2015 INTEGRATED MASTER PLAN

RECYCLED WATER MASTER PLAN

December 2015

FINAL REPORT

Digitally signed by Inge Wiersema
Date: 2015.12.15 11:04:48-08'00'

REGISTERED PROFESSIONAL ENGINEER
INGE WIERSEMA
No. 66123
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
RICARDO A. VIVAS
No. C47946
Exp. 12-31-15
CIVIL
STATE OF CALIFORNIA

199 SOUTH LOS ROBLES, SUITE 530 • PASADENA, CALIFORNIA 91101 • P. 626.535.0180 • F. 626.535.0185

City of Oceanside

Recycled Water Facilities Plan

TABLE OF CONTENTS

Page No.

CHAPTER 4: RECYCLED WATER MARKET ASSESSMENT

CHAPTER 5: POTENTIAL RECYCLED WATER SUPPLIES

CHAPTER 6: PROJECT ALTERNATIVES ANALYSIS

CHAPTER 7: RECOMMENDED ALTERNATIVES

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

A	Agriculture
AACE	Association for the Advancement of Cost Engineering International
ADD	average day demand
AF	acre-foot or acre-feet
afy	acre-feet per year
AS	Special Agricultural Water Rate
AWT	advanced water treatment
B	boron
Basin Plan	San Diego Basin Water Quality Control Plan
BOD	biochemical oxygen demand
C	Commercial
CA	Commercial Agriculture
Caltrans	California Department of Transportation
CBOD	carbonaceous biochemical oxygen demand
CECs	constituents/contaminants of emerging concern
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CIP	Capital Improvement Program
City	City of Oceanside
Cl	chlorine
CRA	Colorado River Aqueduct
CTR	California Toxics Rule
CY	Calendar Year
DDW	Division of Drinking Water
DEH	San Diego County Department of Environmental Health
El Corazon WRF	El Corazon Water Reclamation Facility
ENR CCI	Engineering News Record Construction Cost Index
EPA	U.S. Environmental Protection Agency
ET	evapotranspiration
F	fluoride
Fe	iron
fps	feet per second
FPUD	Fallbrook Public Utility District

G	Government
gpd	gallons per day
gpm	gallons per minute
GR	Grouped Agriculture/Residential
GS	Grouped Agriculture Special Agriculture Water Rate
GWR	groundwater recharge
HA	hydraulic area
HGL	hydraulic grade line
HOA	homeowners association
HP	horsepower
HSA	hydraulic subarea
I	Irrigation/interstate
La Salina WWTP	La Salina Wastewater Treatment Plant
LF	linear feet
M&I	municipal and industrial
MBGPF	Mission Basin Groundwater Purification Facility
MDD	maximum day demand
MG	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
MMD	maximum month demand
Mn	manganese
MWD	Metropolitan Water District of Southern California / Municipal Water District
NTU	Nephelometric Turbidity Units
Na	sodium
NE	Northeast
NEPA	National Environmental Policy Act
NO_3	nitrate
NPDES	National Pollutant Discharge Elimination System
NPR	non-potable reuse
NW	Northwest
O&M	operations and maintenance
PHD	peak hour demand
Plan	City of Oceanside Recycled Water Facilities Plan

PS	Pump station
psi	pounds per square inch
RA	Commercial Agriculture/Residential
RO	reverse osmosis
RS	Agriculture/Residential Special Agriculture Water Rate
RWQCB	San Diego Regional Water Quality Control Board
S	Special Users
San Luis Rey WRF	San Luis Rey Water Reclamation Facility
SANDAG	San Diego Association of Governments
SDCWA	San Diego County Water Authority
SE	Southeast
SO_4	sulfate
SR	State Route
SRTTP	Southern Regional Tertiary Treatment Plant
SS	settleable solids
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
TOC	total organic carbon
TSS	total suspended solids
UWMP	Urban Water Management Plan
WDR	Waste Discharge Requirements
WFP	Robert A. Weese Filtration Plant
WRF	Water Recycling Facility
WRFP	Water Recycling Funding Program
WRR	Water Recycling Requirements

EXECUTIVE SUMMARY

Southern California faces many challenges regarding its water supply. Droughts, climate change, population growth, and legal and environmental constraints combine to reduce water supply reliability. Recycled water offers a reliable, drought-proof approach for augmenting local and imported water supplies. The City of Oceanside (City) has undertaken preparation of this Recycled Water Facilities Plan (Plan) to guide development of recycled water infrastructure and facilities.

The purpose of this Plan is to identify cost-effective recycled water projects and develop a Capital Improvement Program (CIP) for expansion of the City's existing recycled water system. The CIP identifies a phased approach and ultimate build-out projects for implementing recycled water facilities within the City's service area. The recycled water projects are identified by analyzing the recycled water system under future demand conditions. The CIP includes a list of recommended projects, a proposal for phasing of the projects, and planning-level estimates of probable construction costs. The CIP will act as a road map for the City with respect to recycled water system planning.

ES.1 BACKGROUND

The City relies upon imported water and groundwater for their potable supplies. On average, approximately 91 percent[1] of the City's potable water supply comes from the San Diego County Water Authority (SDCWA) and 9 percent comes from Mission Basin groundwater. The reliability and cost-effectiveness of importing water is in question due to environmental concerns and long-term drought conditions that result in periodic cutbacks of imported water allotments. Local water supplies, primarily recycled water, will play an important role in addressing anticipated imported water supply cutbacks in the future. Recycled water offers a reliable, drought-proof approach for augmenting local and imported water supplies.

The City has an existing recycled water system consisting of 1.2 miles of recycled water pipeline that serve two customers with a combined existing demand of approximately 336 acre-feet per year (afy)[2]. Continuing development of recycled water use in the City's service area would help to reduce dependence on imported water supplies, improve water supply reliability, preserve potable water supplies, and allow for the City to meet their strategy in the conservation master plan.

[1] Based on City's water supply source during calendar year (CY) 2003 through 2012 (Carollo, 2015b).

[2] Based on CY 2013 tertiary plant flows (provided by the City) to Oceanside Golf Course (123 afy) and Whelan Lake (213 afy).

ES.2 RECYCLED WATER MARKET ASSESSMENT

The market assessment for this Plan started with the City's potable billing consumption history database. This complete list of all potable meters was refined and consolidated to a smaller list of potential recycled water customers. A non-potable water adjustment value (a percentage) was assigned to each billing class category to estimate the non-potable demand for each customer. The potential recycled water customer database was then modified further by adding future customers.

A total of 669 potential recycled water customers were identified within the Study Area. As shown in Table ES.1, the demand for direct recycled water use is estimated to be 5,536 afy.[3] The primary use of recycled water would be for landscape irrigation.

Table ES.1 Summary of Potential Recycled Water Customers
Recycled Water Facilities Plan
City of Oceanside

	Potential Existing Recycled Water Customers		Potential Future Recycled Water Customers		Total Potential Recycled Water Customers [1]	
Customer Demand (afy)	No. of Potential Ex. RW Customers	Est. RW Demand (afy)	No. of Potential Future RW Customers	Est. RW Demand (afy)	No. of Potential Future RW Customers	Est. RW Demand (afy)
Greater than 50	15	1,237	4	537	19	1,774
25 - 50	26	927	0	0	26	927
10-25	84	1,179	0	0	84	1,179
5-10	145	930	0	0	145	930
Less than 5	395	726	0	0	395	726
Total	**665**	**4,999**	**4**	**537**	**669**	**5,536**

Of the 669 customers identified, 19 large customers were classified as the "target customers." These customers are defined as having large estimated non-potable demands of 50 afy and greater and are shown on Figure ES.1. The target customers comprise just 3 percent of the City's potential recycled water customers, but they represent 32 percent of the total potential demand for recycled water. The majority of use is for irrigation at parks, golf courses, homeowners association (HOA) landscapes, medians and agricultural operations.

[3] After the completion of this report, the City requested to assess the impact to the Ocean Hills Distribution System based on the Homeowner's Association (HOA's) new demand projections. The results of this analysis are summarized in a stand-alone addendum attached to this report.

ES.3 POTENTIAL RECYCLED WATER SUPPLIES

Five recycled water supply options were originally identified and evaluated, each with slightly different water qualities, institutional requirements, availability and reliability. In November 2014, the City Council decided to decommission and convert the La Salina Wastewater Treatment Plant (La Salina WWTP) into a pump station. It is anticipated the new pump station will convey raw wastewater flow, through the Fallbrook Land Outfall, to the San Luis Rey Water Reclamation Facility (San Luis Rey WRF) for secondary treatment. The Fallbrook Land Outfall will be connected into the Oceanside Land Outfall. Based on this decision, three of the potential recycled water supplies were no longer considered as a potential recycled water supply. The two supply sources that could serve the target customers are:

- San Luis Rey WRF: The San Luis Rey WRF is owned by the City and is located in the northern area of the City. The San Luis Rey WRF has an existing secondary treatment capacity of 15.4 mgd and a tertiary treatment capacity of 0.7 mgd. The facility is planned to be expanded to 17.4 mgd of secondary treatment. Existing secondary flows are 9.7 mgd and are anticipated to increase to 12.8 mgd. Once La Salina WWTP is decommission, anticipated secondary wastewater flows at San Luis Rey WRF are 13.2 and 16.5 mgd in 2020 and 2050, respectively.
- Southern Regional Tertiary Treatment Plant (SRTTP): U.S. Marine Corps Base Camp Pendleton is located north of the City and the SRTTP treats all wastewater to tertiary levels. Excess tertiary treated effluent that is not recycled is discharged to the ocean. An agreement between the City and Camp Pendleton is being developed to allow Camp Pendleton to serve recycled water to the northeast area of the City for the Morro Hills and Arrowood developments. This agreement could be extended to serve recycled water in the northwest area and potentially serve Caltrans. Based on verbal communications with the City, the annual recycled water supply available is approximately 1 mgd from the SRTTP.

Table ES.2 summarizes the average dry weather flow supply available from the two treatment plants. For all potential recycled water supplies, the existing water quality for relevant parameters is within the groundwater basin objectives, and total dissolved solids (TDS) concentrations are within the acceptable standards for landscape use.

ES.4 PROJECT ALTERNATIVE ANALYSIS

Based on the potential recycled water demands identified and the potential available recycled water supplies, individual recycled water systems were developed. Factors such as the location of these sources with respect to potential recycled water users, geographic and physical constraints of the City's infrastructure, and future plans of neighboring agencies were included in the analysis. The city's service area was divided into four study areas: Northeast, Northwest, Central, and Southeast. Table ES.3 shows the potential

recycled water demand and supply by study area. As shown, there is sufficient recycled water supply available (over 15 mgd) to serve the target customers maximum day demand (MDD) of 3.1 mgd.

Table ES.2 Comparison of Potential Recycled Water Sources
Recycled Water Facilities Plan
City of Oceanside

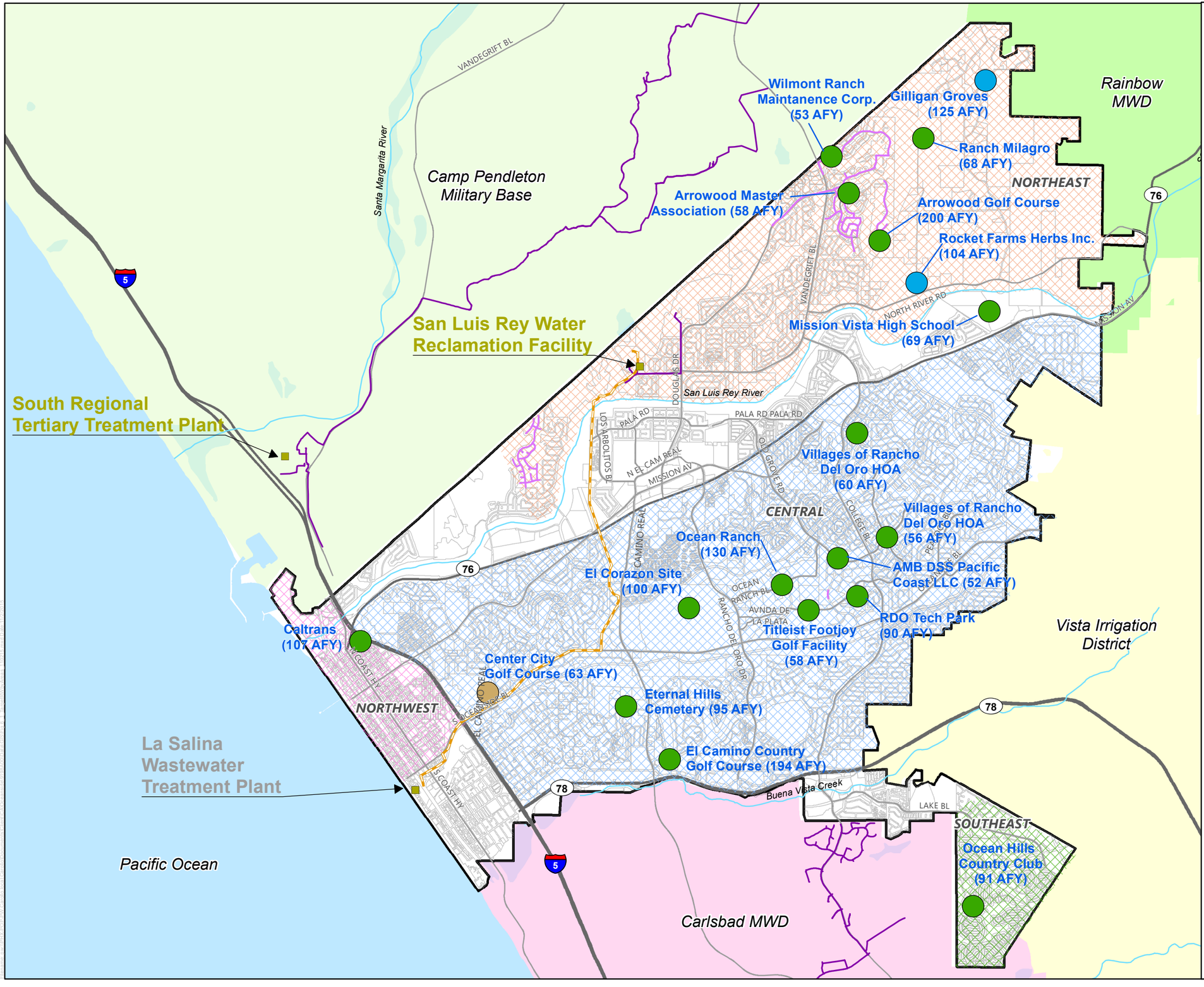
Potential Recycled Water Source	TDS (mg/L)	Average Dry Weather Flow Supply Available (mgd)		Institutional Constraints
		2020	2050	
San Luis Rey WRP [1]	901	13.2	16.5	No agreement is required
SRTTP (Camp Pendleton)	808	1.0	0 [2]	Agreement required; recycled water purchase cost needs to be established
	TOTAL	**14.2**	**16.5**	

Notes:
(1) The San Luis Rey WRF dry weather flow includes secondary flow from the La Salina WWTP.
(2) Camp Pendleton's SRTTP would supply recycled water in the near-term; and in the long-term, it would be replaced by recycled water from the San Luis Rey WRF.

Table ES.3 Potential Supply Sources and Demands by Study Area
Recycled Water Facilities Plan
City of Oceanside

Study Area	Target Customers Demand (afy) [2]	Target Customers MDD (mgd)	Potential Supply Sources	Supply Available (mgd)
Northeast	608	1.1	San Luis Rey WRF SRTTP	16.5 1.0
Northwest	107	0.2	SRTTP	1.0
Central	899	1.6	San Luis Rey WRF	16.5
Southeast	91	0.2	San Luis Rey WRF	16.5
Total	**1,704**	**3.1**		**17.5**

Notes:
(1) SRTTP: Southern Regional Tertiary Treatment Plant
(2) The total potential target demand does not include Mission Vista High School (70 afy) as it is not included in any study area.



Legend

Billing Class
- Irrigation
- Government
- Agricultural

Other
- Water Treatment Plant/ Water Reclamation Facility
- Existing Recycled Water Pipeline (In Use)
- Existing Recycled Water Pipeline (Inactive/Dry)
- Oceanside Land Outfall
- Major Roads
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID
- City Parcel

Study Areas
- Central
- Northeast
- Northwest
- Southeast

0 1 2
Miles

Figure ES.1
Target Recycled Water Customers by Study Area
Recycled Water Facilities Plan
City of Oceanside

The recycled water distribution system analysis identified the facilities to maximize the use of recycled water supplies to offset imported water in a cost-effective manner. The following potential recycled water systems were identified and evaluated in each study area:

- Northeast Study Area: The Northeast study area has an estimated target customer demand of 608 afy. The Upper San Luis Rey WRF System would be expanded and serve tertiary recycled water to target and other potential customers in the NE area of the City, including the California Brisas HOA, Morro Hills and Arrowood Developments. In the near-term, Camp Pendleton's SRTTP would serve tertiary recycled water to the Morro Hills and Arrowood Developments. However, costs for the SRTTP system were not developed herein as an agreement is currently being developed between the City and Camp Pendleton.
- Northwest Study Area: The Northwest study area has the lowest recycled water demand and has one target customer with a demand of 107 afy. Camp Pendleton's SRTTP could potentially extend their recycled water system and serve Caltrans. The Northwest recycled water distribution system was not included in the alternative evaluation in this Plan due to the preliminary nature of the evaluation.
- Central and Southeast Study Areas: The Central and Southeast study areas have a combined estimated target customer demand of 990 afy. The Lower San Luis Rey WRF System would serve tertiary recycled water to target and other potential customers in the Central and Southeast areas of the City, which includes the Ocean Hills area. In the near-term, the existing 10-inch diameter brine pipeline would convey tertiary recycled water to the Central and Southeast study areas. Once the 10-inch diameter brine pipeline has reached its capacity, a new 16-inch diameter pipeline would need to be constructed to serve additional customers in the Central and Southeast areas. In the near-term, two alignment alternatives to serve the southeast study area were evaluated and the El Camino Real alignment was chosen as the preferred alignment.[4]

The Upper and Lower San Luis Rey WRF systems are shown in Figure ES.2 and the demands and facilities are summarized in Table ES.4.

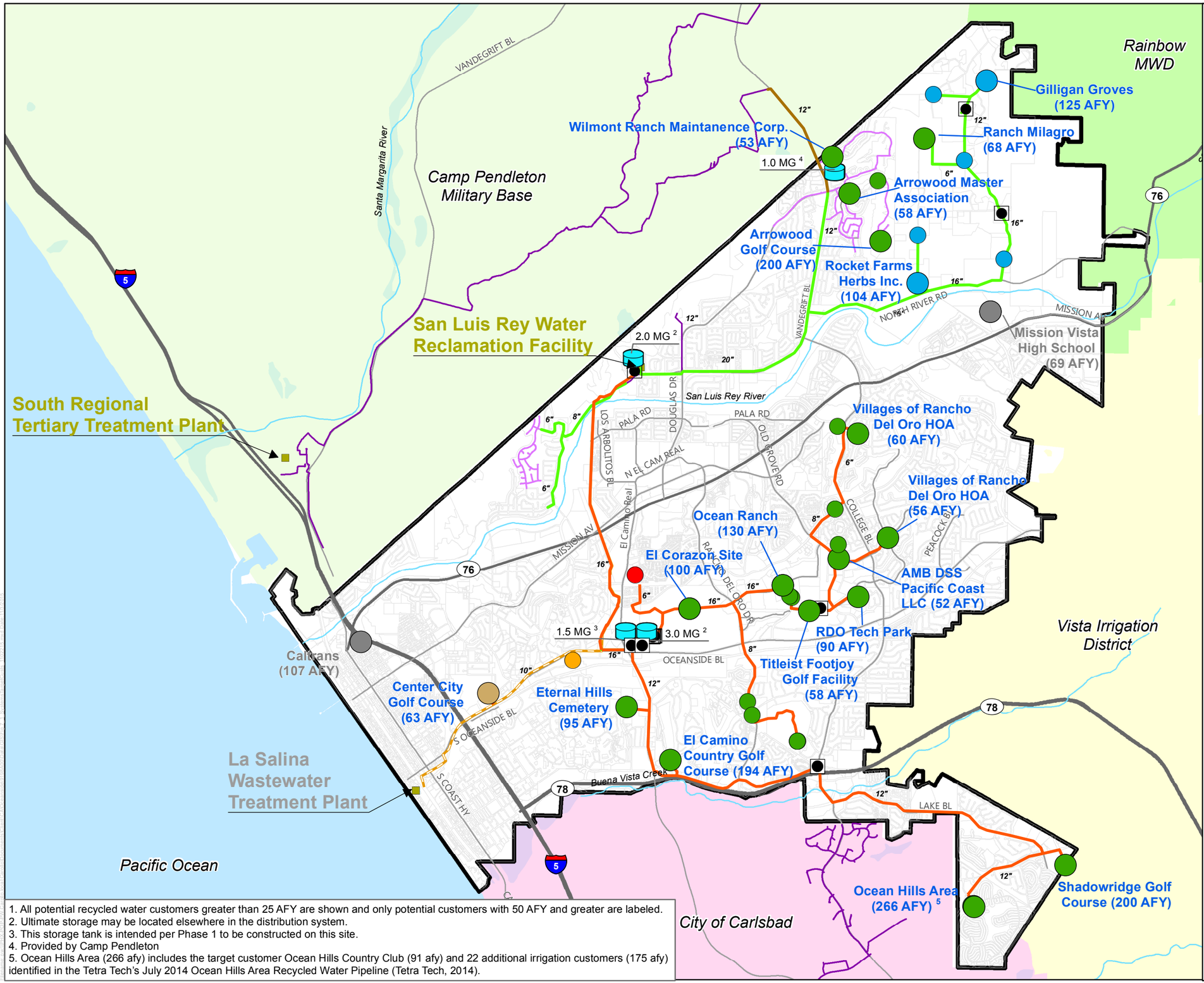
[4] After the completion of this report, the City requested to assess the impact to the Ocean Hills Distribution System based on the Homeowner's Association (HOA's new demand projections. The results of this analysis are summarized in a stand-alone addendum attached to this report.

Table ES.4 Demand and Facilities Summary by System
Recycled Water Facilities Plan
City of Oceanside

System Components	Upper San Luis Rey WRF System	Lower San Luis Rey WRF System	Total
Demand (afy)	1,110 [1]	2,040	**3,150**
Demand Max Month (mgd)	2.0 [1]	3.6	**5.6**
No. of Customers	62 [1]	83	**145**
Total Pipeline Length (mi)	12	23	**35**
Pump Station	1-360 HP; 1-150 HP; 1-30 HP	1-460 HP; 1-130 HP; 1-90 HP; 1-60 HP; 1-330 HP	**--**
Storage Needed (MG)	3.0	4.5	**7.5**
Treatment Expansion (mgd)	2.5 [2]	3.75	**6.25**
Capital Cost ($)	$42.7	$84.1 [3]	**$126.8**

Notes:

(1) The total demand served does not include the two existing customers currently served by San Luis Rey WRF. Demands and number of customers do include the Morro Hills and Arrowood Developments.
(2) The treatment expansion includes upgrading the existing tertiary treatment.
(3) The capital cost for the Lower San Luis Rey WRF System includes costs for a river crossing (standard cost + 50%) and for tunneling (standard cost + 200%).



1. All potential recycled water customers greater than 25 AFY are shown and only potential customers with 50 AFY and greater are labeled.
2. Ultimate storage may be located elsewhere in the distribution system.
3. This storage tank is intended per Phase 1 to be constructed on this site.
4. Provided by Camp Pendleton
5. Ocean Hills Area (266 afy) includes the target customer Ocean Hills Country Club (91 afy) and 22 additional irrigation customers (175 afy) identified in the Tetra Tech's July 2014 Ocean Hills Area Recycled Water Pipeline (Tetra Tech, 2014).

Legend

Billing Class
- Irrigation
- Government
- Special Users
- Commercial
- Agricultural

Range
- 25-50
- >50

Potential Recycled Water Systems
- SRTTP System
- Upper San Luis Rey WRF System
- Lower San Luis Rey WRF System

Other
- Water Treatment Plant/ Water Reclamation Facility
- Operational Tank
- Potential RW Pump Station
- Existing Recycled Water Pipeline (In Use)
- Existing Recycled Water Pipeline (Inactive/Dry)
- Existing 10-inch Brine Pipeline
- Major Roads
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID
- City Parcel

0 1 2
Miles

Figure ES.2
Potential Recycled Water System Expansions
Recycled Water Facilities Plan
City of Oceanside

carollo RMC water and environment

ES.5 RECOMMENDED ALTERNATIVE

The facilities, customers, opinion of probable costs and phasing for the two recommended recycled water systems, including an implementation plan, were developed. Using a phased expansion approach, a detailed CIP was developed which will serve as a guide for the City to expand its recycled water system and increase supply reliability.

ES.5.1 Upper San Luis Rey WRF System

Upper San Luis Rey WRF System would convey tertiary effluent from the San Luis Rey WRF through a 20-inch diameter pipeline to serve recycled water customers in the northeastern area of the City and west of the San Luis Rey WRF. This system would serve 62 customers for an approximately demand of 1,110 afy. This system contains a branched network that includes pipelines ranging from 6 to 20 inches in diameter, storage tanks and two booster stations, which would be implemented into three phases.

Figure ES.3 shows the phases of the Upper San Luis Rey WRF System with the pipeline diameters and target customer IDs. Phase 1 facilities are located at the San Luis Rey WRF. Capital costs by facility type associated with this system are presented in Table ES.5. This table identifies the necessary facilities sizes and capital improvement costs needed for the Upper San Luis Rey WRF System and the phase in which the facility would be implemented.

Table ES.5 Upper San Luis Rey WRF System Capital Improvement Costs Summary
Recycled Water Facilities Plan
City of Oceanside

	Implementation Phase				
Facility Category	**2015-2020 ($ Million)**	**2021-2025 ($ Million)**	**2026-2030 ($ Million)**	**Total ($ Million)**	**Percentage (%)**
Pipeline	- -	$ 23.3	$ 2.5	**$ 25.8**	60%
Pump Station	$ 1.6	$ 1.2	$ 0.8	**$ 3.6**	8%
Storage	$ 2.5	$ 2.5	--	**$ 5.0**	12%
Treatment Plant	$ 1.7	$ 3.3	$ 3.3	**$ 8.3**	19%
Total	$ 5.8	$ 30.3	$ 6.6	**$ 42.7**	**100%**
Demand (AFY)	0	720	390	**1,110** [2]	

Notes:
(1) Costs are based on ENR CCI 10,756 (Los Angeles, December 2014).
(2) Rounded to the nearest tenth.

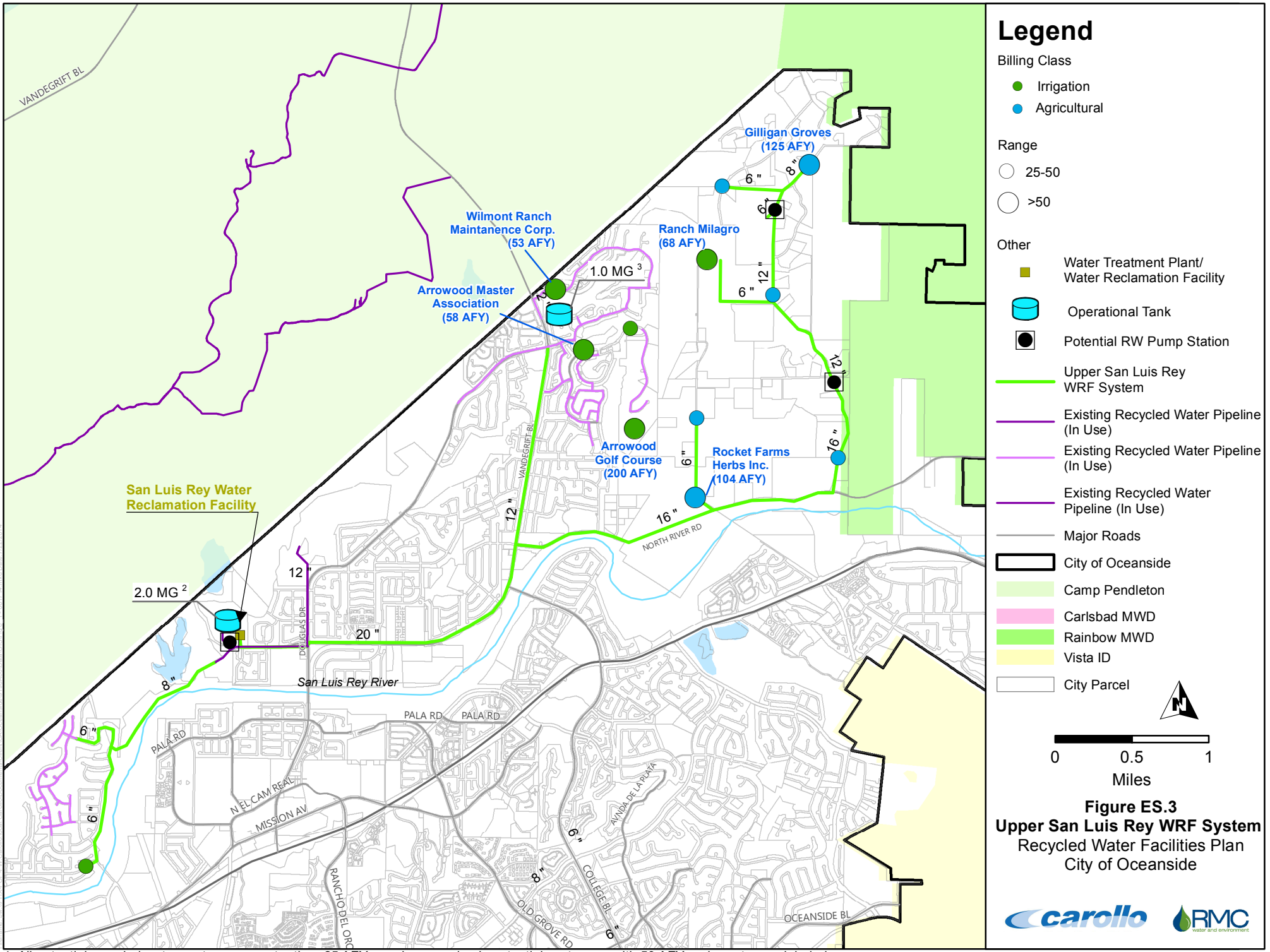


Figure ES.3
Upper San Luis Rey WRF System
Recycled Water Facilities Plan
City of Oceanside

1. All potential recycled water customers greater than 25 AFY are shown and only potential customers with 50 AFY and greater are labeled.
2. Ultimate storage may be located elsewhere in the distribution system.
3. Provided by Camp Pendleton.

