Frequency, follow these steps from the <i>Meter Setup</i> menu:</p> <ol style="list-style-type: none"> 1. Select Power Line Freq to view the <i>Power Line Frequency</i> display. 2. Position the arrow next to 50 Hz or 60 Hz. 3. Press [E] to save the power line frequency and return to the <i>Meter Setup</i> menu.





Meter Setup											
<p>Excitation Freq [Factory Set]</p> 	<p>The Excitation Freq parameter is set at the factory. You can change Excitation Freq to configure the DC excitation of the coils. Supported frequencies are dependent on the configured power line frequency:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">50 Hz</th> <th style="text-align: center;">60 Hz</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 Hz</td> <td style="text-align: center;">1 Hz</td> </tr> <tr> <td style="text-align: center;">3.125 Hz</td> <td style="text-align: center;">3.75 Hz</td> </tr> <tr> <td style="text-align: center;">6.25 Hz</td> <td style="text-align: center;">7.5 Hz</td> </tr> <tr> <td style="text-align: center;">12.5 Hz</td> <td style="text-align: center;">15 Hz</td> </tr> </tbody> </table> <p>To change Excitation Frequency, follow these steps from the <i>Meter Setup</i> menu:</p> <ol style="list-style-type: none"> 1. Select Excitation Freq to view the <i>Excitation Frequency</i> display. 2. Position the arrow next the desired frequency. 3. Press [E] to save the excitation frequency and return to the <i>Meter Setup</i> menu. 	50 Hz	60 Hz	1 Hz	1 Hz	3.125 Hz	3.75 Hz	6.25 Hz	7.5 Hz	12.5 Hz	15 Hz
50 Hz	60 Hz										
1 Hz	1 Hz										
3.125 Hz	3.75 Hz										
6.25 Hz	7.5 Hz										
12.5 Hz	15 Hz										
<p>Pipe Diameter [Factory Set]</p> 	<p>The Pipe Diameter parameter is set at the factory. In the event the amplifier is replaced, verify that the pipe diameter matches the installed pipe size.</p> <p>To change Pipe Diameter, follow these steps from the <i>Meter Setup</i> menu:</p> <ol style="list-style-type: none"> 1. Select Pipe Diameter to open the <i>Pipe Diameter</i> display. 2. Position the arrow next to one of the pipe diameters. 3. Press [E] to save the pipe diameter and return to the <i>Meter Setup</i> menu. 										
<p>Detector Factor [Factory Set]</p> 	<p>The Detector Factor parameter is set at the factory. This factor compensates for accuracy error as a result of the installed detector. If accuracy adjustment of the meter is required, see the Scale Factor parameter.</p> <p>In the event the amplifier is replaced, this parameter must be reprogrammed with the original detector factor.</p>										
<p>Detector Offset [Factory Set]</p> 	<p>The Detector Offset parameter is set at the factory. This parameter compensates for accuracy error as a result of the installed detector. If accuracy adjustment of the meter is required, see the Scale Factor parameter.</p>										



Measurements																																													
<p>Velocity Unit [ft/sec]</p> 	<p>Velocity Unit lets you set the velocity to meters/sec or feet/sec.</p> <p>To set Velocity Unit, follow these steps from the <i>Measurements</i> menu:</p> <ol style="list-style-type: none"> 1. Select Velocity Unit. 2. Position the arrow next to meters/sec or feet/sec. 3. Press [E] to save the Velocity Unit and return to the <i>Measurements</i> menu. 																																												
<p>Flow Units [GPM]</p> 	<p>Flow Units lets you set the unit of measure for the flow rate and full scale flow. Changing the flow units parameter readjusts the full scale flow parameter. For example, changing from gpm to gps would change the full scale flow from 60 gpm to 1 gps.</p> <p>To change the Flow Unit, follow these steps from the <i>Measurements</i> menu:</p> <ol style="list-style-type: none"> 1. Select Flow Units to view the <i>Flow Units</i> display. 2. Position the arrow next to one of the following flow unit options: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Code</th> <th>Flow Unit</th> <th>Code</th> <th>Flow Unit</th> </tr> </thead> <tbody> <tr> <td>LPS</td> <td>Liters/Second</td> <td>GPM</td> <td>Gallons/Minute</td> </tr> <tr> <td>LPM</td> <td>Liters/Minute</td> <td>GPH</td> <td>Gallons/Hour</td> </tr> <tr> <td>LPH</td> <td>Liters/Hour</td> <td>MGD</td> <td>Mega Gallons/Day</td> </tr> <tr> <td>M³S</td> <td>Cubic Meters/Second</td> <td>IGS</td> <td>UKG/Second</td> </tr> <tr> <td>M³M</td> <td>Cubic Meters/Minute</td> <td>IGM</td> <td>UKG/Minute</td> </tr> <tr> <td>M³H</td> <td>Cubic Meters/Hour</td> <td>IGH</td> <td>UKG/Hour</td> </tr> <tr> <td>F³S</td> <td>Cubic Feet/Second</td> <td>MID</td> <td>Mega UKG/Day</td> </tr> <tr> <td>F³M</td> <td>Cubic Feet/Minute</td> <td>LbM</td> <td>Pounds/Minute</td> </tr> <tr> <td>F³H</td> <td>Cubic Feet/Hour</td> <td>OPM</td> <td>Ounces/Minute</td> </tr> <tr> <td>GPS</td> <td>Gallons/Second</td> <td>BPM</td> <td>Barrels/Minute</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 3. Press [E] to save the flow units and return to the <i>Measurements</i> menu. 	Code	Flow Unit	Code	Flow Unit	LPS	Liters/Second	GPM	Gallons/Minute	LPM	Liters/Minute	GPH	Gallons/Hour	LPH	Liters/Hour	MGD	Mega Gallons/Day	M ³ S	Cubic Meters/Second	IGS	UKG/Second	M ³ M	Cubic Meters/Minute	IGM	UKG/Minute	M ³ H	Cubic Meters/Hour	IGH	UKG/Hour	F ³ S	Cubic Feet/Second	MID	Mega UKG/Day	F ³ M	Cubic Feet/Minute	LbM	Pounds/Minute	F ³ H	Cubic Feet/Hour	OPM	Ounces/Minute	GPS	Gallons/Second	BPM	Barrels/Minute
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<p>Totalizer Unit [USG]</p> 	<p>The Totalizer Unit parameter establishes the units of measure for the totalizers.</p> <p>To change the Totalizer Unit value, follow these steps from the <i>Measurements</i> menu:</p> <ol style="list-style-type: none"> 1. Select Totalizer Unit to view the <i>Totalizer Unit</i> display. 2. Position the arrow next to one of the following totalizer units: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Code</th> <th>Totalizer Unit</th> <th>Code</th> <th>Totalizer Unit</th> </tr> </thead> <tbody> <tr> <td>L</td> <td>Liters</td> <td>MIG</td> <td>Mega Imperial Gallons</td> </tr> <tr> <td>HL</td> <td>Hectoliters</td> <td>Lb</td> <td>Pounds</td> </tr> <tr> <td>M³</td> <td>Cubic Meters</td> <td>Oz</td> <td>Fluid Ounces</td> </tr> <tr> <td>CFt</td> <td>Cubic Feet</td> <td>Aft</td> <td>Acre Feet</td> </tr> <tr> <td>USG</td> <td>U.S. Gallons</td> <td>BBL</td> <td>Barrels</td> </tr> <tr> <td>MG</td> <td>Mega Gallons</td> <td>SFD</td> <td>Second Foot Day</td> </tr> <tr> <td>UKG</td> <td>Imperial Gallons</td> <td></td> <td></td> </tr> </tbody> </table> <ol style="list-style-type: none"> 3. Press [E] to save the totalizer unit and return to the <i>Measurements</i> menu. 	Code	Totalizer Unit	Code	Totalizer Unit	L	Liters	MIG	Mega Imperial Gallons	HL	Hectoliters	Lb	Pounds	M ³	Cubic Meters	Oz	Fluid Ounces	CFt	Cubic Feet	Aft	Acre Feet	USG	U.S. Gallons	BBL	Barrels	MG	Mega Gallons	SFD	Second Foot Day	UKG	Imperial Gallons														
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Measurements	
<p>Full Scale Flow [Factory Set]</p>  	<p>The Full Scale Flow parameter sets the maximum flow the system is expected to measure. This parameter has influence on other system parameters. These parameters include:</p> <ul style="list-style-type: none"> • Frequency Output – Full scale frequency is observed at full scale flow • Low Flow Cutoff – Changes to full scale flow affect the measuring cut-off threshold of the meter • Alarm Outputs – Changes to full scale flow adjusts the thresholds for generating set point alarms • Pulse Outputs – Changes to full scale flow adjusts the pulse frequency and duty cycle • Analog Outputs – Changes to full scale flow adjusts the interpretation of the analog output signal <p>Change the full scale flow based on the meter size and the application's requirements. Verify that the full scale flow falls within the meter's suggested flow range limits. In terms of flow velocity, the meter's limits are from 0.1...39.4 feet/second.</p> <p>The full scale flow is valid for both flow directions.</p> <p>NOTE: If the flow rate exceeds the full scale setting, an error message indicates that the configured full scale range has been exceeded. However, the meter will continue to measure. This will affect the latency of the pulse outputs and possibly cause overflow. Furthermore, the analog output may also be placed in alarm mode.</p> <p>To change the Full Scale Flow, follow these steps from the <i>Measurements</i> menu:</p> <ol style="list-style-type: none"> 1. Select Full Scale Flow to view the <i>Full Scale Flow</i> display. 2. Set the full scale flow value to the desired setting. 3. Press [E] to save the full scale flow value and return to the <i>Measurements</i> menu.
<p>Low Flow Cutoff [0.2%]</p>  	<p>Low flow cutoff defines the threshold at which flow measurement will be forced to zero. The cutoff value can be set from 0% to 10% of the full scale flow. Increasing this threshold will help prevent false readings during "no flow" conditions possibly caused by pipe vibration or inherent system noise.</p> <p>To change the Low Flow Cutoff value, follow these steps from the <i>Measurements</i> menu:</p> <ol style="list-style-type: none"> 1. Select Low Flow Cutoff to view the <i>Low Flow Cutoff</i> display. 2. Set the low flow cutoff value to the desired setting. 3. Press [E] to save the new low flow cutoff value.
<p>Flow Direction [Bi-Directional]</p> 	<p>Flow Direction lets you set the meter to measure forward flow only (uni-directional) or both forward and reverse flow (bi-directional).</p> <p>Uni-Directional</p> <p>Flow is totalized in only one direction. The flow direction is indicated by the arrow printed on the detector label. Uni-directional measurements on the main display screen include:</p> <ul style="list-style-type: none"> • T1: Registers forward flow, resettable by menu or MODBUS RTU • T2: Registers forward flow, resettable by menu, MODBUS RTU, or digital input configured for Remote Reset <p>Bi-Directional</p> <p>Flow is totalized in both directions. Bi-directional measurements on the main display screen include:</p> <ul style="list-style-type: none"> • T+: Registers forward flow, resettable by menu or MODBUS RTU • T-: Registers reverse flow, resettable by menu or MODBUS RTU • TN: Registers total flow, T+ – T-, resettable by menu or MODBUS RTU <p>To change the flow direction follow these steps from the <i>Measurements</i> menu.</p> <ol style="list-style-type: none"> 1. Select Flow Direction to view the <i>Flow Direction</i> display. 2. Select Uni-Directional or Bi-Directional. 3. Press [E] to save the flow direction and return to the <i>Measurements</i> menu.






Measurements												
Damping Factor [No Damping] 		<p>The damping factor establishes the stability of the measured flow rate. If back and forth oscillations of the flow rate are observed during normal flow conditions, increase this value incrementally until the flow rate stabilizes. This parameter has no affect on the totalizers.</p> <p>To change the Damping Factor value, follow these steps from the <i>Measurements</i> menu.</p> <ol style="list-style-type: none"> 1. Select Damping Factor to view the <i>Damping Factor</i> display. 2. Select one of the following damping factors: <table style="margin-left: 20px; border: none;"> <tr> <td>1 Second</td> <td>10 Seconds</td> </tr> <tr> <td>2 Seconds</td> <td>20 Seconds</td> </tr> <tr> <td>3 Seconds</td> <td>30 Seconds</td> </tr> <tr> <td>4 Seconds</td> <td>No Dampening</td> </tr> <tr> <td>5 Seconds</td> <td></td> </tr> </table> 3. Press [E] to save the damping factor and return to the <i>Measurements</i> menu. 	1 Second	10 Seconds	2 Seconds	20 Seconds	3 Seconds	30 Seconds	4 Seconds	No Dampening	5 Seconds	
1 Second	10 Seconds											
2 Seconds	20 Seconds											
3 Seconds	30 Seconds											
4 Seconds	No Dampening											
5 Seconds												
Inputs/Outputs												
Analog Output	Range [4 to 20 mA] 	<p>The Analog Output parameter establishes the range of the analog output signal. To change Analog Output range, follow these steps from the <i>Inputs/Outputs</i> menu:</p> <ol style="list-style-type: none"> 1. Select Analog Output to view the <i>Analog Output</i> display. 2. Select one of the following options: <ul style="list-style-type: none"> • 4 to 20 mA • 0 to 20 mA • 2 to 10 mA • 0 to 10 mA 3. Press [E] to save the analog output and return to the <i>Inputs/Outputs</i> menu: 										
	Alarm Mode [OFF] 	<p>This parameter configures the behavior of the analog output during alarm conditions. Three options exist for this parameter: OFF, LOW, and HIGH.</p> <p>OFF: Analog signal is based on flow rate and always within the configured range</p> <p>LOW: During alarm conditions, the analog signal will be 2 mA less than the configured lower range</p> <p>HIGH: During alarm conditions, the analog signal will be 2 mA more than the configured upper range</p> <p>For example, if the analog range is 4 to 20 mA and the alarm mode is set to HIGH, then during a full scale flow alarm condition, the analog output current will be 22 mA.</p> <p>To change the analog output alarm mode, follow these steps from the <i>Inputs/Outputs</i> menu:</p> <ol style="list-style-type: none"> 1. Select Alarm Mode to view the <i>Alarm Mode</i> display. 2. Select one of the following options: <ul style="list-style-type: none"> • OFF • LOW • HIGH 3. Press [E] to save the alarm mode and return to the <i>Inputs/Outputs</i> menu. 										


