

2020 URBAN WATER MANAGEMENT PLAN

APPENDIX J

**MONTE VISTA WATER DISTRICT'S 2011 RECYCLED WATER MASTER
PLAN**

MONTE VISTA WATER DISTRICT 2011 RECYCLED WATER MASTER PLAN

FINAL REPORT

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ACRONYMS and ABBREVIATIONS

AF	Acre-Foot/Feet
AFY	Acre-Feet per Year
C	Coefficient
CBWCD	Chino Basin Water Conservation District
CM	Construction Management
CWSRF	Clean Water State Revolving Fund
DWR	California Department of Water Resources
ET	Evapotranspiration
ft/sec	Feet Per Second
FPGP	Water Recycling Facilities Planning Grant Program
FY	Fiscal Year
HGL	Hydraulic Grade Line
HP	Horsepower
I-10	Interstate 10
IEUA	Inland Empire Utilities Agency
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Powers Authority
LF	Linear Feet
LRP	Local Resources Program
MDD	Maximum Day Demand
mgd	Million Gallons per Day
MHP	Mobile Home Park
MWD	Metropolitan Water District of Southern California
MWH	Montgomery Watson Harza
OWOW	One Water One Watershed
PHD	Peak Hour Demand
PPL	Project Priority List
psi	Pounds Per Square Inch
RP-4	Wastewater Reclamation Regional Plant No. 4
RW	Recycled Water
SAWPA	Santa Ana Watershed Project Authority
SCADA	Supervisory Control and Data Acquisition
SWRCB	California State Water Resources Control Board
USBR	U.S. Bureau of Reclamation
WFA	Water Facilities Authority
WRFP	Water Recycling Funding Program
District Plan	Monte Vista Water District Recycled Water Master Plan

SECTION 1 EXECUTIVE SUMMARY

The objective of this Recycled Water Master Plan (Plan) is to identify potential recycled water customers in the District's service area, estimate the infrastructure required to supply recycled water to those sites, and develop a financially reasonable implementation plan to maximize recycled water usage throughout the District.

History

The District is a county water district officially formed in 1927 to provide domestic water service to a primarily agricultural area. In the early days, groundwater was the major water supply. Gradually, additional water supplies were identified and developed, including connections to the Colorado River Aqueduct, the creation of the Water Facilities Authority to treat northern California imported surface water, the acquisitions of the Monte Vista Irrigation Company and shares in the San Antonio Water Company, and development of a recycled water distribution system. In addition to its retail customers, the District provides wholesale water supply to the City of Chino Hills. At the current time, the District relies on approximately 75 percent of its water supply from groundwater and other local supplies and 25 percent from imported water.

In 2006, the District began the process of developing a retail recycled water distribution system off of Inland Empire Utilities Agency's (IEUA) planned San Antonio Channel Recycled Water Pipeline, which was completed in 2008. This pipeline serves as the backbone pipeline of the District's recycled water distribution system, from which the District has extended four recycled water branch laterals to serve additional customers. In 2010, the District delivered 267 AF of recycled water, with revenues exceeding costs by approximately \$15,000. Initial program results support system expansion.

Recycled Water Design Criteria and Standards

Design criteria and standards ensure that specific facilities meet minimum or maximum requirements for an efficient and appropriately designed recycled water system. Section 3 outlines the specific peak hour demand factors and hydraulic criteria established and/or utilized for the purposes of this Plan.

Recycled Water Customer Demand and Availability

District staff identified 345 potential additional recycled water customers with a total potential demand of 1,571 AFY. Most potential customers are landscape irrigation, agriculture, and nursery accounts which can be directly converted to recycled water use. Additional potential customers have large landscape usage off of mixed-use accounts. Once identified, potential customers were ranked into six broad categories based on ranges of potential annual recycled water demand. In order to avoid over-estimating recycled water demands, District staff performed a conceptual risk analysis on long-term demand potential for particular customers and customer types.

At build-out, the District's recycled water demand is projected at about 5.6 mgd under peak hour demand conditions. IEUA appears committed to providing sufficient recycled water supply to meet recycled water demand from the present through build-out conditions for its entire service area, including the District.

The District will employ a comprehensive customer development process to develop potential recycled water customers from identification to final system connection.

Potential System Layout at Build-Out

The existing recycled water system traverses the District east to west. To reach build-out, the system will need to expand both northerly and southerly while cost effectively negotiating freeways, channels, and railroad crossings. An alignment along Central Avenue from the existing recycled water system has been determined to be the best option for expansion to the northern portion of the District. Two alignments, along Central and Monte Vista Avenues, have been identified for southerly expansion.