ES.5.2 Lower San Luis Rey WRF System

The Lower San Luis Rey WRF System would convey tertiary recycled water from San Luis Rey WRF to serve potential customers identified in the Central and Southeast areas. This system would serve 83 customers for an approximately demand of 2,040 afy. This system contains a branched network system that includes pipelines ranging from 6 to 20 inches in diameter, storage tanks and five pump stations which would be implemented in five phases.

Figure ES.4 shows the phases of the Lower San Luis Rey WRF System with the pipe diameters and the target IDs. Capital costs by facility type are presented in Table ES.6. This table identifies the necessary facilities sizes and capital improvement costs needed for the Lower San Luis Rey WRF System and the phase in which the facility would be implemented.

Table ES.6 Lower San Luis Rey WRF System Capital Improvement Costs Summary
Recycled Water Facilities Plan
City of Oceanside

Facility Category	Implementation Phase					Total ($M)	Percentage (%)
	2015-2020 ($M)	2021-2025 ($M)	2026-2030 ($M)	2031-2035 ($M)	2036-2040 ($M)		
Pipeline	$1.6	$19.1	$17.5	$3.1	$6.0	**$47.3**	56%
Pump Station	$0.0	$1.6	$2.3	$1.2	$2.5	**$7.6**	9%
Storage	$3.7	--	$2.5	$2.5	$2.5	**$11.2**	13%
Treatment Plant	$8.0	--	$5.0	$5.0	--	**$18.0**	22%
Total	**$13.3**	**$20.7**	**$27.3**	**$11.8**	**$11.0**	**$84.1**	**100%**
Demand (afy)	60	590	800	170	420	**2,040**	
Cumulative Demand (afy)	**60**	**650**	**1,450**	**1,620**	**2,040**		

Note:
(1) Costs are based on ENR CCI 10,756 (Los Angeles, December 2014).

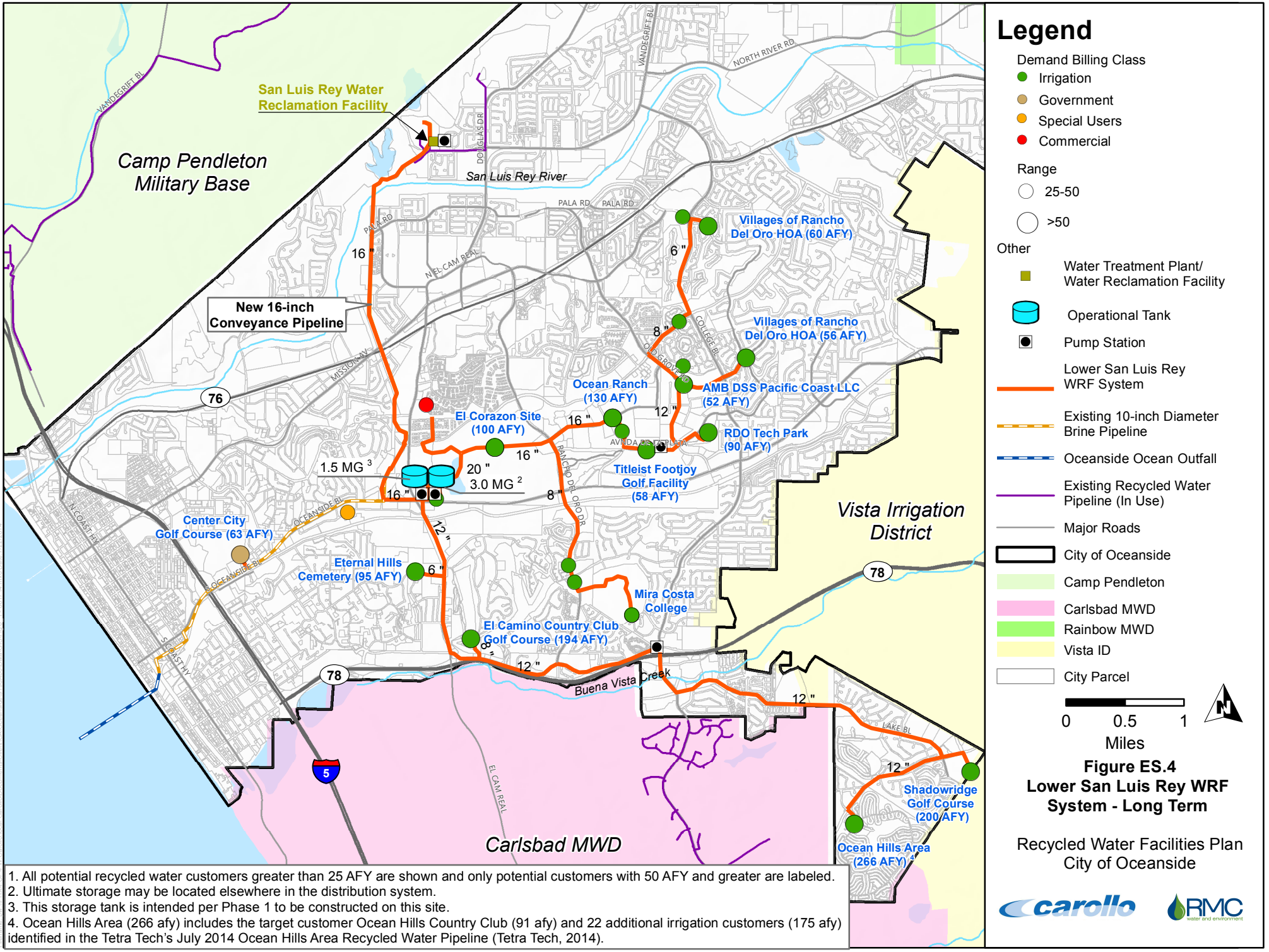


Figure ES.4
Lower San Luis Rey WRF System - Long Term

Recycled Water Facilities Plan
City of Oceanside

1. All potential recycled water customers greater than 25 AFY are shown and only potential customers with 50 AFY and greater are labeled.
2. Ultimate storage may be located elsewhere in the distribution system.
3. This storage tank is intended per Phase 1 to be constructed on this site.
4. Ocean Hills Area (266 afy) includes the target customer Ocean Hills Country Club (91 afy) and 22 additional irrigation customers (175 afy) identified in the Tetra Tech's July 2014 Ocean Hills Area Recycled Water Pipeline (Tetra Tech, 2014).

ES.6 CAPITAL IMPROVEMENT PLAN

The CIP was developed for the two recommended recycled water systems:

- The Upper San Luis Rey WRF System would be implemented in three phases and would have a total capital cost of $42.7 million. The Upper San Luis Rey WRF System would serve 62 customers and offset 1,110 afy of potable water. Over a 50-year period, the unit lifecycle cost of this system is $2,100.
- The Lower San Luis Rey WRF System would be implemented in five phases and would have a total cost of $84.1 million. The Lower San Luis Rey WRF System would serve 83 customers and offset 2,040 afy of potable water. Over a 50-year period, the unit lifecycle cost of this system is $2,300.

Table ES.7 and Figure ES.5 summarize the total capital cost and demands by phase for the two systems combined. As shown in the table, the total estimated CIP cost is $126.8 million, offsetting 3,486 afy of potable demands, including 336 afy of existing recycled water demand. Based a 50-year period and 5 percent interest, the unit lifecycle of both projects combined is $2,000/af. Although the capital costs and demands served vary among the two systems, the unit lifecycle costs are very close. The unit lifecycle also excludes grant funding. Therefore, the City can move forward based on recycled water customer interest.

Table ES.7 Capital Improvement Costs and Demand Summary
Recycled Water Facilities Plan
City of Oceanside

	Implementation Phase						Total
	2013 (Ex.)	**2015-2020**	**2021-2025**	**2026-2030**	**2031-2035**	**2036-2040**	
Capital Costs ($M)							
Upper San Luis Rey WRF System	--	$ 5.8	$ 30.3	$ 6.6	--	--	**$ 42.7**
Lower San Luis Rey WRF System	--	$13.3	$20.7	$27.3	$11.8	$11.0	**$84.1**
Total ($M)	--	**$19.1**	**$51.0**	**$33.9**	**$11.8**	**$11.0**	**$126.8**
Cumulative ($M)	--	**$19.1**	**$70.1**	**$104.0**	**$115.8**	**$126.8**	--
Demands (afy)							
Upper San Luis Rey WRF System	336	--	720	390	--	--	**1,446**
Lower San Luis Rey WRF System	--	60	590	800	170	420	**2,040**
Total (afy)	**336**	**60**	**1,310**	**1,190**	**170**	**420**	**3,486**
Cumulative (afy)	**336**	**396**	**1,706**	**2,896**	**3,066**	**3,486**	--

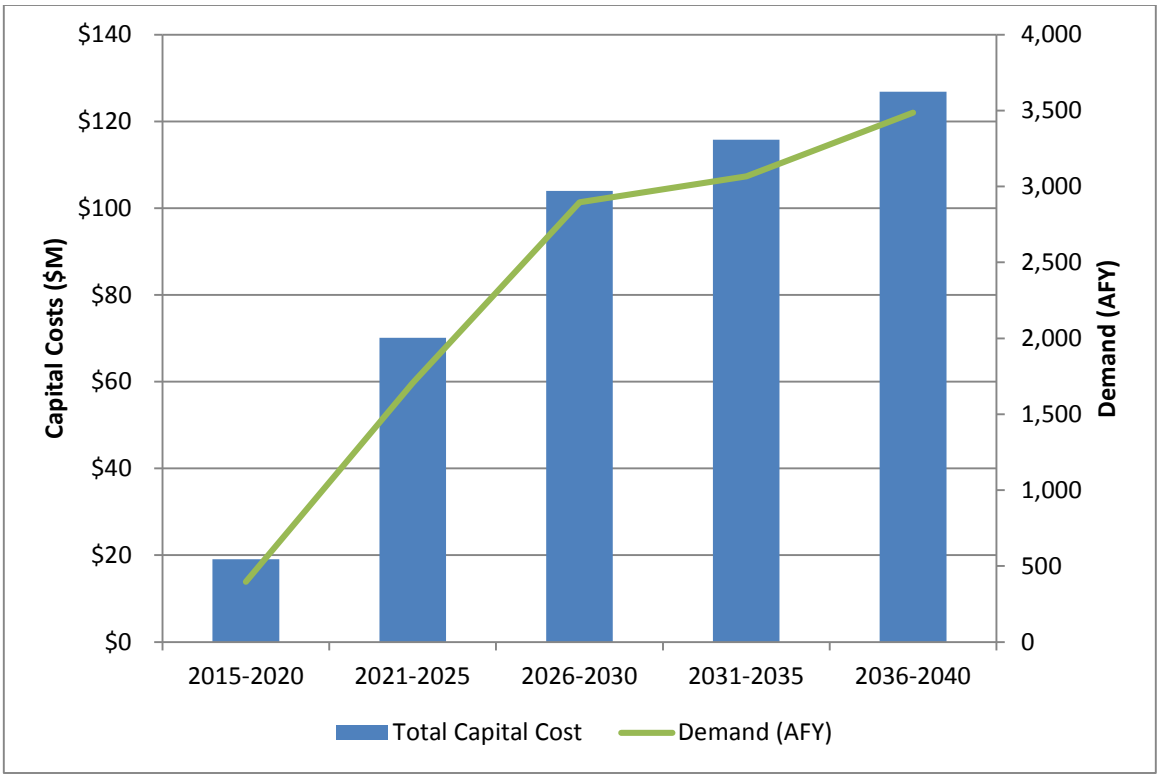


Figure ES.5 Total Capital Improvement Costs and Demands by Year

INTRODUCTION

Southern California faces many challenges regarding its water supply. Droughts, climate change, population growth, and legal and environmental constraints combine to reduce water supply reliability. Recycled water offers a reliable, drought-proof approach for augmenting local and imported water supplies. The City of Oceanside (City) has undertaken preparation of this Recycled Water Facilities Plan to guide development of recycled water infrastructure and facilities.

This chapter provides an overview of the project and an outline of the Recycled Water Facilities Plan (Plan) for the City, including background information, a discussion of the purpose of the project, data sources referenced for the analysis, and a description of the report sections to follow.

1.1 BACKGROUND

The City was incorporated as a general law city in 1888, pursuant to the California Constitution Article XI and the California Government Code. The City is governed by an elected five-member council. The City is a full-service City, providing water and wastewater services through its Water Utilities Department, under the purview of the City Council.

The City is located 35 miles north of the City of San Diego, encompassing about 42 square miles. It predominantly consists of residential neighborhoods, agriculture and smaller commercial and industrial developments. The City has a recycled water system consisting of 1.2 miles of recycled water pipeline that serve two customers with a combined existing demand of approximately 336 acre-feet per year (afy)[1].

The City relies upon imported water from the San Diego County Water Authority (SDCWA) to meet approximately 91 percent of its potable water demand[2]. The reliability and cost-effectiveness of importing water is in question due to environmental concerns and long-term drought conditions that result in periodic cutbacks of imported water allotments. Groundwater from Mission Basin constitutes about 9 percent of the water supply. Local water supplies, primarily recycled water, will play an important role in addressing anticipated imported water supply cutbacks in the future.

[1] Based on Calendar Year (CY) 2013 tertiary plant flows (provided by the City) to Oceanside Golf Course (123 afy) and Whelan Lake (213 afy).

[2] Based on City's water supply source during CY 2003 through 2012 (City of Oceanside's Final Water Master Plan, Table 3.3)

Continuing development of recycled water use in the City's service area would help to accomplish the following:

- **Reduce Dependence on Imported Water Supplies**: Recycled water use within the City's service area will reduce dependence on imported water from SDCWA, which comes from the Colorado River Authority (CRA) and the State Water Project (SWP).
- **Improve Water Supply Reliability**: Recycled water supply is generally not affected by hydrologic conditions; therefore, it provides additional dry-year reliability.
- **Preserve Potable Water Supplies**: Using recycled water to serve non-potable (non-drinking water) demands, such as irrigation, will preserve high-quality drinking water supplies for potable needs.
- **Obtain Objectives of the Conservation Master Plan**: Implementation allows for the City to meet its 20x2020 mandate. The City's 2010 Urban Water Management Plan (UWMP) indicates that 2,016 acre-feet (AF) of recycled water needs to be developed to meet the City's mandated reduction goals (City, 2011).

1.2 PURPOSE OF REPORT

The purpose of this Plan is to evaluate several water recycling (also referred to as "water reuse") strategies and to develop a Capital Improvement Program (CIP) for expansion of the City's existing recycled water system. The CIP identifies a phased approach and ultimate build-out projects for implementing recycled water facilities within the City's service area. The recycled water projects are identified by analyzing the recycled water system under future demand conditions. The CIP includes a list of recommended projects, a proposal for phasing of the projects, and planning-level estimates of probable construction costs. The CIP will act as a road map for the City with respect to recycled water system planning.

Since the preparation of the 2005 Recycled Water Master Plan, the City has considered several options for expanding its recycled water system. Some of these options were developed through the North San Diego County Regional Recycled Water Facilities Plan and, more recently, through the conceptual plan for the El Corazon Development Project, a potential new water recycling facility. This Plan further investigates and prioritizes the City's existing options in a comprehensive manner to expand the recycled water system. Future reuse project alternatives will consider both the demand and supply options, as well as other factors such as benefits to the City's outfall, capital costs, timing, and potential institutional arrangements.

1.3 PREVIOUS AND ONGOING STUDIES

The City has completed several studies investigating the expansion of the recycled water system. In order of completion date, each document is described briefly below:

- *Recycled Water Master Plan* (Carollo, October 2005): The 2005 Recycled Water Master Plan evaluated the potential demands; identified treatment, distribution, and storage facilities; and provided cost evaluations. The plan considered alternative treatment technologies and phasing for treatment facilities. A cost analysis was performed to determine the cost of treatment and distribution for recycled water.
- *La Salina Wastewater Treatment Plant Facility Master Plan* (Carollo, September 2011): The facility master plan identified and prioritized potential improvement projects at the City of Oceanside's La Salina Wastewater Treatment Plant (La Salina WWTP). A new recycled water treatment facility was identified and tertiary treatment alternatives were evaluated.
- *North San Diego County Regional Recycled Water Facilities Plan* (RMC, May 2012): The City collaborated with several other water and wastewater agencies located in northern San Diego County (referred to as "the Partners") in a joint effort to identify and create a more collaborative use of recycled water across agency boundaries. The plan assisted the Partners in identifying the benefits of regionalization of existing and planned recycled water systems to further maximize the use of recycled water through non-potable and indirect potable reuse. New local and regional recycled water projects were identified that would provide additional recycled water supplies to the local water agencies beyond what they could utilize individually.
- *El Corazon Alternative Water Supply Project – Conceptual Plan* (RMC, October 2012): This conceptual plan for the overall El Corazon Alternative Water Supply Project defined the phases in which the project would be implemented, developed a site plan, developed the first phase cost estimate, and provided initial design criteria for the individual project components of each phase.
- *Ocean Hills Area Recycled Water Pipeline – Preliminary Design Memorandum* (Tetra Tech, 2014). The preliminary design study evaluated alignment alternatives and design parameter to serve recycled water to the City of Oceanside and to Vista Irrigation District (VID) from Carlsbad MWD's recycled water system.
- *Cost Analysis of La Salina WWTP Options Technical Memorandum* (IEC, October 2014): This study evaluated and compared three alternative options for rehabilitating the La Salina WWTP.

The City is currently in the process of developing the following additional study related to the City's recycled water system expansion opportunities:

- The Indirect Potable Reuse (IPR) and Pathogen Removal Study is looking at groundwater recharge (GWR) in the Mission Basin. Results from this study are anticipated to be available in summer of 2015.

1.4 FUNDING PARTNERS

This Plan was partially funded by a grant from the State Water Resources Control Board (SWRCB) Water Recycling Funding Program (WRFP) and includes review and input from SWRCB staff. The SWRCB WRFP Study No. is 3926-010.

1.5 PLAN ORGANIZATION

This Plan consists of five chapters and is organized as follows:

- **Chapter 1 – Introduction**: This chapter describes the need for developing the use of recycled water for the City of Oceanside and provides an overview of the Plan. It also provides the background and basis for recycled water planning that have been conducted to date, including previous studies, and identifies the study partners.
- **Chapter 2 – Study Area Characteristics**: This chapter characterizes the Study Area, including climate, hydrologic features, land use, water supply and use, wastewater treatment and disposal, and existing recycled water facilities.
- **Chapter 3 – Regulatory Considerations**: This chapter describes the recycled water quality requirements and the recycled water regulatory setting.
- **Chapter 4 – Recycled Water Market Assessment**: This chapter identifies potential recycled water users within the Study Area, provides estimates of recycled water demand, summarizes information on peaking factors, and gives an overview of a potential groundwater recharge program involving recycled water.
- **Chapter 5 – Potential Recycled Water Supplies**: This chapter describes the potential recycled water supplies and applicable water quality requirements.
- **Chapter 6 – Project Alternatives Analysis**: This chapter discusses the methodology for developing and evaluating various recycled water system alternatives. This chapter defines design criteria and assumptions, provides cost estimating criteria, and describes each alternative, including a "No Project Alternative."
- **Chapter 7 – Recommended Alternatives**: This chapter describes the recommended facilities, including operational strategy, costs and implementation.

1.6 ACKNOWLEDGEMENTS

We would like to thank the following City of Oceanside staff for their assistance and oversight of this project:

- Cari Dale, Water Utilities Director (former)
- Jason Dafforn, P.E., Interim Water Utilities Director
- Amy Czajkowski, P.E., Project Manager
- Greg Keppler, P.E., Water/Wastewater Project Manager

The following RMC and Carollo staff members were principally involved in this project:

- Scott Goldman, P.E., Principal-in-Charge
- Ricardo Vivas, P.E., Project Manager
- Miluska Propersi, P.E., Project Engineer
- Kraig Erickson, P.E., Target Customer Analysis
- Inge Wiersema, P.E., Technical Review

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STUDY AREA

This chapter provides a characterization of the Study Area, including information on population, land use, water supply and use, wastewater treatment and disposal, and existing recycled water use. The Study Area is defined as the City of Oceanside potable water service area as well as the areas for conveyance facilities that would be necessary for delivery of recycled water from adjacent wastewater agencies: Camp Pendleton to the north and Carlsbad Municipal Water District to the south.

2.1 STUDY AREA CHARACTERISTICS

The following is a description of general characteristics of the Study Area:

- **Location:** The City of Oceanside is the most northern city in San Diego County and is located 35 miles north of the City of San Diego. The City is bounded by the Pacific Ocean on the west, Camp Pendleton on the North, the City of Carlsbad on the South, and the City of Vista and unincorporated San Diego County on the east. The City service area, 42 square miles, is the Study Area in this Plan (Figure 2.1). The Study Area is located entirely within the jurisdiction of the San Diego Regional Water Quality Control Board (RWQCB), which is Region 9 in the State of California.
- **Climate:** The Study Area is located in a mild, coastal climate with limited variation in average temperature over the course of the year. Average annual temperature between 2003 and 2012 was 60.2 degrees Fahrenheit. The average annual rainfall is 11.2 inches per year, which occurs mostly during winter from December to March[3].
- **Topography**: The City's service area consists of rolling hills and valleys, with elevation ranging from sea level to approximately 930 feet above mean sea level.
- **Hydrologic Features:** The Study Area is located within four surface water drainage areas that drain west into the Pacific Ocean. The San Luis Rey River (Hydrologic Unit 903.00) drains the northern portion of the Study Area, while the southern portion is drained by the Loma Alta Creek, the Buena Vista Creek and the Agua Hedionda Creek (Hydrologic Units 904.1, 904.2, and 904.3 respectively). Those waterways are part of the overall Carlsbad Hydrologic Unit 904. The RWQCB is responsible for the San Luis Rey and the Carlsbad Hydrologic Units, shown on Figure 2.2.

[3] Data from Western Regional Climate Center for Station 046377 (Oceanside Marina). Period of record: December 2002 through November 2012.

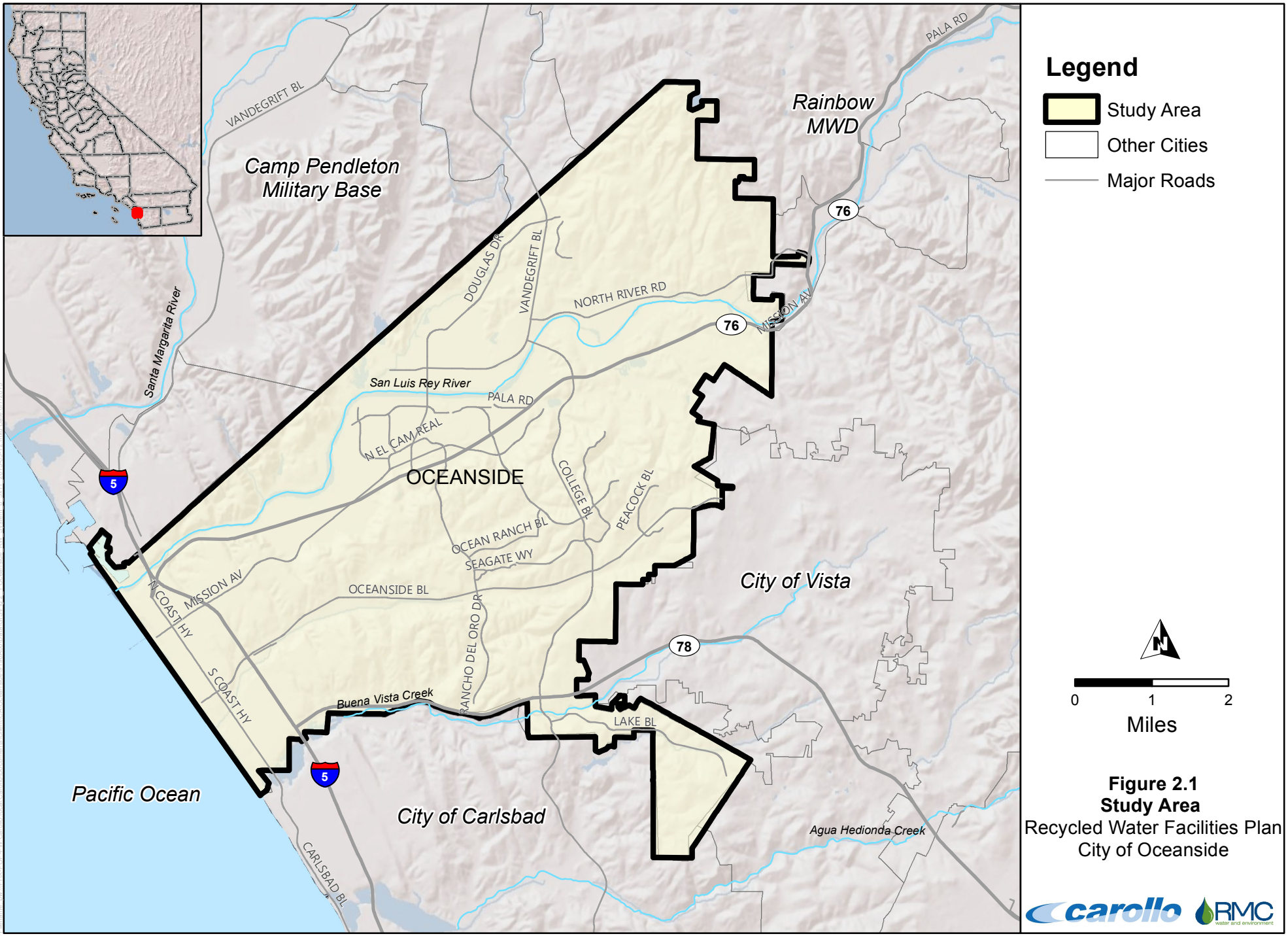
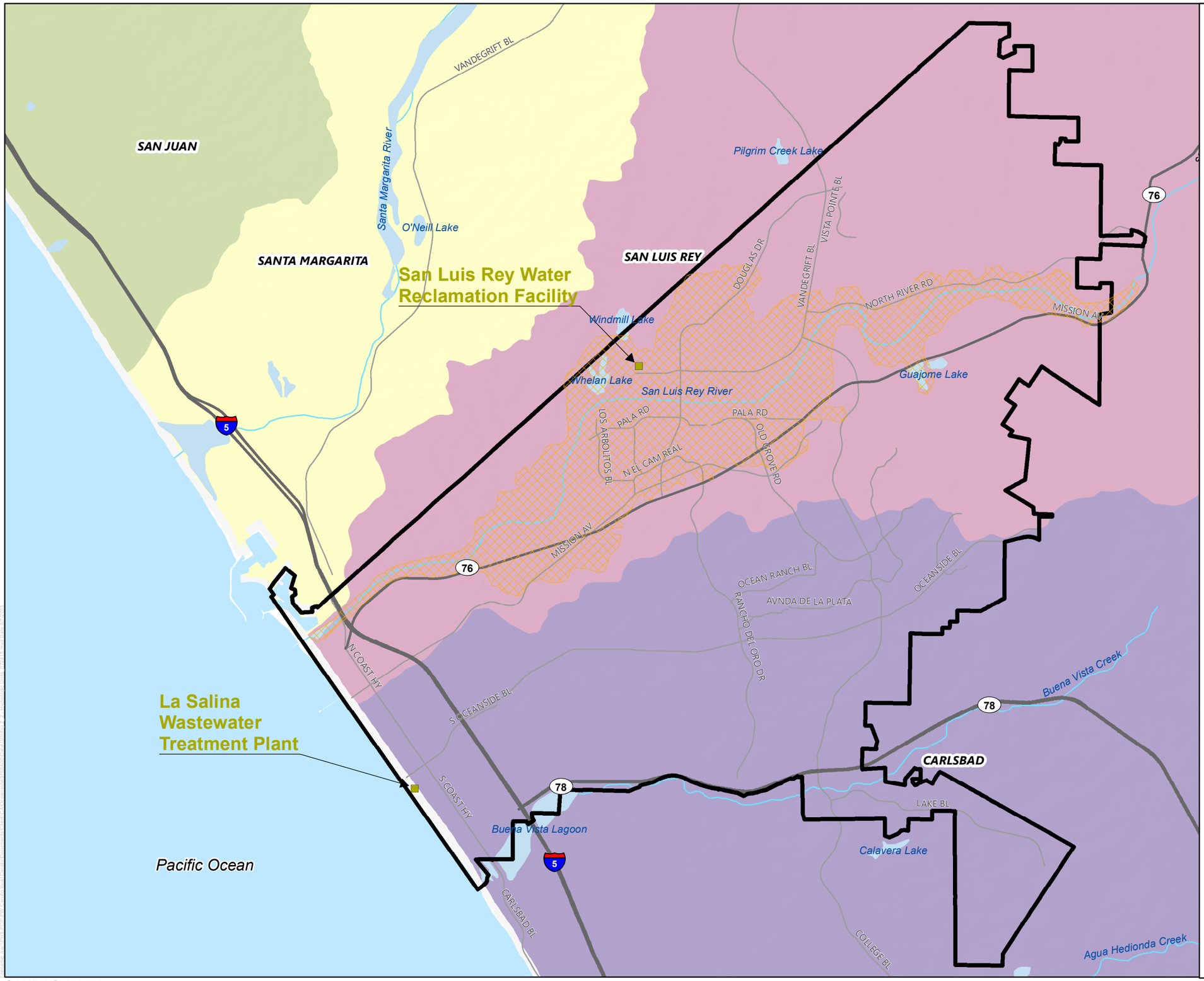


Figure 2.1
Study Area
Recycled Water Facilities Plan
City of Oceanside



Legend

- Wastewater Treatment Plant/Water Reclamation Facility
- Major Roads
- City of Oceanside
- Mission Basin

Hydrologic Units

- San Juan
- Santa Margarita
- San Luis Rey
- Carlsbad

N

0 1 2
Miles

Figure 2.2
Hydrologic Units
Recycled Water Facilities Plan
City of Oceanside

SANDAG (2013)

The San Luis Rey River Watershed is located east of the City of Oceanside. The 558 square-mile drainage area is the largest hydrologic unit in the San Diego Region. The watershed drains to the Pacific Ocean to the west and is bounded by the Moserate Mountains to the north, the Cleveland National Forest and Camp Pendleton to the northwest, and Escondido, San Diego, and other cities to the south. The watershed is roughly 50 miles long by 16 miles wide and is divided into two hydrologic units by Henshaw Dam. The areas above and below the dam encompass 206 and 354 square miles, respectively (Metropolitan Water District of Southern California [MWD], 2007).

