Coachella Valley Water District

FY2022-2023 WRP 7 Phase I NPW Improvements Project

Project Report, CWSRF Attachment T1

I. Project Area

Coachella Valley Water District (CVWD) is implementing the WRP 7 Phase I Non-Potable Water Improvements Project, which consists of expanding the existing non-potable water (NPW) system in phases to additional customers throughout its service area. CVWD is requesting financing for the fiscal year (FY) 2022-2023 Phase I NPW Improvements Project (Project).

CVWD's non-potable water program is growing as customers join in an effort to conserve water and utilize recycled water for unrestricted irrigation purposes. Currently, irrigation systems within CVWD's water service area use water from one of four sources:

- Domestic potable water from CVWD wells
- Colorado river water via the Coachella Canal that is distributed by CVWD's gravity flow network of baffle stands and pipes to customer owned open-air reservoirs
- Customer owned Replenishment Assessment Charge (RAC) wells that are metered by CVWD
- NPW provided from CVWD's WRP 7 and 10

This project is part of the first of two phases for expanding the capacity of the WRP 7 NPW system. The goal established for this first expansion, to expand the plant to 5.5 MGD from 2.5 MGD, will permit WRP 7's tertiary system to meet the 2030 expected maximum day flow of 5.2 MGD. Planning during this first phase will take into consideration the second WRP 7 expansion to 6.2 MGD to permit the facility to meet the 2040 expected maximum day flow of 6.2 MGD.

WRP 7 is located south of Avenue 38 along Madison Street in Indio, CA. The plant has a secondary design capacity of 5.0 MGD and a tertiary design capacity of 2.5 MGD. Plant influent is initially processed through the headworks facility which consists of bar screens and grit vortex chamber. Following the headworks, flow is treated via activated sludge aeration basins and secondary clarifiers. The liquid stream continues on to secondary clarifiers and then to the Advanced Water Treatment (AWT) pump station. At the AWT, flow up to 2.5 MGD is treated to Title 22 requirements via the existing tertiary system consisting of two flocculation basins, three dual media gravity filters, and a single chlorine contact basin. The continuous coagulation process uses aluminum sulfate, and the disinfection process uses chlorine gas. Flow in excess of 2.5 MGD from the secondary clarifiers is pumped off-site to percolation ponds. Solids handling facilities include thickening and dewatering using a belt filter press and gravity belt thickener with the dewatered solids loaded and transported offsite. The WRP 7 NPW pump station that is used to send blended tertiary effluent and canal water to NPW customers has two 4600 gpm vertical turbine pumps operating under a duty + standby control and supported by a jockey pump. Tertiary effluent is supplemented with canal water from the offsite MP (Mile Post) 113.2 pump station to permit the plant to meet NPW demands in excess of 2.5 MGD. The MP113.2 that feeds canal water from the Coachella canal is located at Avenue 40 and Madison and consists of two 2800 gpm pumps operating under a duty + standby control and supported by a jockey pump.

This Phase 1 NPW Improvements Project also includes the installation of the Young's Farm NPW conveyance pipeline, consisting of 1,200 linear feet (LF) of 12-inch pipeline and 920-LF of 6-in on-site pipeline.

Based on CVWD's Sanitation Master Plan, CVWD desires to expand tertiary treatment at WRP 7 to provide Title 22 water to additional irrigation and golf course customers. Growth in the WRP 7 service area is expected to increase plant influent flows to 6.2 MGD by 2040. In response to this growth, CVWD has planned several projects as part of two phases to expand WRP 7 treatment capacity to meet demands and recycle 100% of the WRP 7 influent. Table 1 summarizes the WRP 7 influent flow and total suspended solids projections through 2040.

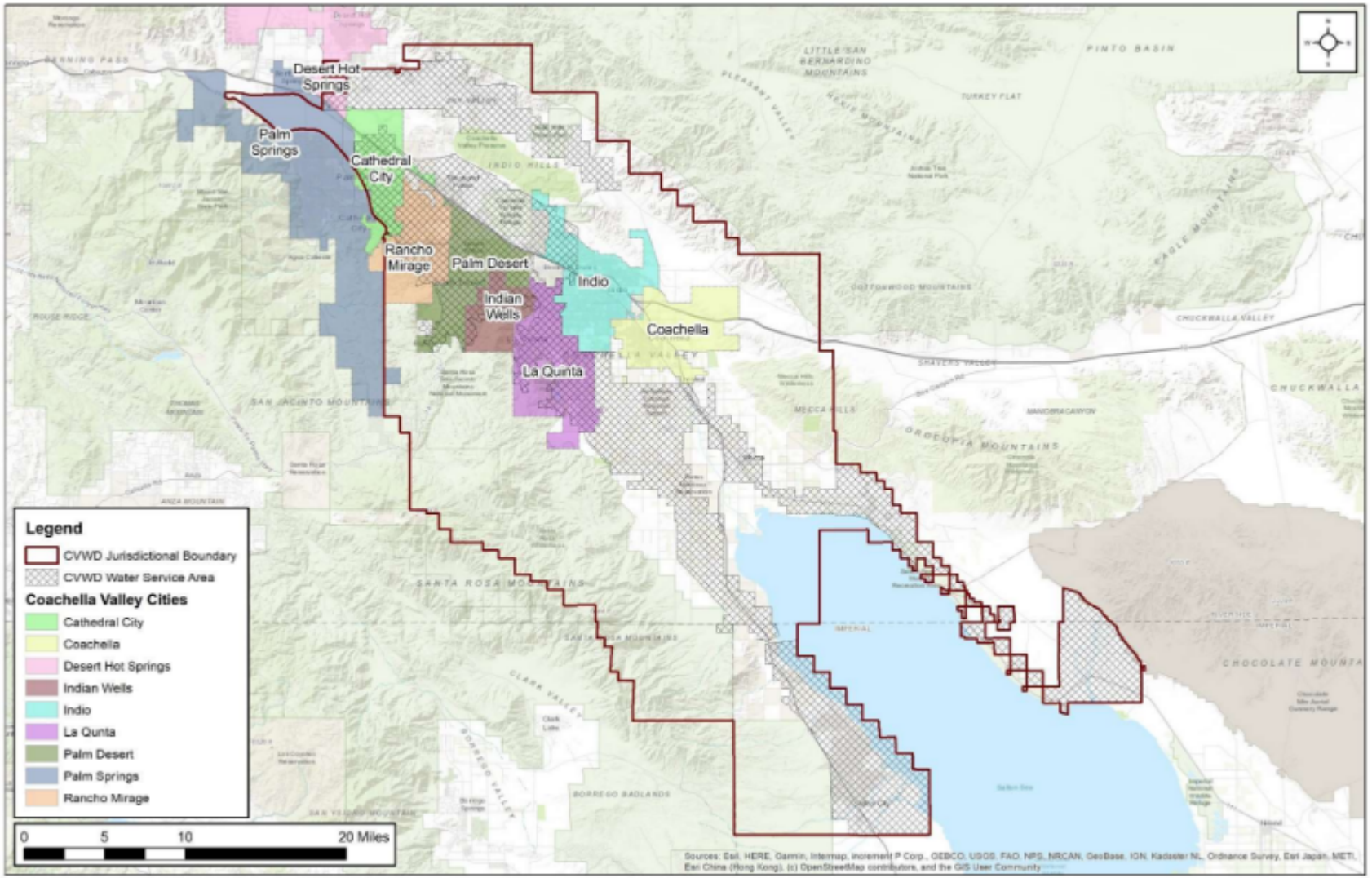
Table 1: WRP 7 Influent Load Projections (CVWD Sanitation Master Plan)

Design Condition	Parameter	Year				
		2020	2025	2030	2035	2040
Minimum Day	Flow (mgd)	2.6	3.0	3.4	3.8	4.0
	TSS (ppd)	2,180	2,520	2,860	3,200	3,460
Average Day	Flow (mgd)	3.2	3.7	4.2	4.7	5.0
	TSS (ppd)	6,880	7,960	9,030	10,110	10,750
Maximum Month Average Day	Flow (mgd)	3.6	4.2	4.8	5.3	5.7
	TSS (ppd)	9,520	11,000	12,490	13,980	14,870
Maximum Day	Flow (mgd)	4.0	4.6	5.2	5.9	6.2
	TSS (ppd)	14,920	17,250	19,580	21,910	23,310

A. Maps

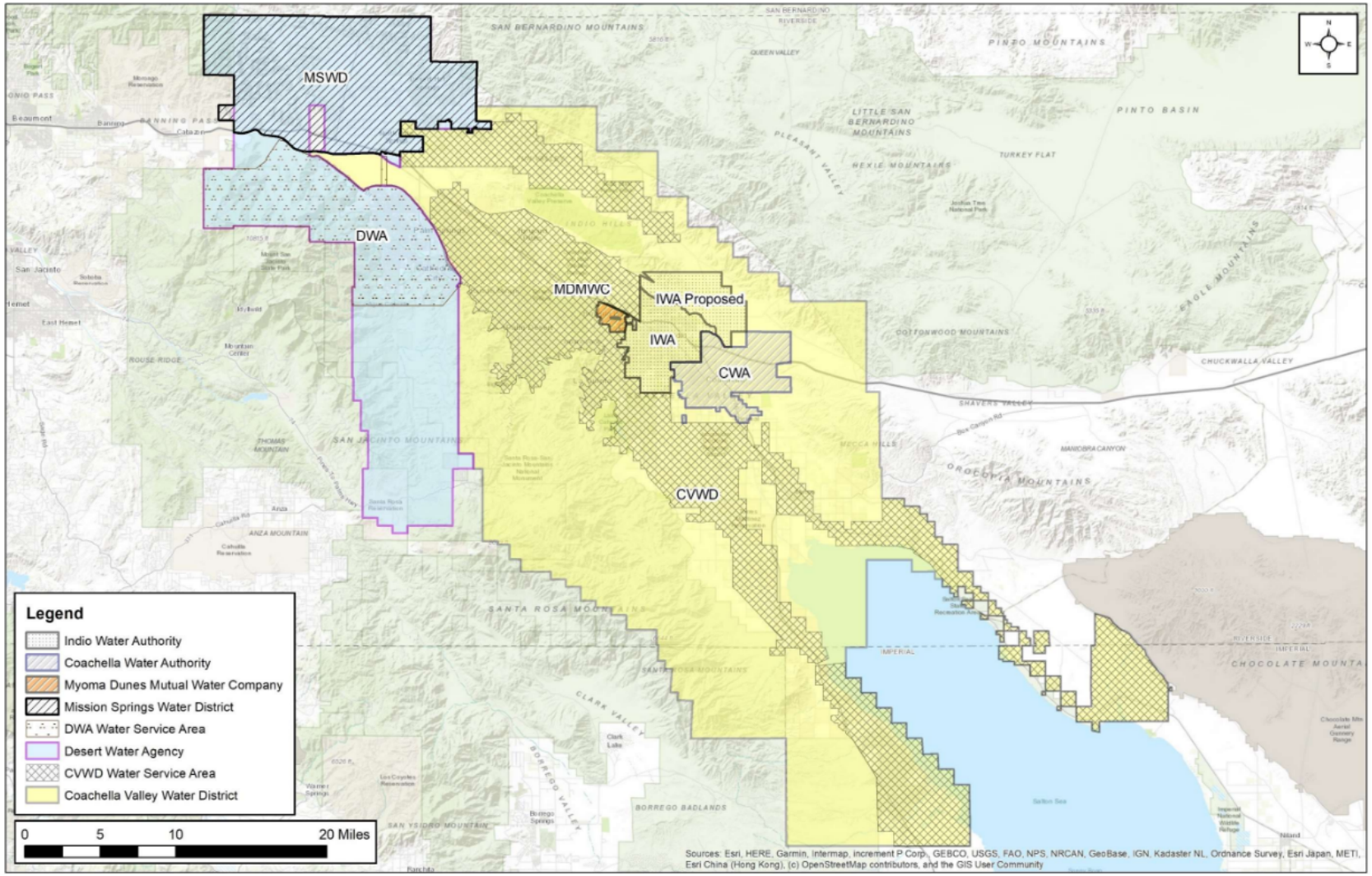
The following figures show the CVWD service area, water agencies participating in the 2020 Regional Urban Water Management Plan (RUWMP), wastewater treatment facilities , groundwater basins, and projected land use in the vicinity.

