THREE VALLEYS
MUNICIPAL WATER DISTRICT

WATER RESOURCES MASTER PLAN

JANUARY 2025

GEI Consultants

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Acronyms and Abbreviations

1,2,3-TCP	1,2,3-Trichloropropane
AF	acre-feet
AF/year	acre-feet per year
CEC	contaminants of emerging concern
CIP	Capital Improvement Program
CPP	California State Polytechnic University at Pomona
CRA	Colorado River Aqueduct
DBCP	Hexavalent Chromium, Arsenic, 1,2-Dibromo-3-chloropropane
CVWC	Covina Valley Water Company
DCP	Drought Contingency Plan
DWR	California Department of Water Resources
FEMA	Federal Emergency Management Agency
ET	evapotranspiration
FY	fiscal year
GAMA	Groundwater Ambient Monitoring and Assessment
gpm	gallons per minute
GRIP	Groundwater Reliability Improvement Program
GRIP+	Groundwater Reliability Improvement Program "Plus"
GSA	Groundwater Sustainability Agency
GSWC	Golden State Water Company
JWL	Joint Water Line
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
O&M	operations and maintenance
PBWA	Puente Basin Water Agency

PCE	Trichloroethene
PFA	polyfluoroalkyl substances
TAF	thousand acre-feet
TAF/year	thousand acre-feet per year
TCE	Trichloroethene
TDS	Total Dissolved Solids
USBR	U.S. Bureau of Reclamation
RWD	Rowland Water District
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWS	Suburban Water Systems
Three Valleys	Three Valleys Municipal Water District
UWMP	2020 Urban Water Management Plan
VHWC	Valencia Heights Water Company
WRMP	Water Resources Master Plan
WVWD	Walnut Valley Water District

1 Introduction

Three Valleys Municipal Water District (Three Valleys) was formed in 1950 and provides water supply and water resource management to over 500,000 people in a 133 square mile area in eastern Los Angeles County. As a member agency of the Metropolitan Water District of Southern California (Metropolitan), Three Valleys provides wholesale water to its 13 member agencies, which includes:

- Boy Scouts of America,
- California State Polytechnic University at Pomona (CPP)
- City of Covina
- City of Glendora
- City of La Verne
- City of Pomona
- Golden State Water Company (GSWC) (Claremont and San Dimas systems)
- Mount San Antonio College
- Rowland Water District (RWD)
- Suburban Water Systems (SWS)
- Valencia Heights Water Company (VHWC)
- Walnut Valley Water District (WVWD).

These member agencies are described in more detail in Section 2.

1.1 Objectives

The mission of Three Valleys is to supplement and enhance local water supplies to meet the region and their member agencies' needs in a reliable and cost-effective manner. The objective of the Three Valleys Water Resources Master Plan (WRMP) is to provide a roadmap of needed capital improvements to meet Three Valleys' member agencies' needs. The key objectives are as follows:

- Assess Three Valleys current water system performance.
- Establish a comprehensive approach to achieve water supply reliability within the Three Valleys service area.
- Inform and supplement Three Valleys' Capital Improvement Program (CIP) to gain efficiency in operations and maintenance (O&M) and sustainably manage the water system.
- Identify the investment priorities for the future and provide information to inform policy decisions related to infrastructure and supply.

1.2 Relevant Studies

To increase water supply reliability and proactively address the region's concern with drought, in 2023 Three Valleys began preparing a WRMP and Regional Drought Contingency Plan (DCP). The WRMP has several elements in common with Three Valleys' DCP, such as the assessment of water shortage conditions based on current and future water supply needs and anticipated impacts to supplies from climate change and other risks, along with the identification and prioritization of projects to enhance

the region's water supply portfolio. The WRMP and Regional DCP were prepared in parallel with a coordinated schedule and approach. The Regional DCP is included as Appendix C.

1.3 Organization of Report

This document is organized as follows:

Section 1 – Introduction

Section 2 – Existing System Description

Section 3 – Water System Reliability

Section 4 – Mitigation Projects Development and System Performance Evaluation

Section 5 – Mitigation Projects Analysis

Section 6 – Opportunities for Regional Agency/Project Collaboration

Section 7 – Summary and Recommendations

Section 8 – References

Appendix A – List of Mitigation Projects

Appendix B – Results of Pairwise Benefit Evaluation

Appendix C – Three Valleys Regional Drought Contingency Plan

2 Existing System Description

Three Valleys was formed in 1950 and provides water supply and water resource management to over 500,000 people in a 133 square mile area in eastern Los Angeles County. The estimated population within the Three Valleys wholesale service area in 2020, along with future population projections documented in Three Valleys' 2020 Urban Water Management Plan (UWMP), is presented in Table 2-1.

Table 2-1. Three Valleys Current and Future Populations

	2020	2025	2030	2035	2040	2045
Three Valleys	513,623	523,167	532,888	542,790	555,204	561,782

2.1 Water Supplier Service Area

Three Valleys' member agencies retail the water directly to their customers, or wholesale it to other water systems for resale. Three Valleys' member agencies produce water from local sources; however, when water demands exceed these local supplies, the member agencies may rely on Three Valleys to supply their supplemental water needs. Three Valleys' service area includes the Cities of Claremont, Covina, Diamond Bar, Glendora, Industry, La Verne, Pomona, San Dimas, Walnut, West Covina, and unincorporated areas of Los Angeles County (including Charter Oak and Rowland Heights) (Figure 2-1).

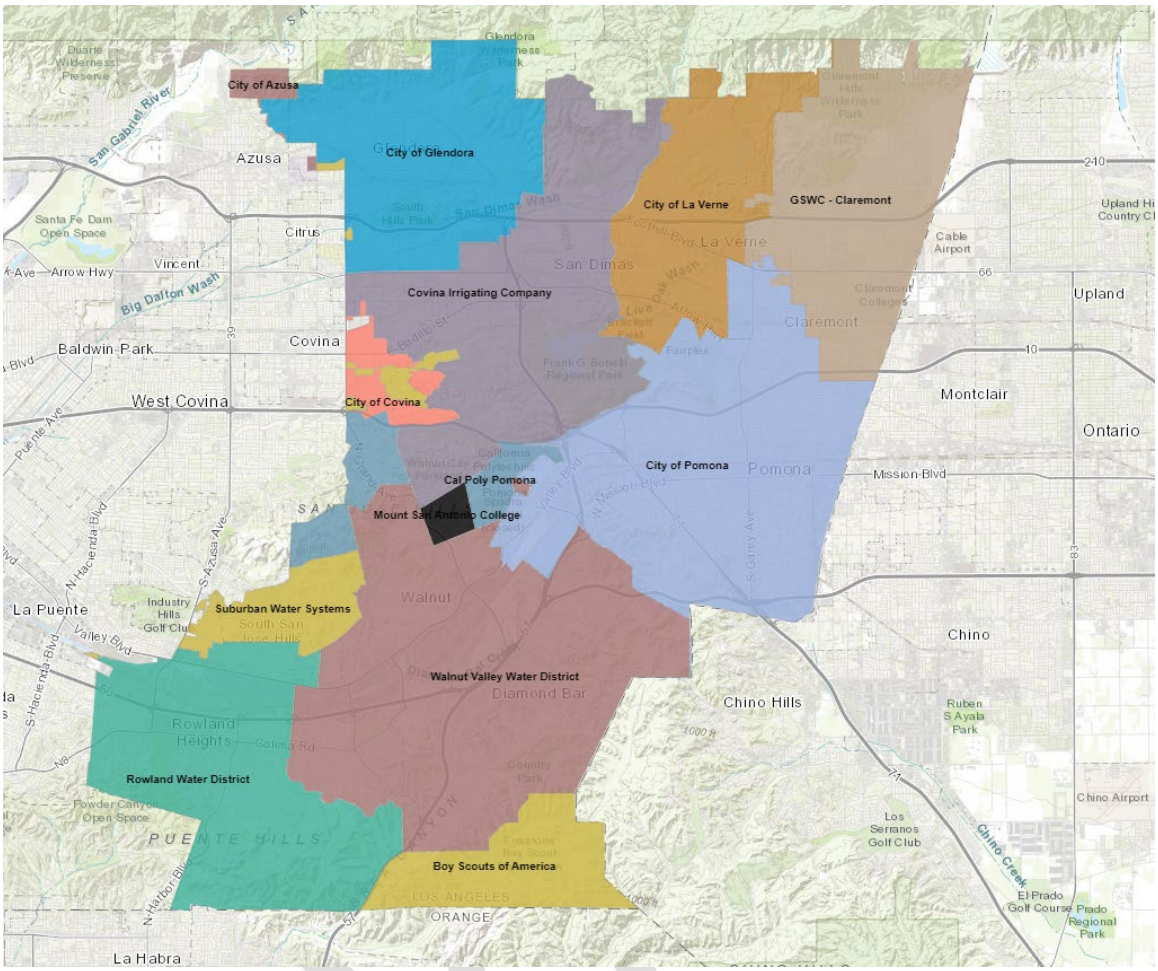


Figure 2-1: Three Valleys Municipal Water District Service Area

Three Valleys is one of 26 member agencies of Metropolitan. Three Valleys' water supply sources consist of untreated imported water purchased from Metropolitan, treated imported water purchased from Metropolitan, and groundwater from the Six Basins groundwater basin, with imported water from Metropolitan accounting for the majority of Three Valleys' supply. Water purchased from Metropolitan comes from the Colorado River Aqueduct and the State Water Project (SWP). Most Three Valleys member agencies rely on a combination of imported water and groundwater supplies. A few members also use other sources including three who currently utilize recycled water, and five who utilize surface water supplies. Several of these agencies are in SWP dependent areas, meaning they cannot receive Colorado River supplies from Metropolitan, and are solely dependent on imported water from the SWP.

2.2 Member Agencies

Wholesale water within the region is supplied by Three Valleys by importing and distributing water obtained from Metropolitan to its 13 member agencies. Three Valleys has 13 members agencies including the following:

- Boy Scouts of America: Boy Scouts of America is one of three institutions that receives imported water from Three Valleys. They own and operate the Firestone Scout Reservation, a campground and wilderness facility located in the southern part of the Three Valleys' service area.
- California State Polytechnic University, Pomona: California State Polytechnic University is one of three institutions that receives imported water from Three Valleys, located within the City of Pomona.
- City of Covina: The City of Covina has a service area of approximately 7 square miles encompassing the majority of the City of Covina, a portion of the City of West Covina and an unincorporated portion of Los Angeles County. In 2020, the City of Covina served a population of approximately 29,287 through about 8,500 municipal connections.
- City of Glendora: The City of Glendora's service area covers approximately 11 square miles encompassing the majority of the City of Glendora and a portion of the Cities of San Dimas, Azusa and an unincorporated portion of Los Angeles County. In 2020, the City of Glendora served a population of approximately 45,551 through about 13,468 municipal connections.
- City of La Verne: The City of La Verne has a service area of approximately 8.56 square miles bounded on the west by the City of San Dimas, on the south by the Puddingstone Recreation area, on the east by Fulton Road and the prolongation of Williams Avenue, and on the north by the Los Angeles National Forest. In 2020, the City of La Verne served a population of approximately 31,321 through about 8,800 municipal connections.
- City of Pomona: The City of Pomona's service area covers approximately 22.9 square miles encompassing the majority of the City of Pomona and portions of the Cities of La Verne, Claremont, and Chino Hills. In 2020, the City of Pomona served a population of approximately 153,988 through about 30,041 municipal connections.
- Golden State Water Company (Claremont and San Dimas systems): Golden State Water Company (Claremont system) provides water service to the City of Claremont, portions of the Cities of Montclair, Pomona, and Upland, and adjacent unincorporated areas of Los Angeles County, which encompasses approximately 9.2 square miles. The San Dimas system serves portions of the Cities of La Verne, Walnut, and Covina, and adjacent unincorporated areas of Los Angeles County, covering approximately 13.7 square miles. In 2020, Golden State Water Company served a population of approximately 36,713 through about 11,076 municipal connections in the Claremont system. In the San Dimas system, Golden State Water Company served a population of approximately 53,120 through about 16,033 municipal connections.
- Mount San Antonio College: Mount San Antonio College is one of three institutions that receives imported water from Three Valleys, located within the City of Walnut.
- Rowland Water District (RWD): RWD's water service area covers approximately 17.2 square miles encompassing portions of the Cities of Industry, La Puente, and West Covina, and unincorporated areas of Los Angeles County including Rowland Heights and Hacienda

Heights. In 2020, Rowland Water District served a population of approximately 59,283 through about 13,202 municipal connections.