A hydraulic analysis of all three alignments was conducted through the development of a recycled water hydraulic model to identify infrastructure requirements needed to deliver recycled water to new users under build-out conditions. The implementation of the northerly system expansion along the Central alignment is hydraulically challenged, while both alignments for southerly system expansion can be successfully implemented.

Grant and Loan Opportunities

Most water providers would not be able to develop a recycled water distribution system without outside funding assistance. The District identified and accessed a number of federal, state, and local funding sources for pipeline installation and onsite retrofits. For detailed descriptions of these funding opportunities, see Section 6.

Financial Evaluation

The total "all in" costs of the District's recycled water system, and the increase in recycled water demand, are summarized below.

Total Costs at Build Out and Per Segment

Segment/ Alignment	Total Cost	District's Portion*	AF of New Demand
Option 1 (Cen-N & Cen-1)	\$14.9 M	\$12.6 M	881
Option 2 (Cen-N & MV-4)	\$15.1 M	\$12.8 M	892
Central-1	\$10.4 M	\$9.1 M	542
Monte Vista-4	\$10.6 M	\$9.3 M	553
Central-North	\$4.5 M	\$3.5 M	339

* Excludes costs for retrofit/improvements behind the customer meter

A financial model has been developed for this Plan to analyze the economic impact of implementing the expansion of the recycled water system to projected build-out conditions and per segment. The financial model results can be viewed from the perspective of either payback period or the cost per acre-foot of new recycled water demand. Payback for each of the buildout options and each of the individual project segments is reached in about three decades. Cost per acre-foot is best understood on an annual basis in comparison with other water sources available to the District; furthermore, the cost per acre-foot during the debt service period will be much greater than during the years that follow.

Financial Model Payback Period Estimation

Option	District's Portion	AF of New Demand	Payback Reached (years)
Buildout Option 1	\$12.6 M	881	29
Buildout Option 2	\$12.8 M	892	29
Central-1 Segment	\$9.1 M	542	31
Monte Vista-4 Segment	\$9.3 M	553	31
Central-North Segment	\$3.5 M	339	24

Financial Model Cost Per Acre-Foot Estimates

Option	20-Year Debt Service Period	40-Year Post-Debt Service Period	60-Year Life of Pipeline
Buildout Option 1	\$1,077	\$287	\$550
Buildout Option 2	\$1,078	\$287	\$551
Central-1 Segment	\$1,211	\$287	\$595
Monte Vista-4 Segment	\$1,212	\$287	\$595
Central-North Segment	\$863	\$287	\$479

All data in cost per AF, 2011 dollars

Projected Cost of Recycled Water Vs. Imported Water

Source	Year 2020	Year 2030	Year 2040	Year 2050	Year 2060	Year 2070
Recycled Water	\$342	\$557	\$907	\$1,478	\$2,047	\$3,920
Recycled Water Including Debt Service	\$1,590	\$1,805	\$907*	\$1,478*	\$2,047*	\$3,920*
WFA Direct	\$1,100	\$1,928	\$3,141	\$5,116	\$8,333	\$13,573

* Debt service already paid off.

Recycled Water Ordinance and Policy Review

As part of this Plan, the District reviewed its current recycled water policies, procedures, and documentation, and made recommendations for improvement.

Implementation Plan

There are opportunities for the District to continue expanding the use of recycled water throughout its service area; however, there is no “low hanging fruit” to achieving system expansion. The payback or break-even financial point of expansion is reached in about three decades, resulting in a potentially significant financial burden on the District. However, the net financial benefits to the District over the useful life of the project are enormous and more than offset the investment costs.

The District has identified potential recycled water customers within close proximity of the existing distribution system. Prior to developing this Plan, these potential “Phase II” customers were contacted and provided permission for the District to perform site visits with a consulting engineer to assist in determining initial onsite retrofit construction cost estimates for each site. The proposed Phase II system expansion costs, payback period, and cost per acre-foot estimates are summarized below.

Phase II Payback Period Estimate

District's Portion	AF of New Demand	Payback Reached (years)
\$1.4 M	104	29

Phase II Cost Per Acre-Foot Estimates

20-Year Debt Service Period	40-Year Post-Debt Service Period	60-Year Life of Pipeline
\$974	\$274	\$507

All data in cost per AF, 2011 dollars.

**Figure 2-2:
 Existing Recycled Water Distribution System**

