

Borrego Water District Board of Directors
Special Meeting
May 12, 2020 @ 9:00 a.m.
806 Palm Canyon Drive
Borrego Springs, CA 92004

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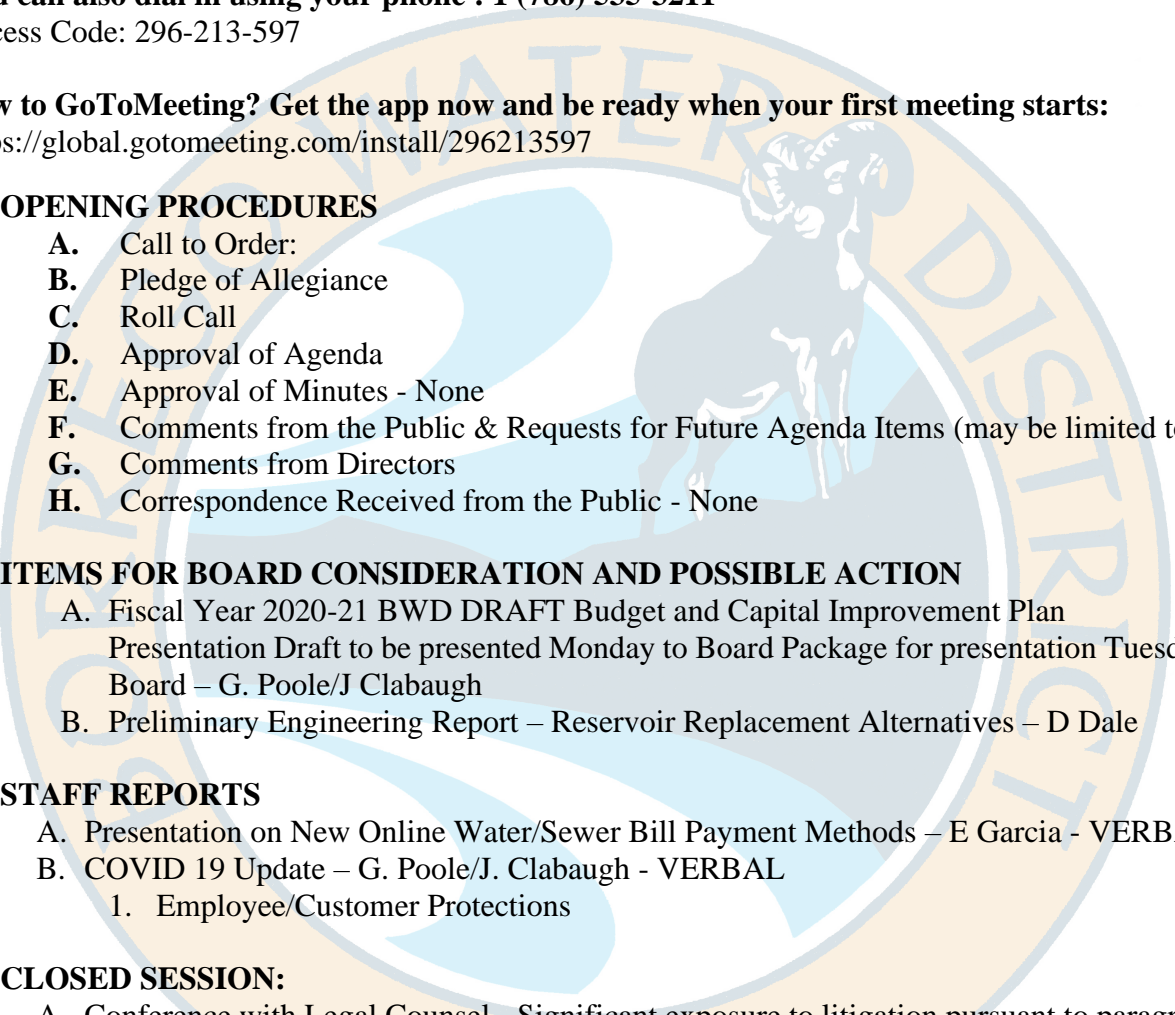
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- I. OPENING PROCEDURES**
- A. Call to Order:
 - B. Pledge of Allegiance
 - C. Roll Call
 - D. Approval of Agenda
 - E. Approval of Minutes - None
 - F. Comments from the Public & Requests for Future Agenda Items (may be limited to 3 min)
 - G. Comments from Directors
 - H. Correspondence Received from the Public - None
- II. ITEMS FOR BOARD CONSIDERATION AND POSSIBLE ACTION**
- A. Fiscal Year 2020-21 BWD DRAFT Budget and Capital Improvement Plan
Presentation Draft to be presented Monday to Board Package for presentation Tuesday to the Board – G. Poole/J Clabaugh
 - B. Preliminary Engineering Report – Reservoir Replacement Alternatives – D Dale
- III. STAFF REPORTS**
- A. Presentation on New Online Water/Sewer Bill Payment Methods – E Garcia - VERBAL
 - B. COVID 19 Update – G. Poole/J. Clabaugh - VERBAL
 - 1. Employee/Customer Protections
- IV. CLOSED SESSION:**
- A. Conference with Legal Counsel - Significant exposure to litigation pursuant to paragraph (3) of subdivision (d) of Section 54956.9: (One (1) potential case)
 - B. Conference with Legal Counsel – Existing Litigation (BWD v. All Persons Who Claim a Right to Extract Groundwater, et al. (San Diego Superior Court case no. 37-2020-00005776)
 - C. Replacement Well Number Two Site - Conference with Real Property Negotiators (Gov. Code § Section 54956.8) Property APN: APN 198-021-08, 77.95 acres BWD Negotiator: Geoff Poole
Negotiating Parties: Geoff Poole, General Manager and Owner: Borrego Nazareth Under Negotiation:
Price and Terms of Payment

- v. **CLOSING PROCEDURE:** The next Board Meeting is scheduled for May 26, 2020 at Borrego Water District, 806 Palm Canyon Drive, Borrego Springs, CA 92004



AGENDA: May 12, 2020

All Documents for public review on file with the District's secretary located at 806 Palm Canyon Drive, Borrego Springs CA 92004. Any public record provided to a majority of the Board of Directors less than 72 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 at the Office of the Board Secretary, located at 806 Palm Canyon Drive, Borrego Springs CA 92004.

The Borrego Springs Water District 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 (c/o the Board Secretary) at, or prior to, the public hearing.

ENGINEERING REPORT



Tank Replacement Options

May 2020

Borrego Water District

806 Palm Canyon Drive
Borrego Springs, CA 92004
760-767-5806 / 760-767-5994 (Fax)

Engineer:

David Dale, PE, PLS
203 Countryside Dr.
El Centro, CA 92243

A handwritten signature in blue ink that reads "David Dale".

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Dive Inspection Reports – Twin Tanks, Indian Head Tank, Rams Hill #2 Tank.....	Error! Bookmark not defined.

Water System Information

Borrego Water District is a community water system formed in 1962 by an election of the landowners in Borrego Valley as a public agency under the California Water District Act of the Water Code. The purpose of the agency is to provide water, sewer, and flood control services within its service area. The Borrego Water District is located in Borrego Springs, CA in San Diego County. Borrego Water District acquired neighboring Borrego Springs Water Company in 1997 and in 2009 consolidated with Borrego Springs Park Community Services District.

The community of Borrego Springs is completely surrounded by the Anza-Borrego Desert State Park. The community's population ranges from less than 3,000 in summer months to over 8,000 in the height of the winter season.

The Borrego Water District (District) provides water and wastewater services to the rural unincorporated community of Borrego Springs. The community is supplied domestic water service from the Borrego Valley Groundwater Basin (BVGB). The Borrego Springs Subbasin of the BVGB has been determined by the California Department of Water Resources to be in a "critical overdraft" status.