- Suburban Water Systems: Suburban Water Systems has a service area of approximately 41.7 square miles encompassing the Cities of Glendora, Covina, West Covina, La Puente, Walnut, Whittier, La Mirada, La Habra, and Buena Park as well as sections of unincorporated Los Angeles County and Orange County. Suburban Water Systems' service area is currently divided into two main service areas: the San Jose Hills Service Area, and the Whittier/La Mirada Service Area. In 2020, Suburban Water Systems served a population of approximately 298,367 through about 42,512 municipal connections. This includes approximately 175,529 residents in the San Jose Hills service area and approximately 122,838 residents in the Whittier/La Mirada service area.
- Valencia Heights Water Company: Valencia Heights Water Company is a mutual water company serving portions of the City of West Covina and unincorporated areas of Los Angeles County. Valencia Heights Water Company serves less than 3,000 customers and does not supply more than 3,000 acre-feet (AF) of water annually and thus is not required to prepare a UWMP.
- Walnut Valley Water District (WVWD): WVWDs water service area covers approximately 29 square miles covering the City of Diamond Bar and portions of the Cities of Industry, Pomona, Walnut, and West Covina, as well as unincorporated areas of Los Angeles County including Rowland Heights. In 2020, Walnut Valley Water District served a population of approximately 99,956 through about 27,100 municipal connections.

2.3 Water Sources

An overview of the water sources used by each agency within Three Valleys' service area is shown in Table 2-2.This summary highlights the diversity of water supply portfolios among the water agencies in the region. As a result, each agency is impacted differently by drought, driving a need for regional solutions that are flexible and adaptable to different community needs.

Table 2-2. Current Three Valleys Member Agency Water Sources

Member Agency	Groundwater	Imported Water	Surface Water	Recycled Water
Boy Scouts of America		X		
Cal Poly Pomona	X	X		X
City of Covina[a]		X	X	
City of Glendora[a]	X	X	X	
City of La Verne	X	X		
City of Pomona	X	X	X	X
Golden State Water Company (Claremont)[a]	X	X		

Member Agency	Groundwater	Imported Water	Surface Water	Recycled Water
Golden State Water Company (San Dimas)[a]	X	X	X	
Mount San Antonio College		X		
Rowland Water District	X	X		X
Suburban Water Systems[a]	X	X	X	X
Valencia Heights Water Company[a]	X	X	X	X
Walnut Valley Water District	X	X		X

[a] Purchases water from Covina Irrigating Company (recently renamed Covina Valley Water Company), which produces water from local surface and groundwater sources and treats imported water from Three Valleys

Historical water supply data was provided by each member agency for the years 2015-2022. Table 2-3 shows the average annual water supply sources for each Three Valleys member agency for this period.

Table 2-3. Three Valleys Member Agencies Average Annual Water Supply Sources (2015-2022)

Agency	Groundwater (AF)	Imported Water (AF)	Purchased Water (AF)	Surface Water (AF)	Recycled Water (AF)	Total (AF)
Boy Scouts of America	0	20	0	0	0	20
Cal Poly Pomona	284	39	0	0	454	777
City of Covina	0	222	4,906	0	0	5,128
City of Glendora	9,732	635	0	14	0	10,381
City of La Verne	1,625	2,007	0	0	0	3,632
City of Pomona	12,777	4,309	0	1,740	1,881	20,707
Covina Valley Water Company (CVWC)	860	2,538	0	1,135	0	4,533
Golden State Water Company (Claremont)	4,159	5,316	0	0	0	9,475
Golden State Water Company (San Dimas)	1,777	8,043	0	0	0	9,821
Mount San Antonio College	0	154	0	0	0	154
Rowland Water District	1,226	9,046	0	0	795	11,067
Suburban Water Systems (San Jose)	13,056	5,374	0	0	682	19,112
Valencia Heights Water Company	298	65	0	288	11	662
Walnut Valley Water District	858	17,232	0	0	926	19,016
TOTAL	46,652	55,000	4,906	3,177	4,749	114,485

2.3.1 Imported Water

Three Valleys purchases both untreated and treated imported water from Metropolitan and supplies it to its member agencies. Three Valleys currently receives a Tier 1 water supply allotment from Metropolitan of 80,688 acre-feet per year (AF/year); from 2010-2020, Three Valleys imported an average of 64 TAF from Metropolitan, with annual imports ranging from 54-73 TAF.

Metropolitan imports water from the SWP which is owned and operated by the California Department of Water Resources (DWR) and conveys water from the Bay-Delta to Southern California via the California Aqueduct, and from the Colorado River through the Colorado River Aqueduct (CRA) which is owned and operated by Metropolitan. Generally, Metropolitan sources around 35 percent of its water from the SWP, with another 25 percent sourced from the Colorado River Aqueduct.

Three Valleys supplies treated imported water directly to its member agencies through service connections from the Metropolitan distribution system, but it does not provide water directly to retail customers. Untreated imported water is sent to Three Valleys' Miramar Water Treatment Plant for processing before being distributed to the member agencies. This untreated water is also used to replenish portions of the Six Basins and is delivered to the Main San Gabriel Basin (also referred to as Main Basin) to meet Replacement Water obligations specified in the Main Basin Judgment. Furthermore, Three Valleys obtains untreated imported water supplies from Metropolitan for delivery to the Covina Irrigating Company, which treats these deliveries at its William B. Temple Treatment Plant before supplying other member agencies within the Three Valleys' region.

During drought periods, water allocations from SWP are significantly reduced, leading to a greater proportion of Colorado River supplies in Metropolitan's supply mix. However, the Colorado River faces ongoing water quality issues, and in August 2021, the federal government declared a water shortage for the first time at one of the river's main reservoirs. Additionally, several of Three Valleys' member agencies are in SWP dependent areas, meaning they cannot receive Colorado River supplies from Metropolitan, and are solely dependent on imported water from the SWP.

Each year, Metropolitan member agencies communicate their anticipated water needs for the next five years, allowing Metropolitan to collaborate with them on forecasts for long-term future water supply. Total imported water use by Three Valleys member agencies amounts to approximately 51 percent of the region's total water supply portfolio.

2.3.2 Groundwater

The region also uses local groundwater from four different groundwater basins including the Six Basins, Chino Basin, Main San Gabriel Basin, and Spadra Basin. However, Three Valleys only has water storage accounts in the Six Basins, the Main San Gabriel Basin, and Chino Basin. Table 2-4 shows Three Valleys operational water storage accounts.

Table 2-4. Three Valleys Operational Storage Accounts

Storage System	Type	Three Valleys Storage Capacity (AF)	Three Valleys - Pomona Agreement**
Six Basins	Groundwater basin	3,500	
Main San Gabriel Basin	Groundwater basin	50,000	
Chino Basin	Groundwater basin		1,390

[a] PBWA has a storage and export agreement with the Main San Gabriel Basin for 30,000 AF

**Chino Basin Three Valleys storage through Pomona is a one-time agreement

Three basins (Six Basins, Chino Basin, and Main San Gabriel Basin) are adjudicated groundwater basins; therefore, they are exempt from the requirement to designate a Groundwater Sustainability Agency (GSA) as mandated by the Sustainable Groundwater Management Act (SGMA). These basins are managed by their respective Watermasters to manage the ownership of water rights and water use with goals similar to that of SGMA. The Spadra Basin is a small, non-adjudicated subbasin of the San Gabriel Valley Basin, designated as a 'very low-priority' basin by DWR. However, the Walnut Valley Water District and the City of Pomona collectively formed the Spadra Basin GSA to manage the basin. Total groundwater use by Three Valleys member agencies amounts to approximately 35 percent of the region's total water supply portfolio.

According to the State Water Resources Control Board's Groundwater Ambient Monitoring and Assessment (GAMA) Program, groundwater from these basins has exhibited Maximum Contaminant Level (MCL) exceedances for numerous constituents, including 1,2,3-Trichloropropane (1,2,3-TCP), Hexavalent Chromium, Arsenic, 1,2-Dibromo-3-chloropropane (DBCP), Perchlorate, Tetrachloroethene (PCE), Trichloroethene (TCE), Total Dissolved Solids (TDS), and Uranium. To remove these contaminants, agencies use a combination of blending and wellhead treatment, both of which are resulting in a greater reliance on imported water.

2.3.3 Recycled Water

Three Valleys does not directly use or have access to recycled water. However, several member agencies in the region use recycled water to meet non-potable demands; Table 2-5 lists these member agencies.

Table 2-5. Average Annual Three Valleys Member Agency Water Use (2015-2022)

Member Agency	Recycled Water Use (AF)
Cal Poly Pomona	454
City of Pomona	1,881
Rowland Water District	795
Suburban Water Systems	682
Valencia Heights Water Company	11
Walnut Valley Water District	926

Recycled water sources in the region are primarily from the Pomona Water Reclamation Plant and San Jose Creek Water Reclamation Plant, both owned and operated by the Los Angeles County Sanitation District. Total recycled water use by Three Valleys member agencies amounts to approximately 6 percent of the region's total water supply portfolio.

2.3.4 Surface Water

Three Valleys does not use self-supplied surface water sources to meet regional water demands. However, the District purchases San Antonio Creek surface water supplies from the City of Pomona to replenish the Six Basins. Several Three Valleys member agencies use surface water to meet potable demands; the City of Pomona, for example, sources local surface water from San Antonio Creek, which is then purchased by Three Valleys to replenish the Six Basins. Additionally, some member agencies obtain surface water from the Covina Irrigating Company, which treats water from the San Gabriel River. Total surface water use by Three Valleys member agencies amounts to approximately 7 percent of the region's total water supply portfolio.

3 Water System Reliability

This section describes the existing and projected water demands in Three Valleys service area, both regionally as well as by member agency, and describes a vulnerability assessment developed by Three Valleys to assess the potential risk to water delivery reliability posed by projected climate change in the region.

3.1 Existing Water Demand

Total water demands in the Three Valleys service area has varied significantly during recent years, particularly during the five consecutive year drought from fiscal year (FY) 2011-12 to FY 2015-16. Total Three Valleys water demand for 2020 was aggregated from the latest available member agency UWMPs and is shown in Table 3-1. These demand estimates are much higher than the actual water use baseline. The combination of conservation measures and water use restrictions that has been imposed for most of the past 15 years due to recurring regional droughts has likely contributed to actual water use being lower than estimated water demand. However, the data from member agency UWMPs is still useful for understanding the distribution of water demand by use types.

Table 3-1. 2020 Distribution of Water Demand for the Three Valleys Service Area

Use Type	Demand (AF/year)	Contribution to Demand (%)
Single-Family Residential	69,639	51.6%
Commercial	18,822	14.0%
Other	11,712	8.7%
Multi-Family Residential	10,233	7.6%
Losses	5,726	4.2%
Recycled Water Demand	6,463	4.8%
Institutional	6,026	4.5%
Landscape & Agriculture	4,789	3.6%
Industrial	1,434	1.1%
Total Demand from Member Agencies	**134,844**	**100%**

AF = acre-feet

Source: Data aggregated from member agencies' 2020 UWMPs

3.2 Projected Water Demand

Three Valleys member agencies projected demands are provided in Table 3-2. Projected demand data by water source was provided by member agencies in five-year increments (starting at 2025 through 2045). The projected demands listed in Table 3-2 were calculated by taking the average of all projected demands provided by each agency for 2025-2045.

Table 3-2. Three Valleys Member Agencies Projected Average Annual Water Supply Sources (2025-2045)

Agency	Groundwater (AF)	Imported Water (AF)	Purchased Water (AF)	Surface Water (AF)	Recycled Water (AF)	Total (AF)
Boy Scouts of America	0	35	0	0	0	35
Cal Poly Pomona	956	60	0	0	1,430	2,446
City of Covina	0	200	5,465	0	0	5,665
City of Glendora	10,450	771	0	0	0	11,221
City of La Verne	2,895	10,890	0	0	0	13,785
City of Pomona	16,040	6,000	0	2,000	2,350	26,390
Covina Irrigating Company (CIC)*	2,293	6,768	0	3,026	0	12,087
Golden State Water Company (Claremont)	5,205	5,596	0	0	0	10,801
Golden State Water Company (San Dimas)	3,000	7,340	0	0	0	10,340
Mount San Antonio College	0	536	0	0	0	536
Rowland Water District	4,700	7,542	0	0	940	13,182
Suburban Water Systems (San Jose)	16,715	6,023	0	0	700	23,438
Valencia Heights Water Company	795	100	0	850	30	1,775
Walnut Valley Water District	5,521	13,986	0	0	2,180	21,687
TOTAL	68,570	65,847	5,465	5,876	7,630	153,388

*CIC receives and treats imported water from Three Valleys. CIC also produces water from local and groundwater sources. CIC was recently acquired by Valencia Heights Water Company and rebranded as Covina Valley Water Company.

3.3 Climate Change Vulnerability

Three Valleys developed a Climate Change Vulnerability Assessment as part of the preparation of their WRMP and DCP to enhance their understanding of the impacts of climate change on future water demand in Three Valleys wholesale service area and the sources of Three Valleys water supplies (Three Valleys 2024). The Assessment analyzed projected changes in future water supplies and water demand during a normal year, single dry and wet years, and multi-year (5-year) dry and wet periods over the next 20 years, using climate projections developed for the water resources planning by DWR. The analysis of future climate impacts on water supplies and demands included three potential future climate conditions: drier future conditions with extreme warming; median future conditions; and wetter future conditions with moderate warming.