Figure 1: CVWD Jurisdictional Boundary



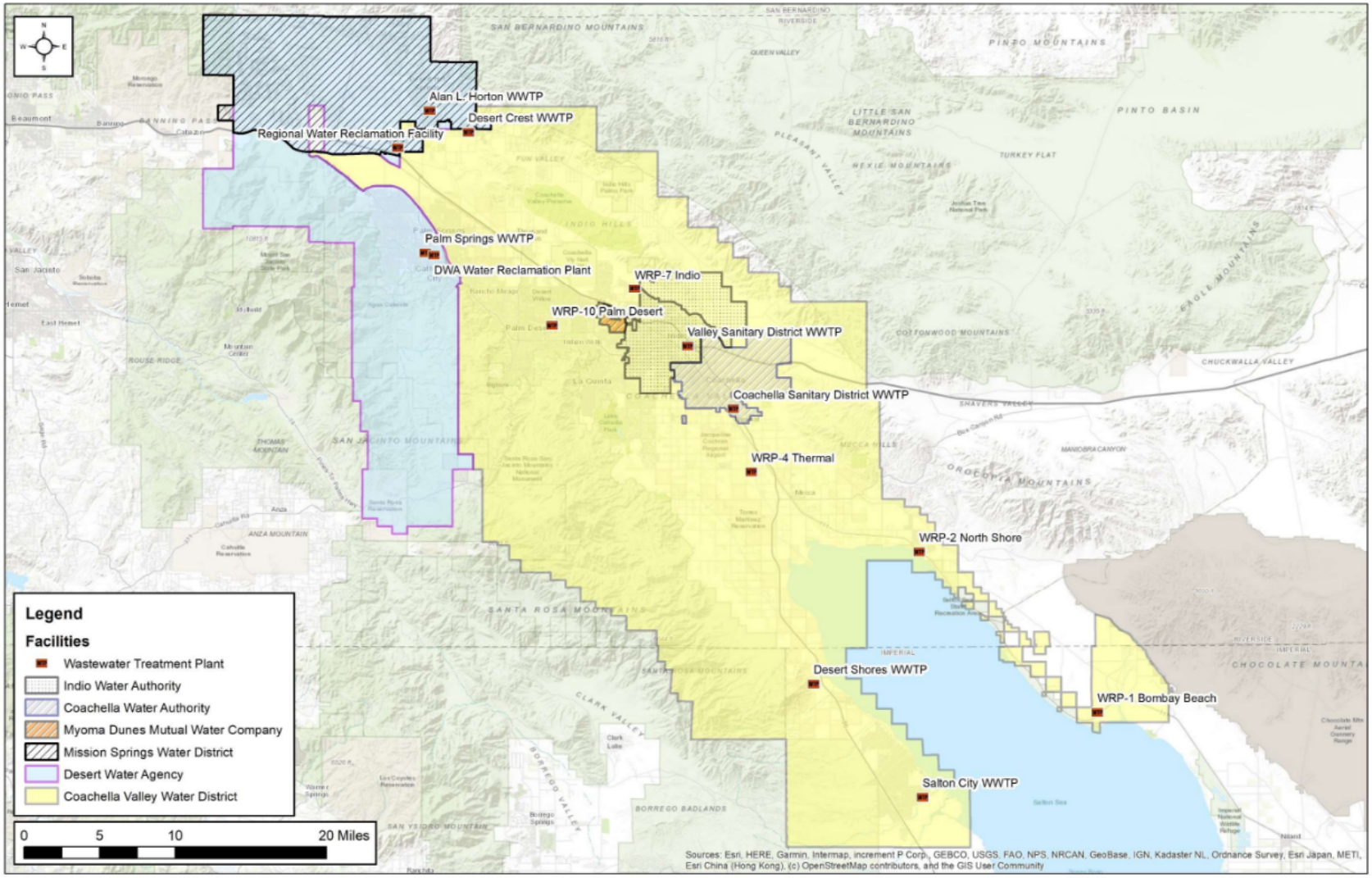
Source: 2020 Urban Water Management Plan Final Report, prepared for CVWD.

Figure 2: Water Agencies Participating in Coachella Valley RUWMP



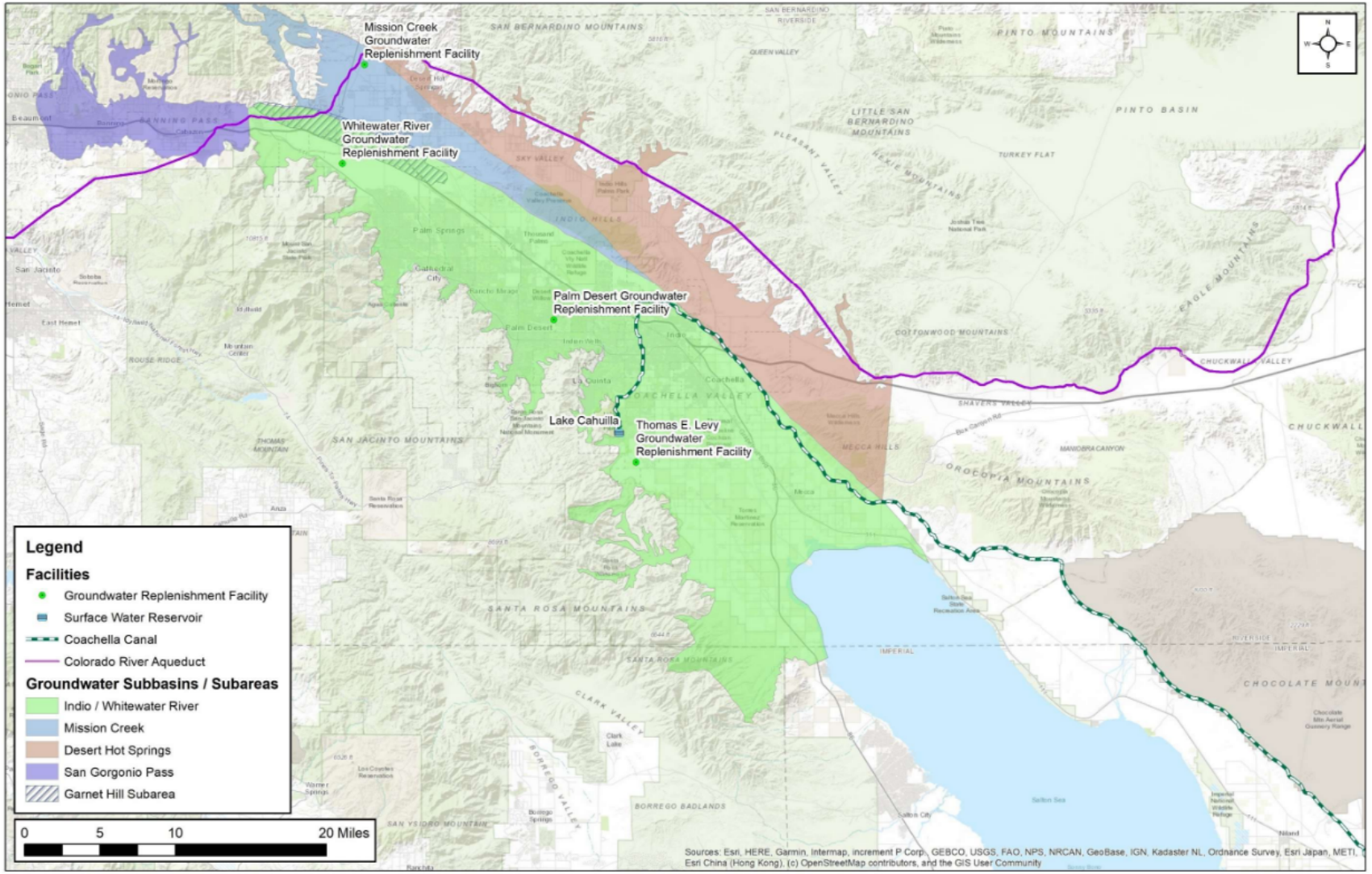
Source: 2020 Urban Water Management Plan Final Report, prepared for CVWD.

Figure 3: Wastewater and Recycled Water Facilities



Source: 2020 Urban Water Management Plan Final Report, prepared for CVWD.

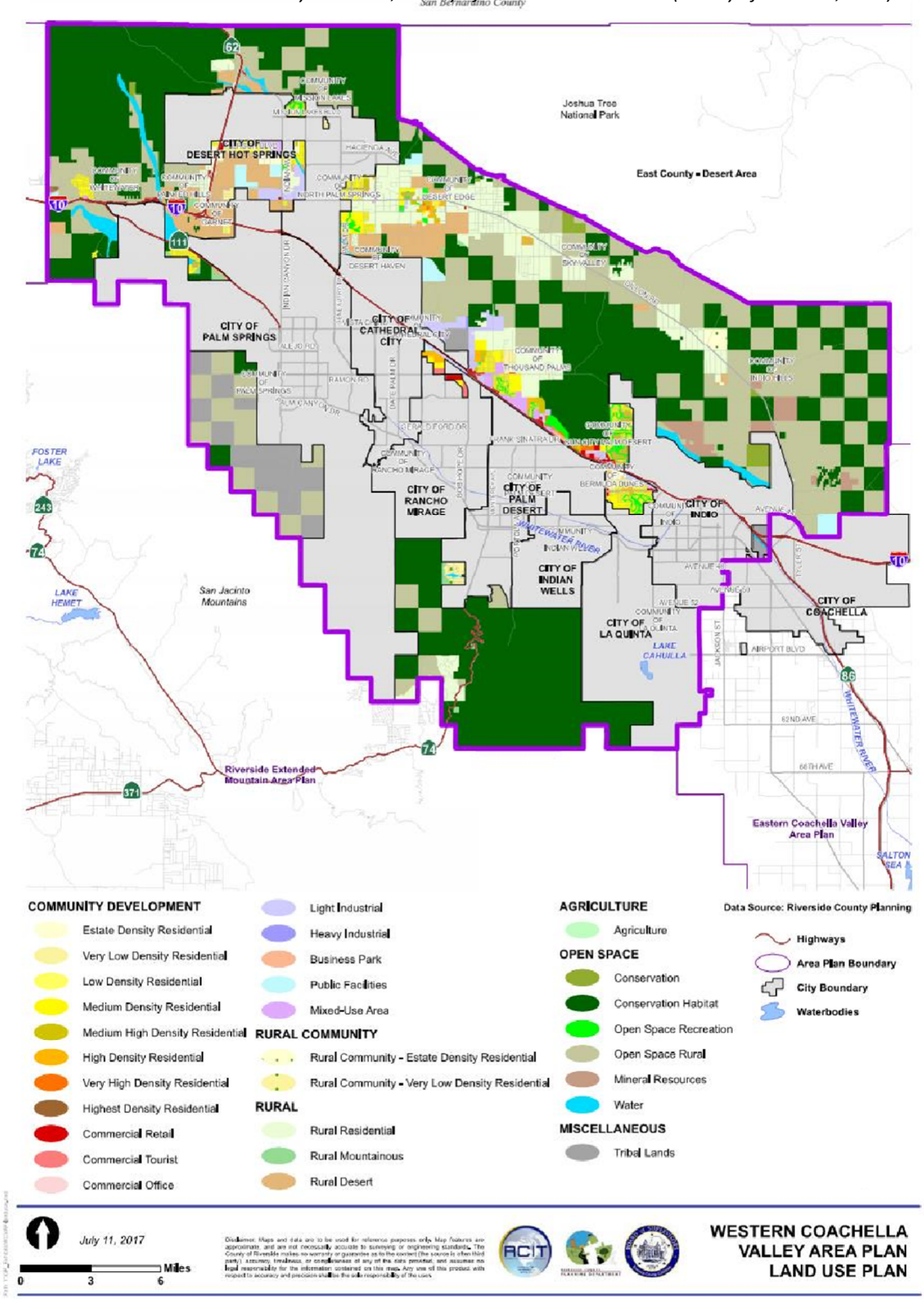
Figure 4: Coachella Valley Groundwater Subbasins and Groundwater Replenishment Facilities



Source: 2020 Urban Water Management Plan Final Report, prepared for CVWD.

Figure 5: Present/Projected Land Use

Source: Western Coachella Valley Area Plan, County of Riverside General Plan (County of Riverside, 2017)



B. Land Use

Coachella Valley is largely a residential and commercial land use with mix of rural, open space and recreation area (Riverside, 2017). See Figure 5 of this PR for present and projected land use in the Coachella Valley.

C. Population Projections

The 2020 RUWMP estimated service area population including seasonal residents within the CVWD service area. Table 2 shows population projections in five-year increments through 2045. Population in the CVWD service area is projected to grow by 114,348, or approximately 43%, in the next 25 years.

Table 2: CVWD Service Area Population Projections

Population Served	2020	2025	2030	2035	2040	2045
	268,952	292,077	315,202	338,274	360,813	383,300

Source: 2020 UWMP, Table 4-4

II. Wastewater Characteristics, Existing Facilities, and Current Water Quality

A. Water Resources

CVWD is not supplied by a wholesale supplier to meet its water demands, but does import water supplies from the Colorado River and is a State Water Project (SWP) contractor. Groundwater is the principal source of municipal water supply in the Coachella Valley. CVWD obtains groundwater from both Whitewater River Subbasin (also known as the Indio Subbasin) and the Mission Creek Subbasin. The Whitewater River Subbasin is a common groundwater source, which is shared by CVWD, Desert Water Agency (DWA), Myoma Dunes Mutual Water Company, the cities of Indio and Coachella, tribes, and numerous private groundwater producers.

In addition to groundwater, CVWD has imported water supplies from the SWP and the Colorado River, and recycled water from several water reclamation plants. There are no physical facilities to deliver SWP water to the Coachella Valley; CVWD's SWP water is exchanged with Metropolitan Water District of Southern California (MWD) for a like amount of Colorado River water. These imported and recycled water supplies are used to meet CVWD's non-urban water demands or to replenish the groundwater basin.