Inputs/Outputs		
Digital Input	<p>Digital Input lets you configure the functional operation of the digital input. The following functions are supported:</p> <ul style="list-style-type: none"> • Remote Reset – Clears totalizer T2 (uni-directional) • Batch Reset – Resets batch totalizer PS to preset amount and clears T2 (uni-directional) • Pos Zero Return – Forces flow rate to zero (does not totalize) • ADE – Input configured for ADE operation. See "Encoder Protocol Interface" on page 47. <p>To change Digital Input, follow these steps from the <i>Inputs/Outputs</i> menu:</p> <ol style="list-style-type: none"> 1. Select Digital Input to view the <i>Digital Input</i> display. 2. Select the desired function. 3. Press [E] to save the digital input and return to the <i>Inputs/Outputs</i> menu. 	
Digital Output	<p>Pulses/Unit [1]</p> 	<p>The Pulses/Unit parameter lets you set how many pulses per unit of measure will be transmitted to remote applications. For example, assuming the unit of measure is gallons:</p> <ul style="list-style-type: none"> • Setting the Pulses/Unit to 1 will transmit 1 pulse every gallon • Setting the Pulses/Unit to 0.01 will transmit 1 pulse every 100 gallons <p>You must configure pulses/unit if the function of the selected output is to be forward, reverse or AMR pulse.</p> <p>This parameter must be considered with the Pulse Width and Full Scale Flow parameters. The maximum pulse frequency is 10 kHz. The frequency is correlated with the flow rate. Violation of output frequency limits will generate a configuration error.</p> <p>To change the pulses/unit, follow these steps from the <i>Inputs/Outputs</i> menu:</p> <ol style="list-style-type: none"> 1. Select Digital Output 1 or 2 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Pulses/Unit, and press [E] to open the <i>Pulses/Unit</i> display. 3. Enter the pulses/unit value. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu.
	<p>Pulse Width [0 ms]</p> 	<p>The Pulse Width parameter establishes the On duration of the transmitted pulse. The configurable range is from 0 to 1000 ms.</p> <ul style="list-style-type: none"> • Non-zero pulse width configuration – the Off duration of the transmitted pulse is dependent on flow rate. The Off duration is to be at least the configured On duration. At full scale flow, the On duration equals the Off duration. The maximum configurable output frequency is limited to 500 Hz. • 0 ms pulse width configuration – the duty cycle of the transmitted pulse is at 50 percent allowing for a maximum configurable output frequency of 10 kHz. <p>This parameter must be considered with the Pulses/Unit and Full Scale Flow parameters. The maximum pulse frequency is 10 kHz. The frequency is correlated with the flow rate. Violation of output frequency limits will generate a configuration error.</p> <p>To change the pulse width, follow these steps from the <i>Inputs/Outputs</i> menu:</p> <ol style="list-style-type: none"> 1. Select Digital Output 1 or 2 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Pulse Width, and press [E] to open the <i>Pulse Width</i> display. 3. Enter the pulse width value. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu.






Inputs/Outputs		
Digital Output (continued)	Full Scale Frequency [3: 1000 Hz] 	The Full Scale Frequency parameter establishes the full scale flow output frequency when the flow rate equals the configured full scale flow. To change the Full Scale Frequency, follow these steps from the <i>Inputs/Outputs</i> main menu: <ol style="list-style-type: none"> 1. Select Digital Output 1, 2, or 3 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Full Scale Frequency, and press [E] to open the <i>Full Scale Frequency</i> display. 3. Set the full scale frequency value to the desired setting. 4. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu.
	Preset Amount [0.0] 	Preset amount lets you set the reset value for the associated PS totalizer when the digital input is set to Batch Reset. To change the preset amount, follow these steps from the <i>Inputs/Outputs</i> menu: <ol style="list-style-type: none"> 1. Select Digital Output 1, 2, 3 or 4 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Preset Amount, and press [E] to open the <i>Preset Amount</i> display. 3. Enter the preset amount value. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu. <p>NOTE: You can only set one Preset Amount. If you set the Preset Amount for Digital Output 1, it will be the same for 2, 3 and 4.</p>
	Set Point Min. [0%] 	This parameter establishes, as a percentage of full scale flow, the threshold at which the output alarm will be activated. Flow rates below the threshold will activate the output alarm. To change the set point minimum, follow these steps from the <i>Inputs/Outputs</i> menu: <ol style="list-style-type: none"> 1. Select Digital Output 1, 2, 3 or 4 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Set Point Min., and press [E] to open the <i>Set Point Min.</i> display. 3. Enter the set point minimum value. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu.
	Set Point Max. [100%] 	This parameter establishes, as a percentage of full scale flow, the threshold at which the output alarm will be activated. Flow rates above the threshold will activate the output alarm. To change the maximum set point, follow these steps from the <i>Inputs/Outputs</i> menu: <ol style="list-style-type: none"> 1. Select Digital Output 1, 2, 3 or 4 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Set Point Max. and press [E] to open the <i>Set Point Max.</i> display. 3. Enter the set point maximum value and press [E] to save the new parameter and return to the <i>Digital Output</i> menu.





Inputs/Outputs		
Digital Output (continued)	<p>Output Type</p> <p>[1: Normally Open] [2: Normally Open] [3: Normally Open] [4: Normally Closed]</p> <p></p>	<p>The Output Type parameter lets you set the output switch to normally open or normally closed. If normally open is selected, the output switch is open (no current) when the output is inactive, and closed (current flows) when the output is active.</p> <p>If normally closed is selected, the output switch is closed (current flows) when the output is inactive, and open (no current) when the output is active.</p> <p>To change the Output Type, follow these steps from the <i>Inputs/Outputs</i> main menu:</p> <ol style="list-style-type: none"> 1. Select Digital Output 1, 2, 3 or 4 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu, select Output Type and press [E] to open the <i>Output Type</i> display. 3. Select Normally Open or Normally Closed. 4. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu.
	<p>Hardware Type</p> <p>[3: Open Collector] [4: Open Collector]</p> <p></p>	<p>The Hardware Type parameter lets you select the type of hardware used to drive the output signal: either open collector or solid-state relay.</p> <p>To change the Hardware Type, follow these steps from the <i>Inputs/Outputs</i> main menu:</p> <ol style="list-style-type: none"> 1. Select Digital Output 3 or 4 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu select Hardware Type, and press [E] to open the <i>Hardware Type</i> display. 3. Select Open Collector or Relay. 4. Press [E] to save the new parameter and return to the <i>Digital Output</i> menu.


Inputs/Outputs		
Digital Output (continued)	Select Function [1: Forward Pulse] [2: Reverse Pulse] [3: Frequency Pulse] [4: Error Alarm] 	<p>Select Function lets you configure the functional operation of the associated output. The following operations are supported:</p> <ul style="list-style-type: none"> • Frequency Output – Generates pulses correlated to the absolute value of the flow rate. • Forward Pulse – Generates pulses during forward flow conditions. • Reverse Pulse – Generates pulses during reverse flow conditions. • AMR (50 ms Pulse) • Flow Set Point – Provides indication when flow rate exceeds thresholds defined by flow set points. • Empty Pipe Alarm – Provides indication when pipe is empty. • Flow Direction – Provides indication on current flow direction (Inactive = Reverse or No Flow, Active = Forward). • Preset Output – Provides indication when preset batch amount has been realized. • Error Alarm – Provides indication when meter has error condition. Error conditions include, empty pipe error, full scale flow error, and detector error. • Totalizer Alarm – Sends alarm when either a rollover error or warning has occurred. • 24V DC Supply – Provides constant 24 volts on output (forces output type to normally open). • ADE – Provides meter information in digital format. See "Encoder Protocol Interface" on page 47. <p>To change the Function Select, follow these steps from the <i>Inputs/Outputs</i> main menu:</p> <ol style="list-style-type: none"> 1. Select Digital Output 1, 2, 3 or 4 and press [E] to open the <i>Digital Output</i> menu. 2. From the <i>Digital Output</i> menu choose Select Function, and press [E] to open the <i>Select Function</i> display. 3. Select the desired function. 4. Press [E] to save and return to the <i>Digital Output</i> menu.
Flow Simulation [Off] 	<p>Flow Simulation provides output simulation based on a percentage of the full scale flow. Simulation will not accumulate the totalizers. The range of simulation includes –100% to 100% of the full scale flow. The Flow Simulation Parameter lets you set the range of simulation in 10% increments.</p> <p>To change the Flow Simulation, follow these steps from the <i>Inputs/Outputs</i> menu:</p> <ol style="list-style-type: none"> 1. Select Flow Simulation to view the <i>Flow Simulation</i> display. 2. Click [+] to increment the percentage by 10, or click [–] to decrement the percentage by 10. 3. Press [E] to save the displayed setting and return to the <i>Inputs/Outputs</i> menu. 	





Clear Totals	
TN 	The bi-directional net totalizer, when reset, clears both the forward and the reverse flow totalizers (T+ and T-). This is reset within the menu manager or through remote communications. Clearing TN also clears the associated rollover counter.
T+ 	The bi-directional forward flow totalizer is reset within the menu manager or through remote communications. Clearing T+ also clears the associated rollover counter.
T- 	The bi-directional reverse flow totalizer is reset within the menu manager or through remote communications. Clearing T- also clears the associated rollover counter.
PS 	The batch totalizer is reset to the configured preset amount value. It is reset within the menu manager, remote communications or through a properly-configured digital input (function = batch reset).
Tpwroff 	The totalizer accumulating meter time without external power is reset with the menu manager or through remote communications.





Communication		
Port A Settings	Interface [MODBUS RTU] 	<p>The Interface parameter lets you configure how the RS232 communication port will be used.</p> <ul style="list-style-type: none"> • MODBUS RTU • Remote menu (RDI – Remote Display Interface) • Primo 3.x • Flow Diagnostic – After every flow measurement, provides data out of the communication port primarily for diagnosing flow measurement issues. • Disable port <p>The remote menu interface will check for display updates once a second. If a change is detected, the display contents will be transmitted in ASCII format over the RS232 communication port. The remote menu interface also allows for menu navigation and control of the meter as if using the external push-buttons. Keyboard control characters such as <UP>, <DWN>, and <ENTER> are supported to navigate the menus.</p> <p>The Primo 3.x interface will emulate the legacy Primo 3.x Protocol. This protocol will transmit an ASCII string in the following format every 500 ms: “RATE;0.0000; GPM; TOT1;150.0000; USG ; TOT2;150.0000; USG ;” – For Unidirectional Mode “RATE;0.0000; GPM; TOT+;10.0000; USG ; TOT-;50.0000; USG ;” – For Bidirectional Mode</p> <p>To change the Interface follow these steps from the <i>Port A Settings</i> menu:</p> <ol style="list-style-type: none"> 1. Select Interface to view the <i>Interface</i> display. 2. Select the desired interface. 3. Press [E] to save and return to the <i>Port A Settings</i> menu.


Communication		
Port A Settings (continued)	Port Address [1] 	<p>This parameter establishes the MODBUS RTU address. MODBUS RTU requests will only be processed if the configured port address of the meter matches the request address found in the MODBUS RTU packet. The range of addresses supported by MODBUS RTU is 1...247. MODBUS RTU request packets with an address of 0 imply the packet is to be treated as a broadcast packet.</p> <p>To change the port address, follow these steps from the <i>Port A Settings</i> menu:</p> <ol style="list-style-type: none"> 1. Select Port Address to view the <i>Port Address</i> display. 2. Select the desired port address (1...247). 3. Press [E] to save the option and to return to the <i>Port A Settings</i> menu.
	Baud Rate [9600] 	<p>The following Baud Rates are supported</p> <ul style="list-style-type: none"> • 9600 • 19200 • 38400 <p>To change the baud rate, follow these steps from the <i>Port A Settings</i> menu:</p> <ol style="list-style-type: none"> 1. Select Baud Rate to view the <i>Baud Rate</i> display. 2. Select one of the following baud rates: 9600, 19200 or 38400. 3. Press [E] to save the option and to return to the <i>Port A Settings</i> menu.
	Data Bits [8 bits] 	<p>The following data bits are supported:</p> <ul style="list-style-type: none"> • 8 bits • 7 bits • 5 bits <p>To change the data bits, follow these steps from the <i>Port A Settings</i> menu:</p> <ol style="list-style-type: none"> 1. Select Data Bits to view the <i>Data Bits</i> display. 2. Select one of the following: 8 Bits, 7 Bits or 5 Bits. 3. Press [E] to save the option and to return to the <i>Port A Settings</i> menu.
	Parity [Even] 	<p>The following Parities are supported:</p> <ul style="list-style-type: none"> • Even • Odd • None <p>To change the parity, follow these steps from the <i>Port A Settings</i> menu:</p> <ol style="list-style-type: none"> 1. Select Parity to view the <i>Parity</i> display. 2. Select one of the following: None, Even or Odd. 3. Press [E] to save the option and to return to the <i>Port A Settings</i> menu.
	Stop Bits [1 Stop Bit] 	<p>The following stop bits are supported:</p> <ul style="list-style-type: none"> • 1 Stop Bit • 2 Stop Bits <p>To change the stop bits, follow these steps from the <i>Port A Settings</i> menu:</p> <ol style="list-style-type: none"> 1. Select Stop Bits to view the <i>Stop Bits</i> display. 2. Select one of the following: 1 Stop Bit, or 2 Stop Bits. 3. Press [E] to save the option and to return to the <i>Port A Settings</i> menu.