Borrego Water District is comprised of 5 Improvement Districts. Borrego Water District operates facilities in four pressure zones:

- 1) 900 feet – Served by ID3 and includes the Deep Well Trail subdivision, the Rancho Borrego area, and La Casa del Zorro Resort.
- 2) 880 feet – Served by ID4 and includes the previous Borrego Springs Water Company, the majority of the Borrego Springs community, and the newly incorporated Borrego Springs Park Community Services District area.
- 3) 900 feet – Served by ID1 and includes the Rams Hill subdivision.
- 4) 1,000 feet – Served by ID1 and includes the Rams Hill subdivision.

The Borrego Water District owns and operates a network of nine groundwater wells (plus one standby) that provide domestic water for the community. Groundwater quality in Borrego Springs varies from good to excellent. Depth to first encountered groundwater is approximately 60 feet below ground surface. The wells are upgradient of the WWTP.

The Borrego Water District (District) encompasses the entire unincorporated community of Borrego Springs. Located in the extreme northeastern corner of San Diego County, the community is completely surrounded by the 600,000 acre Anza-Borrego Desert State Park (ABDSP). The sole source of water, the Borrego Valley Groundwater Basin, has been in a critical overdraft situation for many years. The desert climate ranges from cool winters to harsh summer temperatures reaching 120 degrees. The summer months are susceptible to violent monsoonal events and occasional tropical storms travelling up the Gulf of California.

The area usually experiences one extended power outage per season due to power poles broken by high winds. Many recent outages have lasted more than 20 hours.

Extensive upgrades to provide emergency water supplies have been achieved over the years. The water distribution system was built over time by several entities that were purchased or consolidated into the current District boundary. The major portion of the populated area was subdivided and developed by the Burnand Family. Burnand also created the Borrego Springs Water Company (Company) with its first production well in 1947. As the land was subdivided, they created infrastructure to serve water residents through the water-Company. Some areas were served by a single well and above ground reservoir, but were later connected to the adjacent system for emergency interties. When more subdivisions were added, water mains were small sized and were located in the most cost-effective manner for the developer. The Company had very little storage and in times of power outages, ran out of public drinking water in as little as two hours. The Company was purchased by the District in 1997 and renamed Improvement District #4 (ID-4).

The District is now comprised of five service areas, established as smaller private mutual water companies and one public community services district and later merged together. At present, with increased storage, backup power supplies and system interties, the District has been able to withstand a 24-hour outage with no impacts to the water and wastewater operations. However, the current patchwork system is in need of repairs and upgrades to insure future reliability during power outage emergencies.

The Colorado River Basin Regional Water Quality Control Board has jurisdiction over the BWD water system.

The water distribution system utilizes ground storage tanks strategically located to provide reliability in customer water service. Water is pumped up to the tanks, then flows in down gradient to the end users providing water pressure through gravity. There are four storage reservoirs along the 880-900 foot level. All elevated land surrounding the community has since been donated, or sold to the Anza Borrego Desert State Park (ABDSP) and is now protected. The Twin tanks are surrounded by the ABDSP, and Indian Head tank is located near private property. These tanks were constructed in the 1970's.