The rates for domestic water service are shown in Figure 6:

Figure 6: Domestic Water Service Rates

Volumetric/Consumptive Tiered Rates		
Tiers	**Water use**	**Rate**
Tier 1: Excellent [1]	Up to 8 ccf	$0.94
Tier 2: Efficient	Up to 100% of water budget	$1.17
Tier 3: Inefficient	100% up to 175% of water budget	$3.59
Tier 4: Excessive	175% up to 300% of water budget	$4.21
Tier 5: Wasteful	300% or more of water budget	$6.44

[1] Tier 1 is designed to meet indoor water needs of residential customers. Billing for non-residential customers, including commercial businesses and those with dedicated landscape irrigation meters, start with Tier 2.

Fixed Rates					
Meter Size	**Single Family**	**Multi-Family**	**Commercial**	**Landscape Irrigation**	**Outside Customer Surcharge**
¾" [2]	$12.65	$12.78	$12.71	$16.15	$3.40
1"	$15.15	$15.37	$15.25	$20.98	$5.68
1 ½"	$21.40	$21.83	$21.60	$33.07	$11.22
2"	$28.90	$29.59	$29.22	$47.57	$18.12
3"	$46.40	$47.70	$47.00	$81.40	$33.99
4"	$71.40	$73.57	$72.40	$129.73	$56.67
Larger than 4"	Contact CVWD for current fees.				

Private Fire Protection	
Lateral Size	**Rates**
2"	$2.44
3"	$6.91
4"	$14.23
6"	$40.65
8"	$86.99
10"	$156.09
12"	$252.01

[2] The majority of single-family homes use a ¾" meter.

Source: CVWD Domestic Water Rates effective July 1, 2020

The discharge of treated wastewater is within the Coachella Hydrologic Subunit, and the Water Quality Control Plan for the Colorado River Basin Region (Basin Plan) (RWQCB, 2018) designated beneficial uses for groundwater include:

- Municipal supply (MUN),
- Industrial supply (IND), and
- Agricultural supply (AGR).

In 2020, CVWD's domestic water system provided 99,842 AFY to 268,952 residents. This also represents the highest demand since 2016. For urban water supplies, groundwater is limited by the total production capacity of CVWD's groundwater wells. The vast storage capacity of the Whitewater River Subbasin (about 28.8 million AF) would be more than adequate to meet the projected groundwater extraction needs of CVWD, DWA and the private pumpers. Without replenishment, the decline in storage would be less than 0.5 percent of the basin storage each year.

Wells approximately 1,200 feet deep reach the highest quality water within the aquifer. The pressurized pipeline distribution system has 30 pressure zones and consists of approximately 96 deep wells, over 2,000 miles of pipe, and 135 million gallons of storage in 61 enclosed reservoirs. The bulk of pipelines installed and acquired by CVWD were installed in the 1970s to present. CVWD, on an as needed basis, performs monitoring and repair of water leaks and breaks. CVWD's goal is to maintain the system to keep the water loss around its existing level and prevent it from exceeding the threshold level of 10 percent.

In addition to urban water, CVWD operates several separate non-potable water systems that do not serve urban water customers. CVWD's irrigation system provided approximately 326,000 AFY in 2021 of Colorado River water to over 1,100 customers covering 76,354 acres via the 123-mile, concrete-lined, Coachella Branch of the All American Canal (i.e., the Coachella Canal), as well as for groundwater replenishment. The Coachella Canal water distribution system was constructed to deliver Colorado River water for agricultural uses in the East Valley. The irrigation distribution system consists of 485 miles of buried pipe, 19 pumping plants, and 1,300 acre-feet (AF) of storage. The use of Canal water for potable uses would require treatment to meet drinking water regulations.

In 2009, CVWD completed Phase I of the Mid-Valley Pipeline Project, a $75 million non-potable pipeline distribution system that expanded its existing recycled water distribution system to serve approximately 50 golf courses that were using groundwater for irrigation purposes. The Mid-Valley Pipeline delivers Coachella Canal water to the expanded recycled water system as a secondary source of supply to be blended with recycled water when demand seasonally exceeds WRP 10 tertiary treatment capacities.

CVWD recognizes the need to obtain additional water supplies to meet projected water demands and help eliminate groundwater overdraft, as indicated in Table 3.

Table 3: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with Other Suppliers	Agency Name	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier (AFY)
Lake Perris Dam Seepage Recovery Project	Yes	MWD	2023	Normal	2,425
Sites Reservoir Project	Yes	Sites Project Authority	2035	Normal	10,000

Source: 2020 UWMP, Table 4-20.

In 2014, the California Legislature enacted the Sustainable Groundwater Management Act (SGMA) to provide a framework for sustainable groundwater management. To implement SGMA in the Indio Subbasin, four local water agencies formed Groundwater Sustainability Agencies (GSAs): CVWD, Coachella Water Authority (CWA), Desert Water Agency (DWA), and Indio Water Authority (IWA). In 2016, the Indio Subbasin GSAs entered into a Memorandum of Understanding for collaborative management of the Indio Subbasin under SGMA.

CVWD has the legal authority to manage the groundwater within its service area under special provisions of the County Water District Law (California Water Code, Division 12, Sections 31630-31639). CVWD has specific authority under Part 6, Chapter 7 to levy and collect water replenishment assessments within defined areas of benefit (AOBs) for the purpose of replenishing groundwater supplies within CVWD. CVWD and DWA first executed the Water Management Agreement in 1976, which was amended in 1992 to jointly manage the West Whitewater River Subbasin Management Area. This agreement formalized the water replenishment program and provided a mechanism for distributing the costs of SWP water between the CVWD and DWA benefit areas based on total production within each agency's service area. A similar agreement was implemented in 2002 for the Mission Creek subbasin. Both agreements were updated in 2014.

In 1973, CVWD and DWA began replenishing groundwater within the West Whitewater River Subbasin Management Area of the Coachella Valley Groundwater Basin by importing Colorado River water exchanged for SWP water allocations.

Since 1997, CVWD has been replenishing groundwater with Colorado River water in the East Whitewater River Subbasin Area of Benefit, commencing with a pilot program at the Thomas E. Levy Groundwater Replenishment Facility. CVWD also operated the Martinez Canyon pilot project in the East Whitewater River Subbasin from 2005 to 2013. In 2002, CVWD and DWA expanded the groundwater replenishment program into the Mission Creek Subbasin.

Groundwater replenishment is essential in the Coachella Valley Groundwater Basin. If groundwater replenishment with imported water is eliminated, groundwater overdraft will result. Increased overdraft results in declining water levels, increased pump lifts, and increased energy consumption to pump groundwater for irrigation and domestic use, among other issues.

The historical overdraft in the Coachella Valley had caused groundwater levels to decline in many portions of the East Valley from La Quinta to the Salton Sea and raised concerns about water quality degradation and land subsidence. Groundwater levels in the West Valley from Palm Springs to La Quinta had also decreased substantially, except in areas adjacent to and down-gradient of the Whitewater River Recharge Facility, where artificial recharge has successfully raised water levels. The Coachella Valley Groundwater Basin is presently not in overdraft due to active management of the Basin through Coachella Valley Water Management Plan programs like the Groundwater Replenishment Program (GRP) and non-potable supply to golf courses on private groundwater wells. Further expansion of CVWD's NPW program and converting more users from groundwater irrigation to NPW will add to active management of groundwater basins and further mitigate overdraft concerns.

Colorado River water is a source of drinking water for more than 30 million people. It is high quality and requires no treatment before it percolates into the aquifer through a natural filtration process. Groundwater quality in the Coachella Valley varies depending on a variety of factors including depth, proximity to recharge basins and faults, presence of surface water contaminants, and other hydrogeologic or human factors. CVWD conducts water quality monitoring in accordance with federal and state drinking water requirements and analyzes water samples for more than 100 regulated and unregulated substances. CVWD's drinking water supplied from groundwater wells complies with all state and federal drinking water quality standards, as seen in Table 4 below. A summary of domestic well water (groundwater) quality is provided in Table 4.

Table 4: CVWD 2022 Domestic Water Quality Summary

CVWD 2022 Domestic Water Quality Summary

(Covering the reporting period January - December 2021)

DETECTED PARAMETER, UNITS	PHG or (MCLG)	MCL[1]	COVE COMMUNITIES[2] RANGE (AVERAGE)	ID NO. 8[3] RANGE (AVERAGE)	MCL VIOLATION? (YES/NO)	MAJOR SOURCE(S)
Arsenic, µg/L	0.004	10	ND-8.0 (ND)		No	Erosion of natural deposits
Barium, mg/L	2	1	ND-0.1 (ND)		No	Erosion of natural deposits
Chloride, mg/L	N/A	500;600[1,4]	6.6-250 (23)	11-27 (15)	No	Leaching from natural deposits
Chlorine (as Cl_2), mg/L[5]	MRDLG=4	MRDL=4.0	ND-2.7 (0.55)	ND-1.4 (0.83)	No	Result of drinking water chlorination
Chromium, µg/L	(100)	50	ND-24 (ND)	13-23 (17)	No	Erosion of natural deposits
Chromium-6, µg/L[7]	0.02	N/A	ND-22 (8.5)	14-23 (18)	No	Erosion of natural deposits
Copper, mg/L[8] [homes tested/sites exceeding AL]	0.3	AL=1.3	0.11 [55/0]	0.14 [21/0]	No	Internal corrosion of household plumbing
Dibromochloropropane (DBCP), ng/L	3	200	ND-50 (ND)		No	Leaching of banned nematocide which may still be present in soils
Fluoride, mg/L	1	2.0	ND-1.0 (0.6)	0.4-0.6 (0.5)	No	Erosion of natural deposits
Gross Alpha Particle Activity (excluding Uranium), pCi/L	(0)	15	ND-6.8 (ND)	ND-4.6 (ND)	No	Erosion of natural deposits
Haloacetic Acids (HAA5), µg/L[6,9]	N/A	60		ND-2.5 (2.5)	No	By-product of drinking water chlorination
Hardness (as $CaCO_3$), mg/L	N/A		7.6-320 (120)	72-220 (140)	No	Erosion of natural deposits
Nitrate (as Nitrogen), mg/L	10	10	ND-9.0 (1.4)	0.4-1.4 (0.8)	No	Leaching of fertilizer, animal wastes or natural deposits
Odor as threshold, units	N/A	3[1]	ND-2 (ND)		No	Naturally occurring organic materials
pH, units	N/A		7.5-9.1 (8.1)	7.7-8.1 (8.0)	No	Physical characteristic
Radium 228, pCi/L	0.019	5		ND-1.2 (ND)	No	Erosion of natural deposits
Selenium, µg/L	30	50	ND-5.1 (ND)		No	Erosion of natural deposits
Sodium, mg/L	N/A		18-160 (32)	54-84 (69)	No	Erosion of natural deposits
Specific Conductance, µS/cm	N/A	1,600;2,200[1,4]	240-1,400 (410)	530-870 (640)	No	Substances that form ions when in water
Sulfate, mg/L	N/A	500;600[1,4]	ND-260 (52)	140-250 (180)	No	Leaching from natural deposits
Total Coliform Bacteria, positive samples/month	(0)	5% or 1[10, 11]	ND-0.7% (ND)		No	Naturally present in the environment
Total Dissolved Solids, mg/L	N/A	1,000;1,500[1,4]	130-810 (250)	340-570 (420)	No	Leaching from natural deposits
Total Trihalomethanes, µg/L[9]	N/A	80	ND-14 (13)	1.1-20 (20)	No	By-product of drinking water chlorination
Turbidity, NTU	N/A	5[1]	ND-1.8 (ND)	ND-0.1 (ND)	No	Leaching from natural deposits
Uranium, pCi/L	0.43	20	ND-13 (4.8)	N/A (6.1)	No	Erosion of natural deposits
Zinc, mg/L	N/A	5.0[1]	ND-0.4 (ND)		No	Leaching from natural deposits
2020 UNREGULATED CONTAMINANT MONITORING[12]						
Bromide, µg/L[13]		N/A	25-160 (58)		No	Erosion of natural deposits
Germanium, µg/L[13]		N/A	ND-0.35 (ND)		No	Erosion of natural deposits
Haloacetic Acids (HAA6Br), µg/L[13, 14]		N/A	ND-9.4 (1.7)		No	By-product of drinking water chlorination
Haloacetic Acids (HAA9), µg/L[13, 15]		N/A	ND-18 (2.9)		No	By-product of drinking water chlorination
Manganese, µg/L	N/A	50[1]	ND-1.6 (ND)		No	Erosion of natural deposits

FOOTNOTES:

(1) Values with this footnote have fixed Secondary MCLs, remaining values are Primary MCLs unless identified otherwise.

(2) Cove Communities includes the communities of Rancho Mirage, Thousand Palms, Palm Desert, Indian Wells, La Quinta, Mecca, Bombay Beach, North Shore, Hot Mineral Spa; and portions of Bermuda Dunes, Cathedral City, Indio, Oasis, Riverside County, Thermal, Valerie Jean, Desert Shores, Salton Sea Beach and Salton City.

(3) ID No. 8 includes the communities of Indio Hills, Sky Valley, and select areas within and adjacent to Desert Hot Springs.

(4) This constituent is monitored for aesthetics such as taste and odor. A fixed consumer acceptance contaminant level has not been established for this constituent.

(5) The reported average represents the highest running annual average based on distribution monitoring.