Results from this climate modeling show minor decreases in average annual water supplies from the San Gabriel River basin during drought (single year and multi-year) years relative to baseline conditions due to shifts in precipitation from winter to fall and projected increases in surface water evaporation caused by increasing temperatures, particularly under the extreme warming climate scenario. Modeling results also projected a shorter rainy season with potential for higher intensity precipitation events resulting in higher peak flows of shorter duration.

In terms of water demand, climate modeling results projected increases in outdoor water uses under normal, single dry, and multi-year drought conditions, caused by projected temperature increases. This leads to higher evapotranspiration (ET) rates for landscaping, irrigated crops, and native vegetation. Average annual outdoor water use by customers within the Three Valleys service area could increase by up to six percent under the most severe (Dry Hot) climate change scenario.

A comparison of Three Valleys and Metropolitan's water budget projections under future climate conditions shows similar total demand projections, with Three Valleys showing increased reliance on imported surface water (supplied by Metropolitan) in its future projections. This increased reliance in Three Valleys projections occurs because local water supplies are projected to remain nearly constant while water demand increases due to future growth and increased climate-related water deficits. This highlights the need to develop mitigation actions to reduce future reliance on imported surface water.

Table 3-3 through Table 3-5 display the projected Three Valleys service area water budgets under the three modeled potential future climate conditions. The projected budgets show that between 2020 and 2045, imported water supply requirements will increase by 15.4 thousand acre-feet per year (TAF/year) under drier - extreme warming future conditions, 13.3 TAF/year under median future climate conditions, and 7.8 TAF/year if future conditions are wetter with moderate warming.

Table 3-3. Three Valleys Service Area Water Budget – Drier Future with Extreme Warming

Source (TAF/year)	2018-2022	2025	2030	2035	2040	2045
Total Demand	113,651	120,346	121,219	123,062	125,472	128,004
Groundwater	38,316	38,282	38,234	37,895	37,551	37,202
Surface Water	4,760	4,741	4,718	4,579	4,440	4,301
Recycled Water	5,619	5,929	5,953	6,000	6,073	6,151
Total Local Supply	48,694	48,952	48,905	48,473	48,063	47,655
Net Imported Water Supply Required	64,957	71,394	72,314	74,589	77,409	80,349

Table 3-4. Three Valleys Service Area Water Budget – Median Future Climate Conditions

Source (TAF/year)	2018-2022	2025	2030	2035	2040	2045
Total Demand	113,651	120,346	121,219	122,590	124,513	126,557
Groundwater	38,316	38,282	38,234	38,007	37,763	37,535
Surface Water	4,760	4,741	4,718	4,698	4,678	4,658
Recycled Water	5,619	5,929	5,953	6,000	6,073	6,151
Total Local Supply	48,694	48,952	48,905	48,705	48,514	48,345
Net Imported Water Supply Required	64,957	71,394	72,314	73,885	75,999	78,212

Table 3-5. Three Valleys Service Area Water Budget – Wetter Future with Moderate Warming

Source (TAF/year)	2018-2022	2025	2030	2035	2040	2045
Total Demand	113,651	120,346	121,219	122,220	123,723	125,376
Groundwater	38,316	38,282	38,234	39,101	39,983	40,837
Surface Water	4,760	4,741	4,718	5,012	5,304	5,598
Recycled Water	5,619	5,929	5,953	6,000	6,073	6,151
Total Local Supply	48,694	48,952	48,905	50,113	51,360	52,587
Net Imported Water Supply Required	64,957	71,394	72,314	72,107	72,362	72,790

3.4 Dependence on Imported Water

Based on the historical water use for each of Three Valleys' member agencies from 2015 to 2022, almost all of Three Valleys' member agencies rely on imported water as a major supply source. Imported water constitutes the largest portion of the region's supply, accounting for about 51 percent of the total from 2015 to 2022 (Figure 3-1).

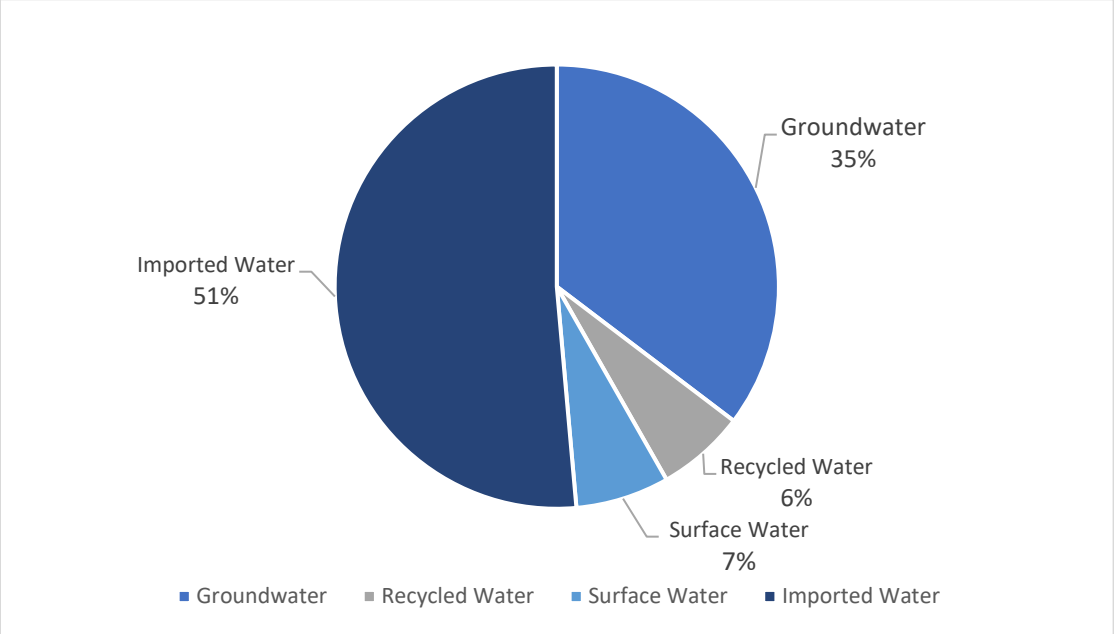


Figure 3-1. Percent Regional Water Use by Source

Table 3-6 presents Three Valleys member agencies dependencies on imported water – relative to their total supply of water – under normal, drought, and future conditions. Using historical data provided by member agencies for 2015-2022 and projected data through 2045, imported water dependency was first calculated under the latest available hydrologic conditions (2015-2022). Over half of the member agencies are at least 50 percent dependent on imported water for their total supply portfolio in these recent years.

Next, imported water dependency was calculated for each member agency looking at the worst drought available in these records (2022). Dependence on imported water supplies increases during drought, with eight member agencies being at least 65 percent dependent on imported water during this drought.

Finally, imported water dependency was calculated for projected supply portfolios in 2045. Similar to recent years, over half of the member agencies are at least 50 percent dependent on imported water in 2045 according to their projections.

Much like the findings of the Climate Change Vulnerability Assessment described in the previous Section, the imported water data and projections from Three Valley member agencies highlight the need to develop regional actions or project portfolios to help reduce dependence on imported supplies and secure more reliable water sources for the region.

Table 3-6. Three Valleys Member Agencies Dependence on Imported Water (IW)

Agency	Dependency on IW (2015-2022)	Dependency on IW during Drought	Dependency on IW (2045)
Boy Scouts of America	100%	100%	100%
Cal Poly Pomona	5%	6%	2%
City of Covina	4%	18%	3%
City of Glendora	6%	25%	7%
City of La Verne	55%	79%	79%
City of Pomona	21%	30%	21%
Covina Irrigating Company	56%	65%	56%
Golden State Water Company (Claremont)	56%	65%	52%
Golden State Water Company (San Dimas)	82%	87%	71%
Mount San Antonio College	100%	100%	100%
Rowland Water District	82%	88%	56%
Suburban Water Systems (San Jose)	28%	75%	26%
Valencia Heights Water Company	10%	29%	6%
Walnut Valley Water District	91%	88%	65%

4 Mitigation Projects Development and System Performance Evaluation

As described in Section 3.3, the Climate Change Vulnerability Analysis conducted by Three Valleys showed an increasing reliance on imported surface water (supplied by Metropolitan) in its future projections, highlighting the need to develop mitigation actions to reduce future reliance on imported surface water. In response to these findings, Three Valleys worked with their member agencies to compile a suite of projects designed towards the goal of increasing regional water supply planning and operational flexibility and resiliency[1]. This suite of mitigation projects includes projects that are in various stages of implementation, including pre-planning, planning, design, and construction. Many of these mitigation projects are consistent with existing planning programs and processes of the various regional stakeholders, such as Three Valleys' Capital Improvement Plan.

This section describes the process of identifying and developing the suite of mitigation projects as well as initial analyses of those projects' proposed benefits relative to existing system performance in four infrastructure categories: water supply storage, conveyance pipelines, wells, and water quality treatment.

4.1 Mitigation Projects Development

In June 2024, Three Valleys sent invitations to its member agencies and regional stakeholders to schedule meetings to discuss potential mitigation projects. Organizations received a project information sheet tailored to their agency. In July 2024, Three Valleys conducted individual meetings with the agencies to review, confirm, and update the mitigation projects.

The project information form asked each organization to assess whether and to what degree their submitted mitigation project(s) have the potential to enhance regional water supply reliability. Relevant features that could contribute to improving water supply reliability include infrastructure such as pipelines and pump stations; reduced reliance on imported water supplies; treatment of groundwater contaminants like per- and polyfluoroalkyl substances (PFAs) or contaminants of emerging concern (CECs); and system enhancements or repairs to storage facilities or other components.

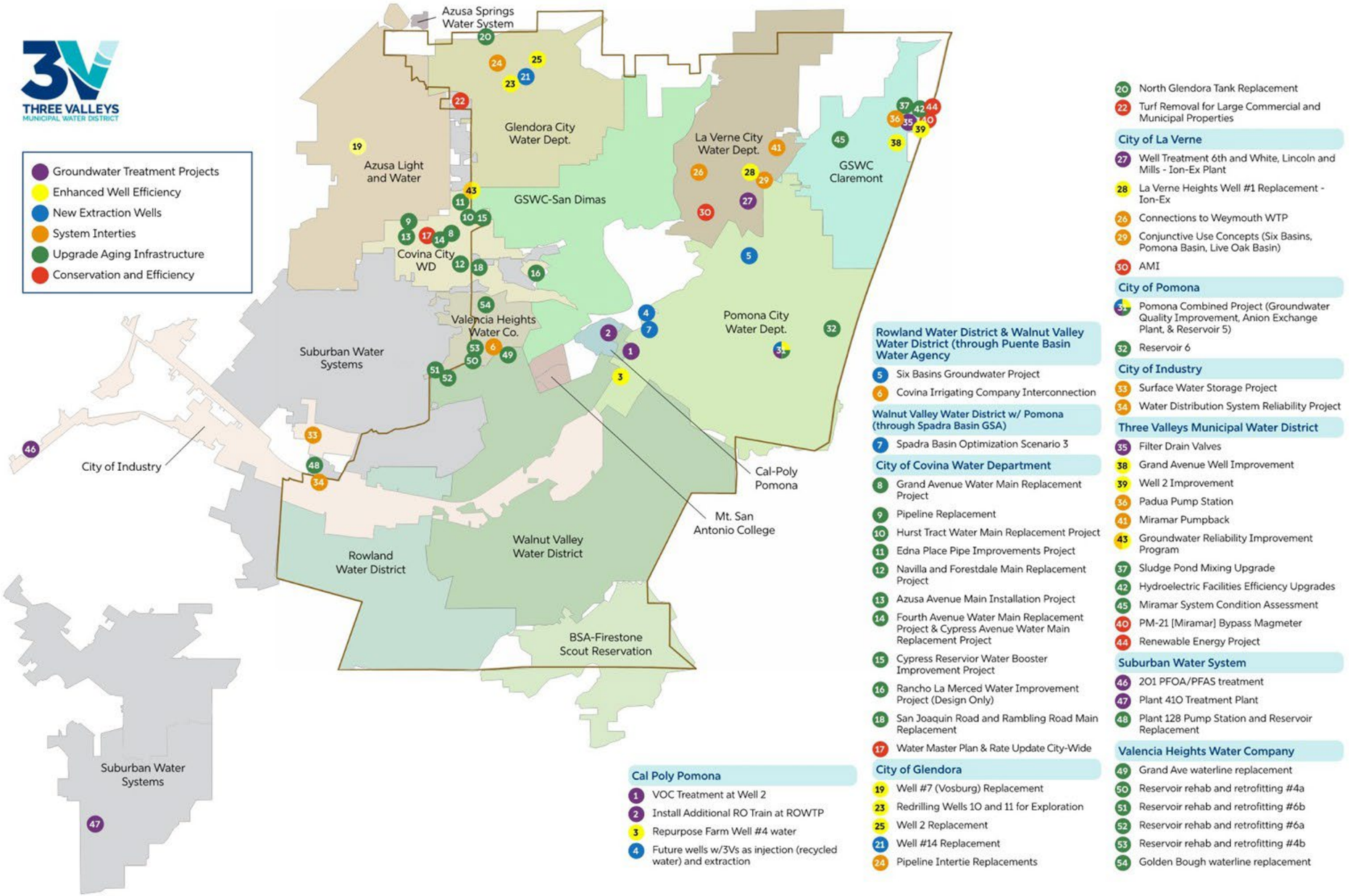
Additionally, each organization was asked to provide as many key identifiers as possible for each mitigation project, including, but not limited to, the following:

- Project stage (conceptual, feasibility, design, construction)
- Implementation timeline/schedule (years)
- Estimated costs (capital and annual)
- Estimated annual water savings or supplemental supplies created

[1] As described in Section 1.2, Three Valleys has been developing a Regional DCP in parallel with the development of this WRMP. As part of the development of the DCP, Reclamation requires identification and description of actions that mitigate the impacts of drought and enhance regional resiliency. Pursuant to this requirement, Three Valleys has compiled a suite of Mitigation Actions; these Mitigation Actions will be referred to as mitigation projects in this WRMP.