Project Area

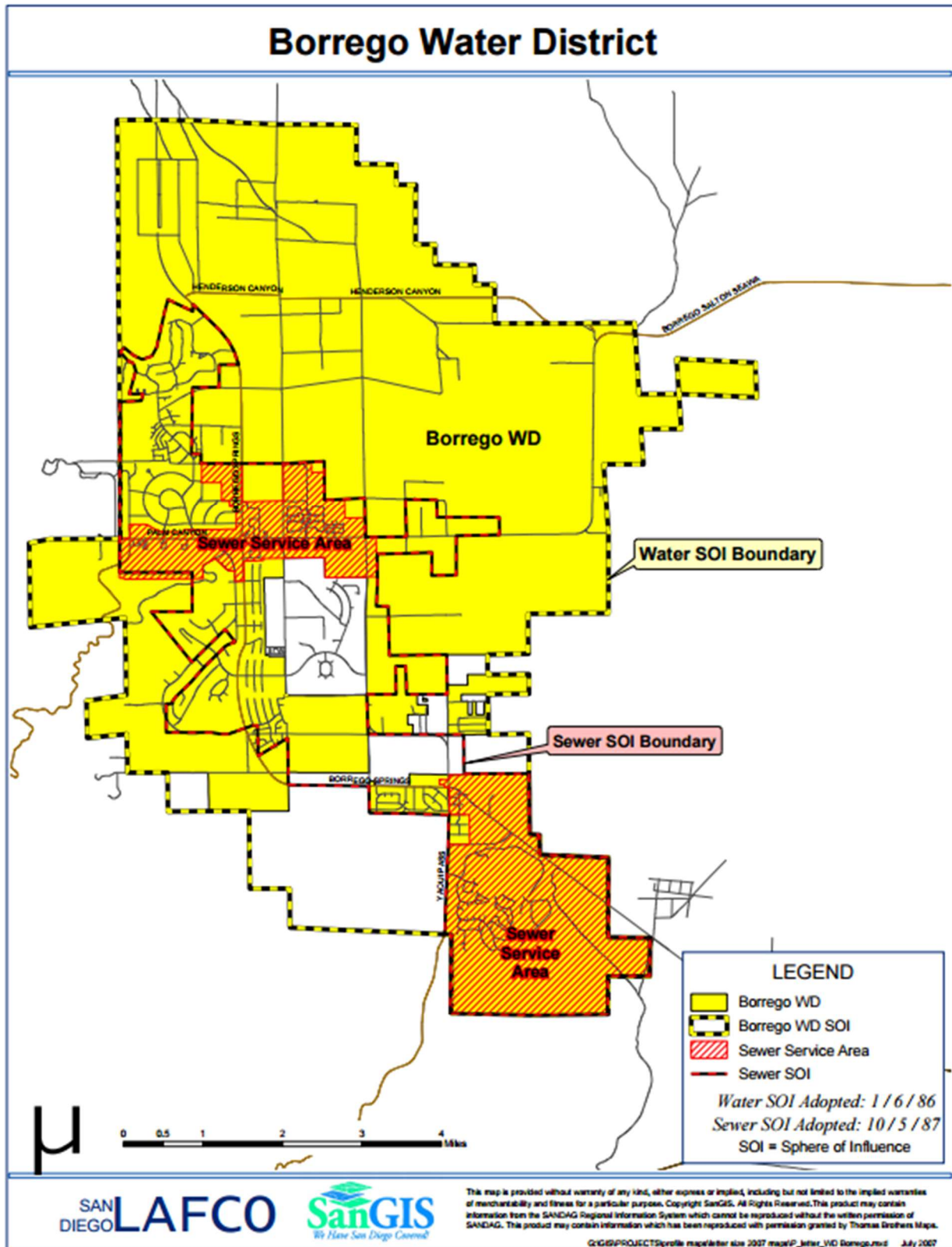


Figure 1 - BWD Sewer Service Areas

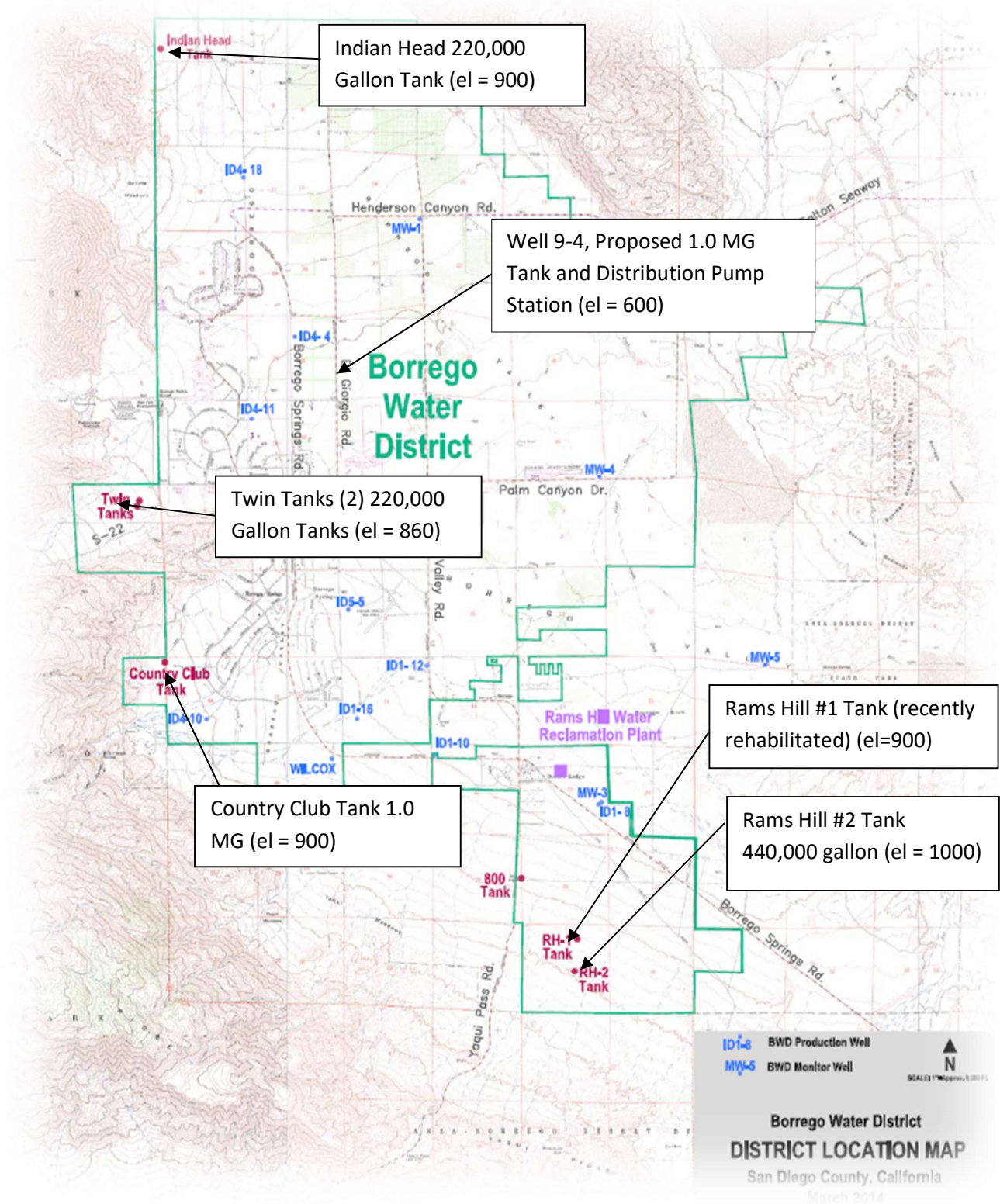


Figure 2 - BWD District Location Map

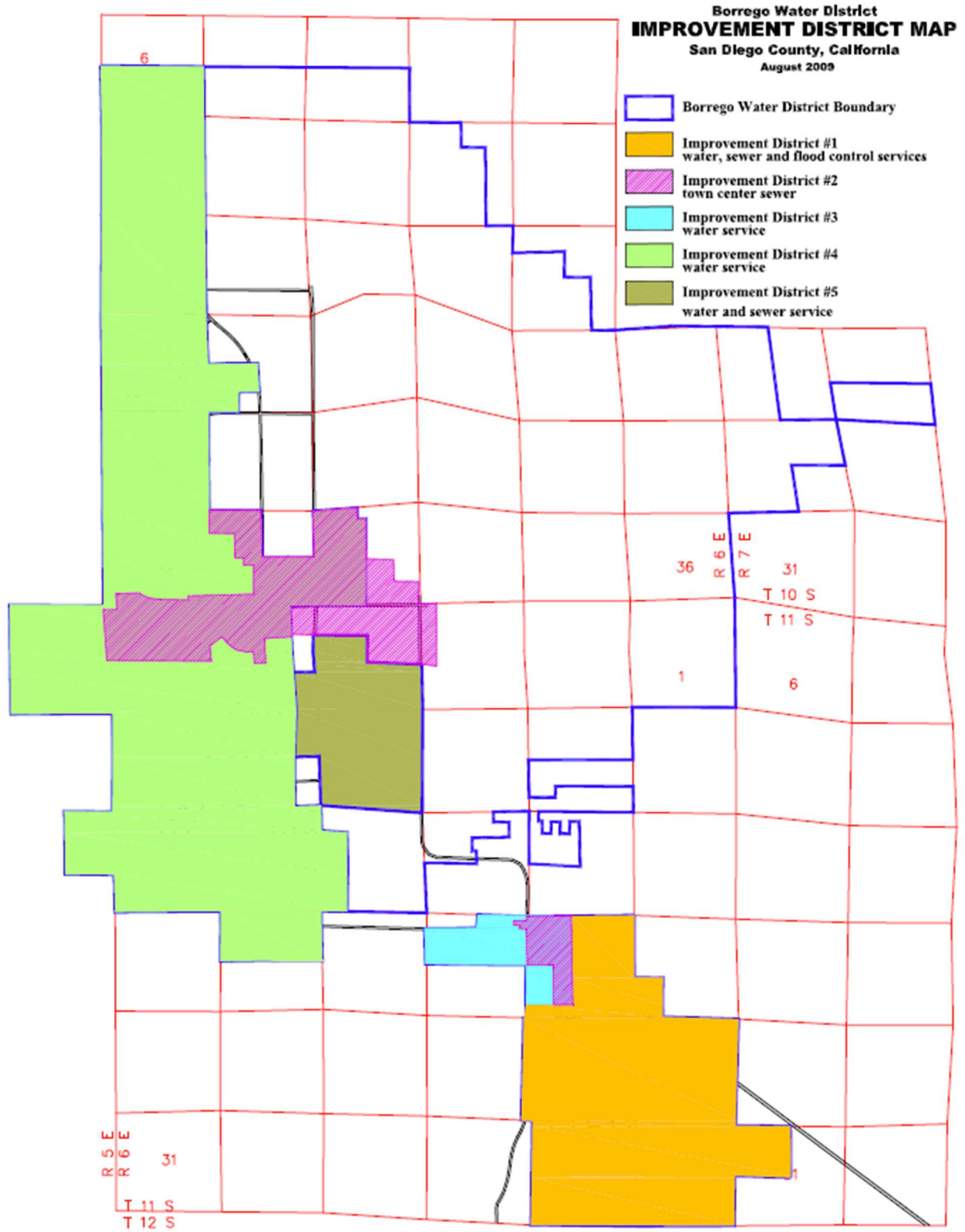


Figure 3 - BWD Improvement District Map

Problem Description

Ground Storage Reservoirs

The Twin Tanks (2 tanks at 220,000 gallons each), Indian Head Tank, all comprised of bolted galvanized steel, and the Rams Hill #2 tank comprised of bolted galvanized steel. These tanks are corroding and in need of replacement. It has been determined by the District that rehabilitation is no longer possible due to the level of corrosion in the tanks. Rehabilitation of the Twin Tanks and Indian Head Tank is therefore not considered in this report. The rehabilitation of the Rams Hill #2 tank is included in this report. The 800 tank has been demolished and is no longer a part of the system.



Figure 4 - Location of Indian Head tank

The Indian Head tank appears to be situated on a prescriptive easement. A prescriptive easement refers to using a property without taking formal ownership of it. The prescriptive easement occurs when the piece of property is used continuously for a period of time without formal approval. The Indian Head tank is used primarily for fire suppression capacity.