Communication															
Port B Settings	<p>NOTE: The parameters for <i>Port B</i> are the same as for <i>Port A</i>, with the exception of the additional <i>External Port Address</i> detailed below.</p>														
	<p>Port Address [1] </p> <p>An additional communication port, known as <i>Port B</i>, is used to offer enhanced communications with the meter. This port is located on the 11-pin terminal of the PCB. Enhanced protocols like Hart, Profibus DP or Modbus RTU over RS485 are available. In addition, this communication port has similar configurable properties as port A. Refer to the following user manuals for additional information regarding the enhanced communication capabilities of the M2000 meter.</p> <ul style="list-style-type: none"> • HART® communication protocol. • PROFIBUS DP communication protocol. • MODBUS RTU communication protocol. 														
	<p>External Port Address [1] </p> <p>For PROFIBUS® use only. This parameter allows configuration of the PROFIBUS DP daughterboard address.</p>														
Diagnostics	<p>Port A Counters [0] </p> <p>Port counters are used for diagnostics when configured for MODBUS RTU. These counters are only cleared on power up.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Counter</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td>Pkts Processed</td> <td>Number of packets processed by meter.</td> </tr> <tr> <td>Broadcast Pkts</td> <td>Number of broadcast packets (address = 0) processed by meter.</td> </tr> <tr> <td>CRC Errors</td> <td>Number of received packets with CRC error; packet is discarded.</td> </tr> <tr> <td>Pkts Rcvd</td> <td>Number of packets received with an address of the configured port address.</td> </tr> <tr> <td>Pkts Sent</td> <td>Number of packets transmitted in response to a received packet.</td> </tr> <tr> <td>Parity Errors</td> <td>Number of characters with parity errors (<i>i.e.</i>, received character has a mismatch between the number of 1s and its parity bit); packet is discarded.</td> </tr> </tbody> </table>	Counter	Description	Pkts Processed	Number of packets processed by meter.	Broadcast Pkts	Number of broadcast packets (address = 0) processed by meter.	CRC Errors	Number of received packets with CRC error; packet is discarded.	Pkts Rcvd	Number of packets received with an address of the configured port address.	Pkts Sent	Number of packets transmitted in response to a received packet.	Parity Errors	Number of characters with parity errors (<i>i.e.</i> , received character has a mismatch between the number of 1s and its parity bit); packet is discarded.
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<p>Port B Counters [0] </p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Framing Errors</td> <td>Number of characters with framing errors (<i>i.e.</i> missing stop bit is not found – indicates that synchronization with the start bit has been lost and that the character is improperly framed); packet is discarded.</td> </tr> <tr> <td>Overrun Errors</td> <td>Number of characters received that were not processed due to degradation of system performance.</td> </tr> <tr> <td>Break Detects</td> <td>Number of detections that transmission line is locked (<i>i.e.</i>, receive line is low for 10-bit transmissions following a missing stop bit).</td> </tr> </tbody> </table>	Framing Errors	Number of characters with framing errors (<i>i.e.</i> missing stop bit is not found – indicates that synchronization with the start bit has been lost and that the character is improperly framed); packet is discarded.	Overrun Errors	Number of characters received that were not processed due to degradation of system performance.	Break Detects	Number of detections that transmission line is locked (<i>i.e.</i> , receive line is low for 10-bit transmissions following a missing stop bit).									
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Advanced																																																																																					
Data Logger	<p>The Data Logger feature requires firmware version 1.10 or later. Reference Badger Meter P/N 67354-003 to obtain a firmware upgrade kit. See the <i>M-Series M2000 Data Logging</i> user manual, available at www.badgermeter.com, for details on this feature.</p> <p>The Data Logging feature records three types of events to a memory token:</p> <ul style="list-style-type: none"> • Totalizer/error events • Configuration change events • Startup events (power up, power down or reset events) 																																																																																				
Token Copy	<ul style="list-style-type: none"> • Configuration • Store to Token • Restore to Token <p>See the <i>M-Series M2000 Store/Restore</i> user manual, available at www.badgermeter.com, for details on using the Token Copy features.</p>																																																																																				
Encoder Protocol	<p>Protocol Type</p> <p>The Protocol Type enables the encoder interface. Selecting V1 or V2 will automatically configure the Digital Input and Digital Output #1 for encoder operation. Manually configuring the input and output for encoder operation is not allowed and will result in an on-screen error.</p> <p>See "<i>Encoder Protocol Interface</i>" on page 47 for further details.</p> <p>V1 – Standard encoder protocol V2 – Enhanced encoder protocol, provides additional digital information Disabled – disables and removes encoder configuration</p>																																																																																				
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Advanced		
Backlight Control [Timed Off] 	<p>You can set the meter's backlight to: Always On, Always Off and Timed Off.</p> <p>When set to Timed Off, the backlight will automatically turn off after one minute of inactivity (no buttons pressed). Pressing any button will turn the backlight on, but will not immediately navigate the menu.</p> <p>To change the backlight control, follow these steps from the <i>Advanced</i> menu:</p> <ol style="list-style-type: none"> 1. Select Backlight Control to view the <i>Backlight Control</i> display. 2. Select the desired option. 3. Press [E] to save the option and to return to the <i>Advanced</i> menu. 	
Analog Calibrate [Zero Scale: 0 mA] [Full Scale: 0 mA] 	Custom Settings [Zero Scale: 0 mA] [Full Scale: 0 mA] 	<p>To set the analog calibration custom settings, follow these steps from the <i>Advanced</i> menu:</p> <ol style="list-style-type: none"> 1. Select Analog Calibrate to view the <i>Analog Calibrate</i> menu. 2. Select Custom Settings to view the <i>Custom Settings</i> display. 3. Select one of the following: <ul style="list-style-type: none"> • Offset 4 mA • Offset 20 mA 4. Configure desired offset. 5. Press [E] to save the option and to return to the <i>Custom Settings</i> menu. 6. Press [E] to return to the <i>Analog Calibrate</i> menu.
	Factory Settings [Factory Set] 	<p>To change the analog calibration factory settings, follow these steps from the <i>Advanced</i> menu:</p> <ol style="list-style-type: none"> 1. Select Analog Calibrate to view the <i>Analog Calibrate</i> menu. 2. Select Factory Settings to view the <i>Factory Settings</i> display. 3. Select one of the following: <ul style="list-style-type: none"> • Calibration Point A • Calibration Point B 4. Set the calibration point to the measured output current. 5. Press [E] to save the option and to return to the <i>Factory Settings</i> menu. 6. Press [E] to return to the <i>Analog Calibrate</i> menu.
Software Filter MDN-Filter	Description	<p>This software filter operates as a Median filter. This filter is very responsive and can be used to help stabilize flow measurements. This filter is enabled by selecting a non-zero filter size. Supported filter sizes are:</p> <ul style="list-style-type: none"> • S0 - Size 0 • S5 - Size 5 • S7 - Size 7 • S9 - Size 9 <p>The filter technique will use the median value of the last Sx samples used for determining flow measurement.</p>

Advanced		
Software Filter ACC-Filter	Description	The software filter operates as an acceleration filter. This filter, when configured properly, allows for filtering of fast changes in fluid flow. Generally, this filter is used in applications having highly conductive fluids. This filter is intended to help provide smoothing of the analog output and display fluctuations.
	Activation [Off] 	The Activation parameter setting enables or disables the software acceleration filter. To change the Activation setting, follow these steps from the <i>Advanced</i> menu: <ol style="list-style-type: none">1. Select Activation from the <i>Advanced</i> menu.2. Select a setting.3. Press [E] to save the option and to return to the <i>Advanced</i> menu.
	Filter Delay [1] 	The Filter Delay parameter lets you set the amount of time that the flow will be held constant once the filter is activated. The filter is activated by an acceleration component of the fluid exceeding the configured limit. To change the Filter Delay follow these steps from the <i>Advanced</i> menu: <ol style="list-style-type: none">1. Select Filter Delay, from the <i>Advanced</i> menu.2. Enter the setting.3. Press [E] to save the option and to return to the <i>Advanced</i> menu.
	Acceleration Factor [1] 	The Acceleration Factor parameter lets you set the maximum acceleration for a given pipe diameter and is dependent on the excitation frequency. The maximum fluid velocity is 12 m/s. The following equation defines the maximum fluid acceleration: $\text{Acceleration(MAX)} = \text{Acceleration Factor} * 12 \text{ m/s} * \text{Pipe Area} * \text{Excitation Frequency} / 1.5$ If the realized fluid acceleration exceeds the configured maximum acceleration, fluid flow will be held constant for the time set at the Filter Delay parameter. To change the Acceleration Factor setting, follow these steps from the <i>Advanced</i> menu: <ol style="list-style-type: none">1. Select Acceleration Factor from the <i>Advanced</i> menu.2. Enter the setting.3. Press [E] to save the option and to return to the <i>Advanced</i> menu.
	Constant Flow [150 M ³ /Sec ²] 	During normal flow conditions, there is always a non-zero acceleration component. For example, if acceleration of the flow activates the filter, the meter will assume constant flow for the duration of the filter delay time unless the flow returns within limits. Properly configured, this parameter will help offset excessive impacts of the filter delay. The Constant Flow parameter lets you set the acceleration limit for constant flow. To change the Constant Flow setting, follow these steps from the <i>Advanced</i> menu: <ol style="list-style-type: none">1. Select Constant Flow from the <i>Advanced</i> menu.2. Enter the setting.3. Press [E] to save the option and to return to the <i>Advanced</i> menu.

Advanced		
Software Filter ACC-Filter (continued)	Peak Detect [0 M ³ /Sec ²] 	<p>Peak Detect offers a diagnostic view of the acceleration components observed during flow conditions. This parameter records the “high water mark” of the measured accelerations component. This value will help to properly configure the Acceleration Factor parameter. Generally, you will set the acceleration factor at about 75% of the Peak Detect measurement.</p> <p>To reset the Peak Detect setting, follow these steps from the <i>Advanced</i> menu:</p> <ol style="list-style-type: none"> 1. Select Peak Detect from the <i>Advanced</i> menu. 2. Press [+] to reset. 3. Press [E] to return to the <i>Advanced</i> menu.
Software Filter ZFS-Filter	Description	<p>This software filter operates as a zero-flow stability filter. Filter options are:</p> <ul style="list-style-type: none"> • Volume USG • Time • Status (shows Volume and Time)
Software Filter IIR-Filter	Description	This software filter operates as an infinite impulse response filter, used to help suppress erratic flow measurements. Contact Badger Meter Technical Support.
	Activation	ON/OFF
	Coefficient Min	Numeric entry
	Coefficient Max	Numeric entry
	Coefficient Status	Numeric entry
	Sensitivity	Numeric entry
	Hysteresis	m/s

Advanced

Empty Pipe Cal.

[Default]



Fluid conductivity impacts the performance of empty pipe measurements. If you require empty pipe detection, you should perform this empty pipe calibration procedure.

Before starting the empty pipe calibration, verify that empty pipe detection is enabled. Also, run both the empty pipe and the full pipe calibration procedures.

Calibrating an Empty Pipe

Before calibrating an empty pipe, verify that the pipe is empty.

To calibrate with an empty pipe, follow these steps from the *Advanced* menu:

1. Select **Empty Pipe Cal** to view the *Calibration* menus.
2. Select **Cal. Empty Pipe** to view the *Empty Pipe Calibrate* menu.
3. To enable calibration, place the cursor on the calibration enable line and press **[E]**.

```
EMPTY PIPE CALIBRATE
Volts = 3.00
>Cal [ON]      E=OFF
Exit with Save
```

4. Wait 30 seconds for voltage measurement to stabilize.
5. To save the setting, place the cursor on **Exit with Save** and press **[E]**.

Calibrating a Full Pipe




Before calibrating a full pipe, verify that the pipe is full.






To calibrate with a full pipe, follow these steps from the *Advanced* menu:


1. Select **Empty Pipe Cal** to view the *Calibration* menus.
2. Select **Cal. Full Pipe** to view the *Full Pipe Calibrate* menu.
3. Enable calibration by placing the cursor on the calibration enable line and press **[E]**.


```
FULL PIPE CALIBRATE
Volts = 1.515
>Cal [OFF]     E=ON
Exit with Save
```

4. Wait 30 seconds for voltage measurement to stabilize.
5. To save the setting, place the cursor on **Exit with Save** and press **[E]**.

Advanced		
Security	Set Admin PIN [00000] 	Users logged in with this PIN will have access to all M2000 meter procedures. To set the administrator's PIN, follow these steps from the <i>Advanced</i> Menu: <ol style="list-style-type: none"> 1. Select Security to view the <i>Security</i> menu. 2. Select Set Admin PIN to view the <i>Admin PIN</i> display. 3. Set the five-digit PIN number to the desired value. 4. Press [E] to save the PIN and to return to the <i>Security</i> menu.
	Set Service PIN [00000] 	Users logged in with this PIN will have access to all service level and user-level procedures. Service users will not have access to administrative procedures. To set the service PIN, follow these steps from the <i>Advanced</i> Menu: <ol style="list-style-type: none"> 1. Select Security to view the <i>Security</i> menu. 2. Select Set Service PIN to view the <i>Service PIN</i> display. 3. Set the five-digit PIN number to the desired value. 4. Press [E] to save the PIN and to return to the <i>Security</i> menu.
	Set User PIN [00000] 	Users logged in with this PIN will have access to user-level procedures. User at this level will not have access to administrative or service procedures. To set the user's PIN, follow these steps from the <i>Advanced</i> Menu: <ol style="list-style-type: none"> 1. Select Security to view the <i>Security</i> menu. 2. Select Set User PIN to view the <i>User PIN</i> display. 3. Set the five-digit PIN number to the desired value. 4. Press [E] to save the PIN and to return to the <i>Security</i> menu.