(6) Results from 2020 unregulated contaminant monitoring rule (UCMR4) testing for five Haloacetic Acids (HAA5) are included in Cove Community data. CVWD performed this monitoring at select CVWD domestic facilities in Cove Communities.

(7) California's Chromium-6 drinking water MCL became effective on July 1, 2014. The Cr6 MCL was invalidated and withdrawn in 2017.

(8) The reported values are 90th percentile levels for samples collected from faucets in water user homes.

(9) The reported average represents the highest locational running annual average (LRAA) based on distribution system monitoring.

(10) Systems that collect 40 or more samples per month (Cove Communities): 5.0% of monthly samples are positive. Systems that collect less than 40 samples per month (ID No. 8): 1 positive monthly sample.

(11) All water systems are required to comply with the California Total Coliform Rule and the Federal Revised Total Coliform Rule. The USEPA anticipates greater public health protection as the new rule requires water systems that are vulnerable to microbial contamination to identify and fix problems.

(12) In 2020, USEPA required unregulated contaminant monitoring (identified as UCMR4) for select CVWD domestic facilities in Cove Communities.

(13) Unregulated contaminants are those for which USEPA and DDW have not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist both regulatory agencies in determining the occurrence of unregulated contaminants in drinking water and whether further regulation is warranted.

(14) Results from 2020 unregulated contaminant monitoring rule (UCMR4) testing for six Haloacetic Acids (HAA8r6). CVWD performed this monitoring at select CVWD domestic facilities in Cove Communities.

(15) Results from 2020 unregulated contaminant monitoring rule (UCMR4) testing for nine Haloacetic Acids (HAA9). CVWD performed this monitoring at select CVWD domestic facilities in Cove Communities.

MORE INFORMATION:

To receive a summary of CVWD's source water assessments or additional water quality data or clarification, call CVWD's Water Quality Division at (760) 398-2651.

Complete copies of source water assessments may be viewed at CVWD's office at 75-525 Hovley Lane East, Palm Desert, CA 92211.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien. También puede llamar al CVWD al número de teléfono (760) 398-2651 ó vaya a **cvwd.org/CCR/Spanish2022.**

Note: Above statement fulfills California Code of Regulations' requirement insection 64481(j).

Source: CVWD 2021-2022 Annual Review

Projected water use is shown in Table 5.

Table 5: Projected CVWD Retail Demands for Water (AFY)

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family		60,142	63,824	67,331	69,816	71,695
Multi-Family		6,873	7,245	7,742	8,267	9,045
CII		7,060	7,244	7,438	7,709	7,985
Landscape		34,193	36,205	38,226	39,865	41,516
Other		1,457	1,563	1,670	1,755	1,840
Losses		13,736	14,501	15,222	15,670	16,085
	Total	123,461	130,582	137,629	143,082	148,166
Note: Projections based on demand projections in draft Alternative Plan Updates for Indio Subbasin and Mission Creek Subbasin. The projected demand increase from 2020 to 2025 reflects planned expansion of the service area to include areas not current connected to the CVWD system. The timing of this expansion will depend on the availability of grant funding.						

Source: 2020 UWMP, Table 4-8.

Groundwater is the principal source of municipal water supply in the Coachella Valley. CVWD obtains groundwater from both Whitewater River and the Mission Creek subbasins. CVWD's non-urban, non-potable water supplies are comprised of recycled water and imported Colorado River water.

B. Description of Entities Contributing to Existing Facilities

. CVWD has imported water supplies from the Colorado River and is a State Water Project (SWP) contractor. CVWD is not supplied by a wholesale supplier to meet its water demands

C. Wastewater Characteristics and Facilities

Sewer service providers in the Coachella Valley area, as shown in Figure 3, include Valley Sanitary District, Coachella Sanitary District, the City of Palm Springs and Mission Springs Water District.

CVWD operates five water reclamation plants (WRPs), two of which (WRP-7 and WRP-10) generate recycled water for irrigation of golf courses and large landscaped areas. WRP 1 and WRP 2 serve isolated communities near the Salton Sea. WRP-4 currently does not produce recycled water, however CVWD has plans to construct a tertiary treatment system with 1 MGD capacity by 2030. A sixth WRP (WRP-9) was decommissioned in July 2015.

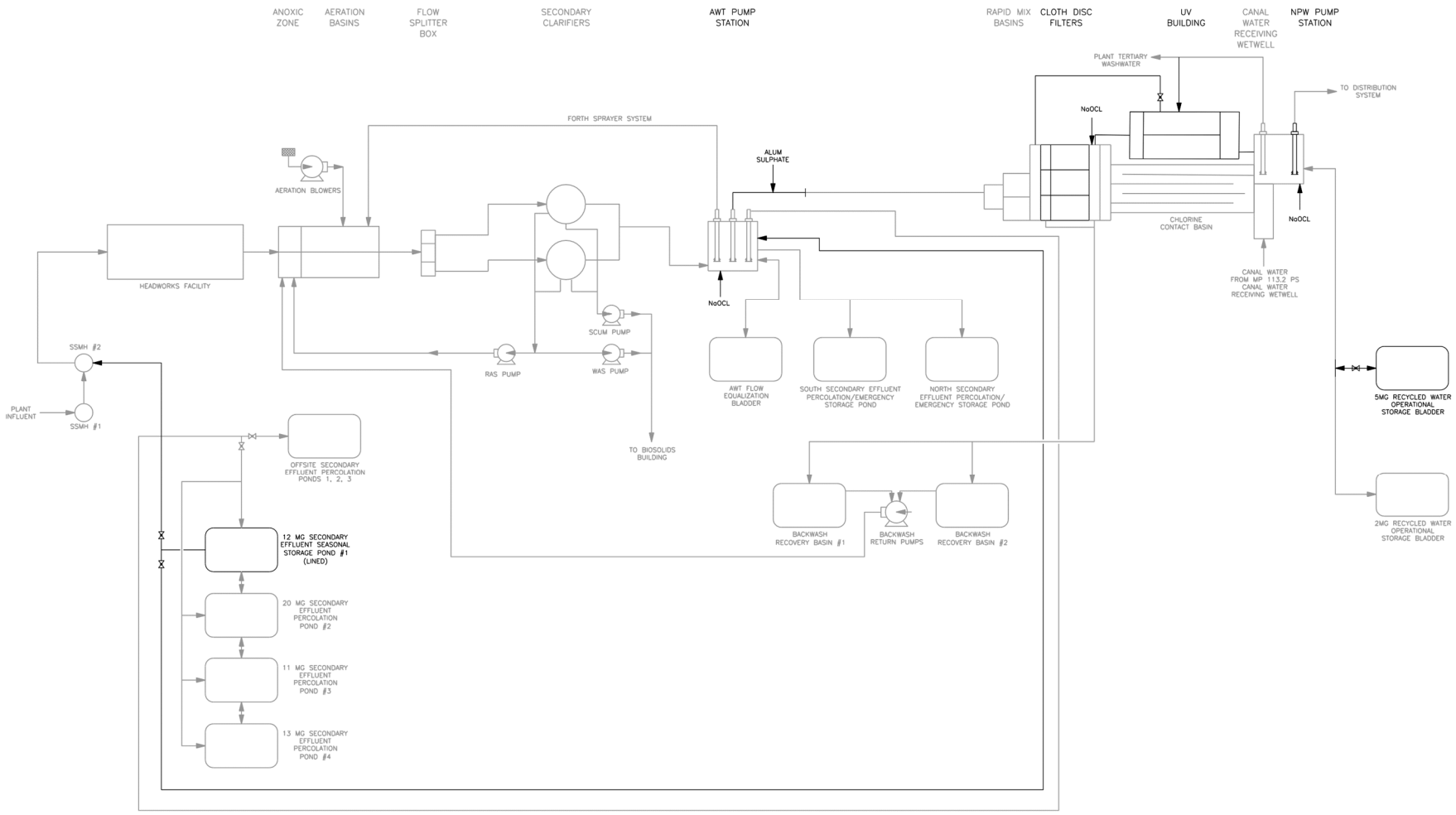
CVWD owns and operates a wastewater collection, treatment, and disposal system that provide sewerage service to a portion of the City of Indio and unincorporated areas of Riverside County, known as Water Reclamation Plant No. 7 (WRP 7 or Facility).

The wastewater treatment plant for the Facility is located at 80-609 Avenue 38 in Indio. The Facility was most recently regulated by Waste Discharge Requirements (WDRs) in Order R7-2022-0009, which was adopted by the Regional Water Board on February 8, 2022.

D. Wastewater Treatment Process Schematics

The wastewater treatment process schematic for WRP-7 is shown in Figure 7 below.

Figure 7: WRP-7 Schematic



E. Water Quality of Effluent

WRP-7 produces disinfected tertiary recycled water in accordance with Title 22 of California's Water Recycling Criteria.

III. Treatment Objectives for Discharge or Reuse

A. Project Objectives

Existing and future customers who would benefit from NPW deliveries from WRP 7 are shown on Figure 8. A range of different customers have been identified, including agriculture customers, golf courses, neighborhoods, and schools. The main objective of producing recycled water at WRP 7 for NPW irrigation is to offset current groundwater and canal water use.

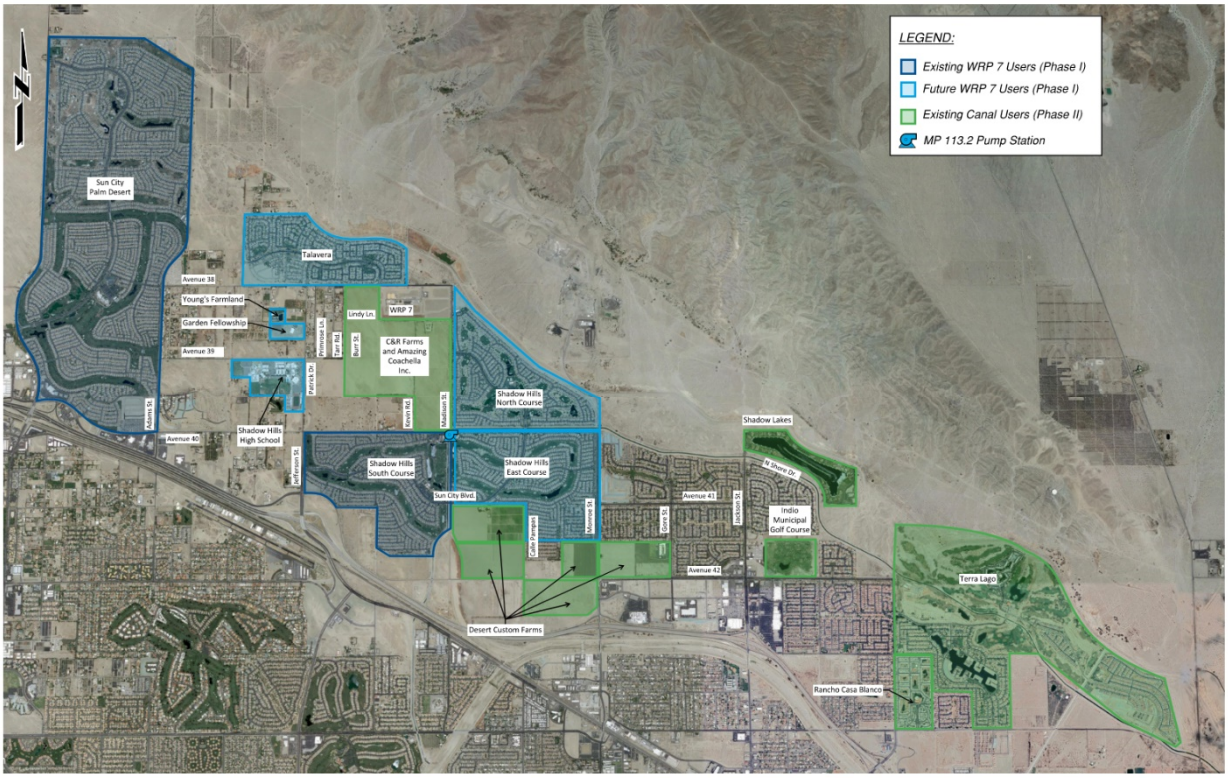
Customer Identification utilized CVWD historical meter delivery information, CVWD irrigation system GIS data, and institutional knowledge of the target area. Meter delivery information was matched with GIS meter numbers to connect customer names with meter usage.

The following key customer information includes:

- Customer Name
- Location
- Delivery Point Number (Sequentially assigned)
- Associated Meter Numbers (Note new meter number will be assigned for NPW Meters)
- Facility Type

Phase I and II customers were determined as part of the draft CVWD NPW Master Plan.

Figure 8: Existing and Future WRP 7 Customers



Customers identified in the Phase I area are summarized in Table 6 below. Six customers were identified as part of the Phase I expansion with a total of nine delivery points – three existing and six future.