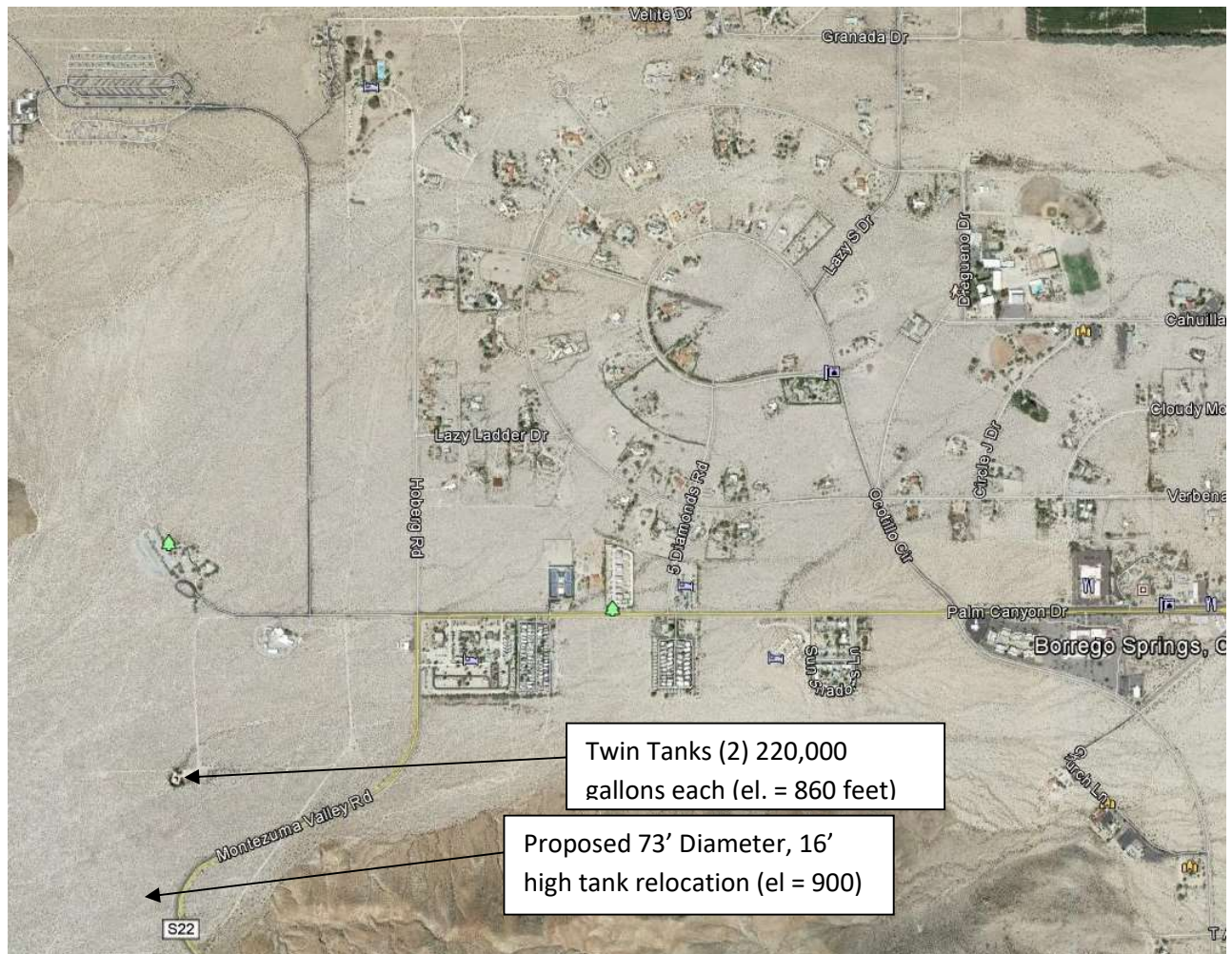


Figure 5 - Location of the Twin Tanks

The District contracted a dive inspection on October 19, 2016 and February 2, 2017 to determine the condition of the interior and exterior of the tanks. The reports recommended repairs to all of the tanks. Inspections occur every three years. The inspection of the Twin Tanks has identified severely corroded areas within the tanks. The Twin Tanks do not appear to be able to be rehabilitated at this time.

Twin Tanks and Indian Head Tank (Each) Size Info.	
38'	Diameter
24'	Height

SF	Area
2865	interior walls
1134	Interior floor
1134	interior roof
38	Center Support
300	Rafters/etc.
5471 SF	Total Interior

SF	Area
1134	exterior roof
2865	exterior shell
3999 SF	Total Exterior

SF=square feet

The Twin Tanks comprise two tanks. Twin Tank #1 is the south tank, and Twin Tank #2 is the north tank. The tanks have been deemed beyond repair and require replacement. There is a valve between the tanks to allow each tank to be taken out of service separately. There is no cathodic protection on the tanks.

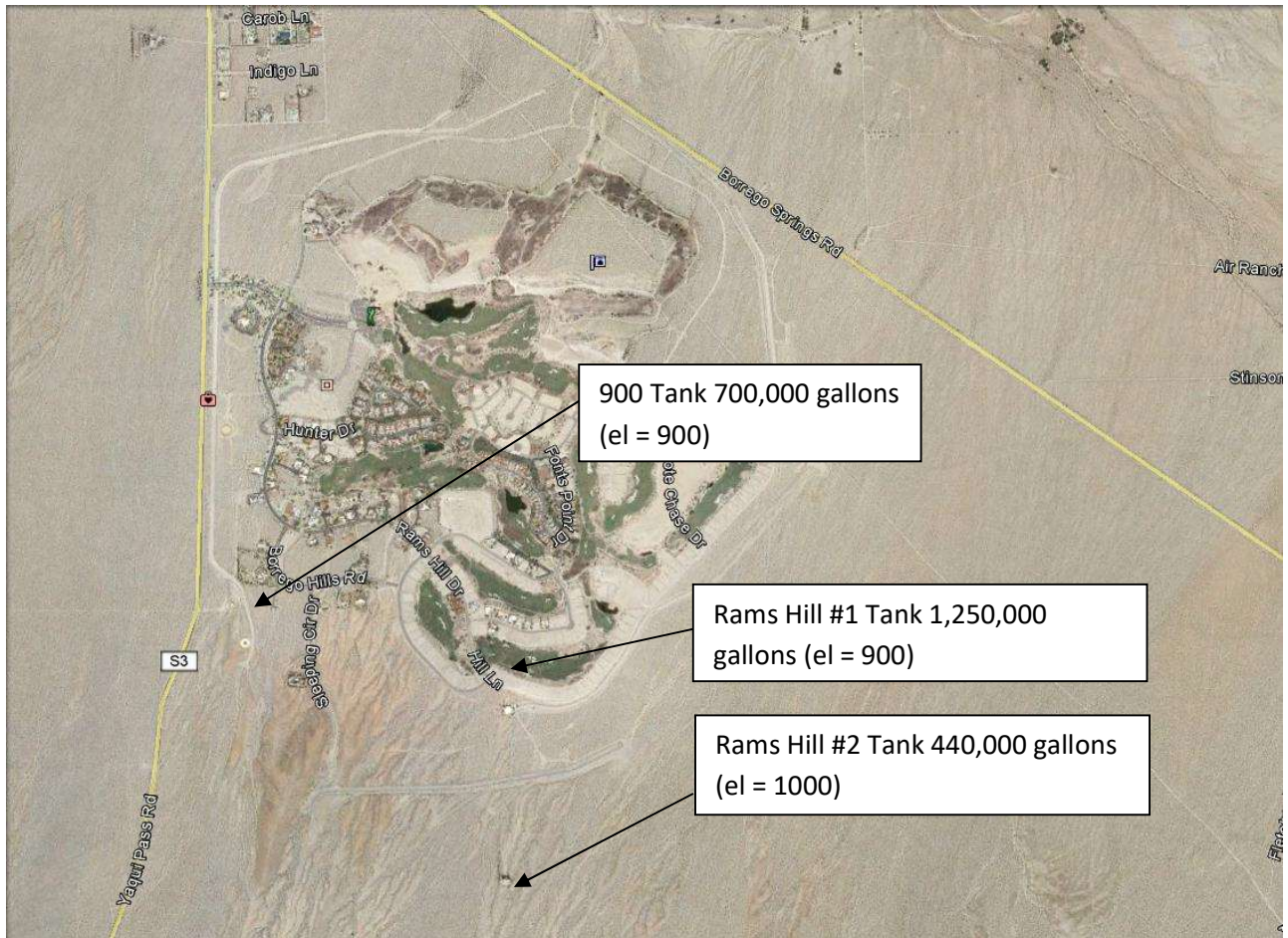


Figure 6 - Location of Rams Hill #1 and #2 Tanks

Rams Hill #1 Tank was rehabilitated in 2016. The 900 Tank was installed and put into service in 2017 and is in good condition. The “800 Tank” and associated booster pump station was removed from service when the 900 Tank came online. The roof structure of the tank is beyond repair. The tank may be able to be rehabilitated, with the roof and rafters replacement.