Info/Help		
Error Counts [0] 	Description	This menu provides a diagnostic view of the meter's performance. Below are several system diagnostic counters and their definitions. Use discretion when interpreting these counters. These values could be altered during system setup or when using the verification device. We suggest that you reset these counters before you start monitoring your system and look for conditions possibly affecting performance.
	Detector	The number of times an invalid detector condition has been observed.
	Empty Pipe	The number of times an empty pipe condition has been observed by the meter.
	Full Scale	The number of times the flow has exceeded the full scale flow setting.
	Totalizer	The number of times the totalizers have exceeded limits of the meter.
	Pulse Sync.	The number of times the pulse outputs have fallen out of synchronization.
	ADC Interrupt	The number of times an analog input measurement has been missed.
	ADC Range	The number of times the analog input measurement range has been exceeded.
	System Error	A diagnostic system message indicating the reason for a system reset.
	System Resets	The number of times the meter has been reset.
	System Reset ID	Diagnostic information about a system reset as a result of expired internal timers.
Token Errors	Indicates the number of parameter copies from a memory token that failed to be copied to the meter.	
Checksum	For MID meters. If a data corruption to the meter memory occurs, this "counter" indicates the memory region that is corrupted.	
PowerUp Counter [Not applicable] 	The number of times that the unit has been powered on.	
Power Off Totalizer [Not applicable] 	The length of time that the unit has been without power.	
Version Info [Not applicable] 	The current software version.	
Serial Number [Not applicable] 	The manufacturing serial number in the format YYMM####. Where YYMM indicates year and month of manufacturing and #### indicates the sequence number.	
Meter Tag Name	For PROFIBUS – This parameter is only programmable over external PROFIBUS communications.	
Daughterboard Information	Describes current version of attached daughterboard. NOTE: RS485 daughterboard is not recognized because it is a pass-through device rather than an intelligent protocol converter like Hart-to-MODBUS.	
Polarization Voltage	Diagnostic voltage to help determine if the meter or application is performing optimally.	

Info/Help	
Restore Defaults [Not applicable] 	Restores all non-calibrated parameters to the factory defaults.

Language Select	
Language Select [English] 	The M2000 meter supports one alternate language along with English. This alternate language choice is set at the factory. The options are: Spanish, German, Czech or French. To select the language, follow these steps from the Language Select menu : <ol style="list-style-type: none">1. Select English or the Alternate Language.2. Press [E] to save the selection.

ENCODER PROTOCOL INTERFACE

This feature requires firmware version 1.10 or later. Reference Badger Meter P/N 67354-003 to obtain a firmware upgrade kit. Enabling the meter as an encoder requires three settings, all within the advanced menu, to be configured.

- Totalizer Resolution – Selects the resolution of the display totalizer.
- Protocol Type – Selects the type of information to be transmitted to the encoder.
- Dial Type – Enables encoder and selects the number of significant totalizer digits to transmit.

Changing the protocol type will automatically configure the necessary digital inputs/outputs. Manually changing the digital inputs/outputs within the *Input/Outputs* menu is not allowed. Below is a wiring diagram for connecting an encoder to the meter.

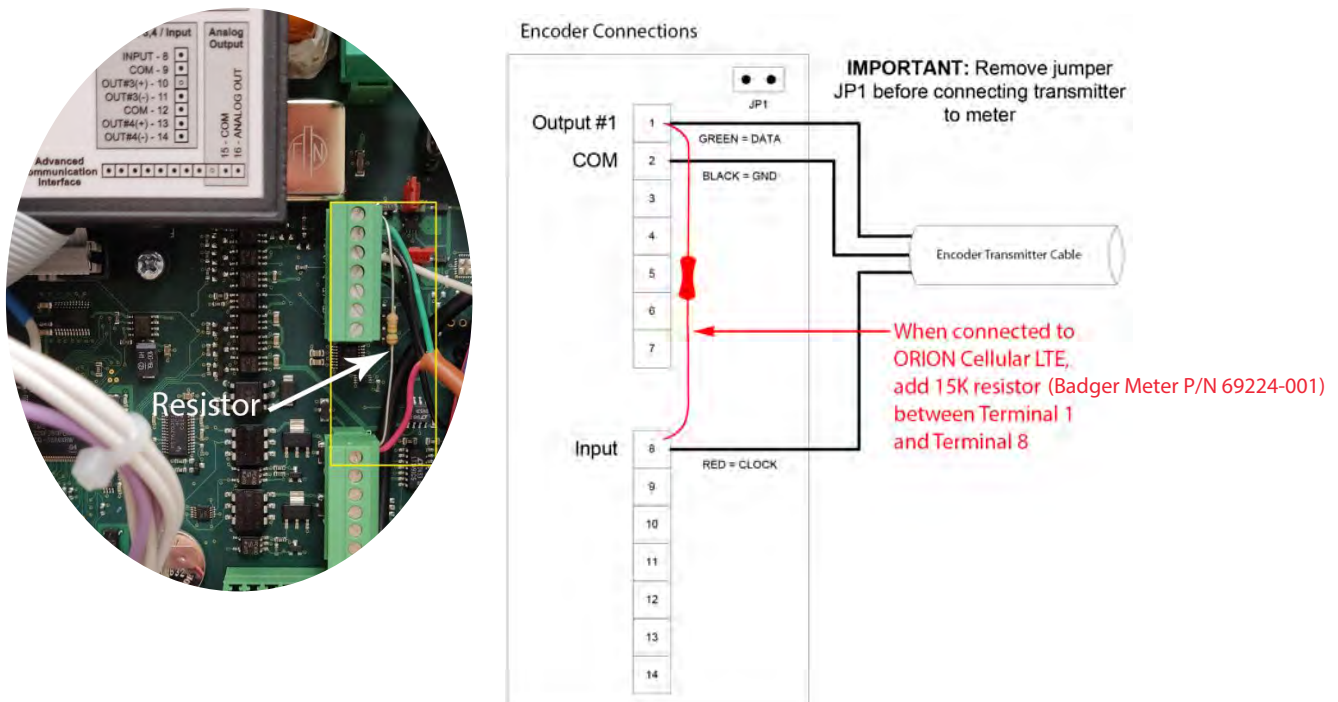


Figure 34: Encoder interface

NOTE: When connected to an ORION Cellular LTE endpoint, add a 15K resistor (Badger Meter P/N 69224-001) to the M2000 meter terminal block between terminal 1 (green wire) and terminal 8 (red wire) as shown to correct any potential meter reading issues. The resistor is indicated by an arrow in the photo and in the drawing.

The following table demonstrates how the totalizers are displayed under various configurations of the Totalizer Resolution (that is, resolution) and Dial Type. The non-shaded digits are transmitted as defined by the dial type.

For example, if the dial type is 4-dial and the resolution is 10000 then an arbitrary totalizer value of 99999999 is displayed on the meter as 99990000 and 9999 is transmitted to the receiving application. In this configuration it will take 10000 units (i.e. USG) before the display totalizer is updated to a new value. For this example the display totalizer will rollover to 00000000.

Dial Type	Totalizer Resolution	Display Digits									
		1	2	3	4	5	6	7	8	9	0
4 dial	10000			1	2	3	4	0	0	0	0
	1000				1	2	3	4	0	0	0
	100					1	2	3	4	0	0
	10						1	2	3	4	0
	1							1	2	3	4
	0.1							1	2	3	.
	0.01							1	2	.	3
	0.001							1	.	2	3
0.0001						0	0	1	2	3	
5 dial	10000		1	2	3	4	5	0	0	0	0
	1000			1	2	3	4	5	0	0	0
	100				1	2	3	4	5	0	0
	10					1	2	3	4	5	0
	1						1	2	3	4	5
	0.1						1	2	3	4	.
	0.01						1	2	3	.	4
	0.001						1	2	.	3	4
0.0001						1	.	2	3	4	
6 dial	10000	1	2	3	4	5	6	0	0	0	0
	1000		1	2	3	4	5	6	0	0	0
	100			1	2	3	4	5	6	0	0
	10				1	2	3	4	5	6	0
	1					1	2	3	4	5	6
	0.1						1	2	3	4	.
	0.01						1	2	3	.	4
	0.001						1	2	3	.	4
0.0001						1	2	.	3	4	
7 dial	10000	Not Applicable – Not enough display digits									
	1000	1	2	3	4	5	6	7	0	0	0
	100		1	2	3	4	5	6	7	0	0
	10			1	2	3	4	5	6	7	0
	1				1	2	3	4	5	6	7
	0.1				1	2	3	4	5	6	.
	0.01				1	2	3	4	5	.	6
	0.001				1	2	3	4	.	5	6
0.0001				1	2	3	.	4	5	6	
8 dial	10000	Not Applicable – Not enough display digits									
	1000	Not Applicable – Not enough display digits									
	100	1	2	3	4	5	6	7	8	0	0
	10		1	2	3	4	5	6	7	8	0
	1			1	2	3	4	5	6	7	8
	0.1			1	2	3	4	5	6	7	.
	0.01			1	2	3	4	5	6	.	7
	0.001			1	2	3	4	5	.	6	7
0.0001			1	2	3	4	.	5	6	7	

Dial Type	Totalizer Resolution	Display Digits									
		1	2	3	4	5	6	7	8	9	0
9 dial	10000	Not Applicable– Not enough display digits									
	1000	Not Applicable– Not enough display digits									
	100	Not Applicable– Not enough display digits									
	10	1	2	3	4	5	6	7	8	9	0
	1		1	2	3	4	5	6	7	8	9
	0.1	1	2	3	4	5	6	7	8	.	9
	0.01	1	2	3	4	5	6	7	.	8	9
	0.001	1	2	3	4	5	6	.	7	8	9
0.0001	1	2	3	4	5	.	6	7	8	9	
10 dial*	10000	Not Applicable– Not enough display digits									
	1000	Not Applicable– Not enough display digits									
	100	Not Applicable– Not enough display digits									
	10	Not Applicable– Not enough display digits									
	1	1	2	3	4	5	6	7	8	9	0
	0.1	1	2	3	4	5	6	7	8	9	.0
	0.01	1	2	3	4	5	6	7	8	.9	0
	0.001	1	2	3	4	5	6	7	.8	9	0
0.0001	1	2	3	4	5	6	.7	8	9	0	

*10 dial reading is not supported by the encoder protocol. When the meter is configured, the display settings for number of dials and resolution are based on what the encoder protocol can support. For example, if the encoder output is enabled (V1 or V2) and you try to select 10 dials, the display will show an error dialog since this is an invalid configuration for the encoder. If the encoder output is not enabled, a selection of up to 10 digits is available.

It is important to understand that the totalizers are represented in a manner equivalent to an actual encoder. For example, 1 USG on a 4 dial will be transmitted/displayed as “0001”. If in bidirectional mode, –1 USG will be transmitted/displayed as “9999”.

The protocol type has two options:

- V1 – meter provides single totalizer, Tn (bi-directional) or T1 (uni-directional)
- V2 – meter provides extended information (For ORION Cellular, ORION Fixed Network (SE) or ORION Migratable (ME))

The additional information provided by protocol type V2 is only accessible for specific models of the encoder (i.e. ORION SE or ORION ME). The additional information of protocol type V2 includes, status information of the meter, meter identification, a second totalizer reading (T+ or T2), relative flow rate (0...100%), and flow direction.

STORE / RESTORE FEATURE

The Store/Restore feature is intended to save installation costs and reduce installation time. This feature is also intended to protect meter configuration and assure the operator that the meter is properly configured. Over time and handling of the meter, the meter configuration could change. The Store/Restore feature allows the meter to be quickly set to the operator's original configuration. Refer to the *M2000 Store/Restore* user manual for details on this feature.

DATA LOGGING FEATURE

The Data Logging feature records three types of events to a memory token:

- Totalizer/error events
- Configuration change events
- Startup events (power up, power down or reset events)

Each type of event is recorded into three separate files stored on the memory token. These files are extracted using the provided flow meter tool software over the RS232 communication link. Refer to the *M2000 Data Logging* user manual for details on this feature.

MAINTENANCE

Mandatory, routine or scheduled maintenance should not be required for the M2000 meter electronics or flow tube after proper installation.

However, some instances may require personnel to perform the following:

- Flow tube and electrode cleaning
- Fuse replacement
- Circuit board replacement

⚠ WARNING

- **DISCONNECT MAIN POWER TO THE UNIT BEFORE ATTEMPTING ANY DEVICE MAINTENANCE OR CLEANING.**
- **DO NOT CLEAN COMPONENTS INSIDE THE AMPLIFIER OR JUNCTION BOX.**

Cleaning the Flow Tube and Electrode

At times flow tube, electrodes, amplifier/junction box housings and the amplifier window may need periodic cleaning, depending on process fluid properties, fluid flow rate and surrounding environment.

Clean the flow tube and electrodes by following the material handling and cleaning procedures documented in Material Safety Data Sheet (MSDS) guidelines for the product(s) that were in contact with the flow tube and electrodes.

Should flow tube and/or electrode cleaning become necessary:

1. Disconnect detector from pipeline.
2. Clean electrodes according to MSDS guidelines.
3. Reconnect detector to pipeline.

Replacing the Fuse

⚠ WARNING

DISCONNECT MAIN POWER TO THE UNIT BEFORE ATTEMPTING ANY DEVICE MAINTENANCE. RISK OF ELECTRICAL SHOCK. REPLACE THE FUSE ONLY WITH 250V AC, 2 AMP, SLOW BLOW (5 X 20 MM). AUTHORIZED PERSONNEL MUST REPLACE FUSES.

Replacing the Circuit Board

Refer to the *M-Series M2000 Interchangeability Procedure Application Brief* for information on replacing circuit boards.

TROUBLESHOOTING

The M2000 meter is designed for many years of optimal performance. However, should it malfunction, there are certain things that we recommend you check before contacting our Technical Support department or your local Badger Meter Representative.