The RWQCB has jurisdiction over water use within the Study Area. The RWQCB has adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) that contains water quality objectives and designated beneficial uses for individual groundwater and surface water bodies. The Basin Plan reflects regional differences in existing water quality, beneficial uses of the region's groundwater and surface water, and local water quality conditions and problems. The water quality objectives in the Basin Plans are implemented in permits issued by the RWQCB for water reclamation and water reuse projects.

- **Groundwater Basins**. The San Luis Rey River Watershed includes six groundwater basins: Mission Basin, Bonsall Basin, Moosa Canyon Basin, Pala Basin, Pauma Basin and Warner Basin (MWD, 2007). The groundwater basins within the San Luis Rey River Watershed underlie an east-west-trending alluvium-filled valley located along the western coast of San Diego County. The major hydrologic feature is the San Luis Rey River, which drains the watershed overlying the valley. The watershed is bounded on the east, northeast, and southeast by the contact of alluvium with impermeable Mesozoic granitic and Pre-Cretaceous metamorphic rocks. In the northwest and southwest of the lower portion of the watershed, alluvium is in contact with the semi-permeable Eocene marine deposits and Tertiary non-marine deposits. The watershed is bounded on the west by the Pacific Ocean.

  The Mission Basin (see Figure 2.2) lies almost entirely within the limits of the City of Oceanside and extends upstream from the Pacific Ocean to just past Oceanside's eastern boundary and west of the Bonsall Bridge near the intersection of State Route (SR) 76 and SR 13. The basin is alluvial and unconfined in the central and eastern areas; while there is unconfined alluvium overlying semi-confined alluvium in the western areas. The volume of groundwater currently in storage within the alluvial aquifers (shallow and deep) in the Mission Basin is estimated to be 92,000 AF. The volume of unused storage within the alluvium (occurring between the water table and the ground surface) was estimated to be 9,000 AF. The amount of natural safe yield is 7,000 to 10,000 afy (MWD, 2007).

2.2 LAND USE AND POPULATION PROJECTIONS

This section describes the City's land use and population projections as well as the City's current water supply and use.

2.2.1 Land Use

Inside the existing City boundaries, land use mainly consists of residential neighborhoods, public open space, transportation, and agriculture. Other uses include commercial, industrial, schools and golf courses.

The City's General Plan was updated in 2002 and was amended most recently in June 2012. The City's General Plan defines many elements of land use, including the distribution of land use types and near-term and long-range development plans (Oceanside, 2002). Historically, the City has included significant agricultural components. Over the last few decades, however, large portions of the agricultural areas have been converted to residential planned communities. Existing land use within the Study Area is shown on Figure 2.3, while the total area per land use category is summarized in Table 2.1. The following land uses have potential to use recycled water: Agriculture, cemetery, commercial, golf courses, and park/recreation.

Table 2.1 Existing Land Use and Areas
Recycled Water Facilities Plan
City of Oceanside

Land Use Category (Simplified)	Area (acres)	Area (%)
Agriculture	2,392	9.2%
Cemetery	43	0.2%
Commercial	1,309	5.0%
Fire/Police Station	18	0.1%
Golf Course	536	2.1%
Hospital	39	0.1%
Industrial	714	2.7%
Junkyard/Dump/Landfill	40	0.2%
Military	1	0.0%
Mission	65	0.2%
Monastery	20	0.1%
Park/Recreation	365	1.4%
Parking Lot	72	0.3%
Public Open Space	5,448	20.9%
Residential	9,872	37.9%
School	673	2.6%
Transportation	4,284	16.5%
Water	132	0.5%
Total	**26,023**	**--**

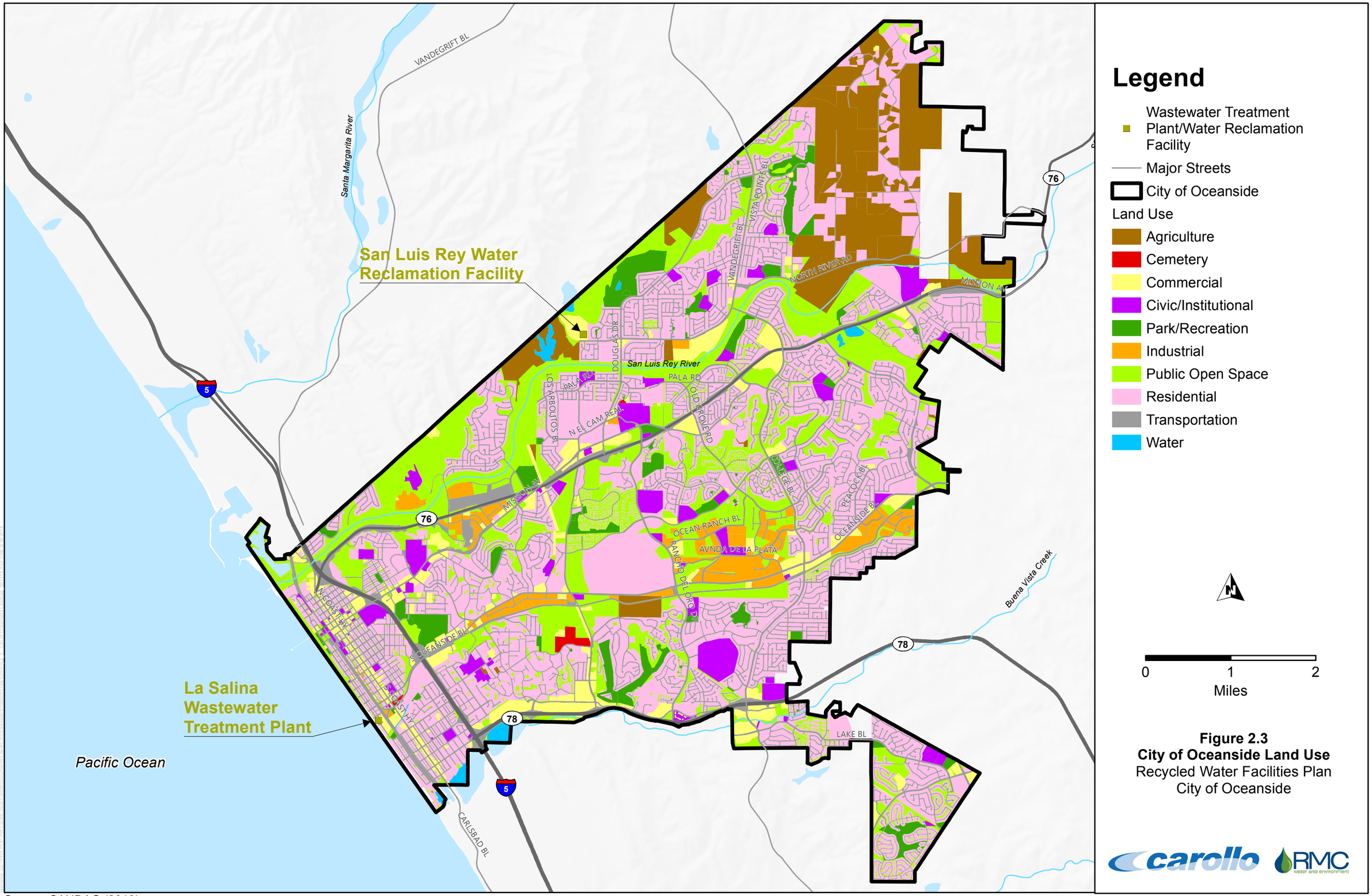


Figure 2.3
City of Oceanside Land Use
Recycled Water Facilities Plan
City of Oceanside

Source: SANDAG (2013)

2.2.2 Population Projections

The population projections are based on the San Diego Association of Governments' (SANDAG's) 2050 Regional Growth Forecast. Minimal demographic growth is expected from 2015 to 2050 in the City, as shown in Table 2.2. Between 2015 and 2050, the population is estimated to increase by approximately 0.4 percent annually. Recycled water demands within the Study Area are not significantly impacted by projected population increase. Recycled water demands in the City will primarily offset current potable water use.

Table 2.2 Population Projections
Recycled Water Facilities Plan
City of Oceanside

Year	Projected Population[(1)]
2010	183,095
2015	189,275
2020	195,455
2025	202,529
2030	209,602
2035	212,024
2050	217,364

Note:
(1) SANDAG 2050 Regional Growth Forecast (for years that were not projected in the Regional Growth Forecast, interpolation of the Oceanside 2011 Water Conservation Plan was used).

2.3 WATER SUPPLY AND USE

This section describes the City's water supplies, major water facilities, and water use trends.

2.3.1 Water Supply Characteristics and Facilities

The City's existing water sources include groundwater, imported water, and recycled water. The predominant source of supply is imported water purchased from SDCWA. The historical water production from 2003 through 2012 is presented by water source is illustrated on Figure 2.4 and further information is provided below.

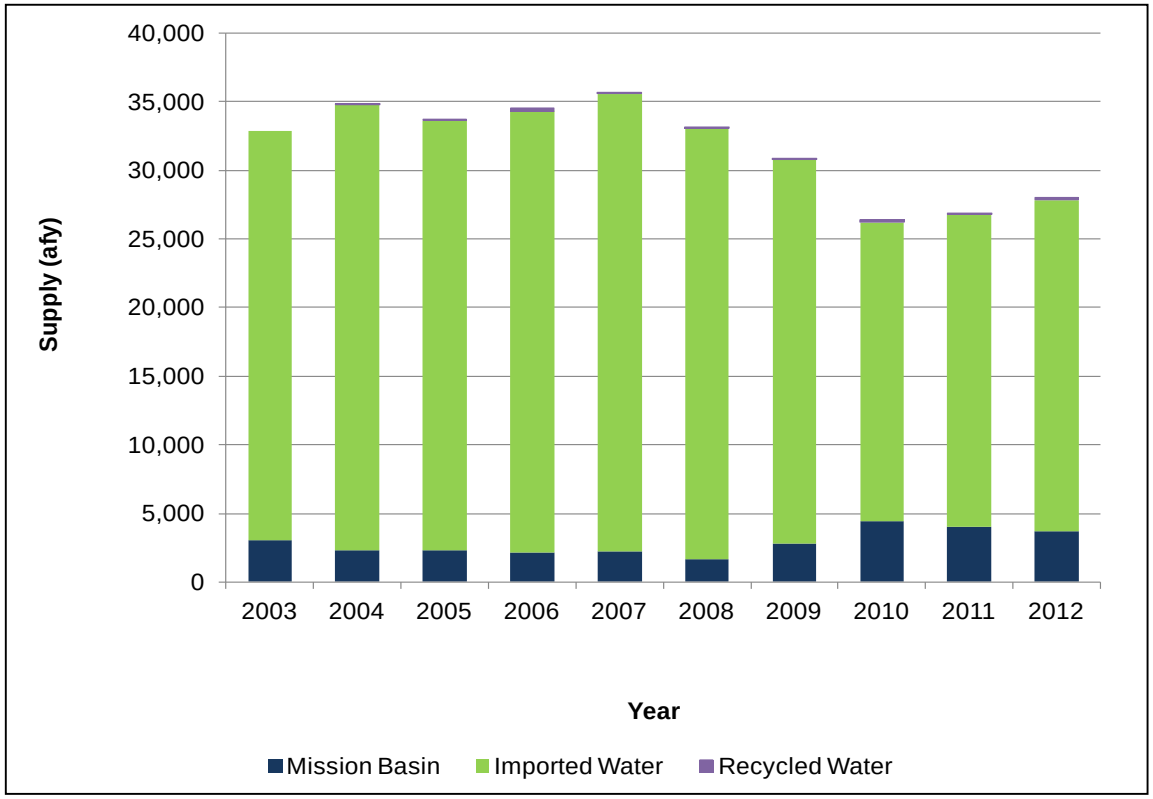


Figure 2.4 Annual Supply by Source

2.3.1.1 Water Supply Source

Imported Water. The City purchases raw and treated imported water from SDCWA through five aqueduct connections. SDCWA is a wholesaler of imported water and also purchases imported water from MWD. MWD imports water from the Colorado River and the State Water Project. Raw imported water that the City purchases from SDCWA is treated at the City's Robert A. Weese Filtration Plant (WFP). Treated imported water is purchased when demands exceed local treatment capacity. In CY 2012, imported water accounted for 87 percent of the City's supplies, or 24,148 afy (Carollo, 2015b).

Groundwater. The City pumps groundwater from the Mission Basin and treats it at the Mission Basin Groundwater Purification Facility (MBGPF). The MBGPF treatment process utilizes reverse osmosis (RO) membranes to reduce salts, iron, magnesium and organics present in the groundwater. In CY 2012, the MBGPF supplied approximately 13 percent of the City's supplies, or 3,704 afy (Carollo, 2015b). Several customers (mainly agriculture) have private groundwater wells that are not connected to the City's potable water network; however, their consumption is part of the City's overall demand projections. These private wells are located in the northeastern area of the City.

Recycled Water. The City uses tertiary-treated recycled water produced at the San Luis Rey Water Reclamation Facility (San Luis Rey WRF) for irrigation at the City of Oceanside

Municipal Golf Course and to maintain the lake level at the Whelan Lake Bird Sanctuary. The San Luis Rey WRF can currently produce up to 0.7 million gallons per day (mgd) of recycled water in accordance with Title 22 regulations for unrestricted reuse. In CY 2013, the recycled water demand was approximately 336 afy (0.30 mgd), less than 1 percent of the City's water supplies[4]. The City also has the ability to divert and use recycled water from the Fallbrook Public Utility District's (FPUD) land outfall, which runs through the City and ties into the Oceanside Ocean Outfall for disposal. Through an agreement with the City, FPUD's land outfall serves recycled water to the California Department of Transportation (Caltrans) along Interstate 5. In CY 2013, Caltrans recycled water demand was approximately 107 afy (0.10 mgd). The La Salina WWTP is an existing plant but does not have tertiary treatment capability at this time.

2.3.1.2 Water Use Trends

Table 2.3 presents the potable and recycled water demand forecast for the City's service area without new water conservation and under normal weather conditions. Total water demands are projected to be 36,800 afy in 2035, representing an annual increase of 1.0 percent. The increase in demand in 2015 is due to adopting the per capita water demand projections from the 2010 UWMP. It is anticipated that there will be an increase in demand to the year 2015, then a more gradual increase as per capita demand is reduced but population continues to grow. With the exception of 2015, demand is anticipated to follow an approximately similar trend to population (Carollo, 2015b).

Table 2.3 City's Total Water (Potable and Recycled) Demand Projections (AF)
Recycled Water Facilities Plan
City of Oceanside

Source	Year					
	2012	2015	2020	2025	2030	2035
Potable Water [1]	26,278	33,286	31,089	32,214	33,339	33,725
Recycled Water [2]	323	933	2,016	2,505	3,075	3,075
Total Demand	**26,601**	**34,219**	**33,105**	**34,719**	**36,414**	**36,800**

Note:
(1) City of Oceanside's Final Water Master Plan; Chp 3 Tbl 3.4 and Tbl 3.10 (Carollo, 2015b)
(2) 2012 annual recycled water demand based on CY 2012 water usage at Oceanside Golf Course (135 AFY) and Whelan Lake (189 AFY). 2015 through 2035 annual recycled water demands are from the 2010 UWMP (IEC, 2011)

[4] Based on 2013 tertiary plant flows (provided by the City) to Oceanside Golf Course (123 afy) and Whelan Lake (213 afy).

2.3.1.3 Potable Water System Facilities

The City's potable water system is comprised of the following components:

- **Groundwater Facilities.** The City maintains 8 groundwater wells of which three are currently operating with an average flow rate of 1,630 gallons per minute (gpm)[5].
- **Storage Reservoirs.** The City maintains 12 storage reservoirs totaling 50.5 million gallons (MG) of storage.
- **Treatment Plants**. The City owns and operates two water treatment plants: the WFP and the MBGPF. The capacity of the WFP and the MBGPF are 25 and 6.3 million gallons per day (mgd), respectively. The WFP treats imported raw water and the MBGPF treats local groundwater.
- **Water Mains.** The City maintains approximately 574 miles of water mains with diameters ranging from 2 to 42 inches.
- **Pump Stations**. The City maintains 9 booster pumping stations.

More details can be found in the City's Final Water Master Plan (Carollo, 2015b).

2.3.1.4 Wastewater Collection and Treatment Facilities

The City serves a wastewater service area of over 45 square miles, including customers in the Rainbow Municipal Water District service area. The City's wastewater system is comprised of the following components:

- **Treatment Plants.** The City owns and operates two wastewater treatment plants: the San Luis Rey WRF and La Salina WWTP. The secondary treatment capacities of the San Luis Rey WRF and the La Salina WWTP are 15.4 mgd and 5.5 mgd, respectively. Currently, both treatment plants discharge secondary effluent into the Pacific Ocean.
- **Sewer Collection System.** The City maintains approximately 460 miles of gravity sewer pipeline ranging from 4 inches to 42 inches in diameter and 135 miles of force mains ranging from 3 inches to 42 inches in diameter.
- **Pump Stations.** The City owns and operates 32 lift stations[6].
- **Outfalls.** Secondary treated wastewater from San Luis Rey WRF is discharged into the Oceanside Land Outfall which ties into the Oceanside Ocean Outfall. FPUD's Land Outfall also connects to the Oceanside Ocean Outfall at the La Salina WWTP. Both FPUD and Camp Pendleton discharge to the Oceanside Ocean Outfall and these agencies have an agreement to discharge up to 2.4 mgd and 3.6 mgd, respectively.

[5] Based on January 2000 data provided by the City.
[6] Based on City of Oceanside's Final Sewer Master Plan (Carollo, 2015a).

More details can be found in the City's Final Sewer Master Plan (Carollo, 2015a).

2.3.1.5 Recycled Water Facilities

The City's existing recycled water facilities are depicted Figure 2.5. As shown, the City currently has two sources of recycled water: San Luis Rey WRF and FPUD's land outfall. The La Salina WWTP does not treat recycled water and therefore is not part of the existing recycled water facilities. The recycled water systems are comprised of the following components:

- **Treatment Plant**. The City currently treats recycled water at the San Luis Rey WRF, which has a tertiary treatment capacity of 0.7 mgd. Recycled water is pumped into two separate systems and serves two customers.
- **Recycled Water Mains.** The City maintains approximately 1.2 miles of recycled water pipelines with diameters ranging from 10 inches to 12 inches in diameter. There are additional recycled water pipelines installed at the Morro Hills, Arrowood, and California Brisas developments, in the northeast part of the Study Area. However, these pipelines are currently not utilized for recycled water and were installed at the time of the development's construction in preparation to connect to the recycled water system. The existing recycled water system is shown on Figure 2.5.
- **Fallbrook Land Outfall.** This outfall is a 16-inch diameter ductile iron pipe, approximately 18 miles long. FPUD can discharge up to 2.4 mgd on an annual average basis through Oceanside's ocean outfall. FPUD's contract with Caltrans allows up to 2 mgd of recycled water to be diverted from the FPUD land outfall for irrigation purposes.

The City's existing plant, San Luis Rey WRF, is being considered as supply options for the Study Area. In addition, three other supply sources from neighboring agencies (FPUD, Camp Pendleton, and Carlsbad Municipal Water District) are considered as potential recycled water supply sources in this Plan along with a new satellite plant. These supply options are discussed in detail in Chapter 5, while the distribution system options for these supplies are presented in Chapter 6.

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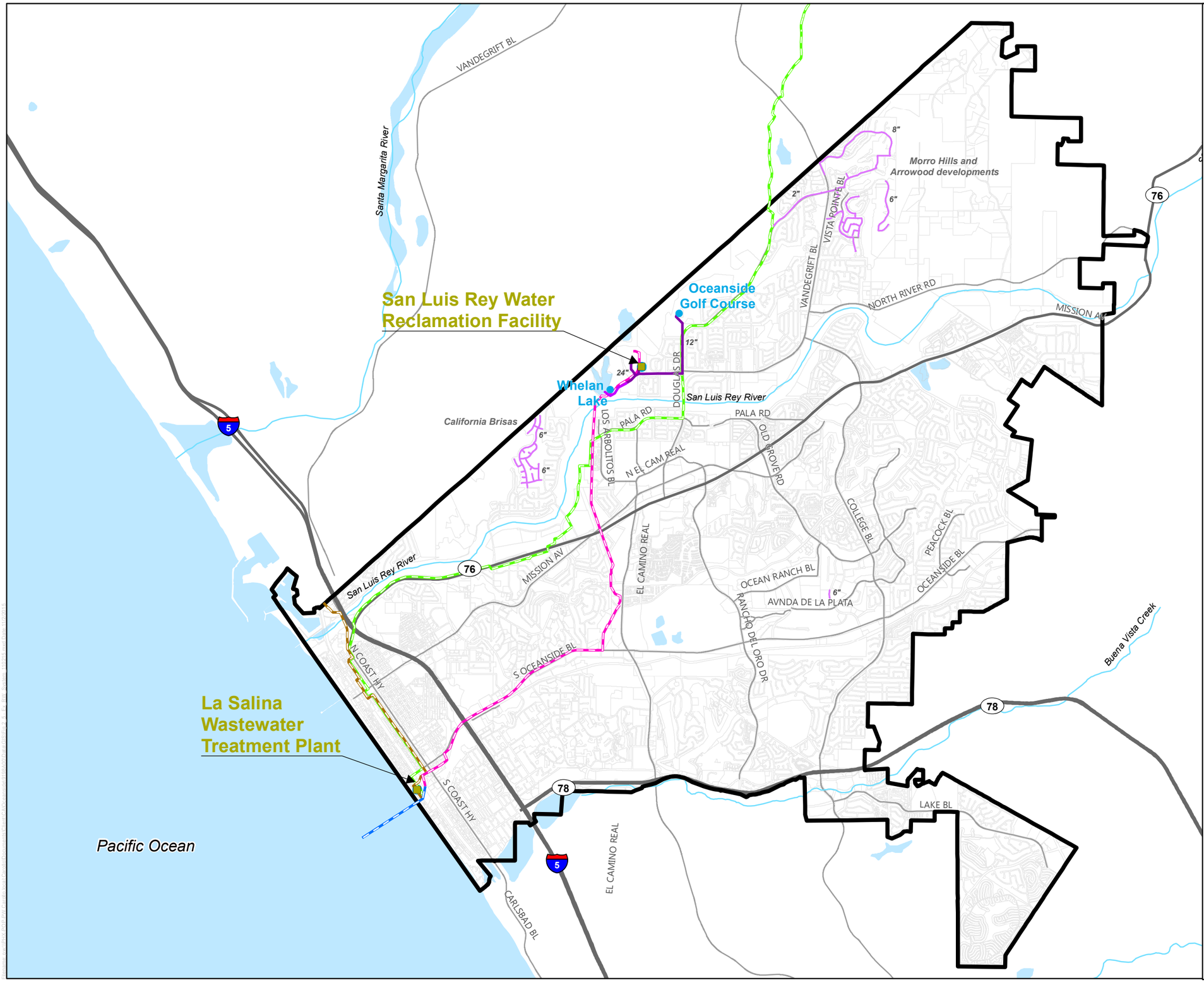

Figure 2.5
Existing Recycled Water System
Recycled Water Facilities Plan
City of Oceanside

2.3.1.6 Historical Recycled Water Use

The City provided monthly recycled water data for the Oceanside Golf Course (August 2011 through May 2014) and for Whelan Lake (May 2011 through May 2014). Figure 2.6 shows the historical recycled water demands for these two customers. Over the 2011 through 2014 fiscal period (June through July), the City served an average of 351 afy of recycled water. In CY 2013, Oceanside Golf Course demand was 123 afy and Whelan Lake was 213 afy.

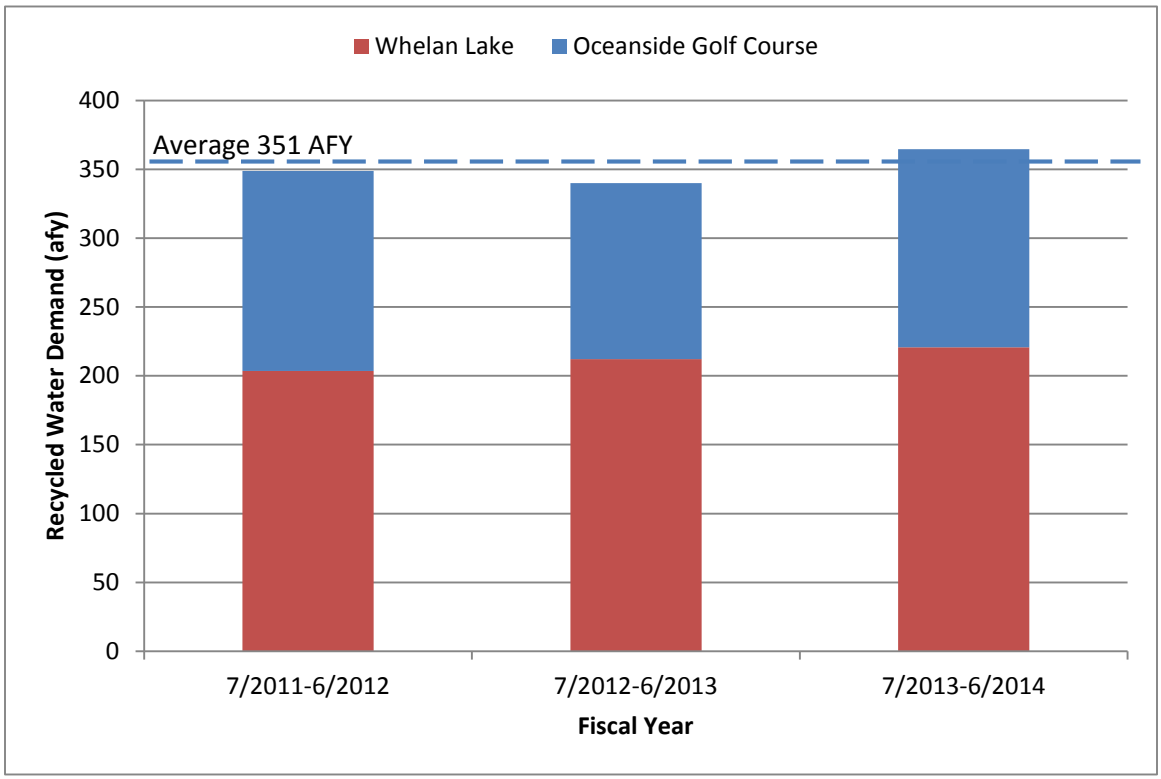

Figure 2.6 Total Historical Recycled Water Demands

Figure 2.7 shows the average monthly recycled water demands from the past three years (2001-2014). As shown, the highest demands for the Oceanside Golf Course occur in the summer months (May through September), when while the high demand months for Whelan Lake occur in from March through October as recycled water is used to maintain lake levels. The monthly peaking factors for Oceanside Golf Course and Whelan Lake are 2.0 and 1.4, respectively.