Alternative Solutions

Twin Tanks

The following are detailed cost estimates for the three alternatives to replace the Twin Tanks. After completion, the tanks will be filled with water and tested for Volatile Organic Compounds (VOC) and bacteria prior to putting them back into service.

Alternative #1A – Replace the Tanks in Kind and in Situ

Twin Tanks Replacement						
No.	Qua	Unit	Description	Unit Cost	Total Cost	
1	Construction Cost					
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance, Payment Bond, Taxes, Permits, Fees and Similar Expenses	\$ 45,000.00	\$ 45,000	
1.2	2	LS	Demolish existing bolted 220,000 gallon steel tank. Remove and dispose of the tank.	\$ 23,500.00	\$ 47,000	
1.3	1	LS	Provide tank submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 2,500.00	\$ 3,500	
1.4	1	LS	Survey Tank Locations	\$ 2,500.00	\$ 2,500	
1.5	300	CY	Prepare Tank Pad – Install Class 2 Base 24 inches thick. Install ½" Fiber expansion joint material on top of the rock.	\$ 225.00	\$ 67,500	
1.6	2	LS	Form and Install new concrete ringwall, with steel rebar and steel anchors	\$ 75,000.00	\$ 150,000	
1.7	2	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 15,000	
1.8	2	LS	Install fusion powder coated bolted steel tank, nominal dimensions 24' high and 38' diameter. After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 155,820.00	\$ 311,640	
1.9	2	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10" flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 19,500.00	\$ 39,000	
1.10	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 3,800.00	\$ 3,800	
			Project Construction Cost:	\$	684,940	
			10% Contingency:	\$	68,494	
			Total Construction Cost:	\$	753,434	
2	Admin and Engineering					
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications (5%)	\$	37,672	
2.02	1	LS	Construction Management	\$	25,000	
			TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$	816,106	

Alternative #1B – Replace the Tanks with (1) Large Tank and Relocate to District Parcel

ALTERNATIVE # 1B - REPLACE TANKS WITH (1) LARGER TANK						
Twin Tanks Replacement						
No.	Qua	Unit	Description	Unit Cost	Total Cost	
1 Construction Cost						
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance, Payment Bond, Taxes, Permits, Fees and Similar Expenses	\$ 35,000.00	\$ 35,000	
1.2	2	LS	Demolish existing bolted 220,000 gallon steel tank. Remove and dispose of the tank.	\$ 23,500.00	\$ 47,000	
1.3	1	LS	Provide tank submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 2,500.00	\$ 3,500	
1.4	1	LS	Survey Tank Location	\$ 2,500.00	\$ 2,500	
1.5	125	CY	Prepare Tank Pad – Install new galvanized steel ring around the perimeter of the tank. Install 1-inch No. 4 Rock eight inches thick. Install ½” Fiber expansion joint material on top of the rock.	\$ 275.00	\$ 34,375	
1.6	1	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 7,500	
1.7	1	LS	Install fusion powder coated bolted steel tank, nominal dimensions 16’ high and 73’ diameter. After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 344,214.00	\$ 344,214	
1.8	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10” flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 28,500.00	\$ 28,500	
1.9	1	EA	Install Altitude Valve	\$ 12,000.00	\$ 12,000	
1.10	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 3,800.00	\$ 3,800	
				Project Construction Cost:	\$	518,389
				10% Contingency:	\$	51,839
				Total Construction Cost:	\$	570,228
2 Admin and Engineering						
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications (5%)		\$ 28,511	
2.02	1	LS	Construction Management		\$ 25,000	
				TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$	623,739

The District recently commissioned a survey of the Twin Tanks location. The District owns a rectangular parcel 140 feet x 125 feet (total 0.40 acres or 17,500 square feet). The tanks were constructed nearby, but outside of the parcel. If the Twin Tanks are replaced, discussions should be made with the ABDSP related to the location of the new tanks. The existing tanks sit on “disturbed land”; the District’s parcel is in undisturbed land.

Another potential site has been identified to replace the Twin Tanks, if necessary, along the curve at Montezuma Valley Road (S-22), approximately 1,200 feet south of the existing Twin Tank site. The location was identified because of the ground elevation of approximately 900 feet. It is privately owned and would need to be acquired by the District, through direct sale or the eminent domain

process (see Figure 2 above). This would also require approximately 1,300 linear feet of 8-inch diameter pipeline and an easement for the pipeline.

The following Alternative #1C includes relocating the Twin Tank capacity to another location, approximately 1,200 feet to the south of the existing location. The purpose of the relocation would be to remove the tanks from the ABDSP area, and raise the tank elevation to the standard 900 foot level. The current tank sits at an elevation of approximately 860 feet.

Alternative #1C – Replace the Tanks with (1) Large Tank and Relocate 1,200 feet South

Twin Tanks Replacement					
No.	Qua	Unit	Description	Unit Cost	Total Cost
1	Construction Cost				
1.1	1	LS	Obtain site control and pipeline easements through Eminent Domain process (Estimate)	\$ 500,000.00	\$ 500,000
1.2	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance, Payment Bond, Taxes, Permits, Fees and Similar Expenses	\$ 35,000.00	\$ 35,000
1.3	2	LS	Demolish existing bolted 220,000 gallon steel tank. Remove and dispose of the tank.	\$ 23,500.00	\$ 47,000
1.4	1,200	LF	Install 8-inch diameter PVC pipe to new location, including fittings and valves	\$ 140.00	\$ 168,000
1.5	1	LS	Provide tank submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 2,500.00	\$ 3,500
1.6	1	LS	Survey Tank Location	\$ 2,500.00	\$ 2,500
1.7	125	CY	Prepare Tank Pad – Install new galvanized steel ring around the perimeter of the tank. Install 1-inch No. 4 Rock eight inches thick. Install ½” Fiber expansion joint material on top of the rock.	\$ 275.00	\$ 34,375
1.8	1	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 7,500
1.9	1	LS	Install fusion powder coated bolted steel tank, nominal dimensions 16’ high and 73’ diameter. After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 344,214.00	\$ 344,214
1.10	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10” flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 28,500.00	\$ 28,500
1.11	1	EA	Install Altitude Valve	\$ 12,000.00	\$ 12,000
1.12	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 3,800.00	\$ 3,800
				Project Construction Cost:	\$ 1,186,389
				10% Contingency:	\$ 118,639
				Total Construction Cost:	\$ 1,305,028
2	Admin and Engineering				
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications (7%)	\$	91,352
2.02	1	LS	Construction Management	\$	75,000
				TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$ 1,471,380