4.1.1 Mitigation Projects Identified

Three Valleys held a workshop in August 2024 where the submitted mitigation projects were presented and discussed amongst member agencies and regional stakeholders. The workshop aimed to address gaps in the requested mitigation project data as well as to solicit additional feedback on the submitted projects. From the data collected and the input received during the workshop, a total of 54 projects, programs, and strategies were identified (Figure 4-1). A full list of the submitted mitigation projects and their descriptions (where available) are provided in Appendix A – List of Mitigation Projects.



Rowland Water District & Walnut Valley Water District (through Puente Basin Water Agency
- 5 Six Basins Groundwater Project
- 6 Covina Irrigating Company Interconnection

Walnut Valley Water District w/ Pomona (through Spadra Basin GSA)
- 7 Spadra Basin Optimization Scenario 3

City of Covina Water Department
- 8 Grand Avenue Water Main Replacement Project
- 9 Pipeline Replacement
- 10 Hurst Tract Water Main Replacement Project
- 11 Edna Place Pipe Improvements Project
- 12 Navilla and Forestdale Main Replacement Project
- 13 Azusa Avenue Main Installation Project
- 14 Fourth Avenue Water Main Replacement Project & Cypress Avenue Water Main Replacement Project
- 15 Cypress Reservior Water Booster Improvement Project
- 16 Rancho La Merced Water Improvement Project (Design Only)
- 18 San Joaquin Road and Rambling Road Main Replacement
- 17 Water Master Plan & Rate Update City-Wide

Cal Poly Pomona
- 1 VOC Treatment at Well 2
- 2 Install Additional RO Train at ROWTP
- 3 Repurpose Farm Well #4 water
- 4 Future wells w/3Vs as injection (recycled water) and extraction

City of Glendora
- 19 Well #7 (Vosburg) Replacement
- 23 Redrilling Wells 10 and 11 for Exploration
- 25 Well 2 Replacement
- 21 Well #14 Replacement
- 24 Pipeline Intertie Replacements

- 20 North Glendora Tank Replacement
- 22 Turf Removal for Large Commercial and Municipal Properties

City of La Verne
- 27 Well Treatment 6th and White, Lincoln and Mills - Ion-Ex Plant
- 28 La Verne Heights Well #1 Replacement - Ion-Ex
- 26 Connections to Weymouth WTP
- 29 Conjunctive Use Concepts (Six Basins, Pomona Basin, Live Oak Basin)
- 30 AMI

City of Pomona
- 31 Pomona Combined Project (Groundwater Quality Improvement, Anion Exchange Plant, & Reservoir 5)
- 32 Reservoir 6

City of Industry
- 33 Surface Water Storage Project
- 34 Water Distribution System Reliability Project

Three Valleys Municipal Water District
- 35 Filter Drain Valves
- 38 Grand Avenue Well Improvement
- 39 Well 2 Improvement
- 36 Padua Pump Station
- 41 Miramar Pumpback
- 43 Groundwater Reliability Improvement Program
- 37 Sludge Pond Mixing Upgrade
- 42 Hydroelectric Facilities Efficiency Upgrades
- 45 Miramar System Condition Assessment
- 40 PM-21 [Miramar] Bypass Magmeter
- 44 Renewable Energy Project

Suburban Water System
- 46 201 PFOA/PFAS treatment
- 47 Plant 410 Treatment Plant
- 48 Plant 128 Pump Station and Reservoir Replacement

Valencia Heights Water Company
- 49 Grand Ave waterline replacement
- 50 Reservoir rehab and retrofitting #4a
- 51 Reservoir rehab and retrofitting #6b
- 52 Reservoir rehab and retrofitting #6a
- 53 Reservoir rehab and retrofitting #4b
- 54 Golden Bough waterline replacement

Figure 4-1. Potential Suite of Mitigation Projects Identified by Member Agencies and Regional Stakeholders

Note:

1. GSWC = Golden State Water Company, BSA = Boy Scouts of America
2. Project #44 is included to account for all proposed mitigation actions. However, upon further review with Three Valleys, it was determined that Project #44 does not qualify as a drought mitigation action.

4.1.2 Conservation Measures

Mitigation actions such as water conservation can also reduce future water supply deficits. Recent legislation such as SB 1157 requires urban retail water suppliers in California to implement water conservation measures which will reduce overall water use. Water conservation targets required by state regulations include the following indoor residential water use targets:

- 55 gallons per capita daily prior to January 1, 2025,
- 47 gallons per capita daily from January 1, 2025, to January 1, 2030,
- 42 gallons per capita daily beginning to January 1, 2030.

Table 4-1 shows how much water conservations saving would be realized if member agencies meet pre-2025, 2025 to 2030, and post-2030 indoor water use targets. The numbers in red show potential future water savings that would be achieved if member agencies reduced the water use to below the target. Total conservation savings are only aggregated from member agencies which have not yet met the indoor water use targets. Existing water saving from member agencies which have already met the water conservation targets are shown in black.

Table 4-1: Water Conservation Targets and Savings

Agency	Savings if Current 55 GPCD Target is Met (AF)	Projected 2025 Savings if 47 GPCD Target is Met (AF)	Projected 2030 Savings if 42 GPCD target is Met (AF)
Glendora	-1,854	-2,326	-2,621
La Verne	171	-97	-231
Pomona	1,015	-226	-817
GSWC Claremont	2,531	2,193	2,002
GSWC San Dimas	1,194	693	387
Rowland	168	-313	-602
Suburban	2,341	805	-99
Walnut	173	-701	-1,208
Conservation Savings	-1,854	-3,663	-5,578

Based on this analysis, total water use in the region would be reduced by an additional 5.6 TAF/year if all Three Valleys member agencies meet the state's 2030 water conservation target. Achieving this conservation reduction would reduce the overall future water supply deficit from 15 TAF/year to about 10 TAF/year.

The state has also passed AB 1572 which includes bans on the use of potable water for irrigation of nonfunctional turf with potable water on institutional properties including public agencies, commercial and industrial properties, common areas of properties of homeowners' associations, community organizations, and public water systems. The full impact of the legislation on total water in the region cannot be easily determined at this time because of the gradual phasing-in of irrigation prohibitions

for different land use types. As with other conservation measures, total savings will depend on levels of compliance achieved.

4.2 System Performance Evaluation

The following sections describe the initial analyses of the identified mitigation projects' proposed benefits relative to existing system performance in four infrastructure categories: water supply storage, conveyance pipelines, wells, and water quality treatment.

4.2.1 Storage Capacity

As described in Section 2.3.2, Three Valleys' water supply sources include: groundwater pumped from Six Basins; untreated, imported surface water purchased from Metropolitan for use at Three Valleys' treatment plant; and treated imported surface water purchased from Metropolitan. Three Valleys' main source of water supply is imported water from Metropolitan.

At of the end of 2023, Three Valleys had approximately 1,150 AF stored in the Main San Gabriel Basin (which is projected to increase to 10,000 AF by the end of 2024). The highest volume of water stored by Three Valleys in the Main San Gabriel Basin was 24,000 AF in 2019. Three Valleys also had 3,300 AF stored in the Six Basins groundwater basin in 2023, projected to decrease to 2,500 AF for 2024, and approximately 1,390 Fheld in a storage account in the Chino groundwater basin by City of Pomona (2024). By end of 2024, Three Valleys is projected to have approximately 14 TAF in storage compared to its current storage capacity amongst the basins of 54,890 AF. The availability of water and the groundwater spreading facility availability limits the ability for Three Valleys to fully utilize its groundwater storage programs.

System Storage Facilities Analysis

Additional investment in water storage infrastructure is needed to ensure that all member agencies have access to storage facilities. In addition, the region seeks to enhance water supply reliability by maximizing use of its full storage capacity (of approximately 55 TAF), which is currently about a year's worth of imported water supply.

Table 4-2 shows proposed and conceptual mitigation projects from Three Valleys – and their member agencies – that could increase Three Valleys' storage capacity and/or improve the reliability of their current storage systems. These mitigation projects are summarized and described in more detail in Section 5.

Table 4-2. Proposed Projects to Enhance Storage Capacity

Project	Proponent	Increase in Storage Capacity (AF)
Surface Water Storage Project	City of Industry	n/a
Spadra Basin Optimization Scenario 3	Walnut Valley Water District with Pomona (through Spadra Basin GSA)	3,500
	TOTAL	3,500+

4.2.2 Pipelines

As a water wholesaler, Three Valleys relies on a network of pipelines to deliver water to retail agencies. In addition, Three Valleys connects to neighboring pipelines for added flexibility. For instance, in the spring of 2015, Three Valleys was able to connect to the City of Pomona's Canon pipeline that conveys water from San Antonio Creek to the City of Pomona's Pedley Filtration Plant located in the City of Claremont to the direct surface water to San Antonio Spreading Grounds that benefit the Three Valleys' groundwater wells located in the Six Basins.

System Pipeline Facilities Analysis

A full asset condition survey has not been conducted for the Three Valleys water system. However, many pipelines and associated infrastructure within the system are approaching or even past their planned service life of approximately 50 years. This is particularly true for infrastructure constructed soon after the agency was established nearly 75 years ago. In addition, operational constraints in the conveyance system limit full utilization of water supply and storage capabilities. For example, Three Valleys has capacity to store 50,000 AF in the Main San Gabriel Basin but currently only has turnout capacity to import 5,000 to 6,000 AF/year from Metropolitan. Three Valleys developed a conceptual project which was tested in the fall of 2024 which provided an additional recharge capacity of 30 cubic feet per second. The facility would be able to recharge approximately 10,000 AF if operated continuously for six months without interruptions for basin maintenance or other facility limitations.

Table 4-3 shows proposed and conceptual mitigation projects from Three Valleys – and their member agencies – that could improve the reliability of their current pipeline systems. These mitigation projects are summarized and described in more detail in Section 5.

Table 4-3. Proposed Projects to Enhance Pipeline Reliability

Project	Proponent
Miramar System Condition Assessment	Three Valleys Municipal Water District
Covina Irrigating Company Interconnection	Rowland Water District & Walnut Valley Water District (through Puente Basin Water Agency)
Water Loss Reduction through Pipeline Replacement	City of Covina Water Department
Pipeline Intertie Replacements	City of Glendora

4.2.3 Wells

The number of active wells in the Three Valleys' region is estimated at between 40 and 50 based on the annual groundwater extraction of approximately 46,652 AF/year and an estimated yield of 800 gallons per minute (gpm) per well operating approximately 80 percent of the time. Some functioning wells are less efficient to operate as they approach the end of their planned service life. In addition, the region also has several wells which are no longer in use because of malfunctioning infrastructure or water quality conditions.

There is currently no comprehensive study on the state of wells in the region. However, anecdotal information from member agencies indicates that additional investment in new wells, groundwater treatment and rehabilitation projects is required to maintain or even increase total well extraction capacity in the region over the next few years.

System Wells Facilities Analysis

Table 4-4 shows well projects proposed by Three Valleys and member agencies to increase the total extraction capacity and improve the reliability of current wells. These mitigation projects are summarized and described in more detail in Section 5.