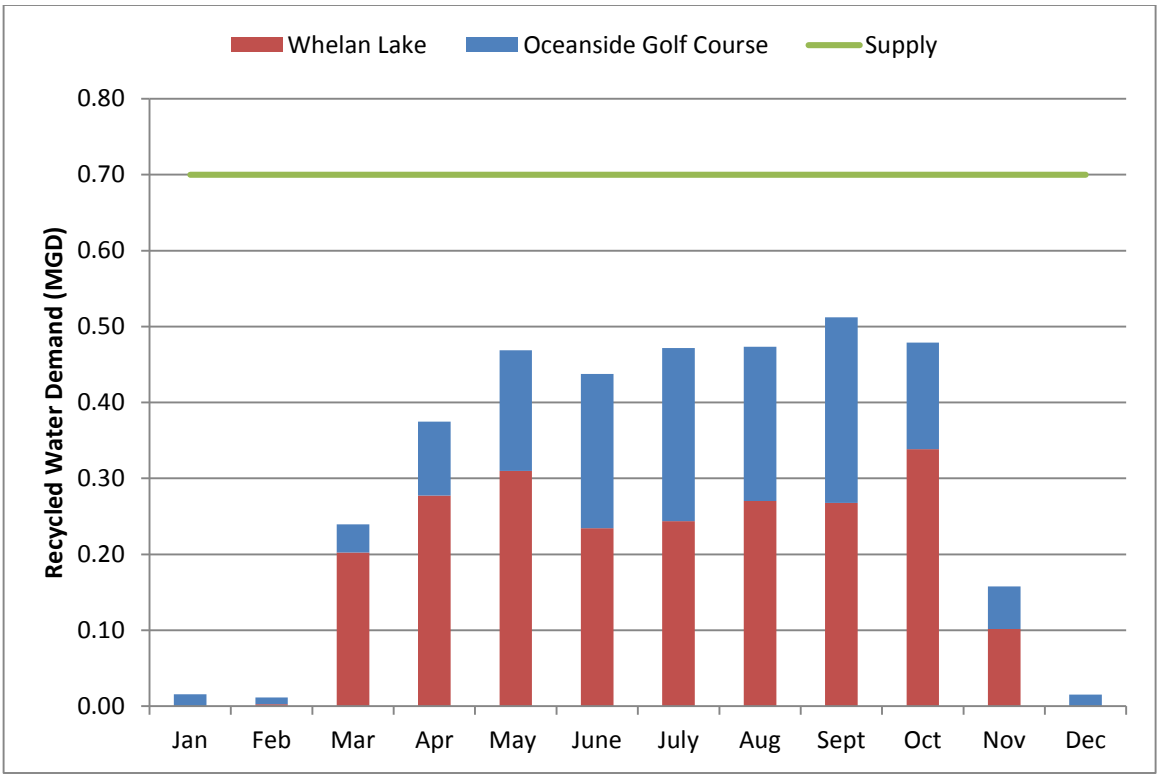

Figure 2.7 Three Year Average Monthly Recycled Water Demands

REGULATORY CONSIDERATIONS

This section describes regulatory requirements, typical landscape irrigation requirements, and groundwater water quality requirements.

3.1 WATER QUALITY REQUIREMENTS

Water quality requirements for recycled water in the Study Area can be characterized as either regulatory requirements or irrigation requirements. Regulatory requirements are set by state and local regulatory agencies, including Division of Drinking Water (DDW), San Diego County Department of Environmental Health (DEH), State Water Resources Control Board (SWRCB), and the San Diego Regional Water Quality Control Board (RWQCB). Irrigation water quality requirements are water quality parameters that should be met for recycled water to be used successfully for irrigation without negative effects on plants or customer operations.

The water quality requirements established herein are used for evaluating the suitability and benefits of various supply alternatives and to establish baseline water quality objectives for treatment of secondary treated effluent from San Luis Rey Water Reclamation Facility (San Luis Rey WRF) as a supply.

The following is a summary of the key drivers and water quality parameters that are used in the development of the City's recycled water system:

- Recycled water used in the Study Area will meet DDW Title 22 Requirements
- Total Dissolved Solids (TDS) target will be 1,000 mg/L based on industry standard for irrigation. Concentrations above 1,000 mg/L TDS can cause issues with turf and other plants. TDS and chlorides are the main concern for agricultural users and generally have additional on-site treatment. The TDS driver for regulatory compliance is 1,500 mg/L based on the most stringent Basin Groundwater Objective for the area per the Basin Plan.
- Though not mandatory, standard practice is to provide a minimum chlorine residual in the system to prevent bio-growth and associated maintenance issues.
- Recycled water may be used by local agriculture.

More detail on key drivers (regulatory and irrigation quality) is provided in the following section. Permitting requirements will vary for each supply source. Water quality from each supply must be compared against regulatory and irrigation water quality requirements identified in this section to determine its suitability for a recommended project.

3.2 REGULATORY SETTING

Wastewater treatment, wastewater discharges, and recycled water use within the Study Area are regulated by the RWQCB, SWRCB Recycled Water Policy, DDW, and DEH. Relevant regulations from each of these agencies and policies are described below.

3.2.1 Regional Water Quality Control Board

Overview. The RWQCB has primary authority to permit and regulate recycled water treatment and use within the Study Area. Recycled water discharges to groundwater (such as recycled water irrigation and groundwater recharge) are regulated by the RWQCB pursuant to requirements established within the State of California Porter-Cologne Water Quality Act. Through authority delegated by the U.S. Environmental Protection Agency (EPA), the RWQCB also regulates recycled water or wastewater discharges to inland surface waters, estuarine waters, and marine waters in accordance with requirements established pursuant to the federal Clean Water Act.

To implement state and federal water quality laws, regulations, and policies, the RWQCB:

- Designates beneficial uses for each watershed within the San Diego Region,
- Establishes ground and surface water quality objectives required to protect the beneficial uses, and
- Regulates wastewater discharges to implement the ground and surface water quality objectives.

Designated Beneficial Uses of Groundwater. Table 3.1 presents designated beneficial uses of groundwater within the Study Area. In accordance with the State's Sources of Drinking Water Policy, all groundwater is considered potentially suitable as a source of potable supply. The RWQCB, however, has formally exempted the Loma Alta Hydrologic Area from the municipal supply designation due to high concentrations of TDS. The Basin Plan designates municipal supply, agricultural supply, and industrial supply as existing beneficial uses within the El Salto basin (the downstream portion of Buena Vista Creek watershed) on the basis of historic wells that existed in the basin.

Basin Plan Groundwater Quality Objectives. Table 3.2 presents groundwater quality objectives established by the RWQCB to protect designated uses of groundwater within the Study Area. As shown in the table, the Basin Plan does not establish any groundwater quality objectives in the Loma Alta Hydrologic Area.

Table 3.1 Basin Plan Beneficial Uses of Groundwater
Recycled Water Facilities Plan
City of Oceanside

Hydrologic Subarea	Basin Unit No.	Beneficial Use of Groundwater[1]		
		Municipal Supply	Agricultural Supply	Industrial Supply
Mission HSA[2]	903.11	●	●	●
Loma Alta HA[3]	904.1			●
El Salto HSA[4]	904.21	●	●	○

Notes:

● Designated as an existing beneficial use ○ Designated as potential beneficial use

(1) Beneficial uses of groundwater designated by the RWQCB in the Basin Plan (RWQCB, 1994).
(2) The Mission Hydrologic Subarea (HSA) includes the Mission Basin. See Figure 3.1.
(3) The Loma Alta Hydrologic Area (HA) comprises the watershed of Loma Alta Creek. See Figure 3.1.
(4) The El Salto HSA comprises the downstream portion of the Buena Vista Creek watershed. See Figure 3.1.

Table 3.2 Basin Plan Groundwater Quality Objectives
Recycled Water Facilities Plan
City of Oceanside

Hydrologic Subarea	Basin Unit No.	Water Quality Objective[1] (mg/L or as noted))								
		TDS	Cl	SO_4	%Na	Fe	Mn	NO_3	B	F
Mission HSA[2]	903.11	1,500	500	500	60	0.85	0.15	45	0.75	1.0
Loma Alta HA[3]	904.1	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]
El Salto HSA[4]	904.21	3,500	800	500	60	0.30	0.05	45	2.00	1.0

Notes:

(1) Groundwater quality objectives for mineral constituents, not to be exceeded more than 10 percent of the time, as established within the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). Objectives are established for total dissolved solids (TDS), chloride (Cl), sulfate (SO_4), percent sodium (%Na), iron (Fe), manganese (Mn), nitrate (NO_3), boron (B) and fluoride (F)
(2) The Mission HSA includes the Mission Basin. See Figure 3.1.
(3) The Loma Alta HA comprises the watershed of Loma Alta Creek. See Figure 3.1.
(4) The El Salto HSA comprises the downstream portion of the Buena Vista Creek watershed. See Figure 3.1.
(5) Not applicable. The Basin Plan does not establish any groundwater quality objectives within the Loma Alta HA.

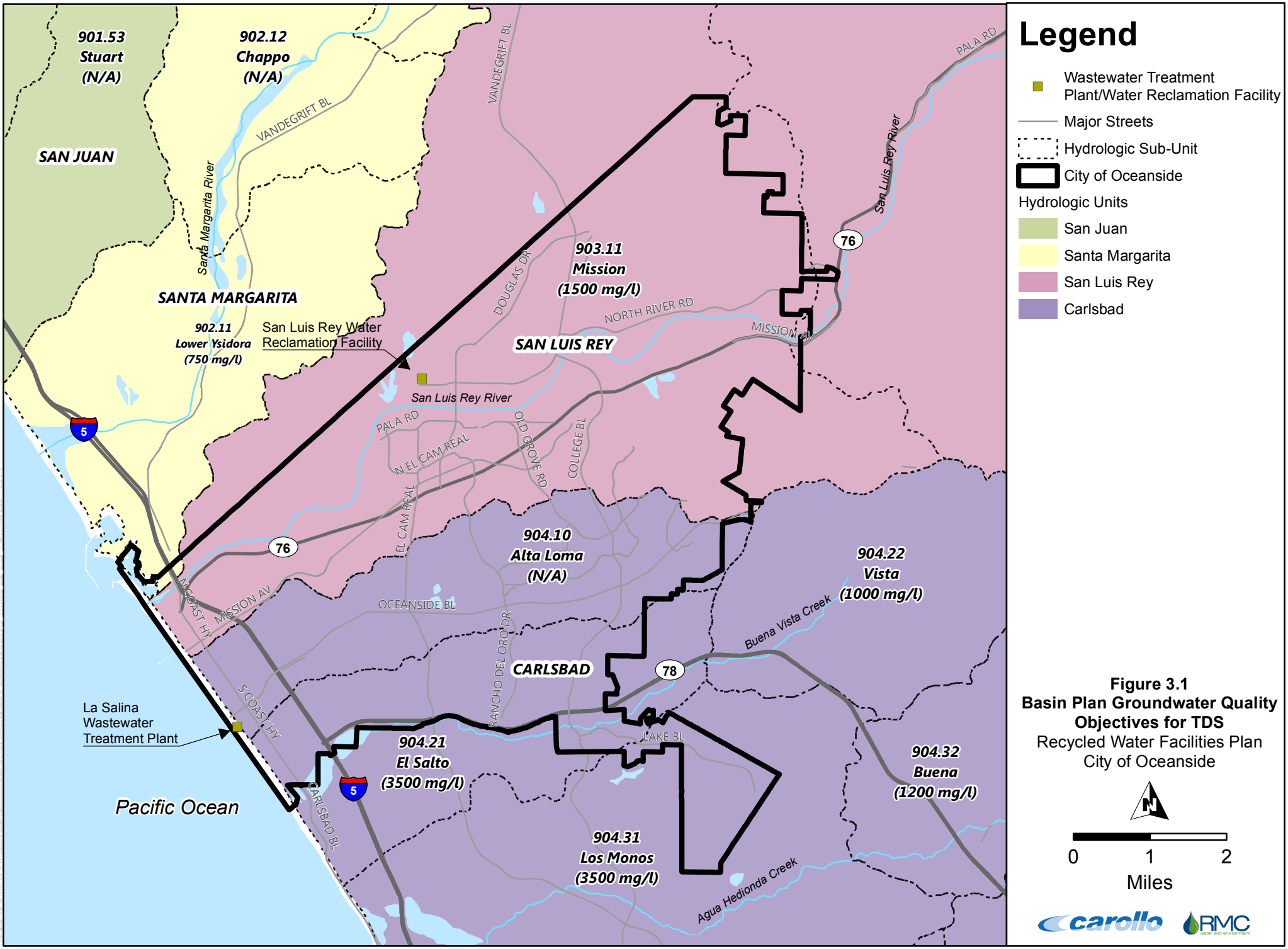

Figure 3.1
Basin Plan Groundwater Quality Objectives for TDS
Recycled Water Facilities Plan
City of Oceanside

Waste Discharge Requirements. The use of recycled water for land application (e.g., irrigation) or groundwater recharge is regulated by the RWQCB through the issuance of "waste discharge requirements" (WDRs). The WDRs identify project-specific effluent limits, recycled water use requirements, treatment requirements, prohibitions, and other applicable water quality regulations or policies.

Effluent concentration standards are established within the WDRs to implement Basin Plan water quality objectives in accordance with implementation procedures and recycled water use policies and regulations established within the Basin Plan. The WDRs also incorporate requirements of other agencies (e.g., DDW) which have jurisdiction for the regulation of recycled water use.

Prior to operating any new or modified recycled water treatment and distribution facilities, recycled water agencies must file a "report of waste discharge" in the application for WDRs (or modified WDRs). The report of waste discharge describes proposed recycled water treatment and use operations, addresses compliance with projected RWQCB and DDW requirements, and documents compliance with provisions of the California Environmental Quality Act (CEQA).

National Pollutant Discharge Elimination System Permits. Federally-regulated surface waters include rivers, streams, wetlands, lakes, reservoirs, lands subject to flooding with a 100-year storm, and other "navigable" surface waters. Through authority delegated by EPA, the RWQCB regulates the discharge of recycled water to federally-regulated surface waters through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. The NPDES permits include effluent concentration standards that implement applicable state water quality policies and standards, including those established within the Basin Plan, State of California *Enclosed Bays and Estuaries Plan* (SWRCB, 2009) and *California Toxics Rule* (CTR).

The CTR regulations are established by EPA within Title 40, Section 131 of the Code of Federal Regulations (40 CFR 131). The CTR establishes water quality standards for inland surface waters of California for the protection of aquatic habitat and the protection of human health. The CTR standards are applicable to recycled water discharges to federally-regulated surface waters.

3.2.2 SWRCB Recycled Water Policy

In February 2009, the SWRCB adopted Resolution No. 2009-0011: Policy for Water Quality Control for Recycled Water (Recycled Water Policy). The purpose of the Recycled Water Policy is:

> "to **increase the use of recycled water** from municipal wastewater sources that meets the definition in Water Code section 13050(n), in a manner that implements state and federal water quality laws… When used in compliance with this Policy, Title 22 and all

applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses."

The Recycled Water Policy is intended to streamline SWRCB and RWQCB permitting processes in order to expedite the implementation of recycled water projects. The Recycled Water Policy includes requirements for development of stakeholder-driven Salt and Nutrient Management Plans, streamlined permitting for landscape irrigation and groundwater recharge projects, guidance regarding anti-degradation analysis, and a research program for constituents of emerging concern (CECs).

The Salt and Nutrient Management Plan portion of the Recycled Water Policy requires every groundwater basin/sub-basin in California to prepare a groundwater management plan addressing salts and nutrients by 2014. The intent of the Recycled Water Policy is for "salts and nutrients from all sources to be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses through the development of regional or subregional Salt and Nutrient Management Plans rather than through imposing requirements solely on individual recycled water projects." These plans will require significant efforts throughout the State and are currently ongoing.

3.2.3 DDW Regulation

DDW regulates public water systems and establishes standards for recycled water treatment and reuse to protect public health. DDW serves as the primary permitting agency for public water systems. DDW implements applicable state and federal drinking water, source water, treatment, and distribution regulations through the issuance of water supply permits to municipal potable water purveyors.

The RWQCB serves as the primary permitting agency for recycled water treatment and use. DDW serves as a consulting agency in the RWQCB recycled water permitting process; recycled water WDRs issued by the RWQCB implement applicable DDW recycled water treatment and reuse regulations and requirements.

Recycled Water Treatment and Use. DDW statewide regulations governing the use of recycled water are established within Title 22, Division 4, Chapter 3 of the *California Code of Regulations* (Title 22). DDW Title 22 regulations establish treatment requirements and effluent limits for a variety of potential recycled water irrigation uses. Key classes of recycled water addressed in the Title 22 regulations include:

- *Disinfected tertiary* recycled water, applicable for use on areas of high degree of public contact, including irrigation of parks, playgrounds, schoolyards, residential commons, golf courses near home sites, residential fill stations, non-restricted recreational impoundments, and the irrigation of food crops where the recycled water may contact the edible portion of the crop.

- *Disinfected secondary-2.2* recycled water, applicable for use on areas of limited public contact, including cemeteries, freeway landscaping, golf courses with limited public access and no adjacent housing, impoundments that restrict body-contact recreation, ornamental nursery stock, pastures, or other non-edible vegetation.
- *Disinfected secondary-23* recycled water, applicable for use on agricultural areas where the public is excluded, including the irrigation of fiber or fodder crops, non food-bearing trees, and vineyards and orchards where the recycled water does not contact the edible portion of the crop.

Figure 3.2 lists additional recycled water based on recycled water treatment.

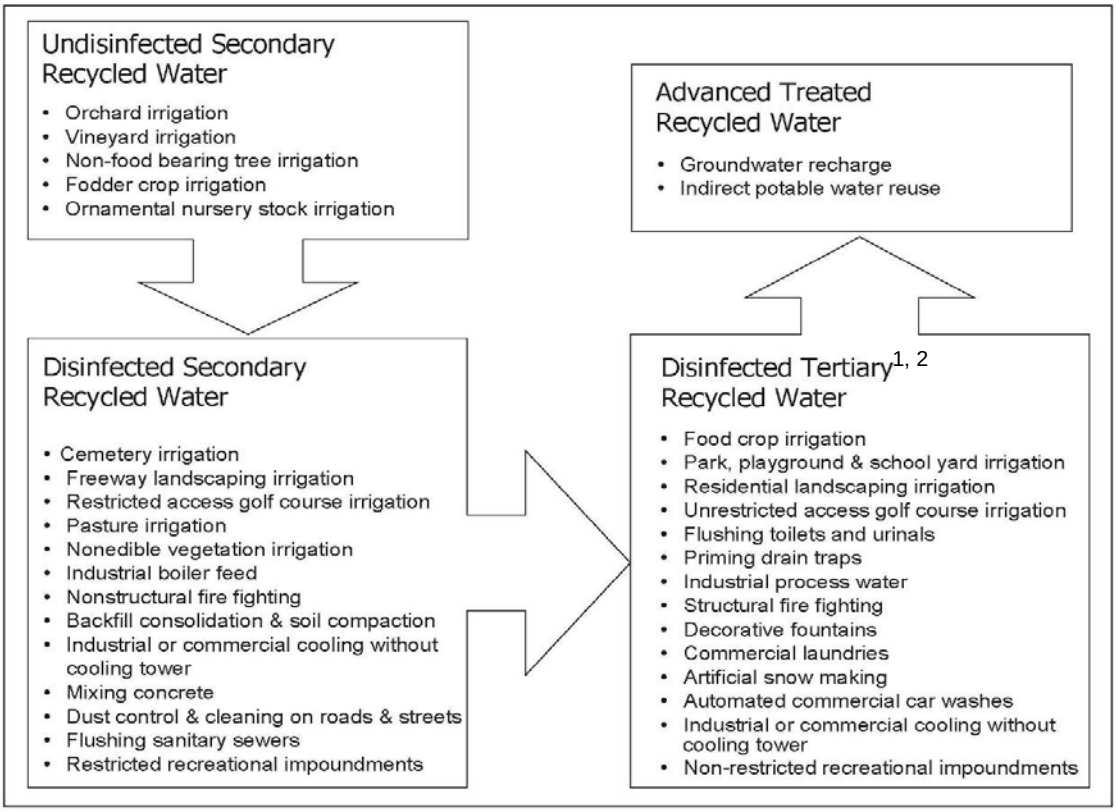

Figure 3.2 Recycled Water Treatment and Use in California

Notes:
(1) "Disinfected Tertiary Recycled Water" is the category most commonly referred to as recycled water in California under Title 22.
(2) This figure does not represent an all-inclusive list of recycled water uses. See Statutes Related to Recycled Water and California Department of Public Health, January 2011 for requirements for impoundment, cooling, and other uses (http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Lawbook/RWstatutes2011-01-01.pdf).

Groundwater Recharge Requirements. DDW has adopted regulations that address groundwater replenishment for aquifers designated as sources of drinking water using recycled water from domestic wastewater sources. The final version of the groundwater recharge regulations (adopted in 2014) addresses recycled water recharge to groundwater aquifers using surface recharge and subsurface groundwater injection.

California Water Code Section 13562 required DDW to adopt the regulations by December 31, 2013, but time required for DDW to proceed through the formal regulation adoption process has delayed and the regulations were adopted in June 2014. DDW is using the final regulations in reviewing projects that involve the recharge of recycled water to potable water aquifers.

Advanced water treatment (AWT) including RO and oxidation is required for the subsurface application (injection recharge) of recycled water to potable groundwater basins. Under the final regulations, required minimum initial recycled water underground retention times range from two months (if tracer study using an added tracer is performed) to six months (if a computer model is used to estimate retention time).

The final recharge regulations specify the use of diluent water (water from other sources mixed with the recharged water) to achieve designated recycled water contribution targets. The final regulations allow DDW flexibility to assign recycled water contribution targets based on recycled water treatment and total organic carbon (TOC) concentrations.

To ensure compliance with drinking water standards for nitrate, the draft recharge regulations specify that total nitrogen concentrations in water recharged to the ground may not exceed 10 mg/L.

DDW regulations regarding recycled water recharge to groundwater aquifers are implemented through (1) recycled water groundwater recharge WDRs issued by the RWQCB, and (2) the DDW water supply permit issued to the municipal water purveyor utilizing the recharged aquifer.

3.2.4 Department of Water Resources - Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) was passed by the California State Legislature in September 2014, establishing new requirements for groundwater management in medium and high priority groundwater basins. The act requires the development and implementation of groundwater sustainability plans (GSPs) for each groundwater basin and subbasin. The GSP must contain objectives and actions to achieve and maintain groundwater sustainability and to avoid the undesirable results of overdraft. SGMA also requires the establishment of groundwater sustainability agencies (GSAs) to oversee development and implementation of GSPs, and provides authority to GSAs to sustainably manage groundwater. Local water authorities and counties have primary responsibility and authority for the development and implementation of GSPs and GSAs;

however, the State has been given authority to intervene if specific requirements are not met.

3.2.4.1 Groundwater Sustainability Agencies

The SGMA requires that high and medium priority groundwater basins, as designated by the California Department of Water Resources (DWR), create groundwater sustainability agencies by June 30, 2017. The bill authorizes any local agency or combination of agencies to become a GSA with the purpose of developing and implementing GSPs in order to meet the goals and standards of sustainable management of groundwater basins as described in SGMA. Multiple GSAs and GSPs in a single basin are allowed under the law; however, multiple GSPs within a basin must be coordinated and meet all requirements for achieving sustainable groundwater management within the entire groundwater basin or be subject to state intervention. A combination of agencies creating a GSA can be formed by a joint powers agreement (JPA), a memorandum of agreement (MOA), or other legal agreement. A newly formed GSA must inform DWR within 30 days of its formation and its intent to undertake sustainable groundwater management.

Under SGMA, GSAs are provided the broad ability to manage groundwater within a basin through a variety of authorized powers including, new regulations, ordinances, investigations, metering, monitoring, levying of fees, and enforcement actions. The SGMA does not afford GSAs or any other entity the ability to determine or alter surface water or groundwater rights under common law or any provision of law that determines or grants surface water rights. However, how those rights are applied will likely be impacted. Additionally, Native American Tribes and federal agencies have the opportunity to participate in basin management, but are not mandated to do so.

3.2.4.2 Groundwater Sustainability Plans

The SGMA requires that GSAs develop and implement groundwater sustainability plans. GSPs must be completed by January 31, 2020 for basins deemed by DWR to be in critical overdraft. For all remaining medium and high priority basins, GSPs must be completed by January 31, 2022. Implementation of the GSPs must result in groundwater quantity and quality sustainability within 20 years (by 2040 or 2042 based on the basin overdraft situation). DWR may grant up to two extensions of additional five years to GSAs to achieve sustainability upon a showing of good cause. If the GSPs are not completed within the above timeframe, or if the State Water Resources Control Board (Water Board), in consultation with DWR, determines that groundwater sustainability is not being achieved in the time given, authority for developing and implementing a GSP will be designated to the Water Board.

The GSPs for medium and high priority basins are intended to guide groundwater management in the basins in order to meet the sustainability goal established in the SGMA. Multiple GSPs can be developed in the same basin, but they must meet specific

coordination, data, and monitoring requirements for overall basin compliance. Each GSP has a number of required elements:

- Physical description
- Measureable objectives
- Planning and implementation horizon
- Various monitoring protocols
- Consideration of applicable county and city general plans
- Other groundwater quality and quantity criteria

The SGMA also requires annual reporting and evaluation of the effectiveness of GSP implementation.

3.2.4.3 Implications of SGMA

Given the developing nature of the SGMA regulations and guidelines and ongoing activities for forming GSAs statewide, the direct implications of SGMA on an individual groundwater basin will be basin-dependent. In moving forward with groundwater-related projects, it is important to identify potential future basin management strategies that may bring a groundwater basin into sustainability and to maintain it in that state, and to evaluate these strategies in the context of the proposed project or plan. Expectations for increases in future groundwater extractions will need to be re-evaluated under this new paradigm, and groundwater recharge opportunities should be considered in light of how the groundwater basin will ultimately be managed (i.e. will a particular recharge project 'qualify' as a basin management strategy and in that context, how would it be managed?).

Additionally, it is important for cities and local water agencies to evaluate interactions and/or partnerships with the surrounding communities and agencies. As stated above, the SGMA provides for multiple GSAs in any given sub-basin, but it also requires coordination for achieving sustainable groundwater management within the entire basin. To this end, it will be important for lead agencies to engage with the other entities such as cities, irrigation districts, resource conservation districts, and other regional water entities in developing and implementing the GSPs. Early and active coordination will help guide the GSA formation process and offer early recommendations for associated planning and project implementation in the basin.

3.2.5 County Department of Environmental Health

DDW delegates authority to the DEH for the application and enforcement of Title 22 regulations regarding recycled water conveyance, recycled water use, public notification, backflow prevention, cross connection prevention, and to ensure that recycled water is applied in a manner consistent with protecting public health.

In this capacity, DEH reviews recycled water use plans, conducts site inspections, monitors field tests to assess cross connection and backflow prevention, and evaluates conformance with Title 22 signage requirements. DEH also monitors irrigation sites to ensure compliance with Title 22 use regulations and to ensure that recycled water irrigation operations do not present a risk to public health.

DEH requires that recycled water use sites pass an initial cross-connection control shut down test; shutdown tests are conducted every four years thereafter.

3.3 PROJECTED EFFLUENT REQUIREMENTS

In addition to meeting water quality needs of irrigation customers, the City must also conform to applicable recycled water treatment and reuse requirements established by the RWQCB, DDW, and DEH.

Existing Recycled Water Permit. Existing City of Oceanside recycled water use requirements are established by the RWQCB for the San Luis Rey WRF within Order No. 93-07. Table 3.3 presents effluent limits established in Order No. 93-07.

Projected Recycled Water Requirements. Order No. 93-07 was established in 1993 before the current Basin Plan was adopted. As a result, Order No. 93-07 is not reflective of current Basin Plan water quality objectives and implementation policies.

Updated WDRs would be required for expansion of the City's recycled water operations. It is possible to project probable requirements in updated WDRs on the basis of current Basin Plan groundwater quality objectives, current Basin Plan implementation policies, and recent recycled water WDRs issued by the RWQCB for recycled water irrigation use. Table 3.3 also presents an opinion of probable WDR effluent standards for recycled water irrigation use within the Study Area.

In addition to the probable effluent standards presented in Table 3.3, it is current Regional Board practice to directly incorporate DDW Title 22 treatment, disinfection, and monitoring standards into the updated recycled water WDRs.

As shown in Table 3.3, the current RWQCB WDRs for recycled water irrigation operations do not establish an effluent limit for nitrogen or nitrate in recognition of the fact that typical landscape nitrogen demands exceed nitrogen concentrations in recycled water. In lieu of establishing nitrate effluent concentration standards, current RWQCB WDRs require recycled water agencies to notify recycled water users of the quantity of nitrate in the recycled water so that irrigation users can reduce fertilizer application loads commensurate with the nitrate value of the recycled water.