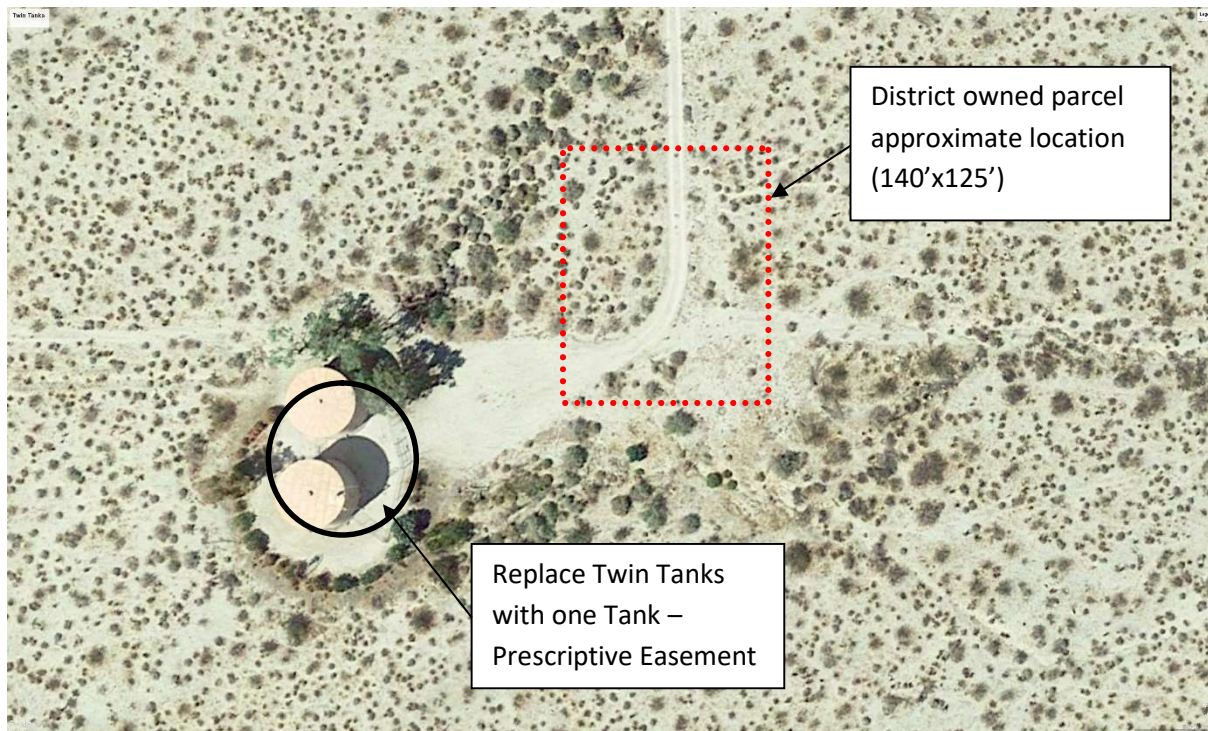


Figure 7 - Alternative 1B – Approximate location - Replace Twin Tanks with one Larger Tank

Indian Head Tank

Alternative #2A – Replace Indian Head Tank with Same Size Tank

Indian Head Tank Replacement					
No.	Qua	Unit	Description	Unit Cost	Total Cost
1	Construction Cost				
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance,	\$ 25,000.00	\$ 25,000
1.2	1	LS	Demolish existing bolted 220,000 gallon steel tank. Remove and dispose of the tank.	\$ 17,500.00	\$ 17,500
1.3	1	LS	Provide tank submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 2,500.00	\$ 3,500
1.4	1	LS	Survey Tank Locations	\$ 2,500.00	\$ 2,500
1.5	150	CY	Prepare Tank Pad – Install Class 2 Base 24 inches thick. Install ½” Fiber expansion joint material on top of the rock.	\$ 225.00	\$ 33,750
1.6	1	LS	Form and Install new concrete ringwall, with steel rebar and steel anchors	\$ 75,000.00	\$ 75,000
1.7	1	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 7,500
1.8	1	LS	Install fusion powder coated bolted steel tank, nominal dimensions 24’ high and 38’ diameter. After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 155,820.00	\$ 155,820
1.9	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10” flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 19,500.00	\$ 19,500
1.10	1	EA	Install Altitude Valve	\$ 12,000.00	\$ 12,000
1.11	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 3,800.00	\$ 3,800
				Project Construction Cost:	\$ 355,870
				10% Contingency:	\$ 35,587
				Total Construction Cost:	\$ 391,457
2	Admin and Engineering				
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications (7%)	\$	27,402
2.02	1	LS	Construction Management	\$	15,000
				TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$ 433,859

Due to the proximity to local earthquake faults, a new 24 feet tall tank with a diameter of 38 feet would require a concrete ringwall and steel anchoring.

A shorter tank could potentially be installed in this location if the District receives permission for an easement and/or owns the parcel. Depending on favorable soils, the shorter tank would not need the anchorage and would be approximately 50 feet in diameter and 16 feet tall. A geotechnical report will be required.

Alternative #2B – Replace Indian Head Tank with a Shorter and Larger Diameter Tank, Same Capacity

Indian Head Tank Replacement					
No.	Qua	Unit	Description	Unit Cost	Total Cost
1	Construction Cost				
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance, Payment Bond, Taxes, Permits, Fees and Similar Expenses	\$ 25,000.00	\$ 25,000
1.2	1	LS	Demolish existing bolted 220,000 gallon steel tank. Remove and dispose of the tank.	\$ 17,500.00	\$ 17,500
1.3	1	LS	Provide tank submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 2,500.00	\$ 3,500
1.4	1	LS	Survey Tank Locations	\$ 2,500.00	\$ 2,500
1.5	150	CY	Prepare Tank Pad – Install Class 2 Base 24 inches thick. Install ½" Fiber expansion joint material on top of the rock.	\$ 225.00	\$ 33,750
1.7	1	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 7,500
1.8	1	LS	Install fusion powder coated bolted steel tank, nominal dimensions 16' high and 50' diameter. After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 135,000.00	\$ 135,000
1.9	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10" flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 19,500.00	\$ 19,500
1.10	1	EA	Install Altitude Valve	\$ 12,000.00	\$ 12,000
1.11	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 3,800.00	\$ 3,800
			Project Construction Cost:	\$	260,050
			10% Contingency:	\$	26,005
			Total Construction Cost:	\$	286,055
2	Admin and Engineering				
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications (7%)	\$	20,024
2.02	1	LS	Construction Management	\$	15,000
			TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$	321,079

Rams Hill #2 Tank

Alternative #3A – Rehabilitate Rams Hill #2 Tank

Rams Hill #2 Rehabilitation					
No.	Qua	Unit	Description	Unit Cost	Total Cost
1	Construction Cost				
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Construction	\$ 50,000.00	\$ 50,000.00
1.2	1	LS	Test for lead, chromium and arsenic in interior of tank.	\$ 700.00	\$ 700.00
1.3	11,912	SF	Sandblast Complete Interior Including Columns, Rafters, Appurtenances, Exterior Roof Coatings and Small Localized Areas on the Exterior Shell (to be located in the field), to SSPC-SP 10. Remove and Legally Dispose of Spent Blast Material.	\$ 6.00	\$ 71,472.00
1.4	1	LS	Metal Repair Estimate	\$ 210,000.00	\$ 210,000.00
1.5	9,536	SF	Recoat Interior Surfaces.	\$ 8.90	\$ 84,870.40
1.6	6,523	SF	Coat Exterior Surfaces	\$ 6.50	\$ 42,399.50
1.7	1	LS	Coating Inspection and Testing	\$ 8,500.00	\$ 8,500.00
1.8	2	EA	Replace Manway Gaskets	\$ 500.00	\$ 1,000.00
1.9	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10" flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 19,500.00	\$ 19,500.00
1.10	1	LS	Hydrostatic Testing, VOC Testing, Disinfection of Tank, Bacteriological Testing	\$ 3,800.00	\$ 3,800.00
				Project Construction Cost:	\$ 492,242
				10% Contingency:	\$ 49,224
				Total Construction Cost:	\$ 541,466
2	Admin and Engineering				
2.1	1	LS	Preliminary Engineering, Engineering Plans and Specifications	\$ 40,000	\$ 40,000
2.2	1	LS	Construction Management	\$ 35,000	\$ 35,000
			TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$	616,466

Rehabilitation of the Rams Hill #2 Tank is included in this report. It may be possible to rehabilitate the tank; however substantial steel repairs and replacement would be required. For purposes of comparison in this report, the costs of the steel repairs is only estimated because the tank would need to be drained, sandblasted fully inspected and an estimate from a licensed contractor obtained. The condition of the metal will not be known until sandblasting operations are complete. The costs of replacement of the tank and the rehabilitation of the tank are similar, so it is recommended to replace the tank in lieu of rehabilitation.