Table 6: Phase I Customer Summary – Existing and Future WRP 7 Users

NAME	TYPE	LOCATION	DELIVERY POINT NO.	FACILITY TYPE
Sun City Palm Desert – Lake	Existing	Avenue 38 and Adam Street	1	Golf Course & Neighborhood
Sun City Palm Desert – Pond	Existing	Avenue 38 and Adam Street	2	Golf Course & Neighborhood
Shadow Hills South Course	Existing	Avenue 40 and Madison Street	3	Golf Course & Neighborhood
Talavera	Future	Avenue 38 and Goodman Road	4	Neighborhood
Young's Farmland	Future	Southwest of Avenue 38 and Jefferson St	5	Agricultural

NAME	TYPE	LOCATION	DELIVERY POINT NO.	FACILITY TYPE
Garden Fellowship	Future	Southwest of Avenue 38 and Jefferson St	6	Agricultural
Shadow Hills High School	Future	Avenue 39 and Jefferson Street	7	School
Shadow Hills North Course	Future	Avenue 40 and Madison Street	8	Golf Course & Neighborhood
Shadow Hills East Course	Future	Avenue 40 and Monroe Street	9	Golf Course & Neighborhood

Customers identified in the Phase II area are summarized in Table 7 below. Six customers were identified as part of the Phase II expansion with a total of nine delivery points.

Table 7: Phase II Customer Summary – Existing Canal Users for Potential WRP 7 NPW Conversion

Name	Location	Delivery Point No.	Facility Type
C&R Farms and Amazing Coachella Inc.	Lindy Lane and Madison Street	10	Agricultural
Shadow Lakes	Jackson Street and North Shore Drive	11	Neighborhood
Desert Custom Farms	Sun City Boulevard and Madison Street	12	Agricultural
Desert Custom Farms	Sun City Boulevard and Calle Pampas	13	Agricultural
Desert Custom Farms	Avenue 42 and Monroe Street	14	Agricultural
Desert Custom Farms	Avenue 42 and Monroe Street	15	Agricultural
Indio Municipal Golf Course	East of Avenue 42 and Jackson Street	16	Golf Course
Terra Lago	East of Avenue 44 and Golf Center Pkway	17	Golf Course & Neighborhood
Rancho Casa Blanca	East of Avenue 44 and Golf Center Pkway	18	Golf Course & Neighborhood

Note: Desert Custom Farms Meter 1327 was not included in Table 7 because historic meter data showed no use at this location.

B. Performance Characteristics and On-Site Requirements

The NPW Pump station has a total of five pump bays. Bays #1 and #2 each house a 4,600 gpm (6.6 MGD) pump, Bay #3 houses a 50 gpm jockey pump, and Bays #4 and #5 are reserved for Phase I and II expansions. The existing NPW Pumps are shown on Figure 9.

Figure 9: Existing NPW Pump Station

Design criteria for the existing NPW Pump Station is shown in Table 8. This information was taken from the design criteria included in the Water Reclamation Plant No. 7 Phase 2 Expansion (Specification No. 93-28) Record Drawings and information obtained from Pentair based on pump serial numbers.

Table 8: NPW Pump Station Existing Facilities

Parameter	Value (Main Pumps)	Value (Jockey Pump)
Total Installed Capacity	13.2 MGD (9,200 gpm)	50 gpm
Rated Capacity	6.6 MGD (4,600 gpm)	50 gpm
Rated Head	130 ft	130 ft
Installation Date	1997	1997
Number of Pumps	2 (1 duty, 1 standby)	1
Pump Type	Vertical Turbine	Vertical Turbine
Drive Type	VFD	Unknown
Motor Size	200 hp	5 hp
Max Motor Speed	1,180 rpm	1,800 rpm
Pump Discharge Header	16-inch	8-inch
Flow Meter	10-inch	

Based on customer estimated demands summarized in Table 9, the NPW pump station should be designed, at a minimum, to achieve the capacities shown in Table 9 to meet customer demands.

Table 9: NPW Pump Station Design Capacity Minimums

Phase	GPM	MGD
Phase I	5,235	7.5
Phase I & II	9,366	13.5

The NPW pump station will need at least 5,235 gpm design capacity for Phase I and 9,366 gpm design capacity for Phase II. See Table 10 for a summary of recommended improvements at the NPW pump station. See Figure 10 for the NPW pump station rendering.

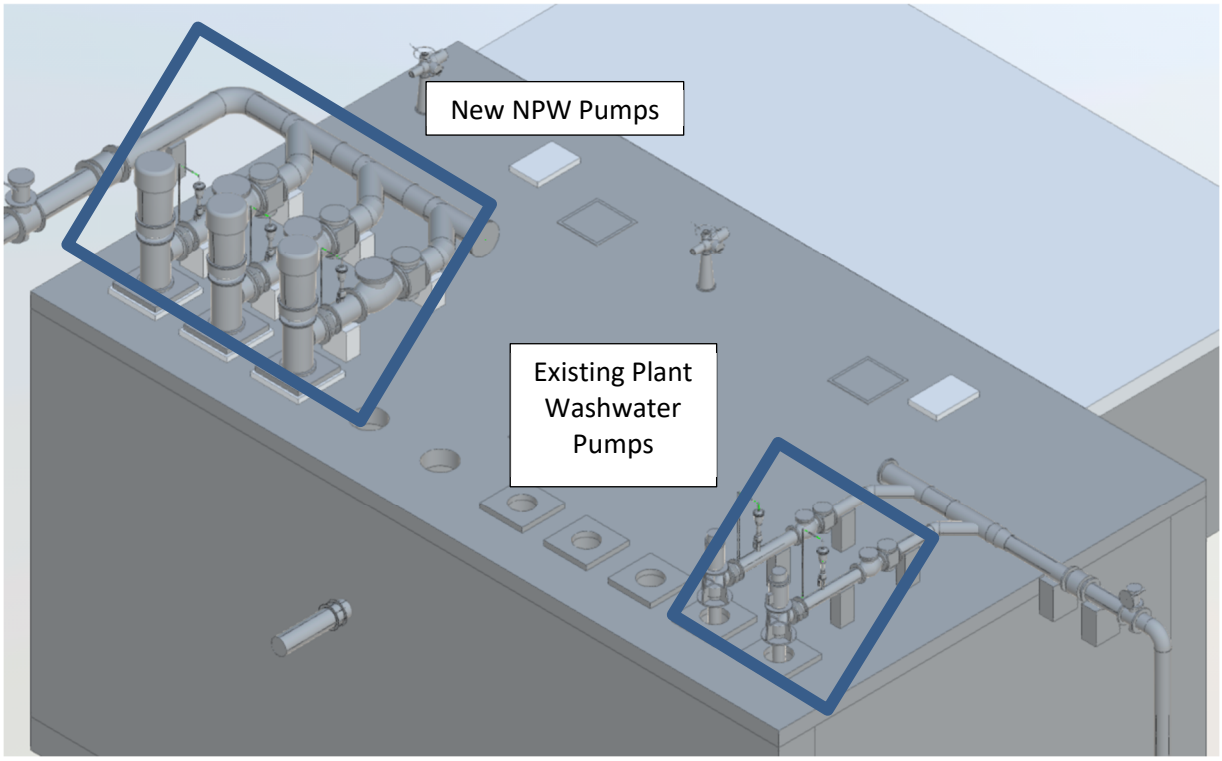
Keeping the size of the pumps consistent will permit operations to rotate lead+lag assignments on the pumps to lengthen their lifespan and minimize the variety of spare parts needed for the pump station. The NPW pump station was constructed in 1994 and was placed into service in 1997. The existing pumps have been in operation for 25 years which is past the typical 20-year life for pumps of similar type and size. CVWD's asset management data indicates the pumps have less than two years of remaining life, therefore it is recommended the existing pumps #1 and #2 and their VFDs be replaced as part of this project.

In an interest of fiscal consideration and O&M simplification, the recommended improvements are to remove the two existing main pumps and jockey pump from service and install three (3) new 5,200 gpm pumps in Bays #1, #2, & #3. Additional capacity is included as contingency and buffer to prevent the pump station operating at 100% capacity during peak flow in summer months.

Table 10: NPW Pump Station Design Options

Parameter	Phase I	Phase I & II
Recommended Modification	Install three (3) 5,200 gpm pumps	No required modification based on capacity
Pump Station Rated Design Capacity	10,400 gpm (15.0 MGD)	10,400 gpm (15.0 MGD)
Pump Station Total Installed Capacity	15,600 gpm (22.5 MGD)	15,600 gpm (22.5 MGD)
Minimum Rated Design Capacity	5,235 gpm (7.5 MGD)	9,366 gpm (13.5 MGD)

Figure 10: NPW Pump Station Rendering



The MP 113.2 Pump Station has a total of three existing pumps which includes two 2,800 gpm (4 MGD) pumps and a 50 gpm jockey pump, within a 10-foot internal diameter (ID) circular wet well. Record drawings indicate space for a future pump which appears to have the same footprint as the existing 2,800 gpm pumps. There is an existing turnout structure with traveling screen and 30-inch sluice gate located in the Coachella Canal which conveys water to the MP 113.2 wet well via a 30-inch RCP. There is an existing pump and wet well located adjacent to the MP 113.2 wet well within the property boundary. It is assumed that this pump station will not be modified as a part of this project.

Figure 11: Existing MP 113.2 Pump Station (Left) and Pump Station at Gate MP 113.2 (Right)

Design criteria for the existing MP 113.2 Pump Station are shown in Table Table 11. This information was taken from Del Webb's Sun City Palm Springs Irrigation Pump Station 113.2 and Canal Turnout Record Drawings.

Table 11: MP 113.2 Pump Station Existing Infrastructure

Parameter	Turbine Pumps	Jockey Pump
Total Installed Capacity	5,600 gpm (8.0 MGD)	50 gpm
Rated Capacity	2,800 gpm (4.0 MGD)	50 gpm
Rated Head	128 ft	123 ft
Installation Date	1993	1993
Number of Pumps	2 (1 duty, 1 standby)	1
Pump Type	Vertical Turbine	Vertical Turbine
Drive Type	VFD	Across the Line
Motor Size	150 hp	3 hp
Max Motor Speed	1,175 rpm	1,800 rpm
Number of Stages	3	7
Suction Piping	30-inch	
Discharge Piping	12-inch	6-inch
Wet well	10-foot ID Circular Concrete Wet well	
MP 113.2 Discharge Pipeline	18-inch	

Estimated WRP 7 plant influent was determined as part of CVWD's Sanitation Master Plan. With this project, WRP 7 will recycle 100% of plant influent therefore plant influent will be approximately equal to tertiary effluent. CVWD plans to have Phase I and II pipeline expansion projects complete by 2030. Table 12 shows the 2030 WRP 7 Tertiary Effluent Supply flows based on the Sanitation Master Plan plant influent data for 2030.

Table 12: WRP 7 Tertiary Effluent Supply

Design Condition	GPM	MGD
Minimum Day	2361	3.4
Average Day	2917	4.2
Maximum Month Average Day	3333	4.8
Maximum Day	3611	5.2

Historical flow data for WRP 7 shows that low flow periods occur during summer months. As part of the subsequent capacity analysis, calculations will be based on the minimum day flow of 2361 gpm (3.4 MGD).

To fill the deficit between the tertiary effluent supply and customer demand, canal water will continue to be pumped to WRP 7 to blend with tertiary effluent and provide adequate supply to meet those customer demands. Table 13 calculates the design capacity for MP113.2 based on the difference between Customer Demand and Tertiary Supply. The analysis assumes the same tertiary supply for both Phase I and II.

Table 13: NPW Pump Station Design Capacity Minimums (GPM)

PHASE	PHASE I	PHASE I & II
Customer Demand (-)	5235	9366
Tertiary Supply (+)	2361	2361
MP113.2 Supply (+)	**2874**	**7005**

Based on customer estimated demands summarized in Table 22 and estimated tertiary supply summarized in Table 12, the MP113.2 pump station should be designed, at a minimum, to achieve the capacities shown in Table 14 to meet customer demands.

For Phase I, customer demands will require a maximum of 2874 gpm (4.1 MGD) of supplemental canal water. The existing MP 113.2 Pump Station currently has a rated capacity of 4 MGD (2,800 gpm) which is not sufficient to meet Phase I demands.

During Phase II, customer demands will require up to 7005 gpm (10.1 MGD) of supplemental canal water. To achieve a desired 2+1 pump configuration for Phase II, MP 113.2 will require three (3) 3800 gpm (5.5 MGD) pumps. A summary of the recommended improvements are shown in Table 15. A 2+1 3800 pump configuration will provide operations staff with a greater range of flow capabilities to meet the variation in supplemental canal demand throughout the year.

In an interest of fiscal consideration and O&M simplification, the recommended improvements are to remove the jockey pump from service and replace the existing pumps with three (3) 3800 gpm (5.5 MGD) pumps. Installing three pumps of similar size will permit operations to rotate lead+lag assignments on the pumps to lengthen their lifespan and minimize the variety of spare parts needed for the pump station. Installing all three pumps today will allow CVWD to seamlessly expand to Phase II with no necessary improvements to MP 113.2. Additional capacity is included as contingency and buffer to prevent the pump station operating at 100% capacity during peak flow in summer months.