Table 3.3 Existing and Probable RWQCB Effluent Limits Recycled Water Irrigation Reuse
Recycled Water Facilities Plan
City of Oceanside

	Concentration (mg/L)		
	Existing WDRs for San Luis Rey WRF RWQCB Order No. 93-07[1]		Opinion of Probable Irrigation Reuse Regulation Requirements within Study Area[2]
Parameter	**12-month average**	**Daily Maximum**	**12-Month Average[3]**
Total dissolved solids (TDS)	1200	1300	1500[4,5]
Chloride (Cl)	350	400	500[4,5]
Sulfate (SO_4)	350	400	500[4,5]
Iron (Fe)	0.3	NS[6]	0.85[4,5]
Manganese (Mn)	0.15	NS[6]	0.15[4]
Nitrate as NO_3	NS[7]	50[8]	NS[9]
Boron (B)	0.5	NS	0.75[10]
Fluoride (F)	1.0	1.0	1.0[4]

Notes:

(1) Existing recycled water effluent requirements for the San Luis Rey WRF, as established within RWQCB Order No. 93-07. Order No. 93-07 address requirements for the use of up to 0.7 mgd of tertiary treated recycled water from the San Luis Rey WRF for irrigation reuse within the Mission Basin.

(2) Opinion of probable recycled water effluent discharge requirements based on current Basin Plan groundwater quality objectives (see Table 3.2) and recent WDRs issued by the RWQCB for similar recycled water discharges within the San Diego Region. DDW standards applicable for "tertiary disinfected recycled water" will be incorporated by the RWQCB into the WDRs for recycled water irrigation use within the Study Area.

(3) In accordance with recent WDRs established by the RWQCB for other San Diego Region water recycling agencies, it is probable that updated City of Oceanside WDR effluent limits will be expressed in terms of 12-month average values.

(4) In accordance with current Basin Plan policy, it is probable that updated City of Oceanside recycled water effluent standards would be based on Mission Basin groundwater quality objectives. As shown in Table 3.2, groundwater quality objectives for the Mission Basin are the most restrictive of the objectives in the watersheds of the Study Area.

(5) In the absence of a demonstration of compliance with the State of California non-degradation policy (as set forth in State Water Resources Control Board Resolution 68-16), it is possible that the RWQCB may choose to retain the existing 12-month average effluent limit established in Order No. 93-07 instead of establishing the effluent limit at the corresponding Basin Plan groundwater quality objective for the Mission Basin (as shown in Table 3.2).

(6) NS indicates no standard. RWQCB Order No. 93-07 does not establish a daily maximum effluent standard for iron or manganese.

(7) NS indicates no standard. RWQCB Order No. 93-07 does not establish a 12-month average effluent standard for nitrate.

(8) RWQCB Order No. 93-07 also establishes a 30-day average effluent standard for nitrate (as NO_3) at 45 mg/L.

(9) Current generation RWQCB WDRs do not establish a nitrate effluent limit for recycled water use, as irrigation vegetation nitrate demands typically exceed nitrate loads available in the recycled water. In lieu of establishing nitrate effluent concentration standards, current RWQCB WDRs require recycled water agencies to notify recycled water users of the quantity of nitrate in the recycled water so that irrigation users can reduce fertilizer application loads commensurate with the nitrate value of the recycled water.

(10) The Basin Plan groundwater quality objective for boron throughout the San Diego Region was modified to 0.75 mg/L subsequent to the adoption of Order No. 93-07.

Application/Issuance of WDRs. As documented in Section 3.2, the City must submit a report of waste discharge and documentation of CEQA compliance to the RWQCB in application for modified WDRs for any proposed increase in recycled water flow, change in recycled water treatment or treatment capacity, or change in reuse operations. After review of the report of waste discharge, the RWQCB will develop tentative WDRs for the City and public review, and present the tentative WDRs before the appointed RWQCB board members for formal consideration and adoption. The final WDRs will contain provisions that, prior to initiation of recycled water operations, require the City to submit a Title 22 engineering report to DDW and the RWQCB for review and approval.

Recycled Water Use Conveyance and Use. New recycled water use sites will be subject to review and approval by DEH. As part of DEH review and approval, DEH will monitor backflow and cross-connection field tests. DEH review of reuse sites can occur prior to or after adoption of final WDRs by the RWQCB.

Recycled Water Use for Groundwater Recharge. As noted, the RWQCB regulates the use of recycled water for groundwater recharge through the issuance of WDRs. Requirements within the WDRs would implement existing Basin Plan groundwater quality objectives and implementation policies, applicable DDW Title 22 requirements, and proposed DDW groundwater recharge regulations.

Table 3.4 presents an opinion of probable WDR effluent standards for recycled water groundwater recharge operations implemented within the Mission Basin for both surface application (e.g., infiltration ponds) and subsurface application (e.g., injection wells.). As noted in Table 3.4, WDRs issued by the RWQCB would also directly incorporate DDW Title 22 requirements, adopted DDW groundwater recharge regulations, and any project-specific requirements imposed on the City by DDW.

Any recycled water groundwater recharge projects that involve AWT should easily comply with Basin Plan groundwater quality objectives. Surface application groundwater recharge operations that utilize a blend of tertiary treated recycled water and diluent water should also comply with the groundwater quality objectives.

As shown in Table 3.4, DDW groundwater recharge regulations require that recharge water not exceed a total nitrogen concentration of 10 mg/L. Recycled water effluent nitrogen requirements and the required degree of recycled water treatment will be dependent on the proposed method of groundwater recharge, recycled water contribution values assigned by DDW, and the quality of diluent water.

Table 3.4 Probable RWQCB Groundwater Recharge Effluent Limits
Recycled Water Recharge to the Mission Basin
Recycled Water Facilities Plan
City of Oceanside

Parameter	Opinion of Probable 12-Month Average Groundwater Recharge Effluent Concentration Limits[1] (mg/L)	
	Subsurface Injection[2]	Surface Spreading[3,4]
Total dissolved solids (TDS)	1500	1500
Chloride (Cl)	500	500
Sulfate (SO_4)	500	500
Iron (Fe)	0.85	0.85
Manganese (Mn)	0.15	0.15
Total nitrogen	10^5	10^5
Boron (B)	0.75	0.75
Fluoride (F)	1.0	1.0

Notes:

(1) Opinion of probable recycled water effluent discharge requirements based on current Basin Plan groundwater quality objectives (see Table 3.2), recent WDRs issued by the RWQCB for similar recycled water discharges within the San Diego Region, and DDW groundwater recharge regulations.

(2) Subsurface application of recharge waters per DDW Discharge would be regulated through State WDRs. Listed requirements represent applicable Basin Plan groundwater quality objectives for the Mission Basin (see Table 3.2). DDW groundwater recharge regulations require full advanced treatment (including RO and advanced oxidation) for recycled water groundwater recharge using subsurface injection. Such treatment would produce recharge water with significantly lower concentrations of dissolved minerals than reflected in the current Basin Plan groundwater quality objectives.

(3) Surface spreading groundwater recharge operations conducted per requirements established by DDW for the use of recycled water for surface spreading application to groundwater. DDW groundwater recharge regulations require the use of recycled water meeting "disinfected tertiary" Title 22 requirements.

(4) Includes surface spreading recharge ponds located outside the 100-year flood plain, or surface spreading recharge ponds that are within the 100-year flood plain but operated in a seasonal manner so as to prevent discharge or overflow to federally-regulated surface waters except in a 100-year event. Recycled water discharges to percolation ponds that may discharge or overflow to federally-regulated surface waters with a frequency greater than once in 100 years would be subject to regulation under a NPDES permit. The NPDES permit would establish effluent standards on the basis of applicable Basin Plan surface water quality objectives and *California Toxics Rule* standards.

(5) DDW groundwater recharge regulations require that the recharge water (which may include both recycled water and diluent water) not exceed a total nitrogen concentration of 10 mg/L. This requirement can be met through either (or a combination of) treatment and diluent water. As shown in Table 3.2, the corresponding Basin Plan standard for nitrate as nitrogen is 10 mg/L (45 mg/L for nitrate as NO_3).

WDRs issued by the RWQCB will require that groundwater recharge facilities, treatment facilities, and withdrawal facilities be protected against the waters of a 100-year flood event. Surface percolation facilities within the 100-year flood plain may be allowed, provided that such facilities are seasonally operated and the City can ensure that no discharge of recycled water to federally-regulated surface waters will occur except during a 100-year event or longer frequency. Any proposed facilities that involve the potential for overflow or discharge to federally-regulated surface waters at a frequency of more than once in 100 years will be subject to regulation under a NPDES permit. As discussed in Section 3.2, such facilities or operations would be unlikely to comply with Basin Plan objectives for total nitrogen.

As discussed in Section 3.2, a number of DDW groundwater recharge requirements (including retention, response time, diluent water, and monitoring requirements) was adopted by DDW on the basis of a project-specific review of the City's proposed recycled water treatment and groundwater recharge operations. Significant hydrogeologic study (including monitoring, tracer studies or modeling) will be required to support DDW information needs and evaluate groundwater recharge opportunities and conformance with DDW requirements.

Application/Issuance of WDRs. The City must submit a report of waste discharge and documentation of CEQA compliance to the RWQCB in application for WDRs for any proposed groundwater recharge program. In concert with the WDR application process, the City must coordinate to provide DDW with applicable information to allow DDW to assess conformance with requirements for source control, groundwater and effluent monitoring, virus and pathogen removal, wastewater treatment methodology, recharge methodology, groundwater detention, recycled water contribution and diluent water, and nitrogen.

Adopted WDRs will include requirements mandating submittal and approval of a Title 22 engineering report, applicable monitoring data, and other information required pursuant to DDW groundwater recharge regulations.

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RECYCLED WATER MARKET ASSESSMENT

This chapter presents an assessment of the market for recycled water use within the Study Area and documents how the potential recycled water demands were identified. Potential recycled water demands within the City's service area represent a range of uses. However, the majority of use is for irrigation at parks, golf courses, homeowners association (HOA) landscapes, medians, agricultural operations and schools. In addition, a portion of the City's recycled water demand is associated with commercial and industrial uses such as laundry and cooling towers uses.

4.1 CUSTOMER DEVELOPMENT APPROACH

The market assessment for this Plan started with the City's potable billing consumption history database and was refined and consolidated to individual customers, including the addition of future customers and demand refinement for the largest customers. The methodology used for the market assessment is described below.

4.1.1 Identify Potential Users

Identifying potential recycled water customers was the first step in the market assessment. Two primary steps were taken to reduce the potable water database of over 16,000 existing meters to 665 potential recycled water customers.

Step 1 - Initial Database Screening. All meters with relatively low demands (less than 0.5 afy) from March 2012 through February 2013 and meters with billing classes associated with mainly potable usage (e.g., construction, single family residential) were removed from the database, because of the low likelihood of becoming recycled water users. Based on this initial screening, the number of existing meters was reduced from 16,000 to 1,616 meters. The following meter billing classes (based on the City's potable database) were carried forward for further screening:

- Agriculture (A) - Includes also the following meter billing classes:
  - Agriculture Special Agriculture Water Rate (AS),
  - Commercial Agriculture (CA),
  - Grouped Agriculture/Residential (GR),
  - Grouped Agriculture Special Agriculture Water Rate (GS),
  - Commercial Agriculture/Residential (RA), and
  - Agriculture/Residential Special Agriculture Water Rate (RS).
- Commercial (C)
- Government (G)
- Irrigation (I)
- Special Users (S)

Step 2 - Database Consolidation. Many customers have more than one meter serving their property or business. Therefore, multiple meters for the same customer were merged to create a single record for each customer in the same property area (e.g., irrigation meters serving the same homeowner association were consolidated). The total consumption for each customer was then determined by adding the monthly consumption for each meter number into one single meter. Using this approach, the number of potential recycled water customers was reduced from 1,161 meters to 665 customers.

4.1.2 Potential Recycled Water Demands

The next step was to estimate the recycled water demand for each of the 665 identified potential recycled water customers, currently served as potable water users, based on customer characteristics. In order to estimate the existing non-potable demand for each customer, a non-potable adjustment value (a percentage) was assigned to each billing class category. The non-potable adjustment value was based on an estimate of the portion of the total potable demand that could likely use recycled water. The estimates are summarized by customer type in Table 4.1 and the rationale for each estimate is discussed in the following sections.

Table 4.1 Potential (Existing) Demand By City Billing Class
Recycled Water Facilities Plan
City of Oceanside

Billing Class	Number of Potable Customers	Potable Demand (afy)	Estimated Recycled Water Percentage (%)	Estimated Recycled Water Demand (afy)
Agriculture (A)	77	1,596	50%	800
Commercial (C)	25	498	10% [2]	100
Government (G)	20	368	90% [3]	153
Irrigation (I)	538	3,862	100%	3,862
Special Users (S)	5	676	0% [4]	85
Total	**665**	**7,001**		**4,999**

Notes:

(1) A complete list of all the potential recycled water customers grouped by billing class is found in Appendix B-1.
(2) It was assumed that all commercial customers would use 10 percent, except for two customers: City Center Golf Course and Tri City Hospital. It was assumed 90 percent would be used at the City Center Golf Course for irrigation and 25 percent at the Tri City Hospital for cooling towers.
(3) It was assumed that most government customers would use 90 percent. However, meters at the San Luis Rey WRF site and at the La Salina WWTP assumed 0 percent of non-potable demand for onsite use and meters at government buildings assumed 10 percent of non-potable demand for onsite use.
(4) It was assumed that all “special users” customers would use 0 percent, except for two customers: Genentech and Mission Linen Supply. It was assumed that 25 percent could be used at Genentech for cooling towers and 50 percent at Mission Linen Supply for laundry process needs.

Two complete lists of customers can be found in Appendix B. Appendix B-1 has the customers grouped by billing class and Appendix B-2 has the customers grouped by their demand range.

The following discussion provides a rationale for each of the non-potable percentages noted in Table 4.1:

- *Agriculture (A)*: The primary water use at agricultural fields is outdoor irrigation and is considered non-potable, but some crops are sensitive to water quality and might not be able to use tertiary-treated recycled water without additional treatment. To account for crops that may not be compatible with tertiary-treated recycled water, a non-potable portion of potable demand of 50 percent was assumed for meters designated as agriculture.
- *Commercial (C):* Commercial customers include a variety of water uses ranging from process water, cooling towers, domestic and landscape uses. Many commercial uses are assumed to be difficult to retrofit. Therefore, a non-potable portion of potable demand of 10 percent was applied to most commercial meter classes. There are two exceptions for commercial use, Emerald Isle Golf Course and Tri City Hospital. The City Center Golf Course assumes a non-potable portion of 90 percent because it is primarily irrigation and the Tri City Hospital assumes a non-potable portion of 10 percent for cooling towers.
- *Government (G)*: This billing class encompasses City-owned facilities which have meters for mixed uses at the City's golf courses, parks, and buildings. If a government meter is located on a golf course or a park, a non-potable portion of potable demand of 90 percent was applied assuming it is primarily for irrigation. There is one exception: government meter San Luis Rey WRF (demand of 147 afy) serves potable water for onsite use, therefore a non-potable portion of potable demand of 0 percent was used.
- *Irrigation (I)*: Irrigation meters are used solely for irrigation purposes. A non-potable portion of potable demand of 100 percent was applied to meters designated as irrigation.
- *Special Users (S):* These meters include special users such as industrial customers. Since potable uses vary per industry depending on what is being manufactured, a non-potable portion of potable demand of 0 percent was applied. However, 25 percent and 50 percent was assumed for Genentech and Mission Linen for cooling towers and laundry process needs, respectively.

4.1.3 Summary of Potential Recycled Water Demands

As shown in Table 4.2, the market assessment process resulted in 665 potential customers with a total demand of 4,999 afy for direct reuse. Figure 4.1 shows the location of potential existing potable water users that can use recycled water. Of the 665 customers,

41 customers with demands greater than 25 afy have a potential recycled water demand of 2,163 afy, which is 43 percent of the total demand identified.

Table 4.2 Potential Existing Recycled Water Customers by Demand
Recycled Water Facilities Plan
City of Oceanside

Customer Demand (afy)	No. of Potential Recycled Water Customers	Percentage of Total Customers (%)	Estimated Recycled Water Demand (afy)	Percentage of Total Est. RW Demand (%)
Greater than 50	15	3%	1,237	25%
25 - 50	26	4%	927	18%
10-25	84	13%	1,179	23%
5-10	145	22%	930	19%
Less than 5	395	58%	726	15%
Total	**665**	**100%**	**4,999**	**100%**

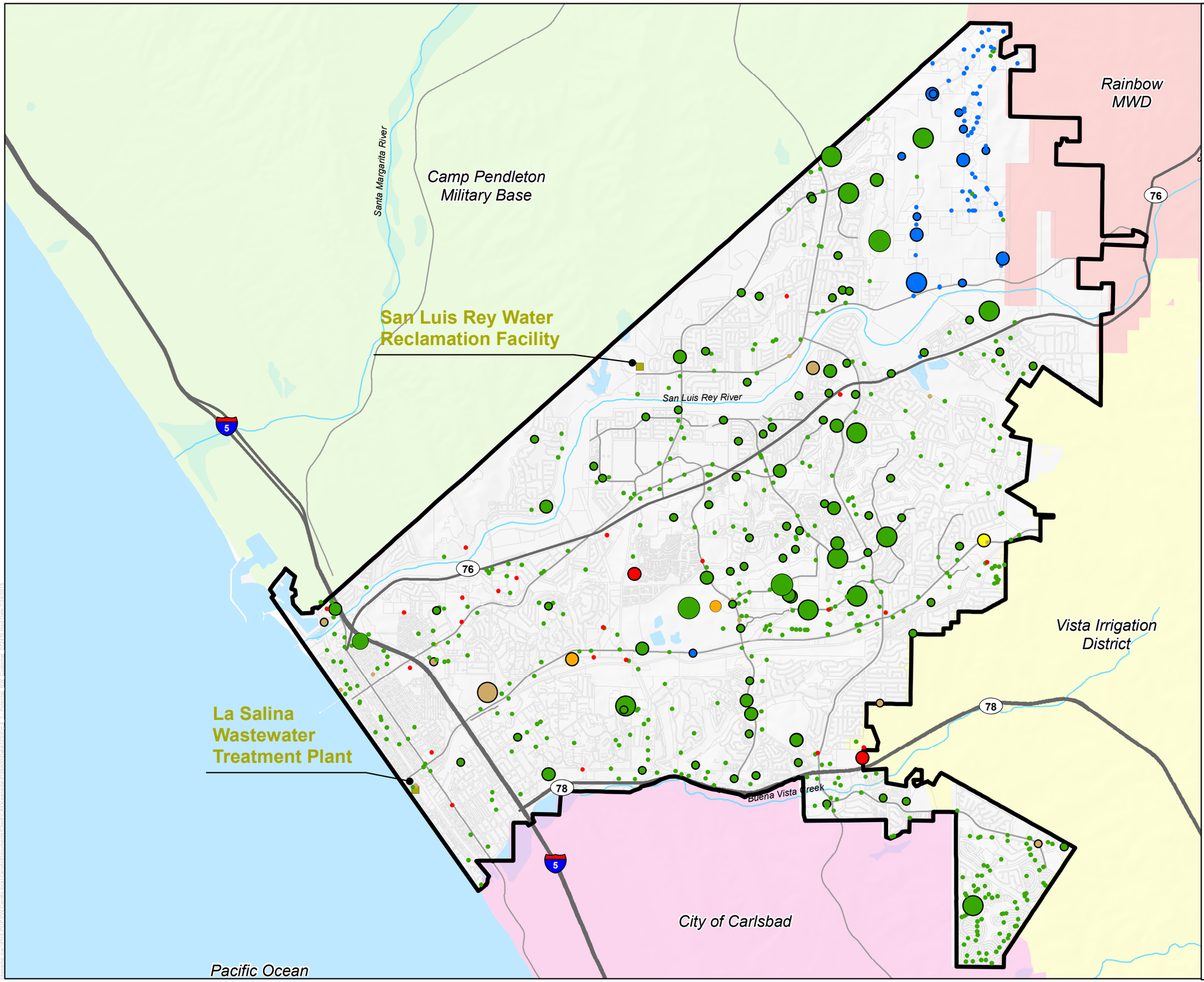
Note:
(1) A complete list of all the potential (existing) recycled water customers grouped by demand range is found in Appendix B-2.

Table 4.3 provides a summary of the number of potential recycled water customers and the estimated annual average recycled water demand for each customer type. As shown, the total estimated annual recycled water demand is 4,999 afy for direct reuse.

Table 4.3 Potential Existing Recycled Water Customers By Billing Class
Recycled Water Facilities Plan
City of Oceanside

Customer Type	No. of Potential Recycled Water Customers	Estimated Recycled Water Demand (afy)	Percentage of Total Est. Recycled Water Demand (%)
Agriculture	77	800	16
Commercial	25	99	2
Government	20	153	3
Irrigation	538	3,862	77
Special Users	5	85	2
Total	**665**	**4,999**	**100**

Note:
(1) A complete list of all the potential recycled water customers grouped by billing class is found in Appendix B-1.



Legend

Meter Rate Class
- Commercial
- Irrigation
- Government
- Multi-Family
- Special Users
- Agricultural

Average (3 year)
- 0-10
- 10-25
- 25-50
- Greater than 50

Other
- Wastewater Treatment Plant
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID

- Major Roads
- City Parcel

N

0 1 2
Miles

Figure 4.1
Potential Recycled Water Customers
Recycled Water Facilities Plan
City of Oceanside

carollo RMC water and environment

Figure 4.2 shows the percentage of recycled water based on billing class. Figure 4.3 shows the comparison between potable water and potential (existing) recycled water demand based on the analysis described in this section.

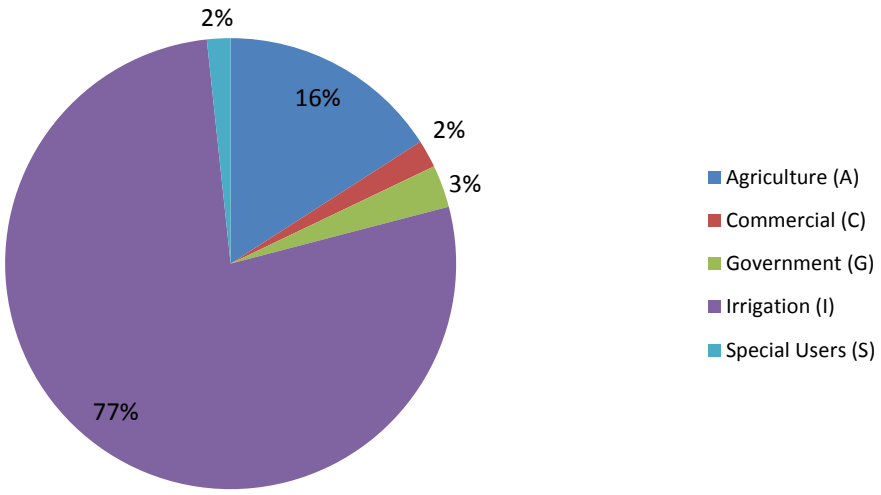


Figure 4.2 Percentage of Recycled Water By Billing Class

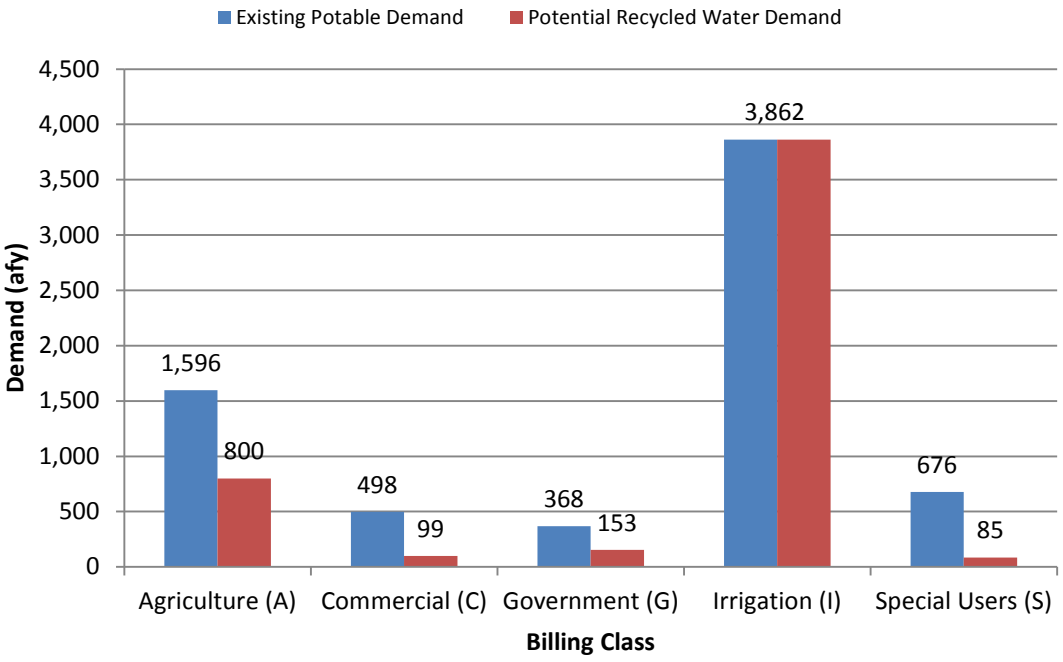


Figure 4.3 Comparison of Potable and Potential Recycled Water Demand

Notes:

(1) Tables of all the potential recycled water customers grouped by demand or by billing class are found in Appendix B-1 and B-2, respectively.
(2) See Table 4.1 for assumptions.
(3) Agriculture well use is not accounted in these estimates.

4.2 FUTURE DEMANDS

Future demands include estimated demands from future developments that will use recycled water and from existing irrigation users supplied by groundwater which are not connected to the City's potable system. Groundwater recharge is also considered a potential future recycled water demand.

4.2.1 Recycled Water (Direct Reuse)

Future demands include new developments, such as irrigation within the Ocean Ranch housing development and the proposed El Corazon Specific Plan. They also include existing customers that currently are not served potable water by the City, such as Caltrans (served by FPUD) and the Arrowood Golf Course (served by groundwater). These customers and those included in the Ocean Ranch development and El Corazon Specific Plan were considered as future non-potable customers.

4.2.2 Groundwater Recharge (Indirect Potable Reuse)

The City is interested in pursuing options to recharge the Mission Basin with advanced treated recycled water. This strategy is referred to as indirect potable reuse. The City recently launched an *Indirect Potable Reuse and Pathogen Removal Study* for Mission Basin that is scheduled to be completed in summer 2015.

Mission Basin is located in the northern portion of the Study Area. Mission Basin is a groundwater basin running along the San Luis Rey River from approximately Vista Way and Mission Road to the Oceanside Municipal Airport. The basin has approximately 90,000 AF of storage, and groundwater is high in TDS. Groundwater pumped from the basin is processed at the City's Mission Basin Groundwater Purification Facility (MBGPF), which has a capacity of 6,000 afy. However, the actual annual production has typically ranged between 3,000 to 3,500 afy due to operational issues related to the groundwater wells treatment equipment and water quality.

Indirect potable reuse at Mission Basin would require groundwater recharge with purified water from the San Luis Rey WTF. For purposes of this market assessment, it is assumed that the demand for purified water within the City's service area could total 5,000 afy. The San Luis Rey WTF currently treats water to tertiary levels suitable for non-potable recycled water use. In order to implement indirect potable reuse in the Mission Basin, the San Luis Rey WTF would need to be upgraded with advanced water treatment (AWT) components necessary to produce purified water. New pipelines would also be required to convey purified water from the San Luis Rey WRF to spreading grounds for the Mission Basin. Location and infrastructure needs are still in the development/planning phase.

4.2.3 Summary of Potential Future Recycled Water Demands

The future market assessment process resulted in four non-potable reuse customers with a total demand of 537 afy for direct reuse and one potential groundwater recharge project with a total demand of 5,000 afy. As shown in Table 4.4, a total of 5,537 afy of potential future recycled water demand was identified.

Table 4.4 Potential Future Recycled Water Demands
Recycled Water Facilities Plan
City of Oceanside

Customer	Use Type	Estimated Recycled Water Demand (afy)
Arrowood Golf Course [1]	I	200
El Corazon Specific Plan	I	100
Ocean Ranch	I	130
Caltrans [2]	I	107
	Subtotal	**537**
Mission Groundwater Basin [3]	Groundwater Recharge	5,000
	Total	**5,537**

Notes:
(1) Arrowood Golf Course is currently supplied by groundwater.
(2) Caltrans is currently supplied with recycled water from Fallbrook Municipal Water District. Demand is based on 2010 through 2014 fiscal year monthly data.
(3) The City is currently studying groundwater recharge in Mission Basin.

4.3 DEMAND PEAKING FACTORS

Two important peak flow conditions are used to evaluate the hydraulic needs of a recycled water system: maximum-month demand (MMD) and peak-hour demand (PHD). For the purpose of this Study, MMD is defined as the average demand of a customer during the maximum demand month, which is typically July or August when irrigation demand is highest. The maximum demand month can vary for industrial customers. MMD and PHD were estimated for each customer by applying peaking factors to the average annual demand values, which vary based on customer type. The peaking factors applied are summarized in Table 4.5. The MMD was used to size the treatment expansion and the PHD was used to size the distribution system. The factors were adjusted for individual customers if specific demand information was collected through customer outreach efforts.