Table 4-4. Proposed Projects to Enhance Reliability of Well Extraction Capacity

Project	Proponent	Estimated Increase in Extraction Capacity (AF)
Grand Avenue Well Improvement	Three Valleys	n/a
Well #2 Improvement	Three Valleys	n/a
Groundwater Reliability Improvement Project	Three Valleys	9,000
Repurpose Farm Well #4 Water	Cal Poly Pomona	600
Future Wells as Injection (Recycled Water) and Extraction - 2 sites	Cal Poly Pomona (with Three Valleys, City of Pomona)	1,200
Six Basins Groundwater Project	Rowland Water District & Walnut Valley Water District (through Puente Basin Water Agency)	1,500
Spadra Basin Optimization Scenario 3	Walnut Valley Water District with Pomona (through Spadra Basin GSA)	2,994
Well #2 Replacement	City of Glendora	n/a
Well #7 Replacement	City of Glendora	n/a
Well #14 Replacement	City of Glendora	2,000
Redrilling Wells #10, #11 for Exploration	City of Glendora	n/a
La Verne Heights Well #1 Replacement	City of La Verne	n/a
	TOTAL	17,294+

4.2.4 Water Quality Treatment Infrastructure

Three Valleys obtains untreated, imported water supplies from Metropolitan for treatment at the District's Miramar Water Treatment Plant. In addition, Three Valleys produces groundwater from three wells located in the Six Basins which are also treated at the Miramar Water Treatment Plant.

System Treatment Infrastructure Facilities Analysis

The total treatment capacity currently operated by Three Valleys and their member agencies is unknown. However, member agencies have identified 8 water treatment projects. If implemented, the projects would enhance the region's treatment capacity by over 9,500 AF/year

Table 4-5 shows proposed and conceptual mitigation projects from Three Valleys – and their member agencies – that could improve the reliability of their water treatment infrastructure and systems. These mitigation projects are summarized and described in more detail in Section 5.

Table 4-5. Proposed Projects to Enhance Water Treatment Infrastructure Reliability

Project	Proponent	Increase in Usable Supply (AF)
Filter Drain Valves	Three Valleys	n/a
Sludge Pond Mixing Upgrade	Three Valleys	n/a
Volatile Organic Compounds (VOC) Treatment at Well #2	Cal Poly Pomona	460
Install Additional Reverse osmosis (RO) Train at Cal Poly Pomona Water Treatment Plant	Cal Poly Pomona	275
Well Treatment	City of La Verne	3,500
City of Pomona Combined Project (Groundwater Quality Improvement, Anion Exchange Plant)	City of Pomona	5,300
201 PFOA/PFAS Treatment	Suburban Water System	n/a
Plant 410 Treatment Plant	Suburban Water System	n/a
	TOTAL	9,535+

4.3 Summary of Infrastructure Need

As described in the previous sections, Three Valleys has a need for additional infrastructure investment across all infrastructure categories analyzed. Investments in mitigation projects identified as part of this process will support Three Valleys' goals of increasing local water supply reliability and reducing dependency on imported water supply.

Table 4-6 shows estimated Three Valleys and member agency project benefits relative to their respective infrastructure needs. It should be noted that the project water supply yields listed in this table were submitted by the respective project proponents as part of the mitigation project development (see Section 4.1); not every project submitted had a yield associated with the project as part of these project proponent submittals. Therefore, the yield and project costs listed in this table were only calculated for projects that included an estimated yield.

Table 4-6. Summary of Proposed Project Benefits Relative to Infrastructure Needs

Category (Number of Projects)	Total Project Yield (AF)	Project Yield Cost ($/AF)	
		Group Range	Group Average
Integrated Storage and Wells (1)	2,994	--	$53,616
Pipelines (2)	2,200	$2,000-$17,000	$3,465
Wells (5)	14,300	$300-$15,000	$10,735
Treatment (4)	9,535	$1,000-$3,000	$1,841
TOTAL	29,029	$300-$17,000	$11,685

5 Mitigation Projects Analysis

As described in the previous Section, Three Valleys and its member agencies, together with other regional stakeholders, identified 54 projects, programs, and strategies designed towards the goal of increasing regional water supply planning and operational flexibility and resiliency. Of those, 26 projects included new infrastructure and/or updates to existing infrastructure; these 26 projects were sorted into four infrastructure categories, described in the previous Section.

Numerous factors have the potential to impact implementation of these mitigation projects, such as funding availability, regulatory requirements, implementation complexities, and strategic planning priorities that are unique to each regional stakeholder. The following sections describe several of these factors: project cost, project implementation schedule, and probability of project's implementation. A summary of funding opportunities for regional and/or local projects is also presented.

5.1 Cost

Table 5-1 and Figure 5-1 present summaries of proposed regional infrastructure project estimated construction costs. The estimated total cost of the 26 proposed projects is over $660 million. Note that the projects included in these summaries include all 26 infrastructure projects described above, not just the infrastructure projects that were submitted with estimated water supply yields as presented in Section 4.3 and Table 4-5.

Table 5-1. Summary of Proposed Infrastructure Project Estimated Construction Costs

Type of Project	Number of Projects	Estimated Average Cost ($)	Estimated Total Cost ($)
Storage	2	$88M	$176M
Pipelines	4	$3M	$12M
Wells	12	$27.3M	$327M
Treatment	8	$6.5M	$52M
		TOTAL	$667M

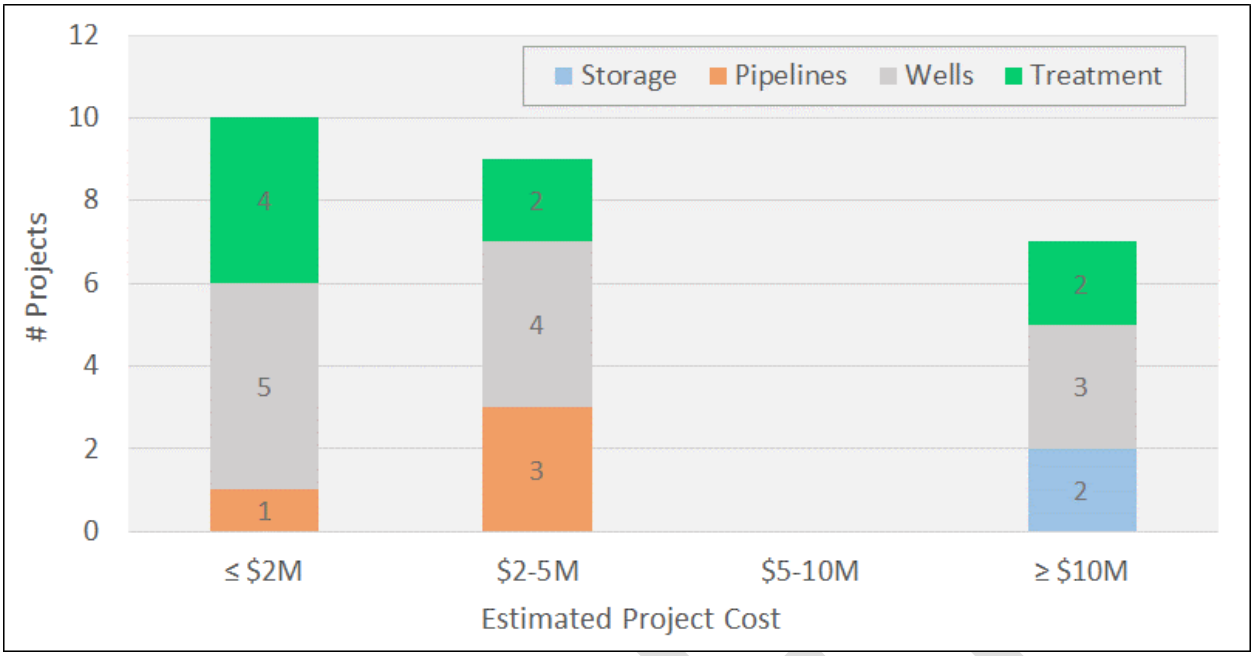


Figure 5-1. Grouped Summaries of Proposed Infrastructure Project Costs

Key Observations:

- Storage projects are relatively expensive in terms of total cost and cost per acre-foot. However, these projects can greatly improve water supply reliability and reduce dependence on imported water during periods of drought.
- Treatment and Wells projects are the most common type of proposed projects. They are also the most cost-effective source of supply in terms of cost per acre-foot. The amount of supply available from these projects is limited by availability of water rights.
- All Pipeline projects proposed are less than $5M. While they do not generate any new supplies, pipeline projects enhance water supply reliability and provide additional operational flexibility.

5.2 Schedule

Table 5-2 and Figure 5-2 present summaries of proposed regional infrastructure estimated project implementation schedules. Note that the projects included in these summaries include all 26 infrastructure projects described above, not just the infrastructure projects that were submitted with estimated water supply yields as presented in Section 4.3 and Table 4-5.

Table 5-2. Summary of Proposed Infrastructure Project Implementation Schedules

Type of Project	Number of Projects	Estimated Construction Schedule
Storage	2	6 yrs
Pipelines	4	3.4 yrs
Wells	12	4.1 yrs
Treatment	8	3 yrs

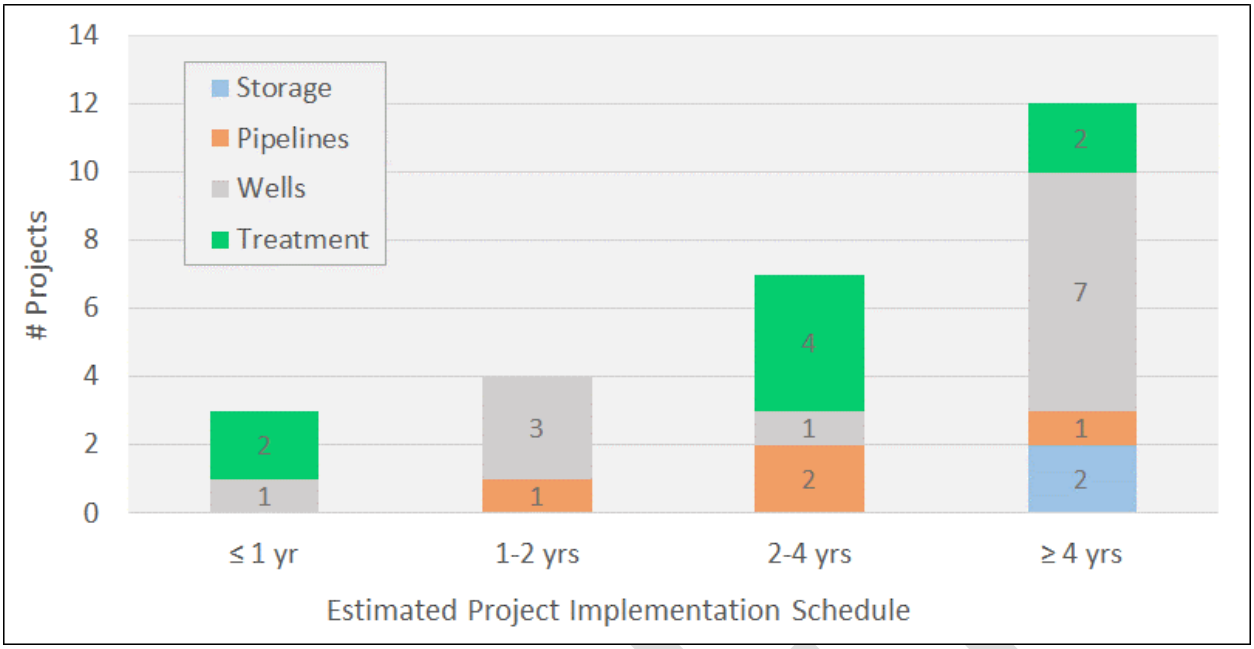


Figure 5-2. Grouped Summaries of Proposed Infrastructure Project Implementation Schedules

Key Observations:

- Most of the proposed projects have implementation schedules of greater than 4 years. These projects typically require external funding and collaboration from multiples agencies for implementation.
- However, there are 7 projects in three categories (wells, treatment, and pipelines) that are estimated to be completed in less than two years. These are typically projects that can be implemented by individual agencies as part of local capital improvement plans.
- Storage projects typically fall within the class of longer-range implementation projects which require external funding and regional partnerships.

5.3 Implementation

Table 5-3 and Figure 5-3 present summaries of proposed regional infrastructure project implementation probabilities. Note that the projects included in these summaries include all 26 infrastructure projects described above, not just the infrastructure projects that were submitted with estimated water supply yields as presented in Section 4.3 and Table 4-5.