Table 15: MP 113.2 Pump Station Recommended Improvements

PARAMETER	PHASE I	PHASE II
Modification Required due to Capacity	Replace existing pumps with three (3) 3800 gpm (5.5 MGD) pumps	No required modification based on capacity
Pump Station Rated Design Capacity	7600 gpm (11 MGD)	7600 gpm (11 MGD)
Pump Station Total Installed Capacity	11400 gpm (16.5 MGD)	11400 gpm (16.5 MGD)
Minimum Rated Design Capacity	2874 gpm (4.1 MGD)	7004 gpm (10.1 MGD)

MP 113.2 pump station site rehabilitation will include all new mechanical, electrical, and I&C equipment. Facilities will be designed for ultimate Phase II capacity which includes:

- Pumps
- Motors
- Yard piping
- Motor Control Center (MCC)
- Variable Frequency Drives (VFD)
- HVAC units
- Surge Tank
- Flow Meter
- Isolation & Check Valves
- Air Vac
- Main Circuit Breaker
- Manual Transfer Switch (MTS)
- Programmable Logic Controller (PLC)
- Radio
- Pressure Sensor
- Level Monitoring System
- Shade Roof

It is recommended that the existing circular wet well undergo field evaluation to confirm existing structural condition, determine any required mitigation measures, as well as to determine if it is sufficient for the pump modifications required to meet Phase II demands.

Hydraulic modeling performed showed that the existing 18-inch canal water pipeline from MP 113.2 to WRP 7 is capable of conveying 6.9 MGD while accounting for CVWD's design criteria requirement of 7 ft of

head loss per 1000 feet of pipe (see Table 16 for CVWD design criteria). Details for the results of the hydraulic modeling performed on the 18-inch line can be found in Table 16. The existing 18-inch raw water line will continue to meet Phase I demands. The pipeline will need to be increased in size to 24" once the Phase II customers are connected to the NPW distribution system.

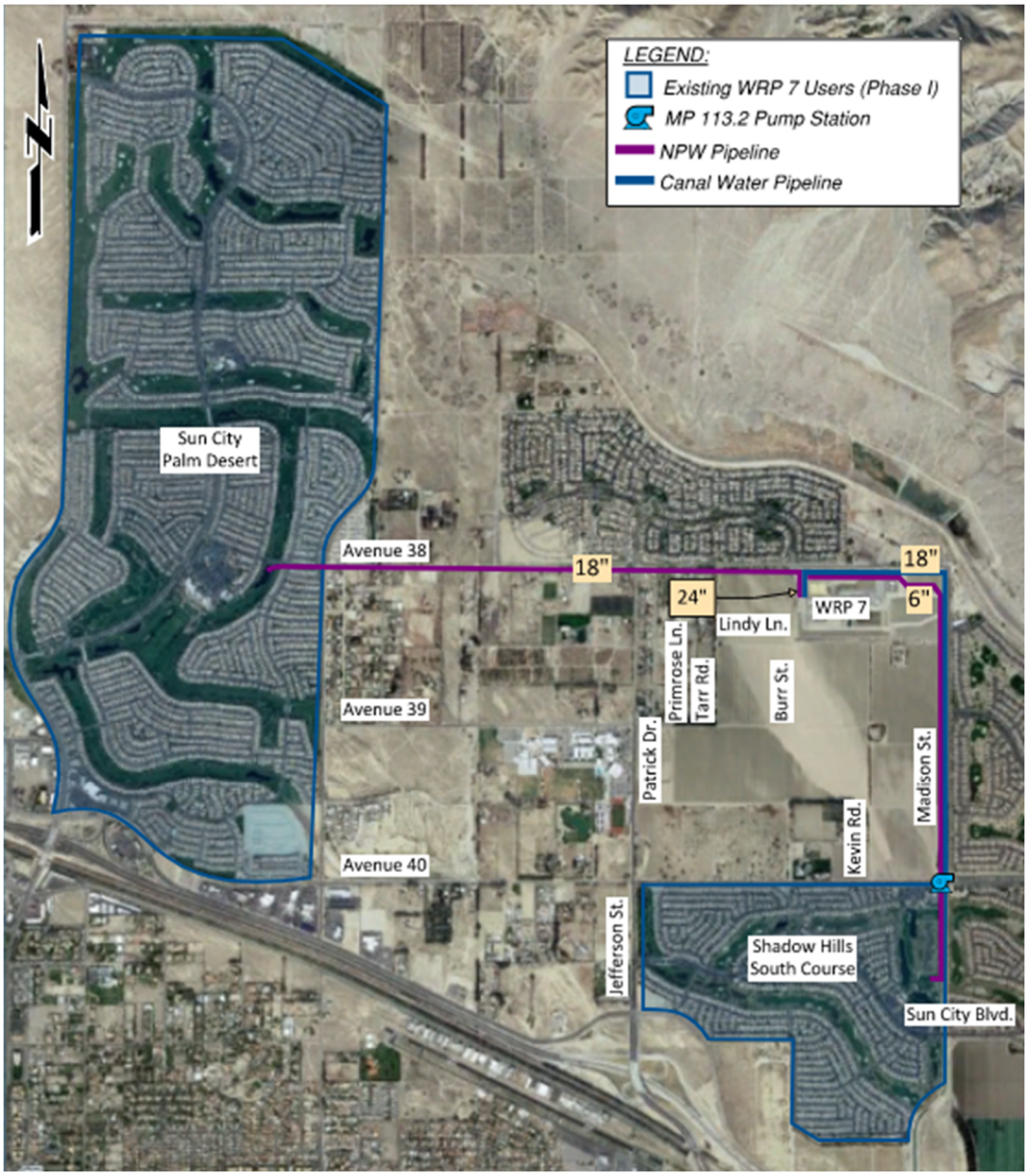
Table 16: Existing 18-inch Pipeline Design Criteria

CRITERIA	CVWD DESIGN CRITERIA	PHASE I	PHASE II
Distribution Pipe size	--	18-inch	24-inch
Maximum Flow (gpm)	--	2,874	7,005
Maximum Velocity (fps)	7.5	3.4	5.0
Maximum Head loss per 1000 feet (ft)	7	1.85	3.5
Pipeline Max Capacity	--	4800 gpm (6.9 MGD)	--

The existing NPW Distribution System includes two pipelines. An 18-inch PVC pipeline that begins at WRP 7 and heads west on Avenue 38 to Sun City Palm Desert and a 6-inch PVC pipeline that begins at WRP 7 and heads east on Avenue 38 then turns south on Madison Street to Shadow Hills South Course as shown on Figure 12.

There is an existing 18-inch pipeline that conveys water from the MP 113.2 Pump Station to the NPW Pump Station shown on Figure 12. The 18-inch pipeline conveys canal water into the Canal Water Wet well which is connected to the NPW Pump Station. There is a 24-inch line that conveys NPW to the 18-inch NPW pipeline that delivers water to Sun City Palm Desert as well as the 6-inch NPW pipeline that delivers water to Shadow Hills South Course.

Figure 12: Existing NPW Pipelines



Design criteria from the CVWD Development Design Manual along with the preliminary pipe alignment and customer historical demands were used to perform pipeline modeling to evaluate the existing NPW distribution system. Design criteria from Section 9.4 of the CVWD Development Design Manual are shown in Table 17.

Table 17: Pipe Design Criteria

DESIGN CRITERIA	STANDARD
Maximum Velocity	12 inch and smaller - 7.5 ft/sec
Maximum Head loss	18 inch and larger - 7 ft/1000 feet of pipeline

Design criteria per CVWD standards for domestic water pipeline for the NPW distribution system is presented in Table 18.

Table 18: NPW Distribution System Design Criteria

DESIGN CRITERIA	2 TO 16-INCH	18 TO 28-INCH
Material	PVC DR 25	DIP C151
Pressure	165 psi	250 psi
Pipeline Size	2 to 16-inch	18 to 28-inch
Max Velocity	7.5 ft/sec	N/A
Max Head loss per 1000’	7.0 ft	7.0 ft

Pipeline modeling was performed based on Customer Estimated Demands provided by CVWD. Each discharge point for customer delivery was assumed to be at grade with no residual pressure. Phase I will provide water to delivery points 1 through 9 and Phase II to delivery points 10 through 18. The pipeline model results for Phase I & II are shown in Table 19.

Table 19: Pipeline Model Results for WRP 7 Phase I & II

CRITERIA	MODEL RESULTS
Minimum Velocity (ft/s)	1.0
Average Velocity (ft/s)	3.1
Maximum Velocity (ft/s)	5.0
Maximum Head loss per 1000 ft of Pipe (ft)	5.0

The modeling results indicate that the existing 18-inch line (See Figure 12 & Figure 13) to Sun City Palm Desert is sufficient for Phase I and II and will not require upsizing. Two new branches off of the existing 18-inch pipe will be required, one 8-inch to service Talavera and one 12-inch to service Young’s Farmland, Garden Fellowship, and Shadow Hills High School.

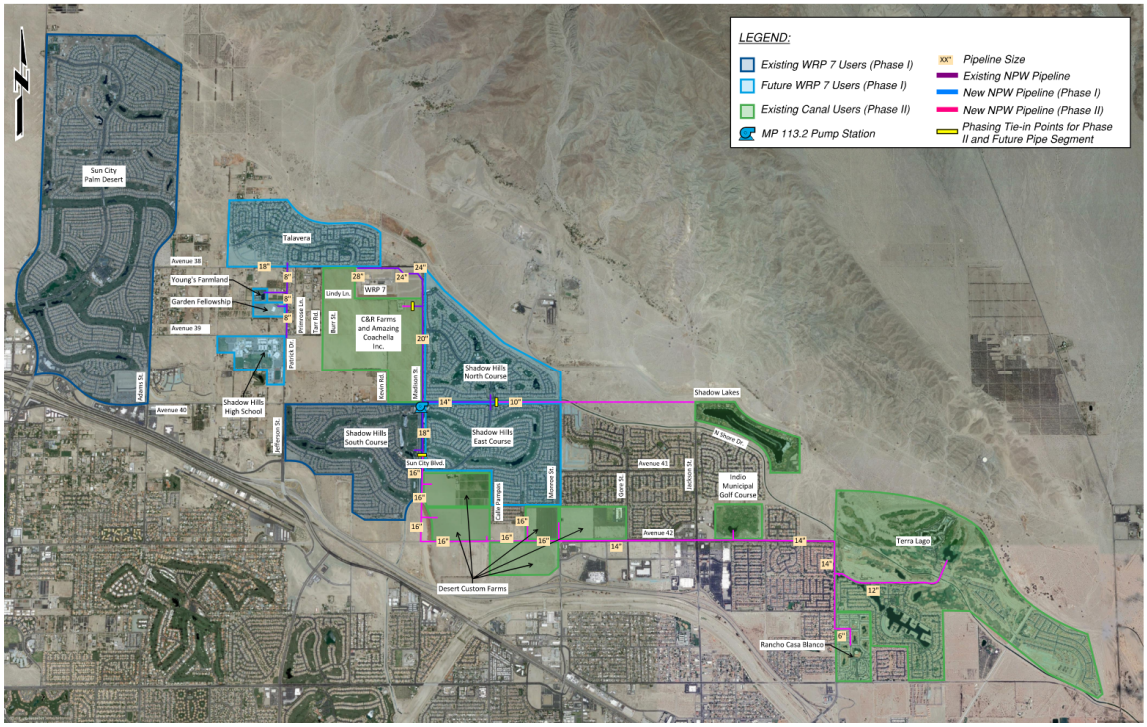
Modeling indicates that the existing 6-inch line to Shadow Hills South Course (See Figure 12) is not sufficient for Phase I or Phase II. The existing 6-inch will need to be increased to 28” at WRP 7 (See Figure 13) and will gradually decrease in size as customer deliveries are made along the distribution system.

The following improvements are shown on Figure 13. For Phase I, the distribution system will need to be extended to the east at Avenue 40 to service Shadow Hills North Course and Shadow Hills East Course. For

Phase II, the branch on Avenue 40 will need to be extended to the east to service Shadow Lakes and an extension will be required on Madison south of Shadow Hills South Course and to the east at Avenue 42 to service the four Desert Custom Farms delivery points, the Indio Municipal Golf Course, Terra Lago, and Rancho Casa Blanco.

The preliminary Phase I and Phase II NPW pipe alignment and pipe diameters are shown on Figure 13.

Figure 13: NPW Distribution System Pipeline Sizes



C. Customer Demand Flow Rates

Customer estimated demands were calculated using values developed as a part of CVWD's Non-potable Water Master Plan. An acre-feet per year (APY) value was provided for each customer. The acre-feet per year (APY) was converted to acre-feet per day (AFD) and then a 1.56 peaking factor was used to identify peak daily demands during summer months when non-potable water demand is high and WRP 7 influent and tertiary effluent are low. The peak daily demand is the value used for sizing the pump stations and pipelines as described in the next section. Peak daily demands are shown in both Gallons Per Minute (GPM) and Million Gallons per Day (MGD). This analysis assumes that customer water orders will be filled over 24 hours and not 12 hours based on input from CVWD operations.

Table 20 shows the calculation for developing the peak demand for Phase I customers that will be used to size the non-potable water and MP113.2 pump stations and the non-potable water pipeline.

Table 21 shows the calculation for developing the peak demand for Phase II customers that will be used to size the non-potable water and MP113.2 pump stations and the non-potable water pipeline.

Table 22 summarizes the Phase I and Phase II customer demands, and detailed demand data are included in Appendix C.