NOTE: If the fluid measured has a high concentration of conductive solids, deposits may accumulate on the internal liner walls and electrodes. These deposits will cause a reduction of the measuring output. Thus, Badger Meter recommends that you remove the meter and inspect the liner and electrodes after six months. If deposits are found, remove them with a soft brush. Repeat inspection process every six months or until an appropriate inspection cycle can be established for the specific application.

NOTE: Other general conditions include:

Description	Possible Cause	Recommended Action
Rollover warning	A rollover warning occurs when the display totalizer can no longer represent the current value within the totalizer. A rollover warning is dependent on the number of dials, resolution and the unit of measure.	To clear rollover error, do one of the following: <ul style="list-style-type: none"> • Increase number of dials • Reduce resolution or • Clear totalizers
Flow is present but display is "0"	Digital input is holding flow. Disconnected signal cable. Detector mounted opposite of the main flow direction (see arrow on the nameplate). Coil or electrode cables exchanged. Improper low flow cutoff or full scale flow.	Check signal cable. Turn detector by 180° or switch terminal E1 and E2 or reprogram to bidirectional mode. Check cable connections for cross wiring. Verify digital input configuration. Replace configuration defaults.
Inaccurate measuring	Improper calibration. Wrong calibration parameter. Pipe not fully filled, or air in pipe. Invalid fluid conductivity. Invalid fluid mixture.	Restore calibration defaults. Check the parameters (detector factor and size) according to supplied data sheet. Check if meter is completely filled with fluid. Purge line to eliminate air bubbles.
No display	No power. Incorrect power. Bad wiring connections. Blown fuse.	Apply power. Check power value. Replace fuse (2 amp, 250V AC, slow blow 5 x 20 mm). Check display ribbon cable.
Flow rate value known to be wrong	Detector factor. Deposits on electrodes and/or liner. Incorrect pipe size programmed.	Check value on label. Check and remove deposits. Check size if necessary.
Flow rate indication unstable	Cable issue. Grounding issue. Partially full pipe. Air in pipe. Amplifier location – outside electrical. Invalid fluid conductivity.	Make sure cable is shielded and not vibrating. Make sure meter is properly grounded to a good earth ground. Make sure pipe is full of fluid. Make sure fluid does not contain air bubbles. Make sure amplifier is not too close to sources of electrical interference.
BEACON displays multiple estimated flow occurrences for meters connected to ORION Cellular LTE endpoints.	ORION Cellular LTE endpoints require additional resistance.	Add a 15K resistor to the M2000 meter terminal block. See "Encoder Protocol Interface" on page 47 for complete details.

Menu Manager Configuration Errors		
Error	Description	Recommended Action
100	ADE: Configuration of the ADE interface is invalid.	<p>This error is displayed when an invalid modification to either of the following menu parameters is detected: Protocol Type, Dial Type, Totalizer Resolution, Digital Input Function Type or Digital Output Function Type.</p> <ol style="list-style-type: none"> 1. Configuring the M2000 meter as an ADE interface has the following limitations, Protocol Type V1 is only allowed if number of dials is less than 8. 2. The resolution of the totalizers (i.e. Totalizer Resolution) must be set to something other than OFF. 3. For 8 dial configuration, a resolution of 10000 and 1000 are not supported. There are not enough display digits to accommodate 8 dials and greater than 100 units of resolution. 4. For 7 dial configuration, a resolution of 10000 is not supported. There are not enough display digits to accommodate 7 dials and greater than 1000 units of resolution.
101	ADE: Enabling/Disabling ADE operation is invalid	<p>This error is observed when Digital input or output function is manually selected for ADE operation. Enabling or Disabling ADE operation can only be accomplished by setting the ADE protocol type.</p>
110	Output 1/2: Pulse Output Configuration Error	<p>This error is observed when improperly configuring either the full scale flow, pulse per unit, pulse width or digital output function type for pulse output operation. Preparing these parameters for pulse output operation (i.e. forward or reverse) has limitations that are monitored by the menu manager. This error can indicate the following configuration violations:</p> <ol style="list-style-type: none"> 1. Pulse Frequency exceeds limits at full scale flow 2. Pulse duty cycle is less than 50% at full scale flow (i.e. pulse on time > pulse off time) 3. AMR Pulse Frequency exceeds limit at full scale flow <p>The pulse frequency limit is 10 kHz when the pulse width is 0 (i.e. 50% duty cycle). The pulse frequency limit is $1 / (2 * \text{Pulse Width})$ when the pulse width is non-zero in order to achieve a 50% duty cycle. For AMR operation, the frequency limit is 3 HZ.</p> <p>Follow these steps for configuring meter for pulse output operation:</p> <ol style="list-style-type: none"> 1. Set PPU to zero for both output 1 and 2 2. If necessary, set full scale flow appropriately for application 3. Set PW as required by equipment receiving pulse transmissions from meter. Observe frequency limits for non-zero pulse widths. 4. Determine the desired pulse frequency at a typical flow rate (i.e. 1000 HZ @ 250 GPM) 5. Calculate ratio of typical flow rate to full scale flow: ratio = typical flow rate / full scale flow (i.e. 250 GPM / 500 GPM = 0.5) 6. Calculate flow rate conversion factor: For GPM, conversion factor = 1/60, for GPH, conversion factor = 1/3600, for GPS, conversion factor = 1 7. Calculate PPU: $\text{PPU} = (\text{Desired pulse frequency at typical flow rate} / \text{ratio}) / [\text{Full Scale Flow} * (\text{conversion factor})]$ = $(1000 / 0.5) / [500 * (1/60)]$ = 240 Pulse / Gallon 8. If an error is received consider reducing value of full scale flow and ensuring desired pulse frequency is within limits. Then redo steps 4-7 <p>If not using the pulse outputs, set the pulses per unit to zero to allow for re-configuration of the full scale flow. If it is required to use the pulse outputs, re-evaluate the pulse output configuration. Consider recording and clearing totalizers following pulse output configuration"</p>
120	Display: Totalizer Conversion Error – Totalizer cannot be properly converted for display	<p>This error is observed while trying to change the totalizer units. Limits of display will prevent improper configuration of the volume unit dependent on current totalizer values. Consider recording and cleaning totalizers prior to changing totalizer.</p>
121	Output 1/2: Pulse Output Configuration Error	<p>This error is observed when changing the totalizer units of measure. This error implies the pulse configuration exceeds limits (see error 110). Please note the pulses per unit is not automatically updated on volume unit re-configuration. The pulses per unit should be manually changed to accommodate the desired units of measure. It may be necessary to set the pulses per unit to zero then change to the desired totalizer units.</p>
140	Output 3: Configuration Error – Full scale frequency exceeds limits of relay (1000 Hz)	<p>Reduce full scale frequency setting of output when hardware is configured for relay operation.</p>
150	Output 3: Configuration Error – Full scale frequency exceeds limits (10 kHz)	<p>Reduce full scale frequency setting of output when hardware is configured for open collector operation.</p>
170	Output 1/2: Output Type Configuration Error	<p>This error is observed when the function type is 24V DC and the output type is changed from Normally Open to Normally Closed. It is required for 24V DC output operation that the output type be Normally Open.</p>

Menu Manager Configuration Errors		
Error	Description	Recommended Action
171	Output 1/2: Output Type Configuration Error	This error is observed when the function type is ADE and the output type is changed from Normally Open to Normally Closed. It is required for ADE operation that the output type be Normally Open.
190	Full Scale Flow: Entered Value exceeds limits	Value entered exceeds the absolute maximum flow the meter supports. Reduce the value for this parameter or consider increasing pipe diameter.

Display Error / Status Messages		
Error Message	Possible Cause	Recommended Action
Err: Detector	No detector connection with amplifier.	Check detector and cable connections in accordance with this manual.
	Connection between amplifier and detector	Contact Technical Support.
	Supply voltage too low.	Contact Technical Support.
	Grounded coils in meter.	Contact Technical Support.
	Water in detector.	Contact Technical Support.
Err: Empty pipe	Pipe may not be full.	Make sure all trapped air is out of system. If fluid or fluid conductivity recalibrate the parameter.
Err: Full scale	Actual flow rate is exceeding programmed flow.	Reduce flow rate or increase the programmed full scale value by more than 5%.
Err: AD-Range	AD-Converter is exceeding signal limits.	Check the grounding scheme of the meter installation. See grounding section in this manual. Verify pipe is not empty.
Err: AD-INT	Initialization of AD-Converter unsuccessful.	Contact Technical Support.
Err: Rollover	Rollover counters have exceeded limit.	Clear all totalizers.
Err: Rollover Status	Totalizer rollover has occurred.	Reload totalizer then clear all totalizers.
Err: Simulation	I/O simulator is enabled.	Disable simulator in I/O menu.

SPECIFICATIONS

Flow Range	0.10...39.4 ft/s (0.03...12 m/s)						
Accuracy	± 0.20% of rate ± 1 mm/s						
Repeatability	± 0.1%						
Power Supply	AC Power Supply: 85...265V AC; Typical Power: 20V A or 15W; Maximum Power: 26V A or 20W Optional DC Power Supply: 10...36V DC; Typical Power: 10W; Maximum Power: 14W						
Analog Output	4...20 mA, 0...20 mA, 0...10 mA, 2...10 mA (programmable and scalable) Voltage sourced 24V DC isolated. Maximum loop resistance < 800 ohms.						
Digital Output	Four total, configurable 24V DC sourcing active output (up to 2), 100 mA total, 50 mA each; sinking open collector output (up to four), 30V DC max, 100 mA each; AC solid-state relay (up to 2), 48V AC, 500 mA max						
Digital Input	Max 30V DC (programmable – positive zero return, external totalizer reset or preset batch start)						
Frequency Output	Scalable up to 10 kHz, open collector up to 1 kHz, solid-state relay						
Misc Output	High/low flow alarm (0...100% of flow), error alarm, empty pipe alarm, flow direction, preset batch alarm, 24V DC supply, ADE						
Communication	RS232 Modbus RTU; RS485 Modbus RTU, HART, Profibus DP require separate daughterboards						
Pulse Width	Scalable up to 10 kHz, passive open collector up to 10 kHz, active switched 24V DC. Up to two outputs (forward and reverse). Pulse width programmable from 1...1000 ms or 50% duty cycle.						
Processing	32-bit DSP						
Empty Pipe Detection	Field tunable for optimum performance based on specific application						
Excitation Frequency	1 Hz, 3.75 Hz, 7.5 Hz or 15 Hz (factory optimized to pipe diameter)						
Noise Dampening	Programmable 0...30 seconds						
Low Flow Cut-Off	Programmable 0...10% of maximum flow						
Galvanic Separation	250V						
Fluid Conductivity	Minimum 5.0 µS/cm (minimum 20 µS/cm for demineralized water)						
Fluid Temperature	With Remote Amplifier: PFA, PTFE & Halar 302° F (150° C) With Meter-Mounted Amplifier: Rubber 178° F, (80° C), PFA, PTFE & Halar 212° F (100° C)						
Ambient Temperature	- 4...140° F (-20...60° C)						
Relative Humidity	Up to 90 percent non-condensing						
Flow Direction	Unidirectional or bidirectional two separate totalizers (programmable)						
Totalization	Programmable/resettable						
Units of Measure	Ounce, pound, liter, US gallon, imperial gallon, barrel, hectoliter, mega gallon, cubic meter, cubic feet, acre feet						
Display	4 x 20 character display with backlight						
Programming	Three-button, external manual or remote						
Amplifier Housing	Cast aluminum, powder-coated paint						
Detector Housing	Standard: Carbon steel welded; Optional: 316 or 304 stainless steel						
Pipe Spool Material	316 stainless steel						
Flanges	Standard: ANSI B16.5 Class 150 RF forged carbon steel; Optional: 300 lb forged carbon steel, 316 or 304 stainless steel						
Pressure Rating	Line sizes up through 24 in: In accordance with ASME B16.5 Class 150 or Flange Rating Class 300 Line sizes greater than 24 in. and through 72 in: AWWA C-207 Class D or Class E Flange Rating						
Liner Material	PFA up to 3/8 in., PTFE 1/2...24 in., soft and hard rubber from 1...54 in., Halar® from 14...40 in.						
Electrode Materials	Standard: Hastelloy C22; Optional: 316 stainless steel, gold/platinum plated, tantalum, platinum/rhodium						
Mounting	Meter mount or remote wall mount (bracket supplied)						
Locations	Indoor and outdoor						
Meter Enclosure Classification	Standard: NEMA 4X (IP66); Optional: Submersible NEMA 6P (IP67) or IP68, remote amplifier required						
Junction Box Enclosure Protection	For remote amplifier option: powder-coated die-cast aluminum, NEMA 4 (IP66)						
Cable Entries	1/2 in. NPT cord grip (3)						
Optional Stainless Steel Grounding Rings	<table border="0"> <tr> <td>Meter Size</td> <td>Thickness (of one ring)</td> </tr> <tr> <td>Up through 10 in.</td> <td>0.135 in.</td> </tr> <tr> <td>12...78 in.</td> <td>0.187 in.</td> </tr> </table>	Meter Size	Thickness (of one ring)	Up through 10 in.	0.135 in.	12...78 in.	0.187 in.
Meter Size	Thickness (of one ring)						
Up through 10 in.	0.135 in.						
12...78 in.	0.187 in.						
NSF Listed	Models with hard rubber liner, 4 in. size and larger; PTFE liner, all sizes						
Token Features	Data Logging (Blue token); Store/Restore (Red token); Firmware Upgrade (Black token)						

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Control. Manage. Optimize.