Table 5-3. Summary of Proposed Infrastructure Project Implementation Probabilities

Type of Project	Number of Projects	Average Implementation Probability
Storage	2	20%
Pipelines	4	40%
Wells	12	52%
Treatment	8	68%

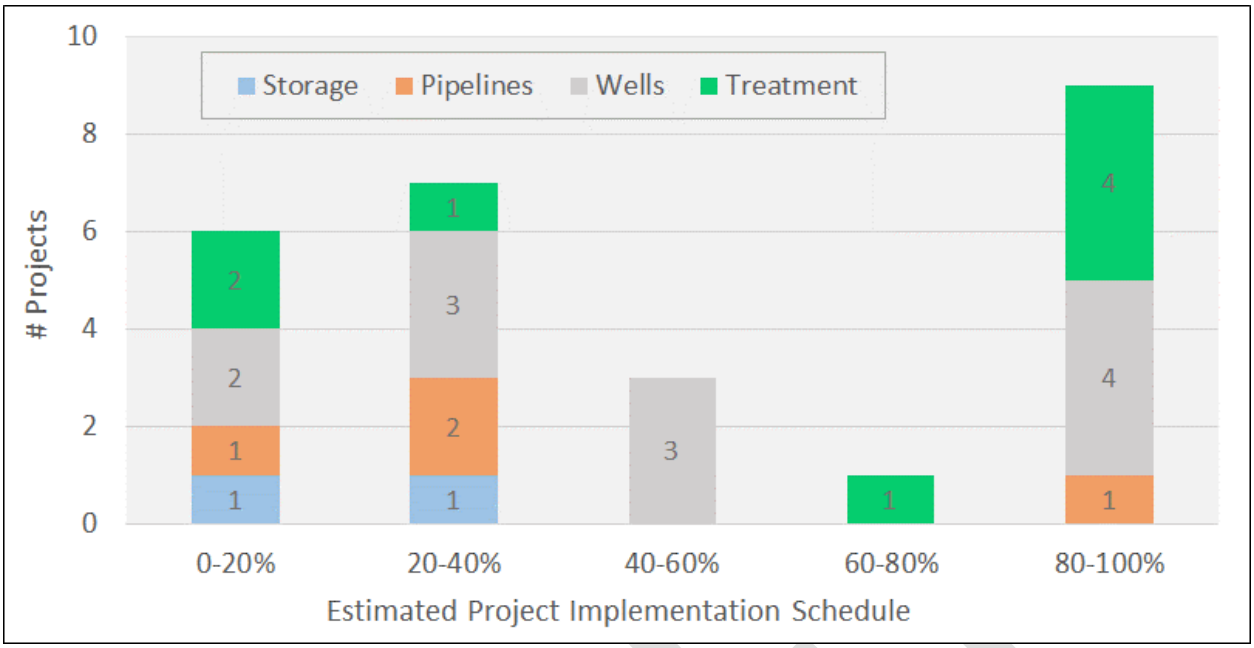


Figure 5-3. Grouped Summaries of Infrastructure Project Implementation Probabilities

Key Observations:

- Approximately half of Treatment and Wells projects are viewed as highly likely to be implemented.
- Storage projects and other infrastructure projects requiring regional partnerships and external funding are viewed as less likely (less than 40% probability) to be implemented.

5.4 Funding Opportunities

Implementation of these regional projects most cost effective with funding from a combination of local, state and federal sources. Federal funding sources have been identified from the Federal Emergency Management Agency (FEMA) and the U.S. Bureau of Reclamation (USBR). State funding has been identified from the State Water Resources Control Board. Additional state funding programs are expected to become available in coming years following the passage in November 2024 of the statewide Proposition 4 ballot measure which authorizes bonds for safe drinking water, wildfire prevention, and protecting communities and natural lands from climate risks.

In general, there are currently several grant programs which could fund treatment and storage infrastructure projects. There are fewer grant programs that are well suited for well and pipeline infrastructure projects. The list of potential grant opportunities which could fund implementation of regional projects in the Three Valley service area are presented in Table 5-4.

Table 5-4. Potential Funding Opportunities for Project Implementation

Organization	Program Name	Type(s) of Projects Funded				Priorities	Timeline(s)	Funding Available ($)		Cost Share / Funding Match
		Storage	Pipelines	Wells	Treatment			Total Funding	Funding / Project	
FEMA	Building Resilient Infrastructure and Communities (BRIC)	x	x	x	x	Research-supported, proactive investment in community resilience	Ongoing ("once the funding opportunity is published, the application period for the BRIC funding cycle will open in the fall and close in early winter")	$800M+	$200K - $12M+[a]	75% federal 25% non-federal
Bureau of Reclamation (USBR)	WaterSmart	x	x	x	x	Water and Energy Efficient Grants	First round of applications has been submitted Second round of applications are due Nov 13, 2024	approx. $50M	Up to $500K: projects completed within two years Up to $5M: projects completed within three years	50% federal 50% non-federal
		x	x	x	x	Drought Response Program - Drought Resiliency	FY25 funding applications received by Oct 7, 2024, are currently under review	up to $40M	Up to $750K: projects completed within two years Up to $3M: projects completed within three years	50% federal 50% non-federal
			x			Small-Scale Water Efficiency Grants	FY25 funding applications received by Oct 7, 2024, are currently under review	approx. $12M	Up to $125K: projects completed within two years Total project costs cannot exceed $250K	50% federal 50% non-federal
					x	Water Recycling and Desalination	FY25 Funding Opportunity expected Dec 2024 Applications due Mar 2025	approx. $30M	n/a	50% federal 50% non-federal
State Water Resources Control Board (SWRCB)	General Drought Funding	x				Projects that address either drought-related urgent drinking water needs or long-term resilience	Next round of applications due Feb 28, 2025	n/a		
	Water Recycling Funding Program				x	Water recycling projects that offset or augment state or local fresh water supplies and water recycling research	Ongoing	approx. $153M[b]	n/a	50% state 50% non-state
	Drinking Water State Revolving Fund (DWSRF)	x	x	x	x	Infrastructure improvements to correct system deficiencies and improve drinking water quality for the health, safety, and welfare of all Californians	Revolving	approx. $220-375M	Low-interest loans, additional subsidy (principal forgiveness), and technical assistance to public water systems	
	Clean Water State Revolving Fund (CWSRF)	x			x	Projects that help protect and improve water quality	Revolving	approx. $600M	Low-interest loans, additional subsidy (principal forgiveness), and technical assistance to public water systems	

[a] Project type-specific funding varies based on type of project being funded (mitigation projects, capability and capacity building activities, management costs, direct technical assistance); for more detailed information, see BRIC website

[b] Total represents sum of funding from multiple sources (Prop 1, Prop 13, Prop 68, General Fund) as of Aug 1, 2024

6 Opportunities for Regional Agency/Project Collaboration

As a region which relies 50 to 60 percent on imported water supplies, it is imperative for Three Valleys to invest in local supplies and supply diversification. Three Valleys has been advocating amongst regional partnering agencies to increase investments in the three groundwater basins that the Three Valleys services are overlies and includes storage accounts, specifically, the Chino, Main San Gabriel, and Six Basins groundwater basins. This section presents four regional projects which were derived from projects proposed by Three Valleys, member agencies, and regional stakeholders. These regional projects are highlighted in this section because they address the regional goals of increasing water supply reliability and reducing dependence on imported water supplies (see Section 0).

6.1 Description of Regional Projects

6.1.1 Regional Project #1 – External Partnership with Covina Valley Water Company (Main San Gabriel Basin)

This regional project would include construction of an intertie to access existing water supply from CVWC. Through Puente Basin Water Agency (PBWA), a joint powers authority between WVWD and RWD, WVWD and RWD would lead the construction of this intertie, which would allow pumping of surplus CVWC well and surface water into the Badillo-Grand pipeline via the new interconnection. Table 6-1 shows the regional needs addressed by this regional project.

Table 6-1: Regional Needs addressed by Regional Project 1

Regional Needs	Components of Regional Project 1
Extraction Wells	
'Put' Facilities	
Regional Pipelines	X
Increase in Treatment Facilities	
Increase in Storage	
Increase of Local Supply	X

This project would increase regional water supply reliability and reduce overall dependence on imported water supplies, thereby improving operational flexibility by integrating additional water sources into the existing network within the Three Valleys service area. This regional project would provide an estimated 2 TAF toward Three Valleys' goals of reducing overall dependency on imported water by 10 TAF and increasing overall water supply by 15 TAF.

6.1.2 Regional Project #2 – Three Valleys Groundwater Reliability Improvement Program (GRIP)

This regional project would include a Three Valleys partnership with the City of Glendora and PBWA to implement a regional distribution network and local supplies by utilizing 9,000 AF/year of stranded City assets. The regional distribution network would be augmented by the construction of new treatment facilities and conveyance pipelines. Three Valleys, as the lead agency, will develop the project that includes new replacement wells with wellhead treatment for City of Glendora's Wells #3, 4, and 7, and the pipeline and pumpstations. This regional project could also be expanded to address

water quality concerns for more member agencies. Table 6-2 shows the regional needs addressed by this regional project.

Table 6-2: Regional Needs addressed by Regional Project 2

Regional Needs	Components of Regional Project 2
Extraction Wells	X
'Put' Facilities	
Regional Pipelines	X
Increase in Treatment Facilities	X
Increase in Storage	X
Increase of Local supply	X

This project would increase regional water supply reliability, thereby improving operational flexibility by integrating additional water sources into the existing network. This regional project would provide an estimated 9 TAF toward Three Valleys' goal of increasing overall water supply by 15 TAF.

6.1.3 Regional Project #3 – Three Valleys Storing Water in Main San Gabriel Basin (GRIP+)

This regional project would include a Three Valleys partnership with the City of Glendora and City of Pomona in which Three Valleys would store surplus imported water in wet years for the Cities via groundwater recharge at the Santa Fe Spreading Grounds in the Main San Gabriel Basin. The project would also include the drilling of five new wells (two for Glendora, three for Pomona) along with wellhead treatments for all five wells, as well as the installation of approximately 5 miles of potable water pipeline by connecting Main San Gabriel Basin supplies to the City of Pomona's distribution system via the Pomona-Walnut-Rowland Joint Water Line (JWL). Table 6-3 shows the regional needs addressed by this regional project.

Table 6-3: Regional Needs addressed by Regional Project 3

Regional Needs	Components of Regional Project 3
Extraction Wells	X
'Put' Facilities	
Regional Pipelines	X
Increase in Treatment Facilities	
Increase in Storage	X
Increase of Local Supply	X

Most of City of Pomona's groundwater supply comes from the Chino and Six Basins groundwater basins, which have degraded water quality; this affects 1) their ability to maximize their groundwater rights, and 2) their reliance on imported water, as their existing wells need blending to remove contaminants. This regional project, therefore, would increase water supply reliability and improve operational flexibility by expanding water storage via the Main San Gabriel groundwater basin, creating infrastructure to integrate supplies into the existing network, and increasing groundwater

treatment capacity. This project would produce approximately 9.2 TAF of local groundwater supply, increasing water supply reliability toward Three Valleys' goal of increasing overall water supply by 15 TAF.

6.1.4 Regional Project #4 – Chino Basin Conjunctive Use with Three Valleys

This regional project would include a partnership between Three Valleys and the City of Pomona. Three Valleys will store water in the Chino Basin and fund City of Pomona's infrastructure projects in exchange for the pumping and delivery of water for use by the Three Valleys member agencies, such as the City of La Verne, Golden State Water Company and the Puente Basin Water Agency. The exchange water could also be conveyed from the Chino Basin to respective member agencies via the Joint Water Line (JWL) and the Badillo/Grand Transmission Main. Alternate water conveyance arrangements could also be considered to enable broader participation and access to water supply benefits by interested member agencies. This local groundwater source could be particularly helpful to member agencies with high dependencies on imported water to meet their demands, such as RWD and WVWD. Table 6-4 shows the regional needs addressed by this regional project.

Table 6-4: Regional Needs addressed by Regional Project 4

Regional Needs	Components of Regional Project 4
Extraction Wells	
'Put' Facilities	
Regional Pipelines	
Increase in Treatment Facilities	
Increase in Storage	X
Increase of Local Supply	X

This project would increase regional water supply reliability and reduce dependence on imported water during droughts, thereby improving operational flexibility by integrating additional water sources into the existing network, contributing toward Three Valleys' goals of reducing overall dependency on imported water by 10 TAF and increasing overall water supply by 15 TAF.

6.2 Risk Analysis and Prioritization of Regional Projects

In this master planning process, member agencies are trying to determine which regional projects deliver the broadest combination of regional benefits with the lowest risk. As projects progress from initial conception to preliminary design, quantitative benefit-cost analyses will need to be conducted. However, the regional projects included in this masterplan are currently at the early stages of initial conception. Qualitative methods applied for evaluating the benefits and risks of the regional projects are described in this section of the report.

6.2.1 Assessing Project Benefits

A pairwise comparison analysis was used to compare the regional projects on multiple benefit criteria. Pairwise comparison is a decision analysis method which allows evaluators to rank multiple decision alternatives by iteratively comparing two alternatives at a time. The pairwise comparison allows

member agencies to compare two projects at a time for each regional benefit. The comparisons are repeated until all project pairs have been compared for each regional benefit of interest. The list of project benefits used as evaluation criteria is shown in Table 6-5.