Table 20: Phase I Estimated Customer Demands

Customer	AFY	AFD	PEAK AFD	PEAK GPM	PEAK MGD
Dell Webb Lake / Sun City Palm Desert	1,382	3.78	5.90	1,336	1.9
Dell Webb Pond / Sun City Palm Desert	1,382	3.78	5.90	1,336	1.9
Shadow Hills - South Course	492	1.35	2.10	476	0.7
Talavera	107	0.29	0.46	103	0.1
Young's Farmland	354	0.97	1.51	342	0.5
Garden Fellowship	32	0.09	0.14	31	0.0
Shadow Hills High School	40	0.11	0.17	39	0.1
Shadow Hills - North Course	1,234	3.38	5.27	1,193	1.7
Shadow Hills East Course	391	1.07	1.67	378	0.5
Phase I	**5,413**	**14.8**	**23.1**	**5,235**	**7.5**

Table 21: Phase II Estimated Customer Demands

Customer	AFY	AFD	PEAK AFD	PEAK GPM	PEAK MGD
C&R Farms Meter 9097	1,302	3.57	5.56	1,259	1.8
Shadow Lakes Meter 9044	521	1.43	2.23	504	0.7
Desert Custom Meter 1652	55	0.15	0.24	53	0.1
Desert Custom Meter 1666	100	0.27	0.43	97	0.1
Desert Custom Meter 9077	155	0.42	0.66	150	0.2
Desert Custom Meter 1336	328	0.90	1.40	317	0.5
Indio Muni Meter 1728	309	0.85	1.32	299	0.4
Terra Lago	1,315	3.60	5.62	1,272	1.8
Rancho Casa Blanca	186	0.51	0.79	180	0.3
Phase II	**4,271**	**11.7**	**18.3**	**4,131**	**5.9**

Table 22: Phase I & Phase II Project Customer Demands Summary

PHASE	AFY	AFD	PEAK AFD	PEAK GPM	PEAK MGD
Phase I	5,413	15	23	5,235	7.5
Phase II	4,271	11.70	18.25	4,131	5.9
Phase I & II	**9,684**	**26.5**	**41.4**	**9,366**	**13.5**

IV. Project Alternatives Analysis

A. Planning and Design Parameters

Currently, CVWD maintains one additional water recycling facility designated WRP 10 and is converting WRP 4 to a water recycling facility by 2024. WRP 7 presently includes 2.5 million gallons per day (MGD) of dual media gravity filters, and WRP 10 includes 10 MGD multi-media gravity filters and 5 MGD of continuous backwash upflow filters. This project is to expand the WRP 7 tertiary system to a capacity of 5.5 MGD (a 3 MGD increase) with planning considerations for a future expansion to 6.2 MGD. Initial discussions with CVWD staff indicate a desire to maintain similar filtration technology between WRP 4, WRP 7, and potentially WRP 10. Although this evaluation establishes quantifiable filtration system evaluation criteria for WRP 7 that considers capital cost (CAPEX) and operating expense (OPEX), filtration technology standardization is another factor considered in this evaluation. Technologies included in this

evaluation are Dual Media Gravity, Continuous Backwash Upflow, Cloth Media Disc, and tertiary membranes. Results of a similar evaluation for WRP 4 yielded Cloth Media disc filtration as the optimal technology.

B. Detailed Alternative Analysis

In March 2021, in coordination with the evaluation of Tertiary Treatment Alternatives for WRP 7, operations staff performed bench scale turbidity testing of samples from secondary clarifier effluent (sample location: filter feed pump effluent pipe) and filter influent following addition of aluminum sulfate injection. Data collected from the testing indicates a median filter influent turbidity of 1.49 NTU. Based on this information, it is recommended that the tertiary system coagulation system be conservatively designed based on a median filter influent turbidity of <5 NTU and an expected filter effluent of <2 NTU. Similar to the current coagulation facilities at WRP 10 and the future WRP 4 tertiary system, the current recommendation is an in-line, continuous coagulation be implemented for the tertiary system expansion at WRP 7.

Table 23 provides a summary of CAPEX and OPEX costs for different technologies to achieve a 5.5 MGD filtration installation to treat the WRP 7 effluent. Baseline costs are based on the expansion of the existing dual media filtration system. Costs for cloth media filtration are based on the use of 5-micron cloth media fabric which has been conditionally approved by DDW.

Economic analysis for the new filtration system indicates that retrofitting the existing dual media filter basins with cloth media filter system is the lowest cost on a present worth basis. To meet Water Recycling Criteria (WRC), California Code of Regulations, Title 22, Division 4, Chapter 3, Section 60351 reliability requirements, each technology must come with multiple units and be able to treat the entire flow with a single unit out of service. Given this requirement, a Cloth Media retrofit of the dual media basins needs to be installed in multiple basins. Utilizing 3 trains of 6 discs, the CAPEX for the cloth media already includes the disc space to meet the future 6.2 MGD plant influent flows (and up to 10 MGD) as additional discs can be added to the basins while still meeting reliability requirements and other design criteria. The cost of expansion is significantly less for cloth media versus the cost of the full additional train for any alternative.

In the future, expansion to 6.2 MGD with this cloth disc system will not require additional filter basins or trains as additional filter discs can be added in each of the existing 3 basins. Based on the wholistic analysis of the current project and future potential, Black & Veatch recommends installation of three 6-disc systems in the existing concrete filter basins at CVWD WRP 7. This recommendation is preferred as it has the lowest Net Present Value and OPCC for this project, has the lowest cost for expansion to 6.2 MGD, and provides filter technology consistency with future WRP 4 and WRP 10 filtration systems. Cloth Disc has successfully been retrofitted into both existing dual media gravity and upflow tertiary filters as a part of other tertiary filtration projects.

Table 23: CAPEX/OPEX Filtration Present Worth Cost Comparison for 5.5 MGD System

FILTER TYPE	DUAL MEDIA GRAVITY	CLOTH DISC – RETROFIT	CLOTH DISC – NEW TANK	MEMBRANE	UPFLOW
Opinion of Probable Construction Cost	$3.2M	$2.2M	$3.2M	$8.0M	$3.6M
Operating Costs Present Value	$2.7M	$1.9M	$1.9M	$14.3M	$2.7M
Lifecycle Operating Costs + OPCC Present Value	$5.9M	$4.1M	$5.0M	$22.3M	$6.4M

V. Selected Project

A. Detailed Description of Project Facilities

Advanced Water Treatment (AWT) Pump Station – Three (3) new filter feed pumps, identical in size and capacity to the existing filter feed pumps, will be installed and tied into the existing manifold to handle increased flows to the tertiary system. The new capacity of the filter feed pumps will be 6.2 MGD which will meet 2040 projected flows.

Seasonal Storage – As part of a phased work plan that will eliminate percolation of secondary effluent, on-site seasonal storage will include lining Pond #1 to store undisinfected secondary effluent during times of low NPW demand. Flow will then be returned to the AWT for tertiary treatment.

Rapid Mix Basins – Based on March 2021 measured turbidity levels, continuous, in-line coagulation will be used. The two existing rapid mix basins will remain operational, and no additional basins will be constructed. The aluminum sulfate injection point will be moved upstream to maximize contact time and coagulation.

Cloth Disk Filters – The existing dual media gravity filters, backwash pumps, and air scour system will be removed, and the filter basins will be retrofitted with three new outside-in cloth disk filter systems. These systems will be designed for a fully redundant 5.5 MGD capacity with space for future disks to be installed and increase capacity to 6.2 MGD with no additional filter systems or basins.

Chlorine Contact Basin (CCB) – The existing CCB will be taken offline.

UV Building & Disinfection – A new masonry block building will house the new UV disinfection system in a 1+1 channel system to provide full redundancy. The system will be designed for 5.5 MGD and 55% UVT with expansion planning for 6.2 MGD. The facility will be located adjacent to the existing CCB.

NPW Pump Station – Three (3) new 5200 gpm NPW pumps will be installed and replace the existing pumps. The new pumps will be able to meet Phase I & II customer demands.

Operational Storage – A new 5 MG NPW bladder will be installed alongside the existing 2 MG NPW bladder. The new bladder will operate on similar hydraulics and control as the existing bladder. The new

bladder would connect via an existing blind flange located on the pipe connecting the NPW wet well to the existing 2 MG storage bladder.

Chemical Storage and Feed – The aluminum sulfate system will be replaced with like and kind for the storage tank and piping. The existing diaphragm pumps will be replaced by peristaltic pumps. The aluminum sulfate injection point will be relocated to immediately downstream of the filter feed flow meter. New recirculation pumps would support adequate mixing at the point of injection.

No polymer system will be added as a part of this project.

A new sodium hypochlorite chlorine disinfection system will be installed to provide maintenance dosing at the AWT wet well, UV influent channel, and NPW pump station.

Electrical Building – Current proposed facilities include modifying the existing MCC3 to replace buckets that supported the existing backwash and air scour systems, using currently empty buckets, and adding on new panels to support the new equipment. The existing MCC3 will be partially relocated to permit a new temperature-controlled masonry block building to be installed around the existing and new electrical and telemetry equipment to support the tertiary system expansion. A generator analysis will be performed as well to determine if the existing generator needs to be increased in size to support the additional loads.

MP113.2 Pump Station – Three (3) 3800 gpm pumps will replace the existing pumping system to provide adequate flow to meet Phase I & II customer demands. The existing mechanical, electrical, and telemetry assets at the site will be replaced as part of this project as well.

Young's Farm NPW Distribution System - This Phase 1 NPW Improvements Project includes the installation of the Young's Farm NPW conveyance pipeline, consisting of 1,200 linear feet (LF) of 12-inch pipeline and 920-LF of 6-in on-site pipeline.

Future NPW Distribution System – The existing 18-inch line to Sun City Palm Desert is sufficient for Phase I and II and will not require upsizing. Anew branch off of the existing 18-inch pipe will be required to service Talavera The existing 6-inch line to Shadow Hills South Course is not sufficient for Phase I or Phase II. The existing 6-inch will need to be increased to 28" at WRP 7 and will gradually decrease in size as customer deliveries are made along the distribution system. For Phase I, the distribution system will need to be extended to the east at Avenue 40 to service Shadow Hills North Course and Shadow Hills East Course. For Phase II, the branch on Avenue 40 will need to be extended to the east to service Shadow Lakes and an extension will be required on Madison south of Shadow Hills South Course and to the east at Avenue 42 to service the four Desert Custom Farms delivery points, the Indio Municipal Golf Course, Terra Lago, and Rancho Casa Blanco.

B. Design Criteria

The WRP 7 design will need to address various construction parameters. Materials of construction will need to be selected to mitigate corrosive soil conditions that can deteriorate concrete and common metals. Phasing of construction work will be performed in the following stages:

1. Installation of pumps and construction of the new facilities will occur. These facilities will be constructed with minimal impact to daily operations and on-goings at WRP 7.

2. Tie-in to the existing system will then occur during low flow season. Temporary bypass pumping will be utilized for the secondary effluent to the filtration system when the new filter feed pumps are installed and connected.
3. Filters will be replaced one by one using existing isolation valves. Filters will continue to discharge to the existing CCB while the UV building connections are constructed.
4. Temporary storage and feed system will be utilized during the replacement of the existing aluminum sulfate storage and feed system. The existing chlorine gas system will remain online while the new chlorine storage and feed system is installed.
5. Improvements at the NPW Pump Station will occur during low NPW season. Pumps will be replaced one by one to keep the pump station online.
6. MP113.2 Pump Station upgrades will be completed during low NPW season with bypass pumping utilized as necessary.

C. Opinion of Probable Construction Costs (OPCC)

An AACE Class 4 Opinion of Probable Construction Cost for the WRP 7 NPW Improvements project is shown in Table 24. The detailed cost estimate is included in Appendix D.

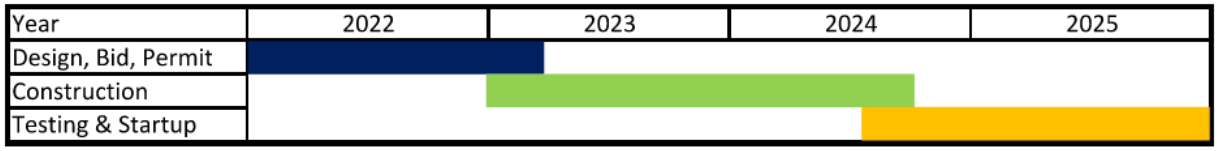
Table 24: WRP 7 OPCC

CAPEX (OPCC)	WRP 7
AWT Pump Station	$283,200
UV Building	$3,044,000
Seasonal Storage Pond	$1,203,100
Filter Facility	$1,090,500
Chlorine Contact Basins	$27,900
NPW Pump Station	$380,200
Operational Storage Pond	$742,600
Chemical Storage & Feed	$255,300
Electrical/MCC Canopy	$43,500
MP 113.2 Pump Station	$578,700
Rapid Mix Basins	$27,900
Electrical	$1,363,600
Instrumentation	$501,800
Yard Piping	$975,500
NPW Distribution System	$836,200
Young's Farm Pipeline	$750,000
Direct Cost Subtotal	**$12,104,000**
Subcontractor Markups	$1,806,350
Risk Assessment Markups	$1,585,800
General Requirements	$2,267,500
Contractor Fee	$2,614,400
Insurances & Bond	$352,600
Construction Subtotal	**$20,730,650**
CVWD Administration (30%)	$6,219,195
OPCC Total	**$26,949,845**

D. Implementation Schedule

The current schedule aims to reach substantial completion in 2025 and have the new systems on-line in late 2025. See Figure 14 for the proposed implementation schedule.