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Legacy Document: IOM-175-04 PN 53400-190

INTERIM BORREGO SPRINGS WATERMASTER
BOARD OF DIRECTORS MEETING
MARCH 31, 2020
AGENDA ITEM III.A(4)

March 27, 2020

TO: Board of Directors

FROM: Michele A. Staples, Esq., Jackson Tidus, Attorneys for Agricultural Alliance for Water and Resource Education (“AAWARE”)

SUBJECT: Comments on Settlement Agreement and Proposed Stipulated Judgment Submitted as Alternative to Groundwater Sustainability Plan (Alternative Package)

RECOMMENDED ACTION:

Receive report summarizing comments on Alternative Package

ITEM EXPLANATION:

On January 30, 2020, Borrego Water District (BWD) submitted to the California Department of Water Resources (DWR) the following Alternative Package:

1. Settlement Agreement, including the following exhibits:
 - A. Party List / Pumping volumes 2014 to 2018 (with 2018 being the last year when pumping data is currently available)
 - B. Form Answer
 - C. Stipulated Judgment (see below)
 - D. Stipulation
 - E. Interim Watermaster Budget
2. Proposed Stipulated Judgment, to be approved by the Court as part of the comprehensive adjudication, including the following exhibits:

1. Proposed Groundwater Management Plan (GMP)
2. Proposed Stipulation for Judgment
3. Minimum Fallowing Standards
4. Baseline Pumping Allocations
5. Watermaster Rules and Regulations
6. Water Rights Restrictive Covenant Forms
7. Processes for Selecting Watermaster Representatives
8. Entry Agreement Form

The Alternative Package documents are posted on DWR's SGMA Portal website for public review and comment at:

<https://sgma.water.ca.gov/portal/alternative/print/37>

Because of the disruption resulting from the novel coronavirus, the close of the public comment period has been extended from April 15, 2020 to May 15, 2020. As of the date of this agenda report, no public comments on the Alternative Package have been posted to the DWR SGMA Portal website. The link to view any comments is:

<https://sgma.water.ca.gov/portal/alternative/comments/37>

In addition to public comments on the DWR SGMA Portal website, some comments have been received on behalf of local groundwater pumpers requesting clarifications to the Alternative Package documents. The local comments received to date are attached to this agenda report. After the close of the public comment period (currently, May 15, 2020), all of the comments will be compiled and considered by the Settling Parties for potential incorporation into the Alternative Documents by way of an addendum to the Settlement Agreement.

NEXT STEPS:

Information only. No action is required by the Watermaster Board.

FISCAL IMPACT:

N/A

ATTACHMENT:

Comments on Alternative Package received to date.

BORREGO AIR RANCH COMMENTS

Paragraphs 1 and 2 on page 23:

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 buyer and seller 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 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 buyer 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 buyer (the “Eligibility Requirement”). The “Anti-Speculation” provisions of this paragraph do not apply to BWD, the County, a mutual water company, or an owner of an Original BPA Parcel; provided, however, that the “Anti-Speculation provisions shall not apply to an owner of an Original BPA Parcel only so long as either (i) the BPA owner retains the same or greater quantity of acreage in proportion to its Original BPA or (ii) the BPA owner does not hold an amount of Annual Allocation in excess of the quantity of its originally granted BPA. As a condition of completing a Permanent Transfer, the Watermaster may demand that a BPA buyer (excepting BWD, the County, a mutual water company and an owner of an Original BPA Parcel satisfying the criteria specified above) submit a deed reflecting the buyer’s ownership in fee duly recorded, or Court order evidencing ownership by the buyer, of a legal parcel or parcels overlying the Basin of sufficient acreage to satisfy the buyer’s satisfaction of the Eligibility Requirement (the “Eligibility Proof”).

Paragraph 4 on page 24:

4. Transfer Records. ~~Except for the BWD, a mutual water company, and the County,~~ ~~u~~Upon completion of the Permanent Transfer, the BPA will be assigned to the buyer's Parcel(s) on the records of the Watermaster. Notwithstanding the foregoing, upon completion of the Permanent Transfer to BWD, a mutual water company, or the County, the BPA will be assigned on the records of the Watermaster to BWD, the mutual water company or the County, as applicable.

NEGOTIATING PARTY COMMENTS REGARDING BASIN AREAS OUTSIDE OF BWD SERVICE AREA

BWD is the only remaining member of the Groundwater Sustainability Agency (GSA) for the Basin since the County withdrew from the GSA as of December 31, 2019. Natalie Stork, one of the Supervisors in the State Water Resources Control Board's (State Board) Groundwater Management Program, recently informed attorneys for the negotiating parties that the State Board considers areas outside of BWD's service area to be "unmanaged areas" of the Basin under the Sustainable Groundwater Management Act requiring the State Board's intervention in the management of those areas. Groundwater pumpers in unmanaged areas must file annual groundwater production reports and filing fees with the State Board starting December 15, 2020. The State Board filing fees could be substantial, with a \$300 base filing fee and up to \$55 per acre-foot. The attached bulletin includes additional information on State Board Intervention.

Nicole Kuenzi, State Board legal counsel, explained that the State Board will recognize the Interim Watermaster's legal authority to manage the entire Basin (including areas outside of BWD's service area) after the Court issues a preliminary injunction approving the Interim Watermaster's management authority. Once the Preliminary Injunction issues, the State Board will no longer classify the areas outside of BWD's service boundary as "unmanaged areas" and will not require groundwater pumpers in those areas to file separate annual reports and filing fees.

There are three groundwater pumpers with BPA outside of BWD's service area: William Bauer, Borrego Air Ranch and the State Park. It is unknown whether and how many de minis well owners might be outside of BWD's service area. William Bauer is already a Settling Party and it is hoped that both Borrego Air Ranch and the State Park will join the Settlement Agreement. The Alternative Package will need to be amended to clarify that groundwater pumpers outside of BWD's service boundary will not have duplicate reporting requirements and fee payments to both the Interim Watermaster and State Board.

STATE INTERVENTION SUMMARY

State Intervention – The State Backstop

Sustainable Groundwater Management Act (SGMA)

SGMA and State Intervention

SGMA requires the formation of local groundwater sustainability agencies (GSAs) in California’s high- or medium-priority groundwater basins. GSAs are required to develop groundwater sustainability plans (plan) that make basins sustainable within 20 years of implementation. If locals are unable or unwilling to sustainably manage their basin or subbasin, the State Water Resources Control Board (State Water Board or Board) can step in to protect groundwater using a process called state intervention. State intervention is triggered by one of the following events:

Date	Event
July 1, 2017	Entire basin is not covered by GSA(s).
Feb. 1, 2020	Basin is in critical overdraft and there is either 1) no plan or 2) the Department of Water Resources (DWR) fails the plan.
Feb. 1, 2022	There is either 1) no plan or 2) long-term overdraft and DWR fails the plan.
Feb. 1, 2025	DWR fails plan and basin has significant surface water depletions.

For general SGMA information, visit: www.waterboards.ca.gov/water_issues/programs/gmp/sgma.shtml.

Levels of Intervention

Unmanaged Area

An unmanaged area is a part of a basin not within the management area of a GSA before July 1, 2017. Anyone that extracts groundwater from an unmanaged area must submit an extraction report to the State Water Board each year. The first extraction reports were due by Dec. 15, 2017, and must include well location and capacity, where the water was used, purpose of use, and monthly extraction volumes.

Probationary Basin

If local agencies fail to form a GSA, fail to develop an adequate sustainability plan, or fail to implement the plan successfully, the State Water Board may designate the entire basin probationary. Anyone who extracts groundwater from a probationary basin, including extractors under the management of a GSA, must file extraction reports with the Board unless the Board decides to exclude certain types of extractions. The Board may require the use of a meter to measure extractions and reporting of additional information.

Interim Plan

The State Water Board will allow local agencies time to fix the issues in the basin that led to probation. If local agencies are unable to fix those issues, the Board will develop an interim plan to directly manage groundwater extractions. An interim plan will contain corrective actions, a timeline to make the basin sustainable, and a monitoring plan to ensure corrective actions are working.

Extraction Reports

Well owners must ensure extraction reports are submitted to the State Water Board by Dec. 15 of each year for extractions made during the previous water year (Oct. 1 – Sep. 30). An extraction report is required for each well and must include monthly pumping data. Extractions must be measured by a method satisfactory to the Board. Extraction reports must be submitted online through the Board’s website. For more information about extraction reports, visit www.waterboards.ca.gov/water_issues/programs/gmp/reporting.shtml.

Intervention Fees

Each extraction report must be accompanied by a fee to cover State Water Board intervention costs. The fees for state intervention are detailed below.

Fee Category*	Annual Fee	Applicable Parties
Base Filing Fee	\$300 per well	All extractors required to report.
Unmanaged Rate	\$25 per acre-foot	Extractors in unmanaged areas. If extractors use a meter to measure extractions the rate is \$10 per acre-foot.
Probationary Rate	\$40 per acre-foot	Extractors in probationary basins.
Interim Plan Rate	\$55 per acre-foot	Extractors in probationary basins where the Board determines an interim plan is required.
De minimis Fee	\$100 per well	A well owner that extracts two acre-feet or less per year for domestic purposes in a probationary basin, if the Board decides these extractions are significant.
Late Fee	25% of total fee per month	Extractors that do not file reports by the due date.

*Fees are subject to change. Additional information available at waterboards.ca.gov/gmp.

Meters and Groundwater Management

The State Water Board can require the installation of meters in a probationary basin. The need for meters will depend on local conditions and the level of intervention required in the basin. The State Water Board is likely to require meters in the development of an interim plan, in order to develop corrective actions and verify compliance with pumping restrictions. Extractors will be responsible for installing and maintaining meters and paying the related costs – although it is unlikely that the Board would require meters for de minimis users (see below).

De minimis Users

A well owner who extracts two acre-feet or less per year from a parcel for domestic purposes is a de minimis user. Domestic purposes do not include commercial activities. A well owner who extracts more than two acre-feet per year from a parcel is not a de minimis user. De minimis users in unmanaged areas are exempt from reporting. However, the State Water Board can require reporting by de minimis users in probationary basins if necessary to manage the basin.

Interim Plans and Groundwater Sustainability Plans

State intervention is intended to temporarily protect groundwater. An interim plan is not intended to permanently manage a basin and is not designed to replace a groundwater sustainability plan. To regain local control, local agencies will have to demonstrate their ability and willingness to manage groundwater sustainably and address the issues that caused state intervention.

For More Information

Additional information on SGMA and state intervention is available at the State Water Board website: www.waterboards.ca.gov/gmp or the DWR website: www.water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management.

March 30, 2020

Via Upload to SGMA Portal
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Re: 7-024.01 Borrego Springs Subbasin of the Borrego Valley Groundwater Basin (the
"Basin")

Dear Sir/Madam:

Our firm represents Borrego Air Ranch Mutual Water & Improvement Co., a California public benefit corporation (the "Air Ranch").

The Air Ranch is located at 2580 Stinson Road, Borrego Springs, CA. The Air Ranch expects to be served with the complaint in, and therefore to become bound by that certain stipulated judgment (the "Stipulated Judgment") proposed for entry in, San Diego County Superior Court Case No. 37-2020-00005776-CU-TT-CTL. Capitalized terms that are used in this letter without definition and that are defined in the Stipulated Judgment are used herein as so defined.

The Borrego Water District ("BWD"), together with the County of San Diego ("County"), established a GSA for the Basin pursuant to the Sustainable Groundwater Management Act, California Water Code sections 10720 et seq. ("SGMA"), in 2016. However, the County withdrew as a GSA, effective December 31, 2019.

Although it expects to be made party to the Stipulated Judgment, the Air Ranch is not located within the boundary of BWD, which is now the sole proponent of the GSP for the Basin. We understand that representatives of the California Department of Water Resources ("DWR") reached out to BWD to express the Department's concern that the Stipulated Judgment cannot apply to the Air Ranch and at least two other Persons who are similarly situated. As a result, we understand these three pumpers who are outside the jurisdiction of BWD could be subject to oversight by DWR. This creates ambiguity in that the Air Ranch could be subject to reporting groundwater usage and to paying groundwater pumping fees to both the watermaster that will be appointed by the Court pursuant to the Stipulated Judgment (the "Watermaster") and to DWR.

The Air Ranch is considering becoming a Stipulating Party by executing the Stipulated Judgment (as opposed to being bound by the Stipulated Judgment solely by virtue of being served with the complaint). Prior to deciding, however, the Air Ranch is requesting (1) certain clarifying changes to the proposed Stipulated Judgment and (2) resolution of the ambiguity described in the foregoing paragraph. The purpose of this letter is to make comments to DWR

addressing these two requests.

A. Suggested Changes to Stipulated Judgment.

(i) Paragraphs 1 and 2 on page 23 of the Stipulated Judgment should be modified as follows (with the proposed modifications underlined or stricken through, as appropriate, and an explanatory comment following each requested modifications):

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

COMMENT: This proposed change is for clarification only. The reason for this proposed change is that some Persons may not sign the Stipulated Judgment, but nevertheless will become bound by it only as a result of having been named and served with the Complaint. The Air Ranch may find itself in this position.

2. Anti-Speculation Provision. A buyer 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 buyer (the "Eligibility Requirement"). The "Anti-Speculation" provisions of this paragraph do not apply to BWD, the County, a mutual water company, or an owner of an Original BPA Parcel; provided, however, that the "Anti-Speculation provisions shall not apply to an owner of an Original BPA Parcel only so long as either (i) the BPA owner retains the same or greater quantity of acreage in proportion to its Original BPA or (ii) the BPA owner does not hold an amount of Annual Allocation in excess of the quantity of its originally granted BPA. As a condition of completing a Permanent Transfer, the Watermaster may demand that a BPA buyer (excepting BWD, the County, a mutual water company and an owner of an Original BPA Parcel satisfying the criteria specified above) submit a deed reflecting the buyer's ownership in fee duly recorded, or Court order evidencing ownership by the buyer, of a legal parcel or parcels overlying the Basin of sufficient acreage to satisfy the buyer's satisfaction of the Eligibility Requirement (the "Eligibility Proof").