Table 4.5 Standard Demand Peaking Factors Recycled Water Facilities Plan City of Oceanside	
Demand Condition	**Peaking Factor (Average Peak)**
Average Day Demand (ADD)	1.0
Maximum Month Demand (MMD)	2.0 * ADD
Peak Hour Demand (PHD)	
8 hour irrigation [1]	3.0 * MMD = 6.0 * ADD
12 hour irrigation [2]	2.0 * MMD = 4.0 * ADD
Commercial	Site Specific

Notes:

(1) Assumes irrigation customers operate over eight hours (2.0 * 24/8 = 6.0) without storage. Landscape irrigation customers operate during the night.

(2) Agriculture, Caltrans, and customers with storage may irrigate during the day. Therefore an irrigation period of twelve hours was assumed (2.0 * 24/12 = 4.0).

4.4 CUSTOMER INTEREST AND BARRIERS TO USE

Customer outreach was conducted during the development of the Plan. Large potable water demand customers were contacted; and if available, a site meeting was scheduled and documented. The goal of the meetings was to investigate specific potential customers for use of recycled water and discuss level of interest and the feasibility of converting non-potable uses from potable water to recycled water. Of the ten large customers contacted, seven customers responded. Four of those customers (three agriculture and one special user) were interviewed over the phone and the special user customer was followed by a subsequent site visit. All four customers expressed an interest in recycled water and summary notes from the interviews and site visit are located in Appendix C. The City also sent out letters to another eight customers, most of which were golf courses. No site visits were conducted with the agriculture customers as the City conducted separate meetings with them. At these meetings, the agriculture customers expressed an interest in recycled water. Summary of the estimated recycled water demand from the four customers interviewed is shown in Table 4.6.

Table 4.6 Customer Outreach Summary
Recycled Water Facilities Plan
City of Oceanside

Customer	Site Visit RW Estimate (afy)	Rating to Convert	Billing Type	Calculated RW Demand (afy)	Calculated RW Demand Notes
Rocket Farms	130	Rating B	A-CA	104	50% of potable use
Gilligan Groves	26	Rating B	A-CA	125	50% of potable use
West Coast Tomato	155	Rating B	A-CA	39	50% of potable use
Mission Linens	87	Rating C	S	38	50% of potable use
Total	**310**			**270**	

When comparing the estimated recycled water demands from the interview with the calculated estimated demands, there were some discrepancies for individual customers. However, the overall total demand is similar (310 afy from site visits and 270 afy with calculated assumption). For the potential recycled water demand for agriculture customers, a global approach of 50 percent of their potable metered water was used. Since only three agriculture interviews were conducted, the survey responses did not provide an overall representation of the agriculture demands. Therefore the calculated recycled water demand for these customers was used. For the special user customer, Mission Linens, an estimated recycled water demand of 87 afy was provided at the site visit. However, their "ease of retrofitting" was rated as "C" (difficult conversion). Therefore their estimated potential demand of 38 afy was considered reasonable to use in this Plan.

Based on the customer site visits, the main end user concern is meeting water quality needs. Chlorides and TDS are the main concerns for agricultural users, and most already have treatment on site to lower TDS. West Coast Tomato Grower currently uses groundwater and a sand filter for treatment. Rocket Farms Herbs currently has a RO unit to treat TDS levels down to 300 parts per million (ppm) from 600 ppm to accommodate herbs which are very sensitive to water quality.

Barriers to recycled water conversions typically include the costs, water quality, and public acceptance. The cost to convert on-site facilities for the safe use of recycled water (e.g., ensuring no cross connections) while replicating the current potable water service conditions (e.g., pressure, connection points and reliability) can require new facilities beyond recycled water meters alone. For example, although the primary water use for large landscape customers is non-potable, it often includes some potable uses primarily for drinking and washing. Most customers have separate irrigation systems, but some irrigation systems may have unauthorized potable connections or hose bibs. For golf courses, tee boxes and greens typically need to remain on higher quality potable water, while the remainder of the course may be irrigated with recycled water.

Public acceptance of the use of recycled water is crucial. The general public could express concerns about direct exposure to recycled water at some sites (e.g., parks, schools, golf courses, etc.). Proper outreach should be conducted to educate the public about the requirements for protective measures regarding public health.

4.5 MARKET ASSESSMENT SUMMARY

The key findings from the recycled water market assessment are as follows:

- There are a total of 669 potential recycled water customers. As shown in Table 4.7, the potential demand for direct recycled water use associated within the Study Area is estimated to be 5,536 afy. This includes 665 existing potable customers to convert for a total demand of 4,999 afy and 4 future customers (for direct use) with a total

demand of 537 afy (not including groundwater recharge). The primary use of recycled water would be landscape irrigation.

- Of the 669 customers, 19 large customers were identified as the "target customers" and are listed in Table 4.8 and are shown on Figure 4.4. These customers are defined as target recycled water customers because of the large estimated non-potable demands of 50 afy and greater. With a combined estimated demand of 1,774 afy, these customers make up 32 percent of the total potential demand identified.
- Maximum groundwater recharge potential in the Study Area is assumed to be approximately 5,000 afy for indirect potable reuse. This topic is being further investigated in a separate study to be concluded by summer 2015.

Table 4.7 Summary of Potential Recycled Water Customers
Recycled Water Facilities Plan
City of Oceanside

	Potential Existing Recycled Water Customers		Potential Future Recycled Water Customers		Total Potential Recycled Water Customers [1]	
Customer Demand (afy)	No. of Potential Ex. RW Customers	Est. RW Demand (afy)	No. of Potential Future RW Customers	Est. RW Demand (afy)	No. of Potential Future RW Customers	Est. RW Demand (afy)
Greater than 50	15	1,237	4	537	19	1,774
25 - 50	26	927	0	0	26	927
10-25	84	1,179	0	0	84	1,179
5-10	145	930	0	0	145	930
Less than 5	395	726	0	0	395	726
Total	**665**	**4,999**	**4**	**537**	**669**	**5,536**

Note:
(1) This table does not include potential demand for indirect potable reuse estimated at 5,000 afy.

Table 4.8 Potential Target Recycled Water Customers (50 afy or greater)
Recycled Water Facilities Plan
City of Oceanside

Cust. ID	Main Meter No.	Customer Name	Billing Class	Existing/ Future User	Avg. Potable Demand from 2010-2013 (afy)	Recycled Water (est. % of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
1	Future 1	El Corazon Site	I	Future	--	--	100	--
2	Future 5	Arrowood Golf Course	I	Future	--	--	200	--
3	W01442934	El Camino Country Club Golf Course	I	Existing	194	100%	194	3
4	Future 3	Ocean Ranch	I	Future	--	--	130	--
5	73104317	Gilligan Groves	A-GS	Existing	250	50%	125	3
6	66891684	Rocket Farms Herbs INC	A-CA	Existing	209	50%	104	5
7	71308439	Eternal Hills Cemetery	I	Existing	95	100%	95	3
8	65188576	Ocean Hills Country Club	I	Existing	91	100%	91	1
9	60149641	RDO Tech Park	I	Existing	90	100%	90	19
10	71686116	Mission Vista High School	I	Existing	69	100%	70	4
11	67810559	Rancho Milagro LLC	I	Existing	135	50%	68	2
12	W23843286	Center City Golf Course	G	Existing	70	90%	63	1
13	W01327649	Villages of Rancho Del Oro HOA	I	Existing	60	100%	60	18
14	1471844	Titleist Footjoy Golf Facility	I	Existing	58	100%	58	1
15	66024565	Arrowood Master Association 01	I	Existing	58	100%	58	11
16	W38254406	Villages of Rancho Del Oro HOA	I	Existing	56	100%	56	10
17	1611491	Wilmont Ranch Maintenance Corp.	I	Existing	53	100%	53	6
18	68003992	AMB DSS Pacific Coast LLC	I	Existing	52	100%	52	11
19	Future 8	Caltrans	I	Future	--	--	107	1
TOTAL							**1,774**	**99**

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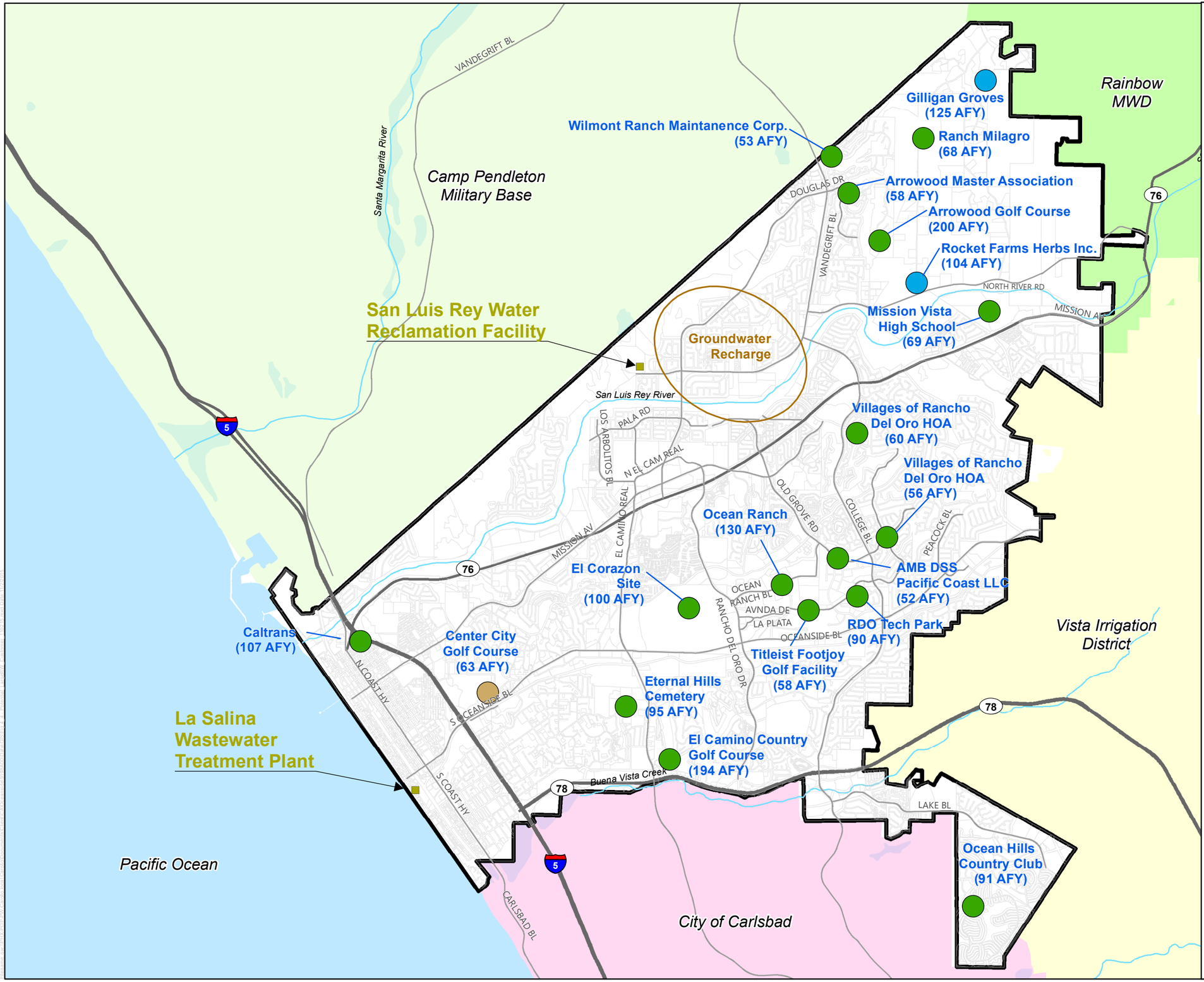

Figure 4.4
Potential Target Recycled Water Customers (>50 AFY)
Recycled Water Facilities Plan
City of Oceanside

Chapter 5

POTENTIAL RECYCLED WATER SUPPLIES

There are five recycled water supply options for the Study Area, each with slightly different water qualities, institutional requirements, availability, and reliability. The five potential recycled water supply facilities presented in this section are:

- San Luis Rey Water Reclamation Facility (San Luis Rey WRF)
- La Salina Wastewater Treatment Plant (La Salina WWTP)
- El Corazon Water Reclamation Facility (Future) (El Corazon WRF)
- Fallbrook Public Utility District (FPUD) Plant No. 1
- Camp Pendleton's South Regional Tertiary Treatment Plant (SRTTP)

As shown on Figure 5.1, the San Luis Rey WRF and La Salina WWTP are the only two existing of the five potential supplies that are located within the City's boundary. This section describes the five potential recycled water supply sources, including a discussion of the existing facilities, water quality, institutional requirements, and supply availability.

5.1 SAN LUIS REY WATER RECLAMATION FACILITY

5.1.1 Existing Facility

The San Luis Rey WRF is located in the north side of City, on River Road, and has an existing secondary treatment capacity of 15.4 mgd and a tertiary treatment capacity of 0.7 mgd. The facility is planned to be expanded to 17.4 mgd of secondary treatment. The 2013 average annual secondary effluent flow was 9.7 mgd, and an average annual flow of 0.30 mgd was treated to tertiary levels. Depending on the recycled water demand, the San Luis Rey WRF tertiary treatment could be expanded beyond the existing tertiary capacity of 0.7 mgd.

The San Luis Rey WRF provides secondary treatment for most of the wastewater generated within the City's service area. In addition to the City's service area, the San Luis Rey WRF treats wastewater from the Rainbow Municipal Water District and portions of the City of Vista. The majority of secondary effluent is sent to the Pacific Ocean via the Oceanside Land Outfall. The treatment processes at the San Luis Rey WRF include preliminary, primary, and activated sludge secondary treatment. The biosolids are anaerobically digested and dewatered by centrifuges prior to land application. The secondary effluent is pumped to a continuous backwashing, down-flow filter. Sodium hypochlorite is added to the filtered effluent. The effluent is disinfected in a chlorine contact channel and then stored in a 2.2 million gallon, lined storage pond located at the southerly portion of the San Luis Rey WRF.

5.1.2 Water Quality

Tertiary effluent water quality data from July 2012 through June 2013 was provided by the City. The reported 12-month average water quality parameters were below the permit limit maximum. As shown in Table 5.1, the average TDS concentration was 901 mg/L, which is below the permit limit of 1,200 mg/L.

Table 5.1 San Luis Rey WRF Recycled Water Quality and Permit Requirements
Recycled Water Facilities Plan
City of Oceanside

	TDS (mg/L)	Cl (mg/L)	SO_4 (mg/L)	Fe (mg/L)	Mn (mg/L)	Boron (mg/L)	Fl (mg/L)
Water Quality Levels[1]	901	263	194	0.11	0.08	0.4	--
Permit Limit [2] (Annual Average)	1,200	350	350	0.30	0.15	0.5	1.0

Note:
(1) FY 2013 average water quality (July 2012- July 2013)

5.1.3 Institutional Requirements

No institutional agreements will be needed for a potential plant expansion since the City owns the plant. Currently, an agreement is in place that San Luis Rey WRF provides treatment for up to 1.5 mgd of wastewater from the Rainbow Municipal Water District (Carollo, 2005).

5.1.4 Supply Availability

In 2013, an average of 9.7 mgd of wastewater was treated at San Luis Rey WRF. The majority of wastewater treated at San Luis Rey WRF was discharged into the Pacific Ocean, while an average of approximately 0.30 mgd was treated to tertiary levels. Table 5.2 presents the average day wastewater flow projection for San Luis Rey WRF during dry weather. It is assumed that all the secondary wastewater flow can be treated to tertiary levels if the plant is expanded.

Table 5.2 Average Dry Weather Wastewater Flow Projections
Recycled Water Facilities Plan
City of Oceanside

	2013 (mgd)	2020 (mgd)	2050 (mgd)
San Luis Rey WRF	9.7	10.3	12.8

Source: City of Oceanside's Final Sewer Master Plan (Carollo, 2015a)

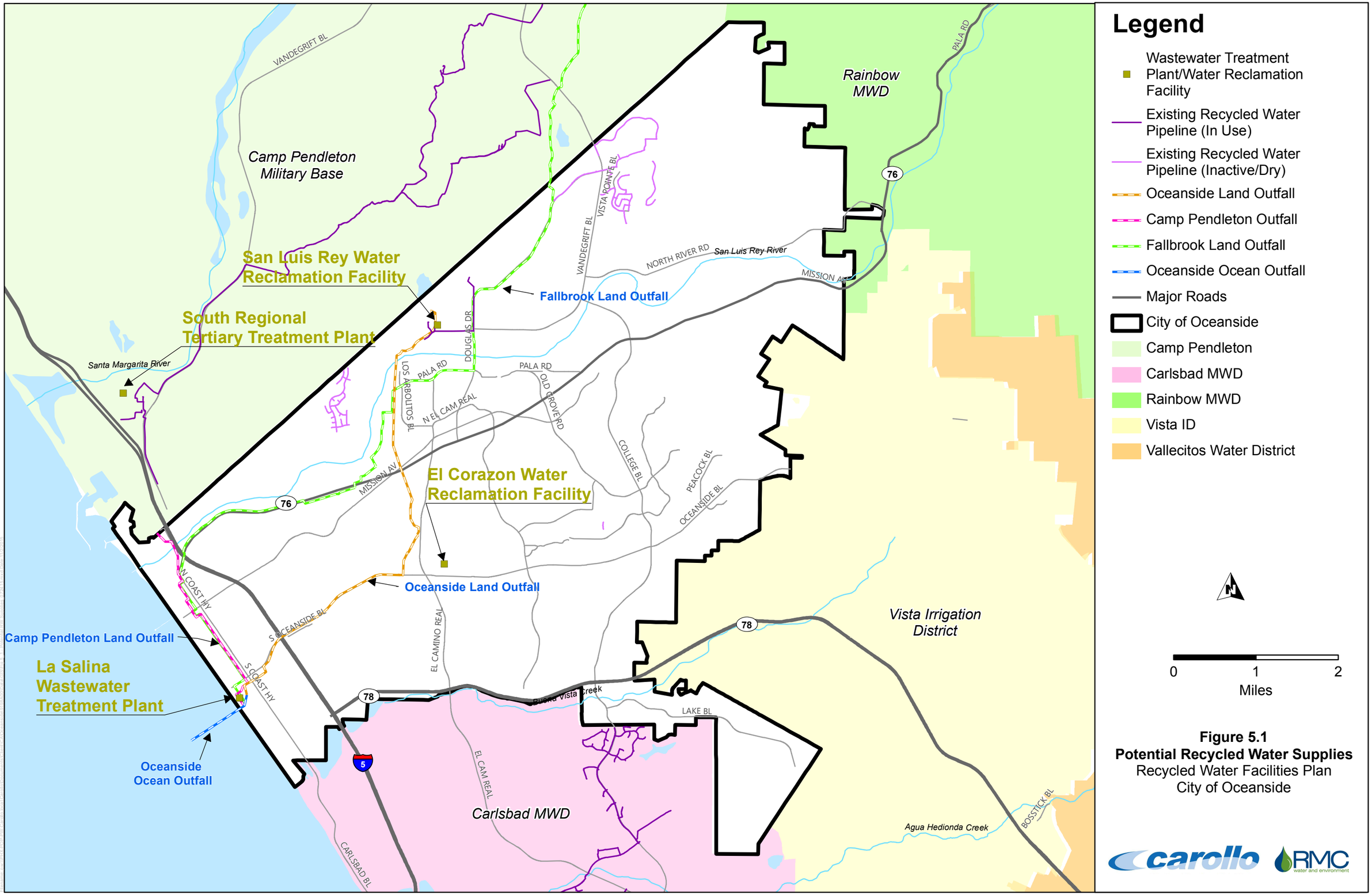

Figure 5.1
Potential Recycled Water Supplies
Recycled Water Facilities Plan
City of Oceanside

5.2 LA SALINA WASTEWATER TREATMENT PLANT

5.2.1 Existing Facility

The La Salina WWTP has a secondary treatment capacity of 5.5 mgd and does not have tertiary treatment facilities. The La Salina WWTP is located in the south portion of the City's service area near the Pacific Ocean and treats wastewater entirely from the City's coastal zone. The plant discharges its entire flow to the Pacific Ocean via the Oceanside Ocean Outfall. The treatment processes at the La Salina WWTP treat wastewater to a secondary level using conventional biological treatment followed by clarification.

In 2011, the City completed a feasibility study which assessed tertiary treatment at the La Salina WWTP to produce recycled water for irrigation purposes in the surrounding area. The *La Salina WWTP Feasibility Plan* (IEC, 2014) developed and evaluated six tertiary treatment alternatives based on the limited available space at the plant. Based on the potential recycled water demand identified, the treatment alternatives were sized for an average annual flow of 0.70 mgd with redundancy and storage that would allow for a peak day delivery of 1.4 mgd (Carollo, 2011).

In October 2014, the City completed the *Cost Analysis of La Salina WWTP Option Technical Memorandum,* which evaluated three alternative options for rehabilitating the La Salina WWTP. The three options consisted of 1) upgrading the plant based on Needs Assessment, 2) replacing the plant with a membrane bioreactor plant, or 3) replacing the plant with a new pump station to convey wastewater flows to San Luis Rey WRF for treatment. The three options were presented at the November 12, 2014 City Council meeting and the City decided to move forward with the third option. Therefore, the La Salina WWTP is no longer a potential recycled water supply as it will be decommissioned and converted to a pump station (City Council, 2014).

5.2.2 Water Quality

Based on the City's decision to decommission this plant, the water quality section is not applicable.

5.2.3 Institutional Requirements

No institutional agreements will be needed since the City owns the plant.

5.2.4 Supply Availability

In 2013, an average of 2.8 mgd of wastewater was treated at the La Salina WWTP and discharged into the Pacific Ocean. Table 5.3 presents the average day wastewater flow projection for La Salina WWTP during dry weather. Based on the City's decision, the existing and projected wastewater flows going to the La Salina WWTP will be pumped to San Luis Rey WRF for treatment. Therefore, the projected wastewater flows listed in

Table 5.3 will augment the raw wastewater flows for secondary treatment at San Luis Rey WRF.

**Table 5.3 Average Dry Weather Wastewater Flow Projections (mgd)
Recycled Water Facilities Plan
City of Oceanside**

	2013	2020	2050
La Salina WWTP	2.8	2.9	3.7

Source: City of Oceanside's Final Sewer Master Plan (Carollo, 2015a)

5.3 EL CORAZON WATER RECLAMATION FACILITY

5.3.1 Future Facilities

In 2012, the City conducted a study that looked at a satellite water reclamation facility at the El Corazon site to serve athletic fields, parks and other landscape irrigation. The El Corazon site is located northeast of the intersection of Oceanside Boulevard and El Camino Real. The City is currently redeveloping the site into a public park with nature trails, commercial opportunities, and community gathering spaces based on the El Corazon Specific Plan (2009).

The 2012 study identified that the El Corazon WRF could potentially be sized to serve major recycled water users in the central part of the City. Due to the proximity of the Oceanside Land Outfall, secondary effluent from the Land Outfall would be diverted to the El Corazon WRF and treated to tertiary levels. The initial phase of the plant includes the construction of a 1.0 mgd water recycling plant to serve the recycled water demands of the El Corazon athletic fields, recycling facility, composting facility, and other recycled water users located near the project site and within the City limits. The subsequent phases would include an expansion of the water recycling plant to 3.4 mgd to serve the buildout demands of the El Corazon site, El Camino Country Club, and other potential recycled water users (RMC, October 2012).

The November 12, 2014 City Council's decision to decommission and convert the La Salina WWTP to a pump station includes redirecting flow from the Fallbrook Land Outfall Pipeline to the Oceanside Land Outfall near the San Luis Rey WRF. FPUD plans to upgrade their treatment plant to produce advanced treated recycled water for indirect potable reuse. This results in brine from the advanced treatment system be discharged into the Oceanside Land Outfall. The secondary effluent would no longer be suitable for diversion to a satellite tertiary treatment plant. Therefore, the El Corazon WRF is no longer a viable potential recycled water supply option.

5.3.2 Water Quality

Not applicable.

5.3.3 Institutional Requirements

Not applicable.

5.3.4 Supply Availability

Not applicable.

5.4 FALLBROOK PUBLIC UTILITY DISTRICT PLANT NO. 1

5.4.1 Existing Facilities

FPUD currently owns and operates one treatment plant (Plant No. 1) which has a secondary and tertiary treatment capacity of 2.7 mgd. The majority of the tertiary recycled water is used within FPUD's service area. Tertiary recycled water that is not used by FPUD is disposed in the Fallbrook Land Outfall, which runs through the City of Oceanside and ties into the Oceanside Ocean Outfall for disposal. The Fallbrook Land Outfall is a 16-inch diameter ductile iron pipe, approximately 18 miles long. Under the agreement with the City, FPUD can discharge up to 2.4 mgd on an annual average basis through Oceanside's Ocean Outfall (Carollo, 2005).

Within the City's service area, FPUD supplies recycled water to Caltrans along Interstate 5 (I-5) and Highway 76. Caltrans average annual demand is approximately 107 afy (0.1 mgd) based on a four year average (July 2010 through June 2014). A 1986 agreement between FPUD and Caltrans allows Caltrans to divert up to 2 mgd of recycled water from the Fallbrook Land Outfall for irrigation purposes. [1]

FPUD is planning to upgrade their treatment plant to produce advanced treated recycled water for indirect potable reuse. The AWT is assumed to consist of a microfiltration/reverse osmosis system and would generate a brine concentrate which would be discharged in the Fallbrook Land Outfall. The timeframe for completion of the AWT has not yet been established. However, based on the City Council's decision in November 2014, the Fallbrook Land Outfall will be used to convey raw wastewater to the San Luis Rey WRF in the near-term. For purposes of this Plan, it is therefore assumed that recycled water from Fallbrook Land Outfall will not be available and another water supply option needs to be identified to replace the recycled water that currently serves Caltrans along I-5 and Highway 76.

5.4.2 Water Quality

FPUD current recycled water quality is shown in Table 5.4. As shown in Table 5.4, all water quality parameters fall with the permit limits. The only parameter that is exactly at the permit limit is fluoride at 0.8 mg/L.

[1] SDRWQCB Tentative Order No. R9-2006-0064 WDR for FPUD Treatment Plant No. 1

Table 5.4 FPUD Existing Recycled Water Quality and Permit Requirements Recycled Water Facilities Plan City of Oceanside							
	TDS (mg/L)	**Cl (mg/L)**	**SO_4 (mg/L)**	**Fe (mg/L)**	**Mn (mg/L)**	**Boron (mg/L)**	**Fl (mg/L)**
Water Quality Levels[1]	723	158	190	0.04	2.11	0.32	0.8
Permit Limit [2]	1,420	450	475	0.80	0.15	0.60	0.8

Notes:

(1) 2013 Tertiary Average Water Quality from Plant No. 1
(2) Based on Tentative Order No. R9-2006-0064 12-month average

5.4.3 Institutional Requirements

FPUD currently has an agreement with the City to discharge 2.4 mgd into Oceanside's Ocean Outfall and an agreement with Caltrans to divert 2 mgd of recycled water from the Fallbrook Land Outfall for irrigation purposes. Information on the existing agreements is not available and coordination and adjustments will be needed when FPUD begins to dispose of brine instead of recycled water into the Fallbrook Land Outfall.

5.4.4 Supply Availability

Based on the agreement with the City, FPUD can discharge up to 2.4 mgd on an annual average basis through Oceanside's Ocean Outfall. However, since FPUD plans to dispose brine through the Fallbrook Land Outfall, FPUD is no longer a potential source of recycled water supply.

5.5 CAMP PENDLETON SOUTH REGIONAL TERTIARY TREATMENT PLANT

5.5.1 Existing Facilities

North of the City, the U.S. Marine Corps, Camp Pendleton owns and operates the South Regional Tertiary Treatment Plant (SRTTP) which began operation in August 2006. The SRTTP has a tertiary design capacity of 5.0 mgd and currently treats an annual average flow of about 2.4 mgd. The recycled water produced is supplied through a recycled water distribution system to irrigate four sites in the southern part of the Camp Pendleton Base. Currently, the SRTTP treats all wastewater to tertiary levels, and excess tertiary treated effluent that is not recycled is discharged to the Pacific Ocean via the Camp Pendleton Land Outfall and the City of Oceanside's Ocean Outfall.

5.5.2 Water Quality

The *Master Reclamation Permit for the Southern Region Tertiary Treatment Plant United States Marine Corps, Camp Pendleton, San Diego County* (Order No. R9-2009-0021) was issued by the San Diego RWQCB on March 11, 2009. Recycled water from SRTTP

undergoes tertiary treatment and complies with Title 22 standards. The permit allows for distribution of recycled water from SRTTP to Ysidora and the Lower San Luis HSA, which encompasses Mission HSA. Therefore, the SRTTP permit will not need to be amended. Table 5.5 shows the 2011 SRTTP tertiary water quality and summarizes the recycled water permit requirements established in Order No. R9 - 2009-0021. As shown in the table, the TDS concentration of SRTTP effluent was 808 mg/L in 2011, which is below the permit limit of the Mission HSA. All the water quality parameters also fall within the permit limits with the exception of percent sodium.