Figure 14: Implementation Schedule



E. Permits Required for Project Implementation

Permits are anticipated to be required for the WRP 7 improvements from the following agencies:

- State Water Resources Control Board
- Regional Water Quality Control Board
- City and County Fire Marshal
- Riverside County Department of Building and Safety

Appendix A – Table of Abbreviations

Acronym	Description
AF	Acre-foot or acre-feet
AFY	Acre-feet per Year
BOR	Bureau of Reclamation
CC	Country Club
CEQA	California Environmental Quality Act
CWSRF	Clean Water State Revolving Fund
CVWD	Coachella Valley Water District
DWA	Desert Wastewater Authority
IS/MND	Initial Study/Mitigated Negative Declaration
IWA	Indio Water Authority
MVP	Mid-Valley Pipeline
NPW	Non-Potable Water
PC	Pumping Cost
RAC	Replenishment Assessment Charge
SRF	State Revolving Fund
SWRCB	State Water Resources Control Board
WRFP	Water Recycling Funding Program
WRP	Water Reclamation Plant

Appendix B – CEQA Compliance

CVWD will be completing an Initial Study/Mitigated Negative Declaration (IS/MND) for the subject project, to be recorded prior to the funding agreement. The IS/MND will be tiered from the Programmatic Environmental Impact Report (PEIR) prepared for the 2022 Sanitation Master Plan Update, which includes the proposed WRP 7 NPW Improvements (Volume 3 of the 2022 SMP is attached).

To date, CVWD has initiated the cultural and biological Federal cross-cutter studies. The District has completed background research, including historic aerial and topographic map review, received the results of the records search of the California Historical Resources Information System (CHRIS) from the Eastern Information Center, located at University of California, Riverside campus, and received the results of the Sacred Lands File search from the Native American Heritage Commission (NAHC).

The purpose of the CHRIS records search was to determine the extent of previous surveys within a 0.5-mile (800-meter) radius of the Proposed Project location, and whether previously documented pre-contact or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area. EIC staff completed and returned the records search to ECORP on October 14, 2022. The CHRIS records search results indicate 16 previous cultural resource investigations have been conducted in or within 0.5 miles of Project, covering approximately 52 percent of total area around Project. Of these 16 studies, two studies encompass portions of the Project, one completed in 1979 and the second one completed in 1996. Both reports cover approximately half of Project. In addition, a total of four previously recorded resources are located within 0.5-mile (800-meter) radius of the Project. Of these, three are believed to be associated with Native American occupation of the vicinity, and one is a historic-era site, associated with the Coachella Canal. There are no previously recorded resources located within the Project Area.

The purpose of the Sacred Lands File search was to determine whether or not the California Native American tribes within the Project Area have recorded Sacred Lands, because the Sacred Lands File is populated by members of the Native American community with knowledge about the locations of tribal resources. In requesting a search of the Sacred Lands File, ECORP solicited information from the Native American community regarding Tribal Cultural Resources (TCRs), but the responsibility to formally consult with the Native American community lies exclusively with the federal and local agencies under applicable state and federal laws. The NAHC responded back stating the search failed to indicate the presence of Native American cultural resources in the Project Area. Tribal Consultation Support has not occurred yet until coordination with the lead agency, SWRCB, has taken place. This coordination set-up is currently on-going.

A review of historic aerials and topographic maps depict the Project Area has been used previously for agriculture. Any structures depicted in historic-age aerials and maps are no longer present by 1984. The site has been utilized in its current configuration as a water treatment plant by the early 1990s.
The 2010 cultural resource assessment conducted for the 2015 IS/MND for CVWD's Water Reclamation Plant No. 7 Biosoilds Upgrade Project yielded negative results for cultural resources. Based on the current data collected for the project thus far, no known constraints are anticipated at this time. This preliminary finding does not include a field visit or additional archival research, which may reveal further information regarding potential resources in the Project Area.

Appendix C – Demand Tables

Project Name: CVWD WRP 7
BV Project Number: 407944
Document Title: Customer Table
Updated: 4/7/2021

Phase	Customer Name	Delivery Point	Customer Status	Location	Meter No.	Data Utilized	Land Use	Projected Monthly Average Usage (MGD)											
								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
I	Dell Webb/Sun City Palm Desert - Lake[2]	1	Existing WRP 7	Avenue 38 and Adam Street	Dell Webb Lake	Demand Summary	Golf Course/Housing Community	0.00	0.34	0.97	1.85	2.08	2.13	2.42	2.48	1.66	1.15	0.00	0.24
I	Dell Webb/Sun City Palm Desert - Pond[2]	2	Existing WRP 7	Avenue 38 and Adam Street	Dell Webb Pond	Demand Summary	Golf Course/Housing Community	0.00	0.39	1.12	2.13	2.39	2.45	2.78	2.85	1.90	1.33	0.00	0.28
I	Shadow Hills South Course - NPW[1,2]	3	Existing WRP 7	40th Avenue and Madison Street	Shadow Hills Flow Meter	Demand Summary	Golf Course/Housing Community	0.00	0.05	0.14	0.27	0.30	0.31	0.35	0.36	0.24	0.17	0.00	0.03
I	Talavera[2]	4	Future WRP 7	Avenue 38 and Goodman Road	Numerous	Demand Summary	Housing Community	0.01	0.02	0.09	0.11	0.08	0.13	0.17	0.16	0.14	0.10	0.06	0.07
I	Young's Farmland[2]	5	Future WRP 7	Southwest of Avenue 38 and Jefferson St	642349-2 (Domestic) 08-07317 (RAC)	Demand Summary	Farmland	0.18	0.24	0.28	0.25	0.13	0.52	0.47	0.40	0.61	0.32	0.27	0.13
I	Garden Fellowship[2]	6	Future WRP 7	Southwest of Avenue 38 and Jefferson St	254753-2 (Domestic)	Demand Summary	Farmland	0.02	0.02	0.03	0.02	0.01	0.05	0.04	0.04	0.06	0.03	0.02	0.01
I	Shadow Hills High School[2,3]	7	Future WRP 7	Avenue 39 and Jefferson Street	6201517-I (Domestic)	Demand Summary	School	0.00	0.01	0.03	0.04	0.03	0.05	0.06	0.06	0.05	0.04	0.02	0.03
I	Desert Ridge Academy[2,3]	8	Future WRP 7	West of Avenue 39 and Jefferson Street	6900034-I (Domestic)	Demand Summary	School	See Shadow Hills High School											
I	Shadow Hills North Course[1,2]	9	Future WRP 7	Avenue 40 and Madison Street	9095 (Irrigation)	Demand Summary	Golf Course/Housing Community	0.00	0.09	0.26	0.49	0.55	0.57	0.64	0.66	0.44	0.31	0.00	0.06
I	Shadow Hills East Course[1,2]	10	Future WRP 7	Avenue 40 and Monroe Street	9076 (Irrigation)	Demand Summary	Golf Course/Housing Community	0.00	0.11	0.33	0.62	0.70	0.72	0.81	0.83	0.56	0.39	0.00	0.08
							Phase I Total	**0.22**	**1.27**	**3.24**	**5.78**	**6.28**	**6.92**	**7.75**	**7.85**	**5.65**	**3.84**	**0.38**	**0.93**
I	Shadow Hills South Course - Canal[1]	11	Existing WRP 7	40th Avenue and Madison Street	9074 (Irrigation)	Meter Data	Golf Course/Housing Community	0.00	0.00	0.00	0.03	0.13	0.71	0.93	0.94	0.66	0.36	0.00	0.00
II	C&R Farms and Amazing Coachella Inc.	12	Existing Canal	Lindy Lane and Madison Street	9097 (Irrigation)	Meter Data	Farmland	1.09	1.29	2.35	3.20	1.30	0.00	1.19	1.42	1.52	1.53	1.30	0.53
II	Shadow Lakes	13	Existing Canal	Jackson Street and North Shore Drive	9044 (Irrigation)	Meter Data	Housing Community	0.06	0.10	0.44	0.56	0.41	0.65	0.83	0.81	0.70	0.52	0.32	0.36
II	Indio Municipal Golf Course	14	Existing Canal	East of Avenue 42 and Jackson Street	1728 (Irrigation)	Meter Data	Golf Course	0.06	0.14	0.19	0.27	0.34	0.38	0.38	0.32	0.25	0.31	0.15	0.10
II	Desert Custom Farms	15	Existing Canal	Avenue 42 and Monroe Street	1336 (Irrigation)	Meter Data	Farmland	0.11	0.15	0.17	0.15	0.08	0.32	0.30	0.25	0.38	0.20	0.17	0.08
II	Desert Custom Farms	16	Existing Canal	Sun City Boulevard and Madison Street	1652 (Irrigation)	Meter Data	Farmland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.16	0.11	0.09	0.06
II	Desert Custom Farms	17	Existing Canal	Sun City Boulevard and Calle Pampas	1666 (Irrigation)	Meter Data	Farmland	0.18	0.25	0.24	0.03	0.02	0.50	0.35	0.70	0.57	0.44	0.50	0.16
II	Desert Custom Farms	18	Existing Canal	Avenue 42 and Monroe Street	9077 (Irrigation)	Meter Data	Farmland	0.06	0.08	0.04	0.03	0.07	0.14	0.03	0.07	0.15	0.24	0.13	0.05
							Phase II Total	**1.57**	**2.02**	**3.43**	**4.28**	**2.35**	**2.69**	**4.02**	**4.62**	**4.39**	**3.71**	**2.65**	**1.35**
							Phase I + Phase II	**1.78**	**3.29**	**6.67**	**10.05**	**8.63**	**9.61**	**11.76**	**12.47**	**10.04**	**7.55**	**3.03**	**2.28**
							Phase I Supplemental Flow from MP 113.2	**0.00**	**0.00**	**0.00**	**0.28**	**0.78**	**1.42**	**2.25**	**2.35**	**0.15**	**0.00**	**0.00**	**0.00**
							Phase I + II Supplemental Flow from MP 113.2	**0.00**	**0.00**	**1.17**	**4.55**	**3.13**	**4.11**	**6.26**	**6.97**	**4.54**	**2.05**	**0.00**	**0.00**

1- For additional information see CVWD data table.
2- Evaluations only utilized CVWD data summary table.
3- B&V assumes CVWD data cover both Shadow Hills High School and Desert Ridge Academy demands

Appendix D – Cost Estimate

WRP 7 PHASE 1 NPW IMPROVEMENTS				
BV Class 4 Opinion of Probable Costs				
Estimate Totals				
Description	**Amount**	**Totals**	**Rate**	**Percent of Total**
Labor	724,907			3.12%
Material	3,094,549			13.30%
Subcontract	7,195,472			30.92%
Equipment	182,591			0.78%
Other	156,000			0.67%
TOTAL DIRECT COST	*11,353,519*	*11,353,519*		*48.79%*
SUBCONTRACTOR MARK-UP'S				
Subcontractor-General Conditions	642,257		8.000 %	2.76%
Subcontractor-Overhead	481,693		6.000 %	2.07%
Subcontractor-Fee	481,693		6.000 %	2.07%
Subcontractor-Bond/Insurance	200,705		2.500 %	0.86%
GRAND TOTAL DIRECT COST	*1,806,348*	*13,159,867*		*7.76%*
RISK ASSESSMENT MARK-UP's				
Construction Contingency	Incl. in CVWD budgeting		15.000 %	
Market Adjustment Factor	Incl. in CVWD budgeting		10.000 %	
Escalation to Mid Point March 2025	1,585,764		12.050 %	6.81%
TOTAL INCLUDING RISK	*1,585,764*	*14,745,631*		*6.81%*
GENERAL REQUIREMENTS				
General Conditions Management	991,958		5.500 %	4.26%
General Conditions Subsistance	360,712		2.000 %	1.55%
General Conditions Temp Facilities	180,356		1.000 %	0.78%
General Conditions Equipment	90,178		0.500 %	0.39%
General Conditions Start-up	270,534		1.500 %	1.16%
General Conditions Permits	90,178		0.500 %	0.39%
Sales Tax	283,577		8.260 %	1.22%
TOTAL INCLUDING GC'S	*2,267,493*	*17,013,124*		*9.75%*
CONTRACTOR FEE				
General & Administrative Costs	1,218,186		6.000 %	5.23%
Profit (Fee)	1,396,203		6.000 %	6.00%
TOTAL INCLUDING FEE	*2,614,389*	*19,627,513*		*11.23%*
INSURANCES & BOND				
Builders All Risk Insurance	73,336		0.320 %	0.32%
General Liability Insurance	46,540		0.200 %	0.20%
Payment & Performance Bond	232,701		1.000 %	1.00%
TOTAL CONSTRUCTION COST	*352,577*	*19,980,090*		*1.52%*
Total		**19,980,090**		
	Youngs Pipeline	**750,000**		
	Construction Subtotal	**20,730,090**		
	CVWD Admin	**6,219,027**	30.00%	
	TOTAL	**26,949,117**		