COMMENT: This proposed change also is for clarification only. The reason for this proposed change is that, under the Stipulated Judgment, BPA is recorded in the name of a mutual water company, such as the Air Ranch, and not in the name of the individual lot owners. The

proposed change is intended to clarify that the Eligibility Requirements do not apply to the Air Ranch, a mutual water company, which, like the County or BWD, is a water service provider that delivers water to a large area or to numerous water service customers, but the Air Ranch, like BWD, owns solely well sites and associated infrastructure. The proposed change would put the Air Ranch on the same footing as BWD and the County, which is how a mutual water company is treated elsewhere in the Stipulated Judgment.

(ii) Paragraph 4 on page 24 of the Stipulated Judgment should be modified as follows (with the proposed modifications underlined or stricken through, as appropriate, and an explanatory comment following the requested modifications):

4. Transfer Records. ~~Except for BWD, the County and a mutual water company,~~ Upon completion of the Permanent Transfer, the BPA will be assigned to the buyer's Parcel(s) on the records of the Watermaster. Notwithstanding the foregoing, upon completion of the Permanent Transfer to BWD, a mutual water company, or the County, the BPA will be assigned on the records of the Watermaster to BWD, the mutual water company or the County, as applicable.

COMMENT: This proposed change also is for clarification only. The reason for this proposed change is that, under the Stipulated Judgment, BPA is recorded in the name of a mutual water company, such as the Air Ranch, and not in the name of the individual lot owners. The proposed change is intended to clarify that, upon completion of a Permanent Transfer, BPA will be assigned to a mutual water company (and to BWD or the County, as applicable), and not to the individual lot owners. This change would be consistent with how BWD, the County and mutual water companies are treated elsewhere in the Stipulated Judgment.

B. DWR Concerns Over GSA.

As previously indicated, the Air Ranch expects to be made a party to the Stipulated Judgment, it is not located within the boundary of BWD (i.e., the sole proponent of the GSP for the Basin), and DWR has expressed concern that the Stipulated Judgment cannot apply to the Air Ranch, which is outside of BWD's jurisdiction. This creates the possibility that the Air Ranch could be subject to oversight by the Watermaster (because the Air Ranch is located within the area of the Stipulated Judgment) and also by DWR (because the Air Ranch is outside of BWD's territorial jurisdiction), which could subject the Air Ranch to reporting groundwater usage and to paying groundwater pumping fees to both the Watermaster and to DWR.

In view of the foregoing, the Air Ranch requests that one of the following alternatives be implemented:

(i) If the Air Ranch becomes a Stipulating Party by executing the Stipulated Judgment, then the Air Ranch would report groundwater usage and pay groundwater pumping fees solely to the Watermaster in accordance with the Stipulated Judgment. DWR would acknowledge in writing that such reporting and payment to the Watermaster satisfies any

Letter to Department of Water Resources

March 30, 2020

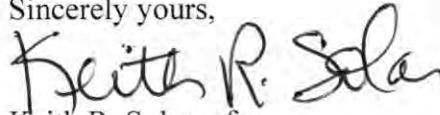
Page 4

obligation of the Air Ranch to report groundwater usage and to pay groundwater pumping fees to DWR.

(ii) If the Air Ranch does not become a Stipulating Party by executing the Stipulated Judgment, then the Air Ranch would report groundwater usage and pay groundwater pumping fees solely to DWR. The Stipulated Judgment would be modified to reflect that such reporting and payment to DWR satisfies any obligation of the Air Ranch to report groundwater usage and to pay groundwater pumping fees to the Watermaster under the Stipulated Judgment.

Thank you for your consideration. Should you have any questions, please contact the undersigned at your convenience.

Sincerely yours,

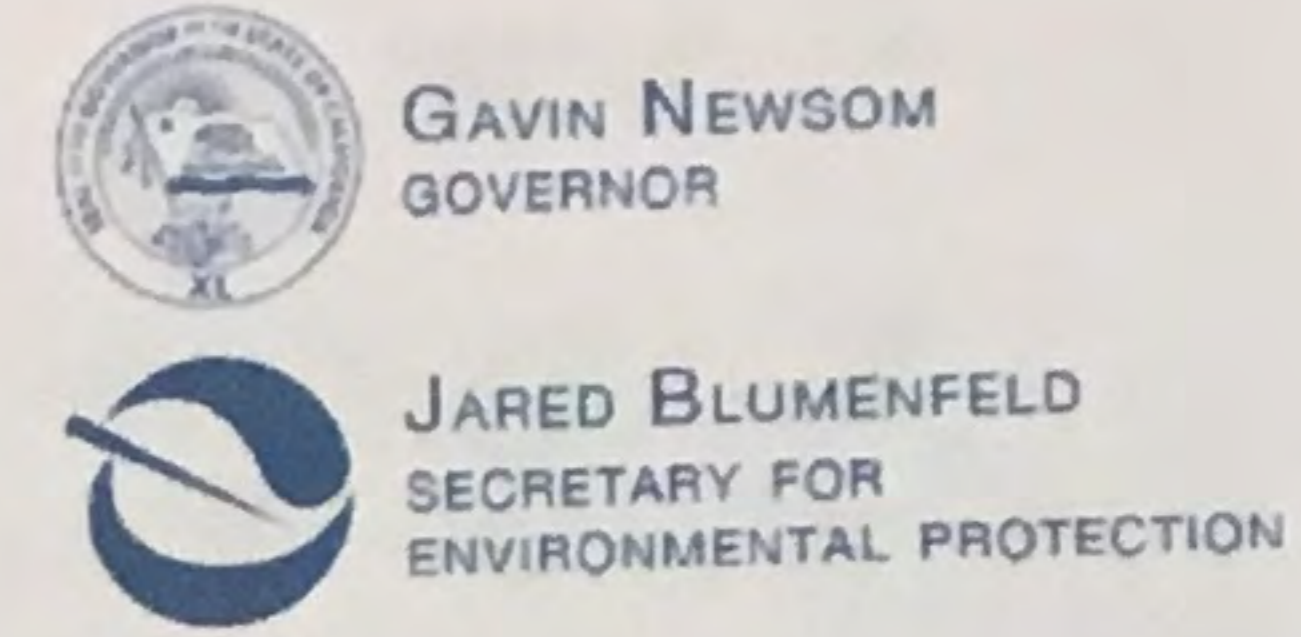


Keith R. Solar, of
Parks & Solar, LLP

KRS:

Cc: Bill Carpenter (via email)

Cary Lowe, Esq. (via email)



State Water Resources Control Board

March 24, 2020

William M. Bauer
32840 Lilac Rd.
Valley Center, CA 92082-3722

Mailing ID: 0000661-01N

This letter is to inform you that you own property or properties that the State Water Resources Control Board (State Water Board) considers to be unmanaged under the Sustainable Groundwater Management Act (SGMA). Unmanaged areas are those areas within high- or medium-priority groundwater basins that are not within the jurisdiction of a groundwater sustainability agency (GSA). Pursuant to SGMA, groundwater pumpers in unmanaged areas are required to file groundwater extraction reports with the State Water Board and pay associated reporting fees. **This letter is intended to provide you with early notification so you may take appropriate steps necessary to meet your reporting responsibilities. Actual groundwater pumping reports are not due to the State Water Board until December 15, 2020.**

The following detailed information is intended to help you understand the reporting requirements for groundwater extractions in unmanaged areas under SGMA, and what you may need to do to satisfy the requirement to report.

Para obtener información en español, nos puede llamar al (916) 322-6508 o enviar un mensaje a: groundwater_management@waterboards.ca.gov.

Borrego Valley Subbasin Adjudication Process and Unmanaged Areas.

The Borrego Valley Groundwater Sustainability Agency (Borrego Valley GSA) was established on October 24, 2016, to comply with requirements under SGMA. At the time it was formed, the Borrego Valley GSA was comprised of the Borrego Water District (District) and the County of San Diego. Effective December 31, 2019, the County of San Diego withdrew from the Borrego Valley GSA. As a result, some areas within the Borrego Valley Subbasin are no longer within the jurisdiction of a GSA. The State Water Board considers the areas outside of the District's jurisdiction to be unmanaged for purposes of SGMA.

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

SGMA allows a stipulated judgment arising out of a comprehensive adjudication of rights to water in a groundwater basin to serve as an alternative to a GSP and therefore prevent state intervention in groundwater management in the basin. Groundwater users within the Borrego Valley Subbasin have negotiated a draft stipulated judgment which may be submitted to the Department of Water Resources (DWR) for assessment as an alternative. If approved by the court and found adequate by DWR, the stipulated judgment may serve as an alternative to a GSP. While the stipulated judgment is being finalized and during DWR's assessment to determine whether the stipulated judgment is an adequate alternative, groundwater users within the Borrego Valley subbasin who are not within the jurisdiction of a GSA are required to report extractions to the State Water Board and pay associated fees.

Why you are receiving this informational letter.

This informational letter is being sent to persons who may own property or operate a public water supply system in an unmanaged area where groundwater is extracted.

Data indicate that you own or are responsible for the parcel(s) or public water supply system(s) listed at the end of this notice. The State Water Board has identified this parcel(s) or water supply system(s) as located within an unmanaged area. If you extract groundwater from an unmanaged area and you are not a small domestic user,¹ SGMA requires that you file an annual groundwater extraction report for extractions made during the previous water year.

Groundwater Extraction Reporting.

Landowners whose property is within an unmanaged area and contains an operating groundwater extraction well must report the volume of groundwater extracted from the well. The groundwater extraction volume is reported as a monthly total. In addition to pumping volumes, reports must include the location of the well and the place and purpose of use of the groundwater.

Groundwater extraction reports are not due to the State Water Board until December 15, 2020. However, if required to report, the report must include pumping volumes for each month between the date of receipt of this letter and September 2020. The State Water Board encourages landowners with a groundwater extraction well to begin

¹ A small domestic user extracts less than or equal to two acre-feet (or 651,702 gallons) of groundwater per year for domestic (household) use only. An acre-foot of water can typically supply one or two households for a year.

collecting and recording the volume of groundwater pumped in a manner that will allow accurate reporting of monthly volumes.

Report Filing Fee.

Any person who must file a groundwater extraction report with the State Water Board must pay the filing fee(s). The filing fee includes a base fee and a fee per acre-foot of groundwater extracted. The fees for reports due in December 2020 are as follows:

Fee Category	Fee Amount	Applicable Parties
Base Filing Fee	\$300 per well	All extractors required to report.
Unmanaged Area Rate	\$10 per acre-foot, if metered	Extractors in unmanaged areas.
	\$25 per acre-foot, if unmetered	
Late Fee	25% of total fee amount per month late	Extractors that do not file reports by the due date.

In unmanaged areas, groundwater extractions measured and reported using a groundwater flow meter qualify for a reduced fee. For metered wells, the pumping fee is \$10 per acre-foot.

How to notify the Board if you believe you are not subject to SGMA reporting requirements.

You can file an online form through the Groundwater Extraction Report website to notify the Board that you meet one of the following conditions:

- You do not own any of the parcels identified in the notice and you do not operate a well on any of the parcels identified in the notice.
- You own one or more of the parcels identified in the notice but you do not own or operate a well on the parcels.
- You are a small domestic well user using less than two acre-feet for domestic purposes.

Resources to assist in completing the online Groundwater Extraction Report.

William M. Bauer

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March 24, 2020

Groundwater Extraction Report Guidance and FAQ

Guidance documents and answers to frequently asked questions are available online at www.waterboards.ca.gov/water_issues/programs/gmp/reporting.shtml.

Groundwater Extraction Report filing fees

Information regarding the fees associated with extraction reporting are available online at https://www.waterboards.ca.gov/water_issues/programs/gmp/fees.html

Groundwater measurement methods

The State Water Board has evaluated methods for measuring groundwater volumes and provided options for measuring extraction volumes at https://www.waterboards.ca.gov/water_issues/programs/gmp/docs/reporting/measure17.pdf.

Groundwater Extraction Annual Reporting System (GEARS)

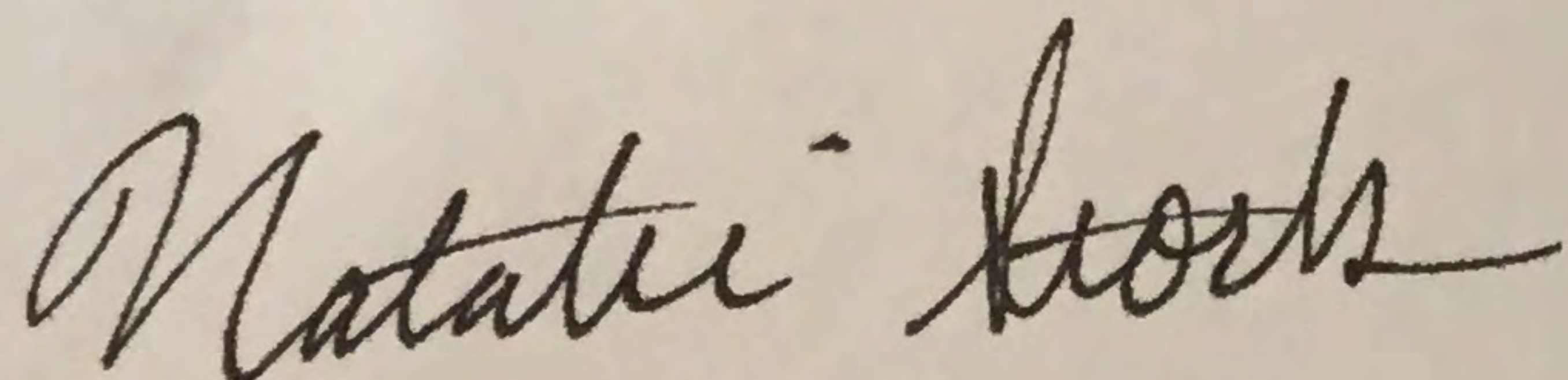
GEARS is a reporting and data management system developed by the State Water Board. GEARS is an easy to use online reporting system for well owners to report groundwater extraction volumes, well location, purpose of use, and place of use.

Becoming managed under SGMA.