Table 5.5 SRTTP Existing Recycled Water Quality and Permit Requirements
Recycled Water Facilities Plan
City of Oceanside

	TDS (mg/L)	Cl (mg/L)	SO4 (mg/L)	%Na (mg/L)	Fe (mg/L)	Mn (mg/L)	NO3 (mg/L)	Boron (mg/L)	Fl (mg/L)
Water Quality Levels[1]	808	165	210	115	<0.1	< 0.02	2	--	0.36
Permit Limit [2]	1,500	500	500	60	0.85	0.15	45	0.75	1.0

Notes:
(1) 2011 Average Water Quality; Source: RMC, May 2012
(2) Based on 12-Month Average – Mission HSA (903.11)

5.5.3 Institutional Requirements

Camp Pendleton's goal is to reuse 100 percent of their recycled water and discharge no effluent into their land outfall and/or the City of Oceanside Ocean Outfall. An agreement between the City and Camp Pendleton is being developed to allow Camp Pendleton to provide recycled water and to serve a portion of the irrigation demand within the Morro Hills and Arrowood developments in the northwest area of the City. This area is known as the "back gate" and has an existing network of recycled water pipelines installed by developers that are currently not connected to any source of supply. This agreement could be extended to serve recycled water in the northwest area, known as the "front gate", and could potentially serve Caltrans. Recycled water rates will need to be established with the City. Based on verbal communications with the City, the amount of recycled water available from Camp Pendleton that the City will potentially be able to use is about 1.0 mgd in the northeast area (City, 2014).

5.5.4 Supply Availability

The annual supply available is approximately 1,120 afy (1 mgd) from SRTTP and would be available in the near-term. In the long-term, supply from Camp Pendleton's SRTTP would be replaced by recycled water from the San Luis Rey WRF and Camp Pendleton's SRTTP supply available would be zero. Based on verbal communications with the City, Camp Pendleton is planning to construct a 1 MG storage tank in the southeast area of their system. The storage will be used to supply future peak demands in the area.

5.6 COMPARISON OF RECYCLED WATER QUALITY

Recycled water from the five supply sources must be compared with both regulatory requirements and end user requirements for irrigation.

5.6.1 Regulatory Water Quality Comparison

The water quality objectives for the affected Hydrologic Areas (HAs) and HSAs as well as the potential supply source permit requirements and recent water quality measurements are provided in Table 5.6. As shown in Table 5.6, available recycled water quality levels from all supply sources fall below the limits for the Groundwater Basins and the permit requirements. Therefore, there is no issue with using recycled water in those groundwater basins.

5.6.2 Landscape Irrigation Water Quality Comparison

In general, since most customers in the Study Area are landscape irrigation customers, they will have similar requirements for water quality. The discussion below examines water quality issues associated with using recycled water supplies for landscape irrigation.

Recycled water generally has a higher salinity content (reported as TDS) than potable water. Plants irrigated with recycled water that has high salinity content can cause reduced soil aeration, water infiltration, and percolation. Other constituents of concern, such as sodium, chloride, chlorine, and nutrients, can cause problems with plant toxicity, leaf burn, and the plugging of sprinkler head openings.

Water quality guidelines for landscape use are available and are shown in Table 5.7. The table shows three degrees of restriction for use of recycled water ranging from “none” to “severe” for both salinity and toxicity constituents. However, specific requirements vary depending on the type of plant. When comparing the irrigation water quality with the potential recycled water quality from the five supplies, all TDS levels are in the “slight to moderate” restrictions range. However, some restrictions for sprinkler irrigation on recycled water will be needed based on the chloride levels.

Table 5.6 Groundwater Quality Objectives versus Permit Requirements and Water Quality
Recycled Water Facilities Plan
City of Oceanside

Hydrologic Subarea	Basin Unit No.	Water Quality Objective[1] (mg/L or as noted))								
		TDS	**Cl**	**SO_4**	**%Na**	**Fe**	**Mn**	**NO_3**	**B**	**F**
Mission HSA[2]	903.11	1,500	500	500	60	0.85	0.15	45	0.75	1.0
Loma Alta HA[3]	904.1	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]
El Salto HSA[4]	904.21	3,500	800	500	60	0.30	0.05	45	2.00	1.0
Los Monos HSA[5]	904.31	3,500	800	500	60	0.30	0.05	45	2.00	1.0
Supply Water Quality										
San Luis Rey WRF	Actual [6]	901	263	194	--	0.11	0.08	--	0.4	--
	Permit Req	1,200	350	350	--	0.30	0.15	--	0.50	1.0
FPUD	Actual [6]	723	158	190	49	0.04	2.11	--	0.32	0.8
	Permit Req	1,420	450	475	--	0.8	0.15	--	0.60	0.8
SRTTP (Camp Pendleton)	Actual [6]	808	165	210	115	<0.1	< 0.02	2	-	0.36
	Permit Req	1,500	500	500	60	0.85	0.15	45	0.75	1.0

Notes:

(1) Groundwater quality objectives for mineral constituents, not to be exceeded more than 10 percent of the time, as established within the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). Objectives are established for total dissolved solids (TDS), chloride (Cl), sulfate (SO_4), percent sodium (%Na), iron (Fe), manganese (Mn), nitrate (NO_3), boron (B) and fluoride (F)
(2) The Mission HSA includes the Mission Basin. See Figure 3.1.
(3) The Loma Alta HA comprises the watershed of Loma Alta Creek. See Figure 3.1.
(4) The El Salto HSA comprises the downstream portion of the Buena Vista Creek watershed. See Figure 3.1.
(5) The Los Monos HAS comprises the Ocean Hills Area. See Figure 3.1.
(6) The existing tertiary water quality is shown in Table 5.1 (San Luis Rey WRF), Table 5.4 (FPUD), and Table 5.5 (SRTTP)

Table 5.7 Landscape Irrigation Water Quality Levels Recycled Water Facilities Plan City of Oceanside				
		Degree of Restriction on Use [1]		
Constituent	**Units**	**None**	**Slight to Moderate**	**Severe**
Salinity				
TDS	mg/L	< 450	450 - 2,000	> 2,000
Specific Ion Toxicity				
Chloride (Cl) [1,2]	mg/L	< 100	> 100	
Boron (B)	mg/L	< 0.7	0.7 - 3.0	> 3.0

Notes:

(1) Values apply to most tree crops and woody ornamentals which are sensitive to sodium and chloride.

(2) With overhead sprinkler irrigation and low humidity (< 30%), sodium or chloride levels greater than 70 or 100 mg/L, respectively, have resulted in excessive leaf adsorption and crop damage to sensitive crops.

It can be concluded that the TDS and boron levels of the different supply sources (Table 5.6) are within the limits of the landscape water quality level. Chloride is higher; however, if the plant health becomes an issue for landscape irrigation, multiple mitigation measures are available to reduce salt buildup. Granulated gypsum can be added to turf grasses to keep salinity levels in soils at acceptable levels. Recycled water could also be blended with potable or raw water to reduce salt buildup.

5.7 POTENTIAL RECYCLED WATER SUPPLY SUMMARY

The available average dry weather flow supply by treatment is summarized in Table 5.8. There are some treatment losses associated when treating secondary flows to tertiary levels. However, based on 10 percent losses, there is still over 12 mgd of potential recycled water supply. The key findings from the recycled water supply assessment are as follows:

- Recycled Water Supply Available: As shown in Table 5.8, over 12 mgd (13,400 afy) of potential available recycled water supply was identified in the Study Area from two existing recycled water supplies: San Luis Rey WRP and SRTTP. This is more supply than the potential recycled water demand identified in Chapter 4 of 5,536 afy (4.9 mgd).
- Water Quality/Permitting Issues: Existing water quality is within the groundwater basin objectives and TDS concentrations are within the standards for landscape “slight to moderate” restriction use.
- Institutional Issues: Recycled water supplied from Camp Pendleton will need agreements and recycled water rates to be established.

Table 5.8 Comparison of Potential Recycled Water Sources
Recycled Water Facilities Plan
City of Oceanside

Potential Recycled Water Source	TDS (mg/L)	Average Dry Weather Flow Supply Available (mgd)		Institutional Constraints
		2020	2050	
San Luis Rey WRP [1]	901	13.2	16.5	No agreement is required
SRTTP (Camp Pendleton)	808	1.0	0 [2]	Agreement required; recycled water purchase cost needs to be established
	TOTAL	**14.2**	**16.5**	

Notes:

(1) The San Luis Rey WRF dry weather flow includes secondary flow from the La Salina WWTP.
(2) Camp Pendleton's SRTTP would supply recycled water in the near-term; and in the long-term, it would be replaced by recycled water from the San Luis Rey WRF.

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Chapter 6

PROJECT ALTERNATIVES ANALYSIS

This chapter presents the development and evaluation of recycled water distribution system alternatives, establishes the planning criteria for evaluation, provides recommended alternatives for further analysis, and discusses a no-project alternative.

Additional evaluations were performed on the two potential recycled supply sources discussed in Chapter 5 for the development of the recycled water system. Factors such as the location of these sources with respect to potential recycled water users, and geographic and physical constraints of the City's infrastructure were included in this additional analysis.

The main purpose of the recycled water distribution system analysis is to identify the facilities that maximize the use of local water supplies to offset imported water supplies in a cost-effective manner. The following approach was adopted to meet this objective.

1. Determine the feasibility of providing service to the "target" customers (greater than approximately 50 afy) identified in Chapter 4 from the supply sources identified in Chapter 5. Service to the target customers will likely determine the primary alignments of the distribution system.
2. Develop a potential network of pipelines to serve these target customers and size the required distribution systems based on the selected supply sources.
3. Refine system alignments based on input from City staff.

6.1 PLANNING CRITERIA

Planning criteria and basic cost data presented in this report represent conceptual or planning-level design of recycled water system components. For facility planning purposes, a close approximation of size, location, and costs for various facilities have been developed. Based on these results, some relocation and resizing of facilities may be required as more detailed engineering analyses are completed during subsequent phases of project implementation.

6.1.1 Demand Criteria

Where available, existing irrigation demands are based on historical consumption from records of recycled water system meters or potable water system irrigation meters. Where there is no dedicated potable water meter for irrigation use, or when a meter is used for a variety of water uses within a customer site, a percent of non-potable water demand was assigned to that meter to estimate the potential use of recycled water. Estimates were developed by applying application rate factors to the estimated irrigable acreage that could use recycled water.

Application rate factors were estimated by using existing customer data. City billing data were analyzed to generate typical factors for a range of irrigation use types. Results from other water retailers with similar coastal climates were provided to offer comparison and data validation. Acreage was estimated from maps or aerial photos.

Maximum Month Demand (MMD) peaking factors are derived from existing billing data. Each month's demand was compared with the average month, and results were compared year-to-year to identify trends and seasonal extremes. From this ratio, historical maximum-month (and minimum-month) to average-month ratios were identified. A unit hydrograph was developed for monthly irrigation demands based on an adjusted multi-year system average. This hydrograph was reviewed for expected recycled water monthly demand variations and compared with typical Southern California irrigation cycles. This analysis provides the basis to project future average-annual demand variations. Monthly recycled water demands were used to estimate seasonal supply and storage needs for the recycled water system.

Peak Hour Demands (PHD) were used in determining pump, operational storage, and pipeline capacities. Irrigation-period demands are determined by average-day use during the maximum month, multiplied by the ratio of 24 hours over the length of the regular daily irrigation period in hours. For example, in calculating irrigation-period demands, the maximum-month factor would be multiplied by 24 hours divided by 12 hours (i.e., a factor of 2) if a 12-hour irrigation period is assumed, or multiplied by 24 hours divided by 8 hours (i.e., a factor of 3) if an 8-hour irrigation period is assumed.

6.1.2 Pressure Criteria

Landscape irrigation typically requires a distribution supply pressure of at least 55 to 60 pounds per square inch (psi) at the service connection. A lower pressure may result in inadequate irrigation system performance. A supply pressure greater than 100 to 130 psi often requires use of a pressure reducing valve downstream of the service meter to protect on-site system components from excessive pressure. Supply pressures on the order of 150 psi and higher can cause failure in standard service meter gaskets.

For the City's future system evaluation the maximum system pressure at the meter location was set at 140 psi, while the minimum pressure at the meter location was set at 40 psi. This pressure criterion may require individual pressure reducing valves or small irrigation boosters according to the customer's on-site physical characteristics or recycled water usage needs.

6.1.3 Hydraulic Criteria

This section provides hydraulic design and performance criteria to be used for facility planning. The recycled water system will be designed to deliver peak hourly flow to customers for recycled water use. System piping should be evaluated under a range of demand conditions, but performance assessment is typically most critical under PHD

conditions. Generally, pipelines 16 inches and greater in diameter are considered "transmission pipelines". Because transmission pipelines cover long distances, they can result in large head losses. These large pipeline friction losses associated with high fluid velocities need to be evaluated with respect to system delivery capacity, contribution to lowered system pressures, and excessive energy consumption.

Transmission pipelines are considered undersized if peak-hour water velocities exceed 5 feet per second (fps) and/or head losses exceed 3 feet of head per 1,000 feet of pipe. Distribution pipelines are considered undersized if peak-hour velocities exceed 5 fps and head losses exceed 10 feet of head per 1,000 feet of pipe. However, these criteria are only a guideline, and higher velocities and head losses may be tolerable under certain operating conditions such as system emergencies, and within short lengths of pumping station or reservoir yard piping where the impact on system pressure is minimal. Table 6.1 summarizes the key system performance criteria for the City's existing and proposed recycled water systems. For the purposes of the Plan, a spreadsheet model was used to conduct hydraulic calculations and aid with distribution system sizing.

Table 6.1 Distribution System Hydraulic Performance Criteria
Recycled Water Facilities Plan
City of Oceanside

Distribution Pipelines
• Sized to handle PHD • Sizes 6-, 8-, 12-, 16-, and 20-inch in diameter • Maximum velocity 5 ft/sec • Head losses 2 to 3 ft/1,000 ft for diameter =>16" • Head losses 5 to 10 ft/1,000 ft for diameter <=12"
Pump Stations
• Sized to handle PHD with largest capacity pump unit out of service
Storage
• Sized for Max Day Demand (1.2 * MMD)
System Level of Service
Minimum Pressure • Agriculture users >= 20 psi • Landscape User >= 40 psi • Other Users >= 40 psi Maximum Pressure • All users =< 140 psi

6.1.4 Economic Benchmark

The economic benchmark represents the upper limit of cost-effectiveness for a proposed recycled water system. For recycled water, the primary alternative is offset of current and for future potable water supply. The economic benchmark is derived from a comparable potable project and is typically expressed in dollars per AF. For purposes of this study a potential recycled water project is considered cost-effective if its unit cost is less than approximately $1,700 per AF.

This unit cost is based on the total project cost for the Carlsbad Desalination Project of $2,257 developed by the San Diego County Water Authority in 2012, assumed to be equivalent to the approximate value of a local water supply. For recycled water projects the economic benchmark is taken at 75 percent of the Carlsbad Desalination Project to allow for unaccounted costs that have not been determined (such as on-site conversion costs) at this level of planning.

6.1.5 Cost Estimating Criteria

The cost estimates presented in this study are opinions developed from bid tabulations, cost curves, information obtained from previous studies, and the experience of Carollo Engineers, Inc. (Carollo) on other projects. The costs are based on an Engineering News Record Construction Cost Index (ENR CCI) 10,756 (Los Angeles, December 2014).

The cost estimates presented in the CIP have been prepared for general master planning purposes and for guidance in project evaluation and implementation. Final costs of a project will depend on actual labor and material costs, competitive market conditions, final project scope, the implementation schedule, and other variable factors such as preliminary alignment generation, investigation of alternative routings, location of operational storage tanks, and detailed utility and topography surveys.

The Association for the Advancement of Cost Engineering International (AACE) defines an Order of Magnitude Estimate, deemed appropriate for master plan studies, as an approximate estimate made without detailed engineering data. It is normally expected that an estimate of this type would be accurate within plus 50 percent to minus 30 percent. More information on facility unit costs, useful life estimates, and construction markups (for contingency, engineering, construction management, environmental and legal) can be found in Chapter 7.

6.2 RECYCLED SYSTEM ALTERNATIVES ANALYSIS

For the purpose of developing the recycled water system alternatives analysis presented in this Plan, the City was divided into four study areas. Considerations such as the location of potential supply sources with respect to potential recycled water users; geographic and physical constraints of the City's infrastructure and terrain; and future plans of neighboring

agencies were factored into the development of the recycled water system layouts of each area. These four study areas are briefly defined as:

- **Northeast**: This area is generally east of the San Luis Rey WRF and is bounded by Highway 76 on the south and Camp Pendleton on the North.
- **Northwest**: This area is generally bounded by the Pacific Ocean on the west, Oceanside Blvd on the south, the I-5 on the east, and Camp Pendleton on the North.
- **Central**: This area is generally bounded by the I-5 on the west, Highway 78 on the south, Highway 76 on the north and City of Vista on the east.
- **Southeast**: This area is generally bounded by Highway 78 on the north, City of Carlsbad on the west and south and City of Vista on the east.

Recycled water systems for each of these study areas are described in the following sections, including current and potential distribution networks. Figure 6.1 shows the potential target recycled water customers for each study area.

6.3 DEVELOPMENT OF ALTERNATIVES

The development and analysis of recycled water distribution systems focused first on supplying the potential target recycled water customers identified in Chapter 4. These 19 target customers mainly consist of irrigation users and were used to drive the pipeline alignment from each supply option. These customers were considered as the target customers to provide service with new recycled water facilities as the backbone distribution system. Additional customers with smaller demands located adjacent to the proposed facilities were also considered for connection to the system.

Figure 6.1 and Table 6.2 show the target customers identified and the potential recycled water supplies identified in Chapter 5. As shown on Figure 6.1 and Table 6.2 most of the recycled water demand is located in the Northeastern and Central areas of the City and there is more supply than demand. This information was used in conjunction with the location of the recycled supply sources to create the system alternatives that are described in the next sections.

Table 6.2 Potential Supply Sources and Demands by Study Area Recycled Water Facilities Plan City of Oceanside				
Study Area	**Target Customers Demand (afy) [2]**	**Target Customers MDD (mgd)**	**Potential Supply Sources**	**Supply Available (mgd)**
Northeast	608	1.1	San Luis Rey WRF SRTTP	16.5 1.0
Northwest	107	0.2	SRTTP	1.0
Central	899	1.6	San Luis Rey WRF	16.5
Southeast	91	0.2	San Luis Rey WRF	16.5
Total	**1,704**	**3.1**		**17.5**

Notes:

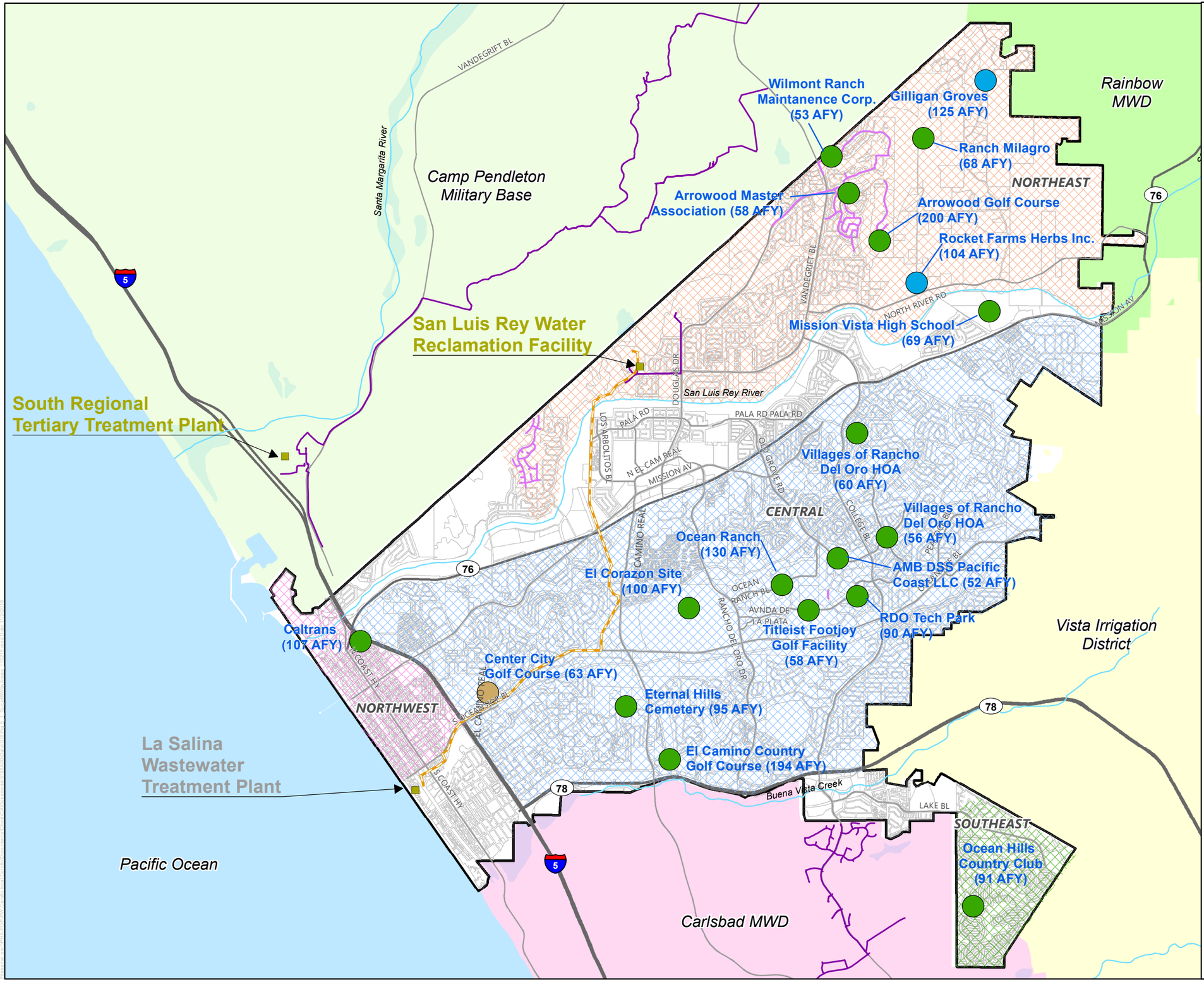
1. SRTTP: Southern Regional Tertiary Treatment Plant
2. The total potential target demand does not include Mission Vista High School (70 afy) as it is not included in any study area.

6.3.1 Northeast Study Area

The NE study area includes two potential supply options: San Luis Rey WRF and Camp Pendleton's SRTTP. The NE area includes the San Luis Rey WRF, which currently serves two recycled water customers: the City of Oceanside Municipal Golf Course and Whelan Lake Bird Sanctuary.

As shown on Figure 6.1, many target customers are located in the NE area. Their estimated combined demand is 608 afy and a MDD of 1.1 mgd. Customers located north of Highway 76 were considered for connection to the potential recycled water system and, therefore, no freeway/river crossings are needed. Mission Vista High School is south of the San Luis Rey River and, therefore, was not connected. The NE area consists of the Morro Hills and the Arrowood developments which can be supplied by both the SRTTP and the San Luis Rey WRF. If the agreement between the City and Camp Pendleton is not finalized or not extended in the long-term, then the recycled water pipelines from San Luis Rey WRF could be extended to serve the Morro Hills and the Arrowood developments. Both potential supply sources are not needed to supply the entire demand in the NE area.

The Upper San Luis Rey WRF System would encompass serving targeted customers north of the San Luis Rey River. This system would require tertiary treatment expansion at the San Luis Rey WRF, pipelines, pump stations, and operational storage to serve all the customers.



Legend

Billing Class
- Irrigation
- Government
- Agricultural

Other
- Water Treatment Plant/ Water Reclamation Facility
- Existing Recycled Water Pipeline (In Use)
- Existing Recycled Water Pipeline (Inactive/Dry)
- Oceanside Land Outfall
- Major Roads
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID
- City Parcel

Study Areas
- Central
- Northeast
- Northwest
- Southeast

0 1 2
Miles

Figure 6.1
Target Recycled Water Customers by Study Area
Recycled Water Facilities Plan
City of Oceanside

6.3.2 Northwest Study Area

The NW study area includes one potential supply option: Camp Pendleton's SRTTP. The City and Camp Pendleton are currently developing an agreement to serve recycled water to the NE area and this agreement could be extended to serve recycled water in the NW. This would allow the SRTTP to serve Caltrans (107 afy) and potentially serve the Center City Golf Course (63 afy) using Caltrans' existing irrigation system. Approximately 0.15 mgd and 0.30 mgd of ADD and MDD, respectively, is needed from SRTTP to serve these two customers. The Caltrans existing irrigation system could potentially be used to convey recycled water from SRTTP to Caltrans and the Center City Golf Course. However, additional information on the Caltrans connections, their distribution system, and working pressures is unavailable.

6.3.3 Central and Southeast Study Areas

The Central and SE study areas includes one potential supply option: San Luis Rey WRF. As shown on Figure 6.1 and Table 6.2, multiple potential recycled water customers are located in the Central area with an estimated combined demand of 899 afy and a MDD of 1.6 mgd. These customers are located south of Highway 76 and north of Highway 78. The SE area includes one target customer, Ocean Hills Country Club, with an estimated demand of 91 afy and a MDD of 0.2 mgd.

The San Luis Rey WRF can supply the Central and SE areas via two options:

- Existing 10-inch diameter Brine Pipeline from San Luis Rey WRF: This option considers using the existing 10-inch diameter brine pipeline as conveyance for tertiary recycled water from San Luis Rey WRF to the Central and SE areas. The 10-inch diameter brine pipeline runs parallel to the Oceanside Land Outfall and has been used to dispose of brine concentrate. The City has currently made modifications to convert the existing 10-inch diameter brine pipeline to a 10-inch recycled water pipeline by diverting the existing brine to the Oceanside Land Outfall. A challenge with this option is that the potential to serve to recycled water customers is limited by the capacity of the 10-inch diameter brine pipeline.
- New Pipeline from San Luis Rey WRF: This option considers constructing a new pipeline from San Luis Rey WRF to serve recycled water to the Central and SE areas. The new pipeline would follow the alignment of the current Oceanside Land Outfall. Major costly challenges face this supply/conveyance option, including river and highway crossings and a tunnel near the intersection of Ocean Boulevard and Mesa Drive.

The Lower San Luis Rey WRF System would encompass connecting target customers in the Central and SE areas, south of Highway 76. This system would consist of both conveyance options and would require tertiary treatment expansion at the San Luis Rey WRF, pipelines, pump stations, and operational storage to serve all the customers.

The Lower San Luis Rey WRF System also has potential to serve recycled water to Shadowridge Golf Course, located in Vista Irrigation District's service area. Shadowridge Golf Course is located east of the Ocean Hills Country Club and has onsite storage. Therefore, it could possibly be served during the day. Although Shadowridge Golf Course is not a target customer within the City, its potential demand of 200 afy during the day would make this a desirable customer to serve. Combined, the Ocean Hills Area (266 afy) and the Shadowridge Golf Course account for 466 afy (0.8 mgd MDD) of potential demand in the SE area. The Ocean Hills Area includes the target customer Ocean Hills Country Club (91 afy) and 22 additional irrigation customers (175 afy) identified in the Tetra Tech's July 2014 Ocean Hills Area Recycled Water Pipeline (Tetra Tech, 2014).

6.4 ALTERNATIVES EVALUATION

The alternatives analysis considers options that are constrained by geography, distance, existing infrastructure, and supply availability.

6.4.1 Northeast Study Area

The NE study area evaluation included the Upper San Luis Rey WRF System only. The San Luis Rey WRF has available supply to meet all long-term demands, including the Morro Hills and Arrowood developments, which would be supplied in the near-term from Camp Pendleton's SRTTP. Those developments currently have recycled water pipelines in the ground; however, they are not connected to a recycled water supply source.

The Upper San Luis Rey System, shown on Figure 6.2, would also connect another existing recycled water pipelines that are currently using potable water. West of the San Luis Rey WRF, an HOA constructed a recycled water pipeline distribution system in anticipation of recycled water use in the area. Although there are no target customers present (demands greater than 50 afy) within the HOA, the pipelines from San Luis Rey WRF were extended west to serve this area and a few customers along the route.

Approximately 62 customers were identified and deemed cost effective to connect from the San Luis Rey WRF in the NE study area. These customers have a total demand of 1,110 afy with a peak hour demand of 3,870 gpm, and they include the demands from the California Brisas HOA, Morro Hills and Arrowood developments. The Upper San Luis Rey WRF System would include approximately 12 miles of pipeline, ranging from 6 to 20-inch diameter. This system would also include a pump station at the San Luis Rey WRF and two booster pump stations along the pipeline alignment, as well as a 3.0 MG operational storage tank. The tertiary treatment expansion cost was based on sizing the facility to satisfy both the potential and existing recycled water demands. This Study assumes that the San Luis Rey WRP expansion would have flow equalization basin and would provide flow to the operational storage volume to be located at the plant. Table 6.3 shows the system's facilities and capital cost.