Table 6-5: Evaluation Criteria used for Project Benefits

Goal	Regional Project Needs as Evaluation Criteria
10 TAF	1. Reduce dependency on imported water during drought years
10 TAF	2. Reduce overall dependency on imported water
60 TAF	3. Increase total water in storage to about one year of imported supplies from Metropolitan
15 TAF	4. Increase Three Valleys PUT capacity by 15 TAF/year
15 TAF	5. Increase climate resilience – need to meet additional 15 TAF/year[2]
	6. Increase operational flexibility with additional Three Valleys conveyance facilities to transmit water from West to East, through a shared program with member agencies.
	7. Affordability of marginal cost of water produced compared to Metropolitan water
	8. Increase local groundwater treatment capacity
	9. Increase local extraction capacity

For each of the 9 evaluation criteria listed, the project being evaluated is placed on a row and compared to other regional (comparison) projects listed on columns. Pairwise comparison scores are assigned as follows:

- A score of 0 is assigned if the evaluation project is worse the comparison project
- A score of 0.5 is assigned if the evaluation project is equal to the comparison project
- A score of 1.0 is assigned if the evaluation project is better than the comparison project

The full pairwise comparison scores are presented in separate tables for each evaluation criterion in Appendix B of this report. The combined pairwise analysis scores assigned by member agencies (aggregated from all 9 evaluation criteria) are shown in Table 6 6.

Table 6 6: Combined Pairwise Benefit Evaluation Scores Assigned by Member Agencies

	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	3.25	2.75	3.667	9.667

[2] *Compliance with State 2030 goal for 42 GPCD reduces total member agency demand by approximately 5 TAF/year*

	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	5.75	X	3.5	4.833	14.083
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	6.25	5.5	X	4.833	16.583
Project 4: Chino Basin Conjunctive Use with Three Valleys	5.333	4.167	4.167	X	13.667

The average benefit scores assigned by member agencies to each project are also shown by each evaluation criterion in Table 6-7. Note that each project can attain a maximum score of 3 per criterion (if it scores 1 when compared with the other three comparison projects). Since there are 9 evaluation criteria, the maximum sum of benefit scores per project is 27.

Table 6-7: Project Benefit Evaluation Scores Assigned by Member Agencies to Each Criterion

Project	Crit.1	Crit.2	Crit.3	Crit.4	Crit.5	Crit.6	Crit.7	Crit.8	Crit.9.	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	1.000	1.667	1.000	0.917	1.417	0.417	1.833	0.500	0.917	9.667
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	1.583	1.500	1.583	1.500	1.333	1.750	1.333	1.750	1.750	14.083
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	1.667	1.500	2.167	2.167	1.417	2.083	1.500	2.250	1.833	16.583
Project 4: Chino Basin Conjunctive Use with Three Valleys	1.750	1.333	1.250	1.417	1.833	1.750	1.333	1.500	1.500	13.667

The results show that member agencies identified Project 3: Three Valleys Storing Water in Main San Gabriel Basin (GRIP+) as the project that would deliver the broadest set of regional benefits. Project 1: External Partnership with Covina Irrigation Company (Main SG Basin) is identified the project that would deliver the least amount of regional benefits.

6.2.2 Evaluation of Project Risks

A qualitative risk analysis was used to compare the regional projects on multiple risk categories. The risk categories include 1) Costs Risk, 2) Implementation Risk, 3) Operations Risk, and 4) Stakeholders Risk. Various elements of risk were identified for consideration when assessing each risk category as shown in Table 6-8.

Table 6-8: Project Risk Categories with Associated Elements of Risk

Risk Category	Risk Elements
Costs	Risk of capital cost overruns
	Risk of partner agencies not paying their share
	Risk of not securing external financing and funding
	Risk of increasing long-term operations and maintenance costs
Implementation	Risk of project duration and schedule overruns
	Risk of land not being available
	Risk of running into constructability issues
	Risk of having limited implementation options
	Risk of permitting complications such as permit conditions and denials
	Risk of the project not being thoroughly planned
Operations	Risk of yield variability and reliability
	Uncertainty of operating partnerships
	Risk of inter-dependent projects not coming through
	Risk of environmental and water quality regulations (e.g., PFAS)
	Lack of redundancy for emergency operations/asset failures
Stakeholders	Lack of ratepayer support
	Risk of not garnering Three Valleys and member board support
	External stakeholder opposition
	Opposition from environmental/special interest groups

A risk score is computed to each regional project based on the Severity and likelihood scores assigned by member agencies for each of the four categories of risk. The risk score is determined as a product of the Severity score and the Likelihood score.

*Risk = Severity * Likelihood*

Severity is a measure of how adversely the occurrence of a category of risk would impact a given project. Severity scores assigned to each risk category range from 1 to 4 as follows:

1. Low Severity = Low to no effect on project
2. Medium Severity = Minor to modest impacts
3. High Severity = Significant or substantial impacts
4. Very High Severity = Extreme potential impacts

Likelihood is a measure of whether a risk category is likely to materialize on a given project. Likelihood scores assigned to each risk category range from 1 to 4 as follows:

1. Very Unlikely = Risks will not materialize
2. Unlikely = Risks probably will not materialize
3. Likely = Risks probably will materialize
4. Very Likely = Almost certain risks will materialize

Table 6-9: Results of Project Risk Evaluation by Risk Categories.

Project	Risk Scores	Costs	Implementation	Operations	Stakeholders
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	Severity	2.00	2.00	2.00	1.71
	Likelihood	2.14	2.29	2.14	1.71
	Risk	**4.28**	**4.58**	**4.28**	**2.92**
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	Severity	3.00	3.14	2.57	3.14
	Likelihood	2.71	3.00	2.86	3.00
	Risk	**8.13**	**9.42**	**7.35**	**9.42**
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	Severity	2.50	2.33	2.33	2.67
	Likelihood	2.50	2.33	2.33	2.50
	Risk	**6.25**	**5.43**	**5.43**	**6.68**
Project 4: Chino Basin Conjunctive Use with Three Valleys	Severity	2.20	2.00	2.20	2.20
	Likelihood	2.40	2.40	2.20	2.00
	Risk	**5.28**	**4.80**	**4.84**	**4.40**

The results show that member agencies identified Project 1: External Partnership with Covina Irrigation Company (Main San Gabriel Basin) as the lowest risk project. Conversely, Project 2: Three Valleys GRIP was identified as the highest risk project.

6.2.3 Summary of Project Benefit-Risk Results

The final preferred project rankings are determined by combining the results of the project benefit evaluation and the risk analysis. For each project, the total risk scores from all four risk categories are divided by the maximum possible risk score of 64 to create a risk index. Similarly, the total benefit scores from all nine evaluation criteria are divided by the maximum possible benefit score of 27 to create a benefit index. The integrated benefit-risk ratio is computed by dividing the benefit index by the risk index as shown in Table 6-10.

Table 6-10: Project Ranking Results for Benefit-Risk Assessment

Regional Project	Sum of Risk (max = 64)	Risk Index	Sum of Benefits (max = 27)	Benefit Index	Benefit - Risk Ratio	Preferred Project Rank
Project 4: Chino Basin Conjunctive Use with Three Valleys	19.32	0.302	13.67	0.506	1.677	1
Project 3: Three Valleys Storing Water in Main San Gabriel Basin (GRIP+)	23.81	0.372	16.58	0.614	1.651	2
Project 1: External Partnership with Covina Irrigation Company (Main San Gabriel Basin)	16.08	0.251	9.67	0.358	1.425	3
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	34.35	0.537	14.08	0.522	0.972	4

The results show that 'Project 4: Chino Basin Conjunctive Use with Three Valleys' has been identified by member agencies as best suited to provide the best combination of high benefits with lower risk. Project 3 (GRIP+) and Project 1 (CIC - Main San Gabriel Basin) are ranked second and third, respectively. Project 2 (GRIP) is viewed as having the lowest benefits relative to its associated risks.

7 Summary and Recommendations

7.1 Summary

The Three Valleys region relies on a variety of sources for its water supply including groundwater (41%), imported water (48%), purchased water (4%), surface water (3%), and recycled water (4%). The region's water supplies are vulnerable to regional and statewide droughts and climate change which can cause disruptions in water availability. The region actively manages changes in annual water supply availability by using groundwater basin storage accounts to store excess water for use during periods of drought and other disruptions. Water stored in these storage accounts currently amounts to approximately 58 percent of the region's annual water supply requirements.

Future uncertainties such as aging infrastructure and climate change could also impact the region's water supply uncertainty. Projections of future water budgets indicate that the Three Valleys region will require up to 15.4 TAF/year of additional imported water supply due to the impacts of climate change. This deficit could be partially mitigated through full implementation of the state's indoor residential water use targets for 2030 which would result in water conservation savings of up to 5.6 TAF/Year. However, the region needs to develop additional infrastructure to maintain current levels of service and build up a recommended year of total water supply in storage in local groundwater basin storage accounts.

Three Valleys has worked with member agencies to identify 26 infrastructure projects including 2 projects to enhance Storage capacity, 4 pipeline reliability projects, 12 projects to enhance well extraction capacity, and 8 water treatment infrastructure projects. The estimated total cost of the 26 proposed projects is over $660 million. Treatment and wells projects are the most common type of projects proposed because they are generally the most cost-effective source of supply (in terms of cost per acre-foot) for agencies with existing, unused pumping rights. While storage projects are generally expensive, they can greatly improve water supply reliability and reduce dependence on imported water during periods of drought.

Implementation of these projects will require a mix of local, state and federal funds. A list of current state and federal funding programs has been developed to align with the types of water supply and infrastructure projects proposed by Three Valleys and its member agencies. These grant funding programs are generally more likely to fund regional projects which involve multiple partnering agencies using shared infrastructure to provide benefits to a wider group of communities, including disadvantaged communities where possible. To enhance the region's competitiveness when pursuing state and federal grant funding opportunities, this WRMP has identified four regional projects which could leverage regional infrastructure to meet the needs of multiple member agencies.

7.2 Next Steps

The regional infrastructure needs and plans included in this WRMP were derived from information compiled by staff of member agencies. While this information has helped to highlight common areas of infrastructure need, it likely reflects current system performance and reliability concerns. To more accurately capture the impact of aging infrastructure on the extent and timing of future infrastructure

needs, the Three Valleys region should undertake a comprehensive assessment of water infrastructure to:

- Quantify the number and characteristics of existing wells, pipelines, pumping, and treatment assets
- Establish the remaining life and replacement schedule of existing assets
- List all existing infrastructure that are no longer functioning or in use
- Assess the timing of future changes in infrastructure performances and water supply reliability if the aging infrastructure is not replaced.

The region also needs to continue development of the regional projects identified in this WRMP. Actions that could be taken to advance the development of these regional projects could include:

- Initiating conceptual planning to establish project components, physical and environment constraints, establish project costs, and review project alternatives
- Engage member agencies to recruit project participants, establish participation agreements, and seek approval of agency boards to seek implementation funds
- Initial development of funding proposals and engaging funding agencies to solicit early input on project fundability

8 References

Three Valleys Municipal Water District (2021), 2020 Urban Water Management Plan.

Three Valleys Municipal Water District (2024), Climate Change Vulnerability Assessment

Three Valleys Municipal Water District (2024), 2024 Regional Drought Contingency Plan.

Appendix A – List of Mitigation Projects

Agency/Organization	Project/Program Name	Project/Program Description
Three Valleys	Filter Drain Valves	Upgrade of existing under drain system within each of the eight existing filter basins. The upgrade will include granular activated carbon, which would also be able to address constituents of emerging concern, especially for the portion of groundwater that could be routed through the treatment plant. This project would be modeled after the recent Weymouth Filter Basin Upgrade.
Three Valleys	Padua Pump Station	The project would construct pump station and pipeline from San Gabriel MWD's pipeline to Three Valleys' Miramar distribution system to provide for reliability to the SWP dependent area's service from the Metropolitan Rialto Feeder.
Three Valleys	Sludge Pond Mixing Upgrade	Better mixing will prevent the growth of algae and other organic material and will increase the amount of water recovered when the sludge is sent to the belt filter press.
Three Valleys	Grand Avenue Well Improvement	Inspection and rehabilitation of the Grand Ave Well as needed. Additionally includes the installation of a VFD to increase Grand Ave Well's operational efficiency.
Three Valleys	Well 2 Improvement	Inspection and rehabilitation of Well 2 and installation of sunshade covers over the VFD to prevent overheating.
Three Valleys	PM-21 [Miramar] Bypass Magmeter	Miramar Treatment Plant's design capacity is 40 cubic feet [cfs]. Lower demands due to factors of water use efficiency and water shortage conditions requires the plant to operate at minimal flows of 8 cfs. This effort initiates a project with Metropolitan Water District to install a meter suitable for lower flow conditions, increasing meter accuracy and reduce potential for apparent water losses.
Three Valleys	Miramar Pumpback	Upgrade to the existing Miramar Pumpback system through a connection with Metropolitan's Weymouth Treatment Plant. This connection adds an alternative source of water, Colorado River water, to the Three Valleys service area which includes SWP dependent areas.
Three Valleys	Hydroelectric Facilities Efficiency Upgrades	The Miramar hydroelectric generators are nearing 40 years of service and require a reassessment of its structural and mechanical integrity. This project will upgrade current hydroelectric facilities and provide repairs if found.
Three Valleys	Groundwater Reliability Improvement Program[a]	Partnership with the City of Glendora and the Puente Basin Water Agency (PBWA), a joint powers authority between Walnut Valley Water District and Rowland Water District, to implement a regional distribution network and local supplies by utilizing 9,000 AF/year of stranded City assets.