To avoid the requirement that groundwater extractions be reported to the State Water Board, a well must be within the management area of a GSA or subject to an approved alternative to a GSP like a stipulated judgment that has been approved by the court and found to be adequate as an alternative by the Department of Water Resources. The State Water Board encourages landowners within unmanaged areas to contact local public officials and county representatives about becoming managed by a GSA.

If you have questions regarding this notice or need assistance completing the online groundwater extraction report, please contact Board staff by email at groundwater_management@waterboards.ca.gov or by phone at 916-322-6508.

Sincerely,



Natalie Stork, P.G.
Chief, Groundwater Management Program
Office of Research, Planning, and Performance

William M. Bauer

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March 24, 2020

**The following Assessor's Parcel Number(s) (APN) or Water Supply Facility
Number(s) prompted this letter:**

140-010-08

The Ralph M. Brown Act: The People's Business and the Right of Access

Borrego Watermaster Board Meeting
March 31, 2020

Overview

- History of the Brown Act
- Purpose of the Brown Act
- Applications of the Brown Act
- Serial Meetings
- Rules Governing Meetings
- Teleconferencing
- Closed Session
- Remedies/Cure
- Alternate Board Members
- Brown Act and COVID-19 Response



The Ralph M. Brown Act

- In late 1951, San Francisco Chronicle reporter Mike Harris spent six weeks looking into the way local agencies conducted meetings. State law had long required that business be done in public, but Harris discovered secret meetings or caucuses were common. He wrote a 10-part series on “Your Secret Government” that ran in May and June 1952.



The Ralph M. Brown Act

- Out of the series came a decision to push for a new state open meeting law.
- Assembly Member Ralph M. Brown carried legislation.
- The “Brown Act”, has evolved under a series of amendments and court decisions, and has been the model for other open meeting laws—such as the Bagley-Keene Act, enacted in 1967 to cover state agencies.



The Right to Access

- Two key parts of the Brown Act have not changed since its adoption in 1953:

“In enacting this chapter, the Legislature finds and declares that the public commissions, boards and councils and the other public agencies in this State exist to aid in the conduct of the people’s business. It is the intent of the law that their actions be taken openly and that their deliberations be conducted openly.”

“The people of this State do not yield their sovereignty to the agencies which serve them. **The people, in delegating authority, do not give their public servants the right to decide what is good for the people to know and what is not good for them to know.** The people insist on remaining informed so that they may retain control over the instruments they have created.”



Purpose of Brown Act

To ensure that almost all aspects of the decision-making process of legislative bodies of local agencies are conducted in public and open to public scrutiny.

“The people, in delegating authority, do not give their public servants the right to decide what is good for the people to know and what is not good for them to know. The people insist on remaining informed so that they may retain control over the instruments they have created.” (Gov. Code 54950.)



Application

To whom does the act apply?

- Local agencies
- Legislative bodies
- Meetings
- Persons elected to legislative bodies, even prior to assuming office



Application

- *Local Agency*
 - Means a county, city, whether general law or chartered, city and county, town, school district, municipal corporation, district, political subdivision, or any board, commission or agency thereof, or other local public agency, including Watermasters that voluntarily agree to follow the Brown Act (which is the norm)
- *Legislative Body*
 1. Governing body;
 2. Board, commission, committee created by formal action of the governing body;
 3. Private organizations (in limited circumstances).

The Key to the Brown Act

- All meetings shall be open and public except when the Brown Act authorizes otherwise.
- The Ralph M. Brown Act (Government Code sections 54950-54963).

Application



- What is a meeting?
- When is a meeting not a meeting?

Application

- *Meeting*

- Any gathering of a majority of the members at the same time and place to hear, discuss or deliberate upon any matter under their jurisdiction.
- No action needs to be taken for a meeting to occur; conversations between and among members of a legislative body about issues confronting the agency is sufficient.



Application

- *Not a Meeting*

- Individual contacts;
- Conferences and seminars;
- Community meetings;
- Purely social or ceremonial occasions;
- Attendance at standing committee meetings;
- Meetings with other legislative bodies – a majority of the governing body may attend as long as they do not discuss among themselves issues related to the agency.



Serial Meetings

- *Serial Meetings – Expressly Prohibited*
 - “Use of direct communication, personal intermediaries, or technological devices employed by a majority of the legislative body members in order to develop a collective concurrence as to action to be taken on an item by the legislative body is prohibited.”



Serial Meetings

Ways Serial Meetings Can Happen

- Personal Meeting
- Telephone
- Email
- Written Correspondence
- Use of Intermediaries
- Social Networking Sites such as Facebook and Twitter.



Social Media

- Engaging in discussion section of social media, article, etc.
- Meeting does not have to be a physical meeting
- Series of comments to a blog or news article



Serial Meetings

Elements of a Serial Meeting

- Series of Communications
- Between Less Than a Quorum
- Taken As a Whole Involves a Majority
- Concurrence
 - Advances or Clarifies the Understanding of an Issue;
 - Facilitates an Agreement or Compromise Among Members;
 - Advances the Ultimate Resolution of an Issue.



Serial Meetings

Two types of Serial Meetings

1. Chain

- Member A speaks to Member B who speaks with Member C about a particular matter and in the process they all form a collective concurrence on a matter.

2. Hub and Spoke

- An intermediary (including an alternate board member) acts as a hub of a wheel with members relaying information back and forth to each other through the hub and in the process a majority of the legislative body develops a collective concurrence.



Serial Meetings

Serial Meeting Exceptions

- While the Brown Act prohibits serial meetings, it also explicitly provides an exception for one-on-one communications by a non-member (i.e., staff) with members of the legislative body.
- Does NOT mean back and forth and sharing of views of different members
- Brown Act also allows communications to call or schedule a special meeting.



Serial Meetings



E-mail Tips

- Refrain from replying to “All” in E-mails
- Do not take a position or make a commitment
- E-mail board members for info only
- Take caution
- Ensure compliance with law

Rules Governing Meetings

- Regular meeting
- Special emergency meetings
- Adjourned meetings
- Public's right to comment



Rules Governing Meetings

REGULAR MEETINGS - Agenda Requirements:

- Post 72 hours prior to the meeting.
- Must include the time and location of the meeting.
- Must contain a brief general description of each item to be discussed or addressed, including closed session items.
- Notices available in alternative ADA formats and distributed in advance to those who request copies.



Special Circumstances at Meetings

- No public meeting shall be inaccessible to the disabled
- All public meetings shall meet the “protections and prohibitions contained in Section 202 of the Americans with Disabilities Act of 1990.”
- Agenda for the meeting needs to include “information regarding how, to whom, and when a request for disability related modification or accommodation, *including auxiliary aids or services may be made by a person with a disability who requires a modification or accommodation in order to participate in the public meeting.*”



Special Circumstances at Meetings

- For bilingual public speakers Brown Act requires that twice as much time to present during limited public comment
- Enough time to provide original statement in native language and translation
- Example: instead of 3 minutes should provide 6 minutes.



Rules Governing Meetings

SPECIAL MEETINGS - Agenda Requirements:

- ⑩ Posted no later than 24 hours prior to the meeting.
- ⑩ Must include the time and location of the meeting.
- ⑩ Must contain a brief general description of each item to be discussed or addressed, including closed-door items.

Rules Governing Meetings

ADJOURNED MEETINGS - Agenda Requirements:

- Not necessary to post a new agenda if legislative body adjourns meeting to a time and place in the order of adjournment that is less than 5 days as long as no additional business is transacted.



Rules Governing Meetings

EMERGENCY MEETINGS - Agenda Requirements:

- ⑩ Requires severe impairment to public health and safety.
- ⑩ Absent a “dire emergency,” at least one hour prior to the meeting, telephonic notice to media organizations.
- ⑩ If a dire emergency, notice given when members of the body are notified.
- ⑩ Generally, emergency meetings may not be held in closed session. The AG’s office encourages bodies to give the public an opportunity to comment on closed-session items prior to the body adjournment into closed session.



Rules Governing Meetings

Distribution of Agenda Packet to Public

In addition to posting an agenda, a local agency must also make the agenda packet available to the public when the materials are distributed to all or a majority of the legislative body, whichever is first.

Rules Governing Meetings

The Public's Right to Comment

- ⑩ At every regular meeting, members of the public have the right to directly address the body on any item of public interest if that item is under the jurisdiction of the body.
- ⑩ For agenda items, the public must be given an opportunity to comment before or during the body's consideration of the item.
- ⑩ At special and emergency meetings, members of the public have the right to address the body about any item that is listed on the agenda.



Willful Interruptions

- The legislative body may remove persons from a meeting who willfully interrupt proceedings.
- Ejection is justified only when audience members actually disrupt the proceedings.
 - Board may not prohibit “insolent” remarks by members of the public absent actual disruption
 - § If order cannot be restored after ejecting disruptive persons, the meeting room may be cleared. Members of the news media who have not participated in the disturbance must be allowed to continue to attend the meeting. The legislative body may establish a procedure to re-admit an individual or individuals not responsible for the disturbance.



Rules Governing Meetings

Public Recording of Meetings

- The public must be allowed to audio or video tape a meeting unless the agency can make a reasonable finding that the recording would constitute a persistent disruption of the proceedings
- Recordings of public meetings by the agency are public records



Rules Governing Meetings

No action or discussion allowed for any item not listed on agenda except for:

- Adding items by majority vote for emergency situations
- Adding Items of Subsequent Need. Adding items by 2/3 vote because of need for immediate action that came to the attention after the agenda is posted
- Consideration of items continued to another meeting within 5 calendar days



Rules Governing Meetings

- Brief responses to statements or questions from public
- Questions to staff for clarification of matters based upon public comments
- Brief announcements or reports on member's or staff's own activities
- Providing references or information to staff
- Asking staff to report back at a future meeting on any matter



Teleconferencing

- Teleconferencing may be used for any meeting of the legislative body.
- All votes by roll call.
- Agendas posted at all teleconference locations and teleconference locations identified.
- Teleconference locations must be accessible to the public.
- Normally, at least a quorum of the board must be within the boundaries of the local agency, but the Judgment provides an exception to state that at least two Board members must be physically in Borrego during a meeting.

Closed Sessions

CONFIDENTIAL

- Must be expressly authorized by law
- Must be briefly described in agenda
- Must verbally announce items
- If action is taken, may need to report to the public

Closed Sessions

- Real Property Transactions
- Litigation--Existing, Anticipated and Initiation
- Personnel Issues--Appointment, Performance, Evaluation, Discipline/Dismissal/Release
- Labor Negotiations
- Threats to Public Services of Facilities
- Joint Powers Authority
 - ⑩ Can disclose closed session discussions with authorizing legislative body in closed session



Closed Session

- Brown Act Agenda Safe Harbor Language
- Requires specific wording for each specific instance
- Consult with your attorney for language requirements
- Subject to any advice from the future WM legal counsel, Board member alternates should not attend closed session unless the regular board member is absent

The Confidentiality of Closed Session Discussions

- The Brown Act explicitly prohibits the unauthorized disclosure of confidential information acquired in a closed session by any person present, and offers various remedies to address breaches of confidentiality.
- Only the legislative body acting as a body may agree to divulge confidential closed session information; regarding attorney/client privileged communications, the entire body is the holder of the privilege and only the entire body can decide to waive the privilege.

Remedies for Disclosure

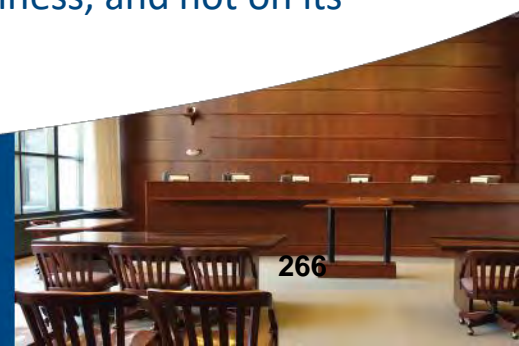
- Employee
 - Disciplinary action against an employee who has willfully disclosed confidential information in violation of this section; up to dismissal
- Member of the Legislative Body
 - Referral of the member who willfully disclosed confidential information in violation of this section to the Grand Jury

Remedies for Violations

- Any interested person, including the district attorney, may seek to invalidate certain actions of a legislative body on the ground that they violate the Brown Act. Violations of the Brown Act, however, **cannot be invalidated** if they involve the following types of actions:
 - Those taken in substantial compliance with the law.
 - Those involving the sale or issuance of notes, bonds or other indebtedness, or any related contracts or agreements; [?]
 - Those creating a contractual obligation, including a contract awarded by competitive bid for other than compensation for professional services, upon which a party has in good faith relied to its detriment; [?]
 - Those connected with the collection of any tax; or [?]
 - Those in which the complaining party had actual notice at least 72 hours prior to the regular meeting or 24 hours prior to the special meeting, as the case may be, at which the action is taken.

Brown Act Cure

- The remedy is available to “[t]he district attorney or any interested person” who must first mail or fax a “cease and desist letter” “to the clerk of secretary of the legislative body being accused of the violation” “clearly describing the past action of the legislative body and nature of the alleged violation.”
- Such a demand must be made within nine months of an alleged violation.
- The legislative body has 30 days to respond to a cease-and-desist letter although a later response may still obviate subsequent suit, but will oblige the agency for the plaintiff’s attorneys’ fees and costs.
- Such a response may be “an unconditional commitment to cease, desist from, and not repeat the past action that is alleged to violate this chapter” in substantially the form specified in section 54960.2, subdivision (c)(1)
- Such an unconditional commitment “shall be approved by the legislative body in open session at a regular or special meeting as a separate item of business, and not on its consent agenda.”



Brown Act Exceptions During the Covid-19 Crisis

- By executive orders issued in March 2020, the Governor suspended various parts of the Brown Act, including:
 - Local Agency Executive Director or other qualified representative of the agency can give Board updates on COVID issues outside of a public meeting
 - Board meetings can be held telephonically only, with no physical meeting room
 - Dial in number for the public must be provided



Questions?