Alternative #3B – Replace Rams Hill #2 Tank

Rams Hill Replacement					
No.	Qua	Unit	Description	Unit Cost	Total Cost
1	Construction Cost				
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance,	\$ 45,000.00	\$ 45,000
1.2	1	LS	Demolish existing bolted 440,000 gallon steel tank. Remove and dispose of the tank.	\$ 45,000.00	\$ 45,000
1.3	1	LS	Provide tank submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 2,500.00	\$ 2,500
1.4	120	CY	Prepare Tank Pad – Install new galvanized steel ring around the perimeter of the tank. Install 1-inch No. 4 Rock eight inches thick. Install ½” Fiber expansion joint material on top of the rock.	\$ 275.00	\$ 33,000
1.5	1	LS	Survey Tank Location	\$ 2,500.00	\$ 2,500
1.6	1	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 7,500
1.7	1	LS	Install fusion powder coated bolted steel tank, nominal dimensions 16’ high and 73’ diameter (500,000 Gallon Nominal Capacity). After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 344,214.00	\$ 344,214
1.8	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10” flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 19,500.00	\$ 19,500
1.9	1	EA	Install Altitude Valve	\$ 12,000.00	\$ 12,000
1.10	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 5,000.00	\$ 5,000
				Project Construction Cost:	\$ 516,214
				10% Contingency:	\$ 51,621
				Total Construction Cost:	\$ 567,835
2	Admin and Engineering				
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications (5%)	\$ 28,392	\$ 28,392
2.02	1	LS	Construction Management	\$ 25,000	\$ 25,000
				TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$ 621,227

Installation of a 1.0 MG Tank, Distribution Pump Station and Backup Generator

Install New Tank at Well 9-4						
No.	Qua	Unit	Description	Unit Cost	Total Cost	
1	Construction Cost					
1.1	1	LS	Mobilization/ Demobilization, Temporary Facilities, Insurance,	\$ 170,000.00	\$ 170,000	
1.2	1	LS	Install new Booster Pump Station with VFD (1,000 gpm Capacity), including building structure, electrical infrastructure	\$ 350,000.00	\$ 350,000	
1.3	1	LS	Install new 400 kW Backup Generator for Pump Station	\$ 400,000.00	\$ 400,000	
1.4	1	LS	Provide tank and pump station submittal, stamped and signed by a Registered Engineer in the State of California. Payment after acceptance.	\$ 3,500.00	\$ 3,500	
1.5	1	LS	Survey Pumps and Tank Location	\$ 4,500.00	\$ 4,500	
1.6	250	CY	Prepare Tank Pad – Install new galvanized steel ring around the perimeter of the tank. Install 1-inch No. 4 Rock eight inches thick. Install ½” Fiber expansion joint material on top of the rock.	\$ 275.00	\$ 68,750	
1.7	1	LS	Furnish and Install OSHA exterior locking ladder kit and railing around the roof hatch	\$ 7,500.00	\$ 7,500	
1.8	1	LS	Install fusion powder coated bolted steel tank, nominal dimensions 16’ high and 100’ diameter (1.0 MG Capacity). After installation, complete holiday testing of interior coating and repair all holidays to the satisfaction of the engineer.	\$ 582,000.00	\$ 582,000	
1.9	1	LS	Install piping, valves, transition couplings, fittings, Tideflex valve, expansion joints, check valves, pipe supports, 10” flow meter (relocate existing), ductile iron risers, thrust blocks, anti-vortex hardware, and other appurtenances as necessary for a functional system and as shown on the plans. Connect to existing piping.	\$ 87,000.00	\$ 87,000	
1.1	3	LS	Demolish the Twin Tanks and Indian Head Tank	\$ 20,000.00	\$ 60,000	
1.11	1	LS	Hydrostatic Testing, VOC Testing, Wash-down and Cleaning of the interior, Disinfection, and Bacteriological Testing. Water provided by the District at no charge.	\$ 3,800.00	\$ 3,800	
				Project Construction Cost:	\$	1,737,050
				10% Contingency:	\$	173,705
				Total Construction Cost:	\$	1,910,755
2	Admin and Engineering					
2.01	1	LS	Preliminary Engineering, Engineering Plans and Specifications	\$ 70,000	\$ 70,000	
2.02	1	LS	Construction Management	\$ 35,000	\$ 35,000	
				TOTAL PRELIMINARY PROJECT ESTIMATED COST	\$	2,015,755

This alternative would see a new 1.0 million gallon capacity storage tank installed at the new Well 9-4 location in lieu of replacing the Twin Tanks and Indian Head Tank. The well is located at an elevation of approximately 600 feet, which is 300 feet below the existing hydraulic grade. Therefore, a distribution pump station installed in an air conditioned building with a substantial dynamic head of 150 psi would be required to pump the water to the higher elevations. Additionally, a backup generator would be necessary; although there is one at Well 9-4, it is not sized to handle additional loads from the distribution pump station.

Analysis of Alternatives

The alternatives for the tanks are reconstructing the tanks, rehabilitating the tanks, or no action. If no action is taken, the tanks will continue to corrode until failure. Sandblasting and recoating the inside of the tanks is risky because the condition of the metal will not be known until the tanks are drained, sandblasted and inspected.

Life cycle costs were not calculated in this report, because the operations and maintenance for the tanks are identified in the District Capital Improvement Program, there are no large short-lived assets with the installation of the new tanks and Alternative 4 (pumps, electricity, O&M etc.) is not recommended due to the high capital costs.

Alternatives Comparison		
Alt.	Description	Pre. Cost
1A	Replace Twin Tanks and Indian Head Tank in situ	\$ 816,106
1B	Replace Twin Tanks with (1) 500,000 gallon tank	\$ 623,739
1C	Replace Twin Tanks with (1) 500,000 gallon tank, Relocate 1,200 feet south	\$ 1,471,380
2A	Replace Indian Head Tank	\$ 433,859
2B	Replace Indian Head Tank with a Shorter and Larger Diameter Tank	\$ 321,079
3A	Rehabilitate Rams Hill #2	\$ 616,466
3B	Replace Rams Hill #2 Tank	\$ 621,227
4	Install New 1.0 MG Tank, Distribution Pump Station at Well 9-4	\$ 2,015,755
5	No Action	\$ -

Table 1 - Alternatives Comparison

Twin Tanks

The alternatives for the Twin Tanks include replacing in kind at the existing location, replacing the tanks with (1) larger tank in the District’s parcel and relocating the tank 1,200 feet southerly to a location that has an preferred elevation of 900 feet.

It appears that the tanks are now located in prescriptive easement due to the amount of time that they have been there.

Relocating the Twin Tanks to a remote location would require the District to not only obtain site control for the tank, but easements for the pipelines to extend to the location would also be necessary. There will be costs for the additional pipelines and valves as well. This is a good alternative to remove the tanks from the park areas, but the costs are prohibitive.