Agency/Organization	Project/Program Name	Project/Program Description
Three Valleys	Renewable Energy Project	Installation of solar panels and battery storage to enhance sustainable energy production.
Three Valleys	Miramar System Condition Assessment	The Miramar distribution pipeline, initially constructed during the 1950s and 1980s, is reaching over 40 years of age and requires an assessment to determine its current condition.
Cal Poly Pomona	VOC Treatment at Well 2	Install VOC treatment at Cal Poly Pomona's Well No. 2. Well No. 2 has known VOC contamination. Cal Poly Pomona would need to use this well as an additional source of water for the RO Water Treatment Plant in producing more potable water.
Cal Poly Pomona	Install Additional RO Train at ROWTP	Install an additional RO train to an existing Cal Poly Pomona Water Treatment Plant to utilize the additional water source from Well No. 2 to produce additional potable water for local use. See Spadra GSP.
Cal Poly Pomona	Repurpose Farm Well #4 water	Over time campus farm operation will diminish and consider repurposing the Farm Well #4 to use for either irrigation or potable water. Advance RO treatment considerations to produce provide potable water for the old Lanterman Hospital property or connect via a pipeline to convey water back onto the main campus for irrigation use; a distance of about 1.25 miles.
Cal Poly Pomona	Future wells w/Three Valleys as injection (recycled water) and extraction - 2 sites	Partner with 3Vs and City of Pomona to develop an injection/extraction well on 3Vs two well sites available at Corporate Center Dr next to I57 & I71 freeways. Treatment of recycled water may be upgraded to advanced treatment by LA County Sanitation District. Use advance treated recycled water to inject into Spadra basin for storage.
Rowland Water District & Walnut Valley Water District (through Puente Basin Water Agency)	Six Basins Groundwater Project	Two new wells are being activated in the Six Basins Groundwater Basin to offset imported water supplies.
Rowland Water District & Walnut Valley Water District (through Puente Basin Water Agency)	Covina Irrigating Company Interconnection	Pump surplus Covina Irrigating Company well and surface water into the Badillo-Grand pipeline via a new interconnect.
Walnut Valley Water District (through Spadra Basin GSA)	Spadra Basin Optimization Scenario 3	Underground recharge gallery, seven injection wells, five production wells, expansion of CPP RO plant, all related pipelines.
City of Covina Water Department	Grand Avenue Water Main Replacement Project	The existing water main was installed in 1939 and is in bad condition. The planned work includes replacement of approximately 1.25 mi of 12-inch- diameter steel from San Bernardino Road to Southerly City Limit including the upgrade of existing services and fire hydrants.

Agency/Organization	Project/Program Name	Project/Program Description
City of Covina Water Department	Water Loss Reduction - through Pipeline Replacement	Auditing reports available for last few years.
City of Covina Water Department	Hurst Tract Water Main Replacement Project from Cypress Avenue to Covina Boulevard and Grand Avenue to Brightview Drive	Existing water main, valves, hydrants and services have exceeded their useful life. All water mains, valves, hydrants and services are to be replaced.
City of Covina Water Department	Edna Place Pipe Improvements Project Grand Avenue to Barranca Avenue	Existing water main, valves, hydrants and services have exceeded their useful life. All water mains, valves, hydrants and services are to be replaced.
City of Covina Water Department	Navilla and Forestdale Main Replacement Project from Puente Street to Rowland Avenue and From Grand to Barranca Avenue	Existing water main, valves, hydrants and services have exceeded their useful life. All water mains, valves, hydrants and services are to be replaced.
City of Covina Water Department	Azusa Avenue Main Installation Project from Badillo Street to Edna Place	Existing water main, valves, hydrants and services have exceeded their useful life. All water mains, valves, hydrants and services are to be replaced.
City of Covina Water Department	Fourth Avenue Water Main Replacement Project from Badillo Street to San Bernardino Road Cypress Avenue Water Main Replacement Project from Citrus Avenue to Barranca Avenue	Existing water main, valves, hydrants and services have exceeded their useful life. All water mains, valves, hydrants and services are to be replaced.
City of Covina Water Department	Cypress Reservoir Water Booster Improvement Project 1051 E. Cypress Street	Install new backup generator, MCC panels, and switchgear.
City of Covina Water Department	Rancho La Merced Water Improvement Project (Design Only) Rancho La Merced	

Agency/Organization	Project/Program Name	Project/Program Description
City of Covina Water Department	Water Master Plan & Rate Update City-Wide	Water Master Plan update & cost study for next 5 years.
City of Covina Water Department	San Joaquin Road and Rambling Road Main Replacement from Covina Hills to Navilla Place	Existing water main, valves, hydrants and services have exceeded their useful life. All water mains, valves, hydrants and services are to be replaced.
City of Glendora	Well #7 (Vosburg) Replacement	Rehabilitation of Well #7 which is located at 201 South Virginia Ave in the City of Azusa almost 3 miles to the southwest of the City of Glendora. The city would conduct a water quality study to address contaminant concerns and well profiling to better understand flow contributions. Project to include design, public bid and construction.
City of Glendora	North Glendora Tank Replacement	This 318,000-gallon reservoir is crucial to the operation of Zone 19 and was installed in 1996 using bolted steel plate construction as this was an inexpensive and viable option for the remote and difficult to access location. Bolted steel tanks have a certain leak allowance in the design and this tank has had a small amount of leakage since installation. The tank is now 25 years old and is nearing the end of its expected service life of 30 years. Current leak rates vary from 35 to 50 gallons per minute depending on water level in the tank and weather conditions. This reservoir is one of two storage reservoirs that serve this pressure zone, the other is Glencoe Reservoir with a maximum capacity of only 212,000 gallons. Over the last few years, the area has seen some growth and there is an increased awareness of fire protection needs within the Urban Wildland Interface of which Zone 19 is entirely within. As a result, the combined storage of approximately 0.5 MG is insufficient for extended outages and for fire protection needs and a larger reservoir for this zone is needed.
City of Glendora	Well #14 Replacement	Well #14 is located along Little Dalton Wash just north of Leadora. The city would conduct a study to investigate low production and address contaminant concerns. This would include some well development work and well profiling to better understand flow contributions. Project to include design, public bid and implementation.

Agency/Organization	Project/Program Name	Project/Program Description
City of Glendora	Turf Removal for Large Commercial and Municipal Properties	As part of our on-going effort to encourage water conservation, The City offers multiple rebate incentives for customers. There are two primary programs that are currently being highlighted as outlined below: 1) Turf Removal Program: Installation of drought tolerant landscaping, synthetic turf, and other non-irrigated ground cover. 2) Rebate Program for the purchasing of water efficient devices, such as toilets, sprinkler nozzles, irrigation controllers, etc.
City of Glendora	Redrilling Wells 10 and 11 for Exploration	
City of Glendora	Pipeline Intertie Replacements	
City of La Verne	Connections to Weymouth WTP	Connection to Weymouth without PWR.
City of La Verne	Well Treatment 6th and White, Lincoln and Mills - Ion-Ex Plant	Ion exchange treatment to reduce blending.
City of La Verne	La Verne Heights Well #1 Replacement-Ion-Ex	Low production on LVH#1.
City of La Verne	Conjunctive Use Concepts (Six Basins, Pomona Basin, Live Oak Basin)	
City of La Verne	AMI	Automated meter reading.
City of Pomona	Groundwater Quality Improvement	The project includes well head treatment and well equipping for wells that are currently stranded: - Well 34 – TCP Treatment [GAC} is required for the well (1,200 gpm) - Well 20 – Re-equip the existing well. (700 gpm) - Well 29 – Install NO3 treatment and rebuild well. (600 gpm) - Well 30 – Drill new well onsite. (800 gpm)
City of Pomona	Anion Exchange Plant	Increasing reliance on groundwater, preserves ability to operate wells.
City of Pomona	Reservoir 5 (per PDR)	Increasing reliance on groundwater, reduce reliance on MET/SWP.
City of Industry	Surface Water Storage Project	

Agency/Organization	Project/Program Name	Project/Program Description
City of Industry	Water Distribution System Reliability Project	
Suburban Water System	201 PFOA/PFAS treatment	Plan, design and construct ground water treatment facilities to remove PFOA/PFAS from ground water sources.
Suburban Water System	Plant 410 Treatment Plant	Construction of a 1,000 gpm (1.4 MGD) treatment plant to remove Manganese from a potable water well.
Suburban Water System	Plant 128 Pump Station and Reservoir Replacement	Remove and replace reservoir and pump station. The existing 0.5MG reservoir is nearly 100 years old and does not meet current seismic requirements. It will be replaced with a 0.5 MG above ground steel reservoir. The pump station is does not meet the reliability requirements and the electrical equipment is unsafe.
Valencia Heights Water Company	Grand Ave waterline replacement	Replace approximately 1300 feet of old steel 12-inch waterline with 12- and 16- inch c-900 PVC.
Valencia Heights Water Company	Reservoir rehab and retrofitting #4a	Repaint and recoat interior and exterior of reservoir and retrofit inlet and outlets to improve water quality and add earthquake shut off valves.
Valencia Heights Water Company	Reservoir rehab and retrofitting #6b	Repaint and recoat interior of reservoir and retrofit inlet and outlets to improve water quality and add earthquake shut off valves.
Valencia Heights Water Company	Reservoir rehab and retrofitting #6a	Repaint and recoat interior of reservoir and retrofit inlet and outlets to improve water quality and add earthquake shut off valves.
Valencia Heights Water Company	Reservoir rehab and retrofitting #4a	Repaint and recoat interior and exterior of reservoir and retrofit inlet and outlets to improve water quality and add earthquake shut off valves.
Valencia Heights Water Company	Golden Bough Waterline Replacement	Replace approximately 1800 feet of old steel 6-inch waterline with 8-inch c-900 PVC.

Appendix B – Results of Pairwise Benefit Evaluation for each Metric

1. Metric: reduce dependency on imported water during drought years.					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.5	0.25	0.25	1.000
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.5	X	0.583	0.5	1.583
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.75	0.417	X	0.5	1.667
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.75	0.5	0.5	X	1.750

2. Metric: Provides benefits to two or more agencies.					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.583	0.5	0.583	1.667
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.417	X	0.5	0.583	1.500
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.5	0.5	X	0.5	1.500
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.417	0.417	0.5	X	1.333

3. Metric: Increase total basin storage in the 3Vs region to a target of one year of supplemental storage equivalent to TVMWD's annual import from Metropolitan, or about 60 TAF.					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.25	0.25	0.5	1.000
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.75	X	0.25	0.583	1.583
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.75	0.75	X	0.667	2.167
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.5	0.417	0.333	X	1.250

4. Increase Three Valleys PUT capacity by 15 TAF/year.					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.25	0.25	0.5	1.000
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.75	X	0.25	0.583	1.583
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.75	0.75	X	0.667	2.167
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.5	0.417	0.333	X	1.250

5. Metric: Increase climate resilience – need to meet additional 15 TAF/year					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.583	0.5	0.333	1.417
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.417	X	0.417	0.5	1.333
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.5	0.583	X	0.333	1.417
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.667	0.5	0.667	X	1.833

6. Metric: Increase operational flexibility with additional Three Valleys conveyance facilities to transmit water from West to East, through a shared program with member agencies.					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.083	0.083	0.25	0.417
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.917	X	0.25	0.583	1.750
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.917	0.75	X	0.417	2.083
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.75	0.417	0.583	X	1.750

7. Metric: Affordability of marginal cost of water produced compared to Metropolitan water					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.583	0.583	0.667	1.833
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.417	X	0.5	0.417	1.333
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.417	0.5	X	0.583	1.500
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.333	0.583	0.417	X	1.333

8. Metric: Increase local groundwater treatment capacity					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.333	0	0.167	0.500
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.667	X	0.417	0.667	1.750
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	1	0.583	X	0.667	2.250
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.833	0.333	0.333	X	1.500

9. Metric: Increase local extraction capacity					
	Project 1: CIC - Main Basin	Project 2: GRIP	Project 3: GRIP+	Project 4: Chino Basin	Sum
Project 1: External Partnership with Covina Irrigation Company (Main SG Basin)	X	0.167	0.333	0.417	0.917
Project 2: Three Valleys Groundwater Reliability Improvement Program (GRIP)	0.833	X	0.417	0.5	1.750
Project 3: Three Valleys Storing Water in Main SG Basin (GRIP+)	0.667	0.583	X	0.583	1.833
Project 4: Chino Basin Conjunctive Use with Three Valleys	0.583	0.5	0.417	X	1.500

Appendix C – Three Valleys Regional Drought Contingency Plan

(Available upon request from Three Valleys as a separate attachment)