It is recommended that the (2) tanks with 220,000 gallons each (440,000 total) be replaced with (1) bolted steel tank with 500,000 gallons nominal storage capacity. **Alternative 1B** is recommended as it has the least cost and the shorter tank would have less aesthetic impact to the local desert park. A new altitude valve would be installed to prevent water from spilling over the tank overflow, as the tank would be located at a lower elevation (approximately 860 feet). The benefit of having the tanks at the higher elevations is that gravity supply into the distribution system provides constant pressures without the need for a Variable Frequency Drive (VFD) or emergency backup power at the tank locations. Please note that a geotechnical report will be necessary to determine if the concrete ringwall is necessary. The geotechnical report is out of the scope of this report.

Indian Head Tank

The District contracted a dive inspection on February 2, 2017 to determine the condition of the interior of the tanks. The last inspection occurred October 14, 2014. Inspections occur approximately every three years. The inspection of the Indian Head Tank identified areas inside the tank that require repair.

Indian Head Tank Size Info.	
38'	Diameter
24'	Height
SF	Area
2865	interior walls
1134	Interior floor
1134	interior roof
38	Center Support
300	Rafters/etc.
5471	Total Interior
SF	Area
1134	exterior roof
2865	exterior shell
3999	Total Exterior
SF=square feet	

Because the tanks have not been rehabilitated or repaired since the inspection in early 2017, it is deemed that the tank is past its useful life and must be replaced. At the time of the inspection in 2017, the repairs were needed immediately to save the tank.

There are two options to replace the Indian Head tank. Alternative 2A would replace the tank with the same size and capacity. Because code changes since 1970 have been increased, the 24-foot tall tank would now require a concrete ringwall with steel anchorage to prevent uplift.

If the District can obtain the easements and/or site control, a shorter tank may eliminate the need for an expensive concrete ringwall and steel anchors. The tank would be 50 feet in diameter and 16 feet tall. A geotechnical report would be necessary to determine if a concrete ringwall would be needed. If it is determined that this is feasible, this **Alternative 2B** is recommended due to the reduced cost if it is possible to obtain the site control.

Rams Hill #2 Tank

The District contracted a dive inspection on October 19, 2016 to determine the condition of the interior of the tanks. The last inspection occurred in 2012. Inspections occur approximately every three years. The inspection of the Twin Tanks has identified areas inside the tank that require repair.

Rams Hill #2 Tank Areas	
55'	Diameter
24'	Height
FT^2	Area
4147	interior walls
2376	Interior floor
2376	interior roof
38	Center Support
600	Rafters/etc.
9536	Total Interior
FT^2	Area
2376	exterior roof
4147	exterior shell
6523	Total Exterior
SF=square feet	

Alternative 3A includes rehabilitating the tank. In this alternative, the interior of the galvanized steel tank will be sandblasted - including the columns, rafters, appurtenances to SSPC-SP 10. The exterior shell requires recoating; the roof will be sandblasted to SSPC-SP10 along with any areas that have corroded. The remaining exterior will be pressure washed prior to coating. The contractor is to remove and legally dispose of the spent blast material. OSHA and Cal-OSHA require a safety railing on the roof structure that will be installed on the tank. Some metal repairs inside the tank will be required. The inspection report identified corrosion on the shell, floor, centerpole, roof structure and interior of the drain and level sensor lines. One rafter is missing, and there appear to be some bolts loose. The loose bolts will be replaced along with the missing rafter. Seventy percent of the bolt runs are estimated to be covered with corrosion. Some attachment hardware will need to be replaced on

the shell and floor panels. The full extent of the metal repairs will not be known until after the sandblasting is complete. According to the tank inspection report, if the corrosion is left unaddressed, metal loss could lead to water leakage. The exterior of the tank is in fair condition, only a few small areas will be repainted. The estimated life of the coating is approximately 30 years if it is properly maintained. The issue with this Alternative is that the condition of the internal metal components will not be conclusively known until the sandblasting operations are complete and the metal inspected. Because of this, the estimated costs included in this report are a conjecture.

Alternative 3B includes the replacement of Rams Hill #2 tank. It is recommended to install a shorter, 16 foot tall tank to potentially eliminate the need for a concrete ringwall. For this report, it is assumed that the soils are of an acceptable quality to allow for this. During the design, the geotechnical report will be commissioned. If it is determined that a ringwall is needed due to the quality of the soils, the costs will be added to the estimate. A geotechnical report is out of the scope of this report.

Well 9-4 Tank, Distribution Pump Station and Electrical Backup Supply

Alternative 4 would see the elimination of the Twin Tanks and the Indian Head tank. In lieu of these tanks, one large tank would be installed at the Well 9-4 location.

The pump station would include:

- 2 – 125Hp main booster pumps to deliver 1000 gpm each @ 150 psi
- 1 – 40Hp jockey pump to deliver low flows up to 300gpm @ 150 psi
- 3 – Fab steel discharge heads w/ mechanical seals
- 3 – 16" diameter SS suction barrels w/ 10" inlet
- 1 – Discharge manifold – tie all 3 pumps into one main outlet
- 1 – 200 gallon 200psi ASME code surge tank
- 1 – 125Hp / 125Hp / 40Hp VFD control panel for constant pressure control
- 1 – 400amp 460vac 3ph underground electric service
- 1 – 400amp 480 volts (AC) 3 phase automatic transfer switch
- Underground conduits and wiring
- 3 – Reinforced concrete pads w/ reinforced footings
- Tie in to the SDG&E electrical system and electrical meter
- Piping to tie the station into the new tank
- A backup generator (450kW)

Advantages

- If treatment of the water becomes necessary in the future, the site would be set up for it already.
- The Twin Tanks and Indian Head Tank could be demolished and removed, thus benefiting the park aesthetics.
- A solar system could be installed at the site to power Well 9-4 and the distribution pump system.

Disadvantages

- The need to “double pump” the water. Water would be pumped to the tank from Well 9-4, then pumped again from the tank to the distribution pump station. There are also costs for maintenance and operation for the distribution pumps, and additional electrical costs.
- The need for a VFD to supply constant pressure to the system, as opposed to the tanks at higher elevations which supply constant pressure due to gravity. There is less reliability for constant pressure with a VFD.
- The high capital costs to install the tank and distribution pump station. The pump station would need an emergency backup power supply, and a dedicated power source. The distribution pumps would need to supply 150 psi at 1,000 gallons per minute.
- Well 11 would possibly need to be modified to pump to the Well 9-4 tank.

Description of the Proposed Projects

Recommended Project(s)				
ALT	Qua	Unit	Description	Unit Cost
No.	Construction Cost			
1B	Replace Twin Tanks with (1) 500,000 gallon tank and (1) Indian Head Tank			\$ 623,739
2B	Replace Indian Head Tank with a Shorter and Larger Diameter Tank			\$ 321,079
3B	Replace Rams Hill #2 Tank			\$ 621,227
			Total Construction Cost:	\$ 1,566,045

The most cost-effective solution to compensate the lost storage capacity of the corroded Twin Tanks, Indian Head Tank and Rams Hill #2 tank is to replace them with new tanks. The Twin Tanks should be relocated to the parcel already owned by the District. New piping and valves should be installed. An altitude valve should be installed at the Twin Tanks and the Indian Head Tank to prevent spill over if the hydraulic grade in the distribution system becomes higher than the overflow elevation in the tanks. The Twin Tanks should be replaced with one, shorter tank with a larger diameter. This will improve the aesthetics of the nearby park, reduce the capital and O&M costs. If the District can receive a formal easement, the Indian Head tank should be replaced with the shorter, wider tank. This will reduce the need for a concrete ringwall and steel anchorage. Consideration was made to rehabilitate the Rams Hill #2 tank; however, the costs are relatively similar. Rehabilitation is risky because the condition of the steel of the tank will not be fully known until it is sandblasted.

Proposed Schedule

Table 1 - Proposed Project Schedule

	May '20	June '20	July '20	Aug '20	Sep '20	Oct '20	Nov '20	Dec '20	Jan '21	Mar '21	Apr '21
Approvals for project											
Preliminary Engineering											
Project to Bid											
Contractor selection											
Submittals											
Construction											
Final Clean up											