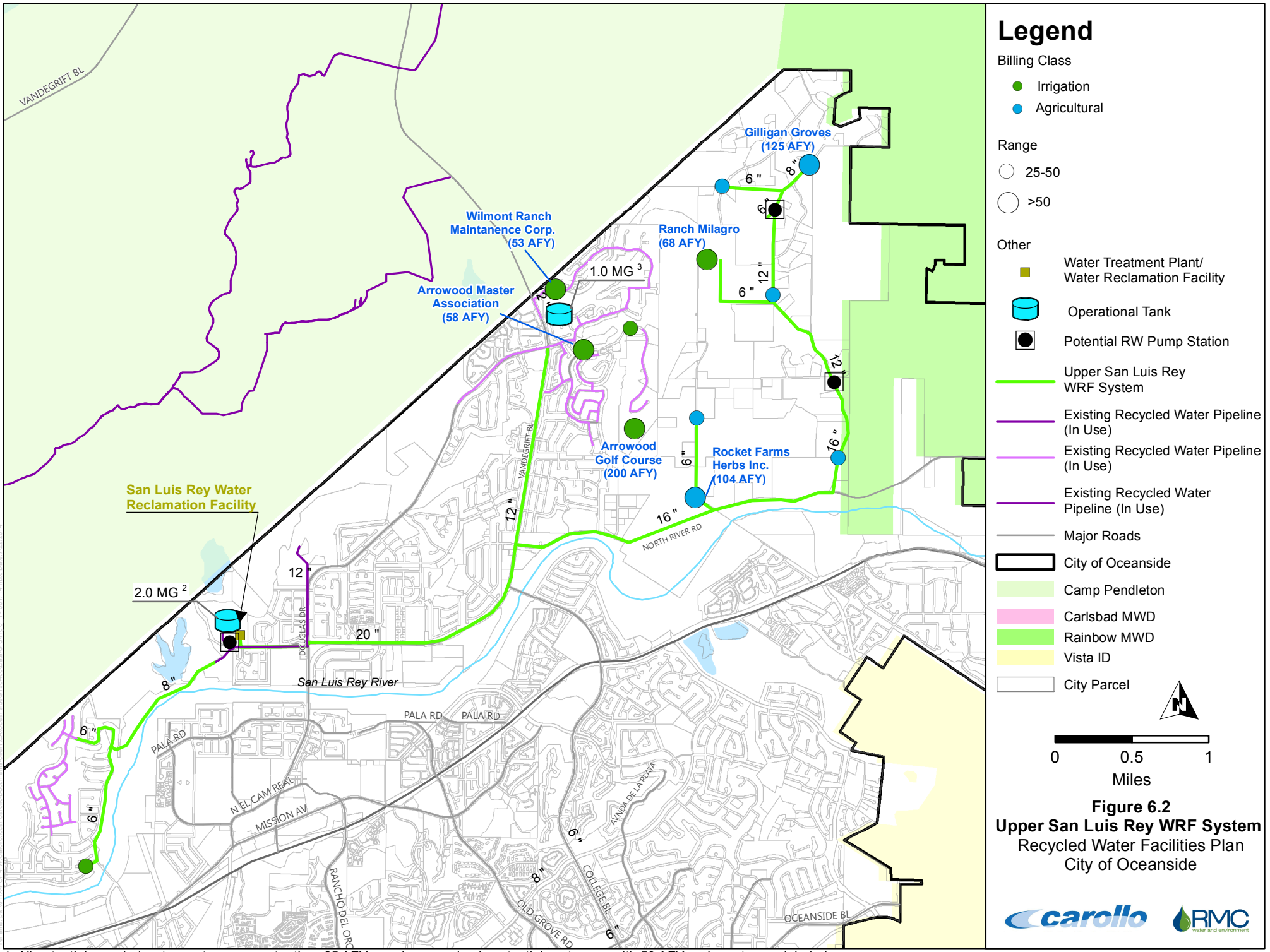


Figure 6.2
Upper San Luis Rey WRF System
Recycled Water Facilities Plan
City of Oceanside

1. All potential recycled water customers greater than 25 AFY are shown and only potential customers with 50 AFY and greater are labeled.
2. Ultimate storage may be located elsewhere in the distribution system.
3. Provided by Camp Pendleton.

Table 6.3 NE Area – Upper San Luis Rey WRF System Recycled Water Facilities Plan City of Oceanside	
System Components	**Upper San Luis Rey WRF System**
Demand (afy) [1]	1,110
Demand Maximum Month (mgd) [1]	2.0
No. of Customers [1]	62
Total Pipeline Length (mi)	12
Pump Stations	1-360 HP; 1-150 HP; 1-30 HP
Operational Storage Needed (MG)	3.0
Treatment Expansion (mgd) [2]	2.5
Capital Cost ($M)	$42.7
Unit Lifecycle Cost ($/AF) [3]	$2,100

Notes:

(1) The total demand served does not include the two existing customers currently served by San Luis Rey WRF. Demands and number of customers do include the Morro Hills and Arrowood Developments.
(2) The treatment expansion includes upgrading the existing tertiary treatment.
(3) An interest rate of 5 percent over a 50-year period was assumed to determine the unit life cycle cost.

As previously mentioned, Camp Pendleton is developing an agreement with the City to provide tertiary flows in the near-term. Due to the proximity and the availability of recycled water from Camp Pendleton's SRTTP, there are a few large recycled water customers that will benefit from this new source in the near-term. It is assumed that Camp Pendleton would incur all the costs of connecting their system to the existing distribution pipelines already installed in the Morro Hills and Arrowood areas. This would include approximately 1.3 miles (one mile within the Camp Pendleton area) of 12-inch diameter pipeline extension and a 1 million gallon operational storage tank. Any infrastructure needed to connect the above area with recycled water will be constructed by Camp Pendleton. Therefore, this near-term supply distribution system is not included in the alternative evaluation nor will the costs be developed under this Recycled Water Master Plan. However, the Upper San Luis Rey WRF System summarized in the above table includes a pipeline connection to the Morro Hills and Arrowood development areas.

To be conservative and absent a siting study, the remaining two million gallons operational storage volume location was assumed at the plant and therefore, certain downstream reaches of pipeline were sized for peak-hour demands. If a tank site is determined in the future out in the distribution system, certain distribution pipelines could have smaller diameters.

6.4.2 Northwest Study Area

Camp Pendleton's SRTTP is the closest potential source of supply for this study area. Camp Pendleton's recycled water system could be extended to replace the recycled water supply from FPUD to serve Caltrans. Since Camp Pendleton currently has excess recycled water, serving Caltrans (potential demand of 107 afy) could be beneficial for both the City and Camp Pendleton. Further conversation is needed between the City and Camp Pendleton to connect their system with the Caltrans irrigation system. This supply distribution system is not included in the alternative evaluation due to the preliminary nature of the supply discussions with Camp Pendleton.

6.4.3 Central and Southeast Study Areas

The Central and SE study area evaluation included the Lower San Luis Rey WRF System only. The San Luis Rey WRF has available supply to meet all future demands in the Central Area and the SE area (Ocean Hills Area). The Lower San Luis Rey WRF System is planned to convey recycled water to the Central and SE areas in two phases: a) a Near-Term period, which would serve the areas through the existing 10-inch diameter brine pipeline from San Luis Rey WRF; and b) a Long-Term period, which would serve the same areas through a new larger pipeline from San Luis Rey WRF, to accommodate further expansion of the system.

In order to serve the Ocean Hills Area with a potential demand of 266 afy, an alignment analysis was conducted to evaluate the connection from the existing 10-inch diameter brine pipeline to the Ocean Hills Area. The two alternative alignments evaluated are described below and are shown on Figure 6.3.

- El Camino Real Alignment: The El Camino Real Alignment would extend south on El Camino Real from the existing 10-inch diameter brine pipeline. The El Camino Alignment would head east on Vista Way. At the intersection of Vista Way at College Boulevard, the pipeline would extend south on College Boulevard and east onto Lake Boulevard to serve the Ocean Hills Area. This alignment is approximately 34,800 feet from the proposed El Corazon Recycled Water Tank.
- Rancho Del Oro Drive Alignment: The Rancho Del Oro Alignment would extend east on Oceanside Boulevard to Mesa Drive and Rancho Del Oro Drive from the existing 10-inch diameter brine pipeline. The Rancho Del Oro Alignment would then extend south on Rancho Del Oro Drive and southeast through an easement after Glacer Driver to Vista Way and College Boulevard. Similar to the El Camino Real Alignment, this alignment would then extend south on College Boulevard and east onto Lake Boulevard to serve the Ocean Hills Area. This alignment is approximately 34,600 feet from the proposed El Corazon Recycled Water Tank. This alignment would serve the El Camino Country Club Golf Course from the northeast side; however, further investigation would be needed to determine the feasibility of connecting recycled water to the golf course irrigation system from that location.

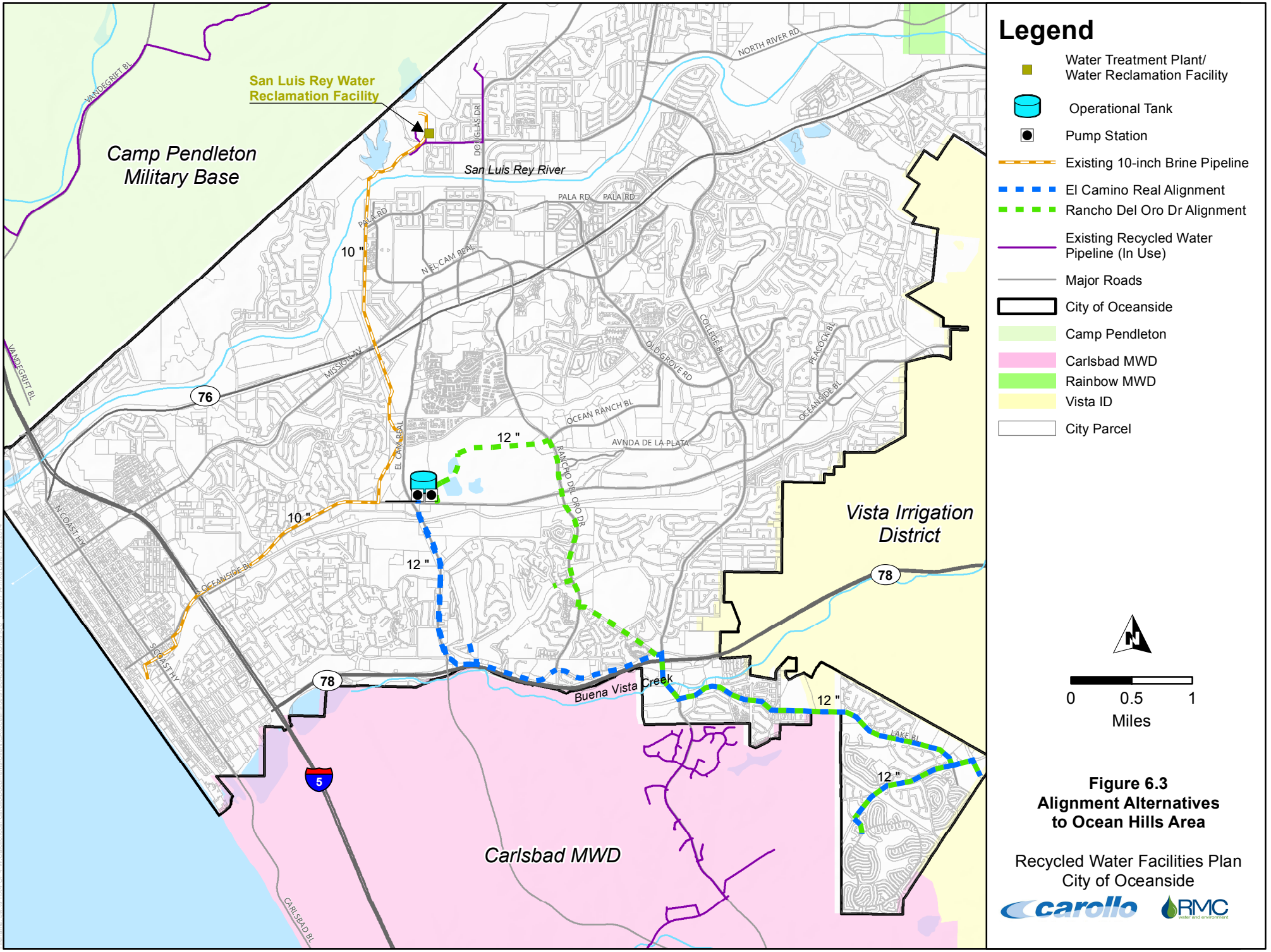


Figure 6.3
Alignment Alternatives to Ocean Hills Area

Recycled Water Facilities Plan
City of Oceanside

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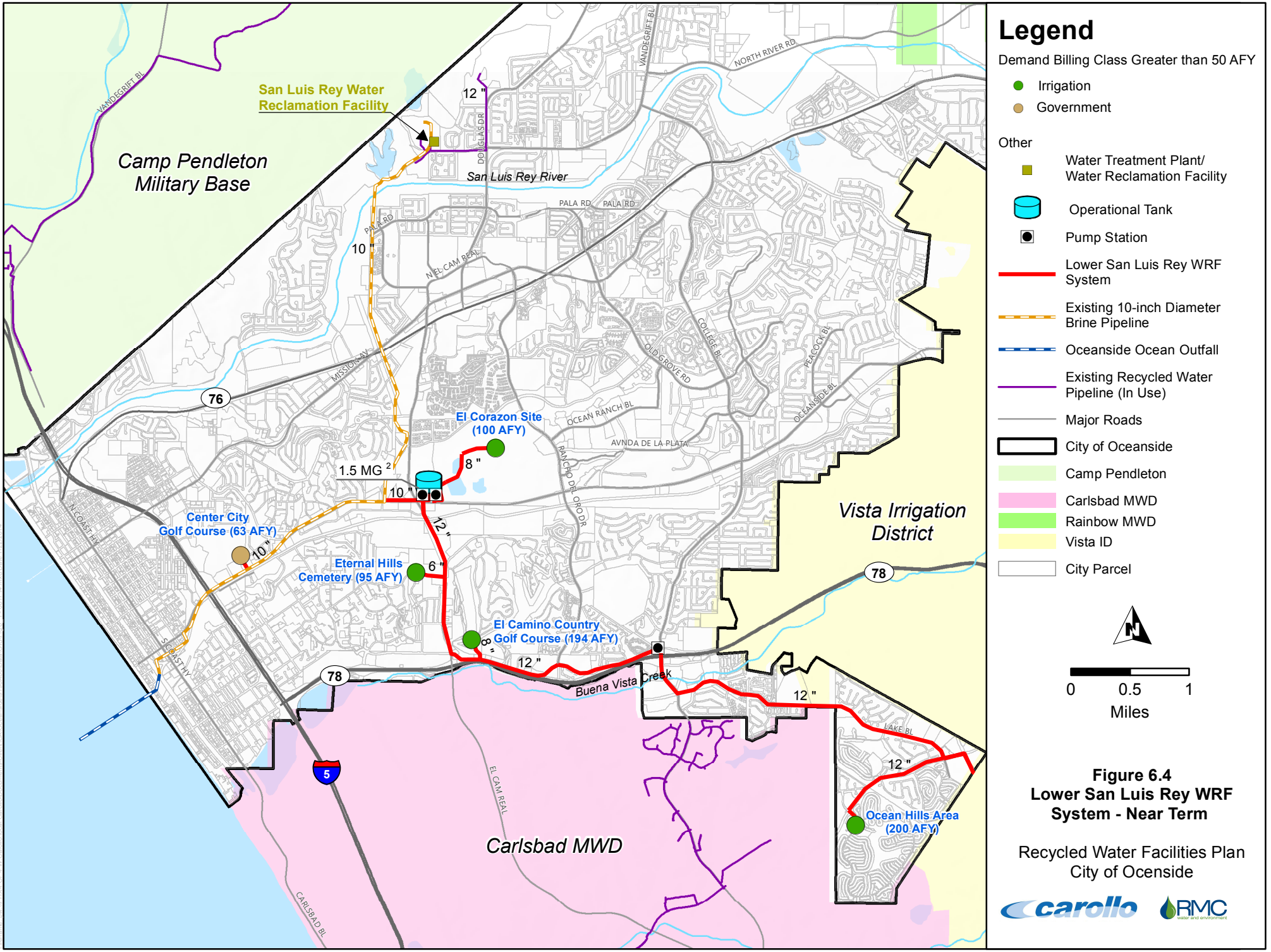
Both alternatives are very similar in length and would consist of a 12-inch diameter pipeline to serve the Ocean Hills Area with a potential demand of 266 afy. The 12-inch diameter pipeline would have capacity to serve the Shadowridge Golf Course (potential demand of 200 afy) in the future where onsite storage allows for deliveries during the day. When comparing the two alignments, the El Camino Real Alignment was preferred based on these reasons:

- This alignment facilitates the connection of recycled water to the El Camino Country Club Golf Course as the alignment passes near the entrance of the golf course where the main irrigation water meter may be located.
- This alignment has fewer potential future recycled water customers along its path. This will ensure that the 12-inch diameter, which has carrying capacity to connect the Ocean Hills Area and the Shadowridge Golf Course, would not need to be upsized for additional customers in the future. On the other hand, the Rancho Del Oro Alignment has the possibility of connecting future recycled water customers along the alignment; however, the 12-inch diameter pipeline may not have the capacity to serve additional customers beyond Shadowridge Golf Course without upsizing its diameter.
- For future buildout of the Central Area (east of the El Corazon Site), the El Camino Real Alignment would only need to upsize the pipeline from the proposed El Corazon Recycled Water Tank to the El Corazon Site. With the Rancho Del Oro Alignment, the pipeline will need to be upsized from the El Corazon Recycled Water Tank to Rancho Del Oro Drive (an additional 2,500 feet) to accommodate the increase in demands.

Based on the above alignment analysis to connect the Central and SE areas and the City's goal to serve Ocean Hills, the Lower San Luis Rey WRF System was further evaluated under the Near- and Long-term periods, independently:

- Near-Term (10-inch Diameter Brine Pipeline from San Luis Rey WRF): The existing 10-inch diameter brine concentrate pipeline would convey tertiary flow from San Luis Rey WRF to serve five customers in the Central and SE areas. These customers have a total demand of 652 afy with a day and night peak hour demand of 480 and 1,670 gpm, respectively. This includes the near-term Ocean Hills Area demand of 200 afy. The near-term system includes approximately 9 miles of pipeline ranging from 6- to 12-inch diameter to serve the five customers. The near-term system also includes a treatment expansion of 1.6 mgd, three pump stations, and 1.5 MG of operational storage at the proposed El Corazon Recycled Water Tank. This Plan assumes that the San Luis Rey WRF expansion would have a flow equalization basin. Currently, two customers discharge into the 10-inch diameter brine pipeline and they will need to be reconnected to the City's Land Outfall. This alternative cost does not include reconnecting these two brine concentrate customers to the Oceanside Land Outfall. Figure 6.4 shows the near-term Lower San Luis Rey WRF System.



Legend

Demand Billing Class Greater than 50 AFY

- Irrigation
- Government

Other

- Water Treatment Plant/ Water Reclamation Facility
- Operational Tank
- Pump Station
- Lower San Luis Rey WRF System
- Existing 10-inch Diameter Brine Pipeline
- Oceanside Ocean Outfall
- Existing Recycled Water Pipeline (In Use)
- Major Roads
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID
- City Parcel

N

0 0.5 1

Miles

Figure 6.4
Lower San Luis Rey WRF System - Near Term

Recycled Water Facilities Plan
City of Ocenside

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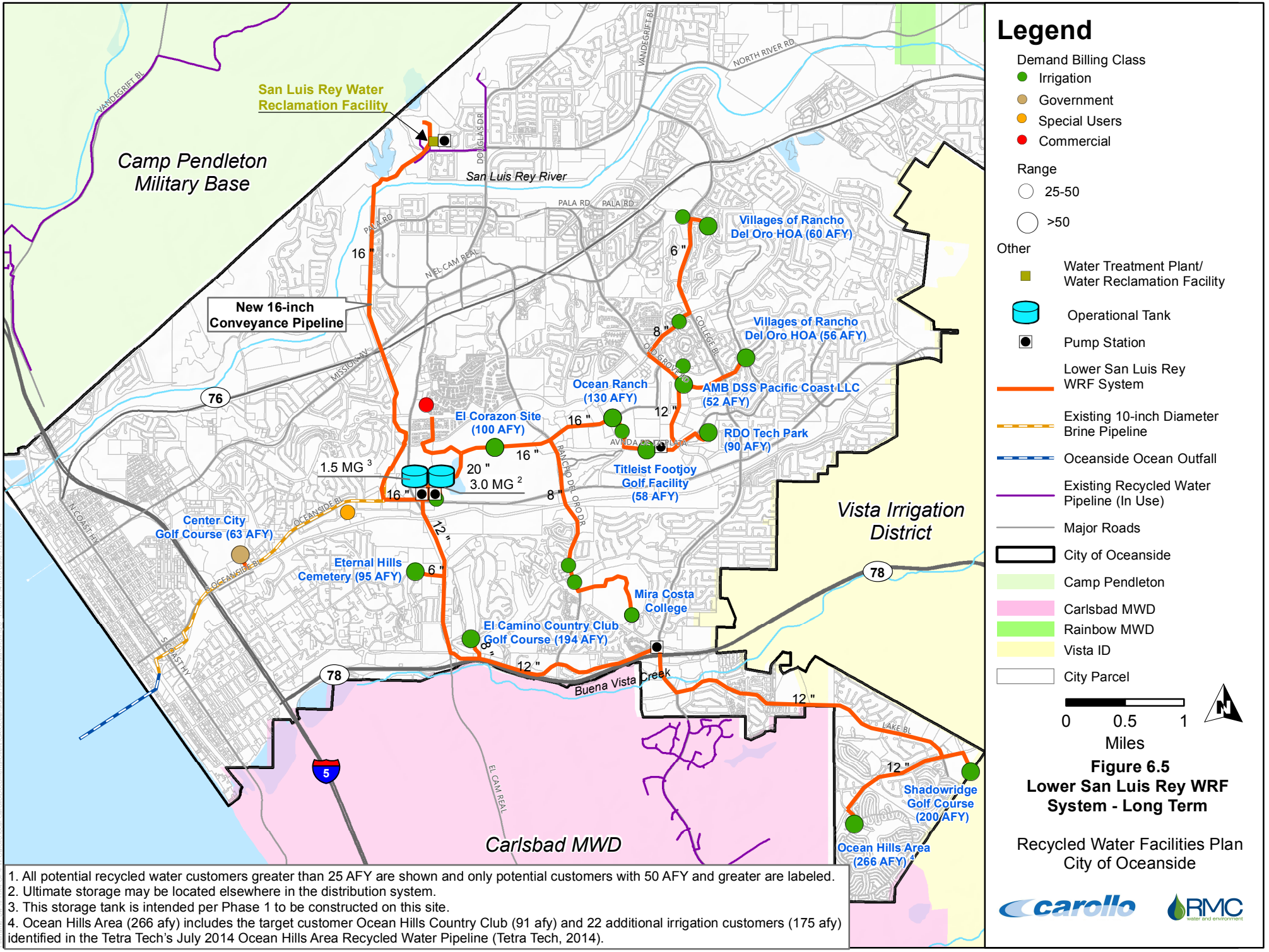
- Long-Term (New Pipeline from San Luis Rey WRF): In the long-term, the 10-inch diameter brine pipeline from the San Luis Rey WRF to the El Corazon Recycled Water Tank would need to be replaced with a 16-inch diameter pipeline to accommodate increased demands from the future expansion of the City's Central Area. The new 16-inch pipeline (19,000 linear feet) would be constructed parallel to the City's land outfall and would use the space available in an existing tunnel currently shared by the land outfall and brine line pipelines. This alignment involves a river crossing and a tunnel crossing. Approximately 83 customers were identified and deemed cost effective to connect in the long-term. These customers have a total demand of 2,040 afy with a day and night peak hour demand of 1,155 and 5,676 gpm, respectively. This includes Ocean Hills Area future demand of 266 afy and Shadowridge Golf Course demand of 200 afy. The long-term system includes approximately 23 miles of pipeline ranging from 6- to 20-inch diameter to serve the 83 customers in the Central and Southeast areas. This system includes a total expansion of 3.75 mgd at San Luis Rey WRF, one pump station at San Luis Rey WRF, two pump stations at the proposed El Corazon Recycled Water Tank, two booster pump station (one on the southeast alignment and one on the central alignment), and a 4.5 MG of total operational storage. Figure 6.5 shows the long-term Lower San Luis Rey WRF System expansion.

Table 6.4 shows a summary of the major components of each term with its associated costs.

Over a 50-year period, the near-term system would have a higher unit lifecycle cost ($2,900/af). However, as additional customers are connected and more demands are served, the unit lifecycle cost would decreases to $2,300/af with relative less infrastructure needed.

As indicated in Table 6.1, storage is sized based on maximum day demand, which is assumed to be 1.2 times the MMD. This is independent of the location of the storage tank. Due to the limited capacity in the existing 10-inch diameter brine pipeline, a more detailed storage calculation was conducted for the near-term and long-term systems to determine the volume and peak-hour demand. As shown in Appendix D, the calculated volume was 0.5 MG and 1.75 MG, which includes two feet of overboard and a foot for base, for a working storage to balance the near-term and long-term system, respectively. However, since the storage planning criteria was used for all the other systems, the proposed storage of 1.5 and a total of 4.5 MG, as indicated in Table 6.4, was used for the near-term and long-term Lower San Luis Rey WRF System, respectively.



Legend

Demand Billing Class
- Irrigation
- Government
- Special Users
- Commercial

Range
- 25-50
- >50

Other
- Water Treatment Plant/ Water Reclamation Facility
- Operational Tank
- Pump Station
- Lower San Luis Rey WRF System
- Existing 10-inch Diameter Brine Pipeline
- Oceanside Ocean Outfall
- Existing Recycled Water Pipeline (In Use)
- Major Roads
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID
- City Parcel

0 0.5 1
Miles

Figure 6.5
Lower San Luis Rey WRF System - Long Term

Recycled Water Facilities Plan
City of Oceanside

1. All potential recycled water customers greater than 25 AFY are shown and only potential customers with 50 AFY and greater are labeled.
2. Ultimate storage may be located elsewhere in the distribution system.
3. This storage tank is intended per Phase 1 to be constructed on this site.
4. Ocean Hills Area (266 afy) includes the target customer Ocean Hills Country Club (91 afy) and 22 additional irrigation customers (175 afy) identified in the Tetra Tech's July 2014 Ocean Hills Area Recycled Water Pipeline (Tetra Tech, 2014).

Table 6.4 Central and SE Areas – Lower San Luis Rey WRF System Recycled Water Facilities Plan City of Oceanside		
	Supply and Alignment Alternative	
System Components	**Near-Term**	**Long-Term [4]**
SLRWRF Supply Pipeline	Existing 10-inch Diameter Brine Pipeline	New 16-inch Diameter Pipeline
Demand (afy)	652	2,040
Demand Max Month (mgd)	1.2	3.6
No. of Customers	5	83
Total Pipeline Length (mi)	9	23
Pump Station	1-40 HP; 1-100 HP; 1-70 HP	1-460 HP; 1-130 HP; 1-90 HP; 1-60 HP; 1-330 HP
Storage Needed (MG)	1.5	4.5
Treatment Expansion (mgd)	1.6	3.75
Capital Cost ($)	$34.0	$84.1
Unit Lifecycle Cost ($/af)	$2,900	$2,300

Notes:

(1) The capital cost for the 10-inch diameter brine pipeline does not include reconnecting the two brine customers to the City's Land Outfall.
(2) The unit lifecycle cost assumes 5 percent interest rate over a 50 year period.
(3) The capital cost for the Lower San Luis Rey WRF System includes costs for a river crossing (standard cost + 50%) and for tunneling (standard cost + 200%).
(4) These values represent total demands and facilities needed to implement the long-term system.

6.5 NO-PROJECT ALTERNATIVE

Benefits of the City's recycled water program are numerous. The primary benefit of water recycling is the offset of imported water from SDCWA. Other general water recycling benefits include:

- Increases local control of supply
- Increases water supply reliability; reduces vulnerability to imported water supply restrictions
- Recycles wastewater for beneficial uses
- Lowers vulnerability to imported water risks, such as hydrologic variability, vulnerability to catastrophe, and vulnerability to climate change
- Avoids habitat impacts in watersheds of imported water supply
- Lowers energy consumption compared to imported water

- Supports “portfolio theory” of water supplies (maximize yields while also reducing variance)
- Avoids use of potable supplies for non-potable demands
- Avoids potable water distribution costs

Under a no-project alternative, potable water would continue to be provided for irrigation (and existing tertiary effluent) customers and the equivalent amount of treated wastewater would be routed to ocean disposal or used for groundwater recharge (indirect potable reuse). With this alternative, certain near-term environmental impacts from the proposed project would not occur, such as pipe installation construction impacts or commitment of resources such as pipes and building materials. However, the alternative potable water supply volume is not cost-effectively available, and the no project alternative would not achieve the long-term benefits noted above.

Since the long term benefits of the proposed project substantially outweigh the short-term impacts; and because the net impact of the no-project alternative is negative, the no-project alternative is not recommended.

6.6 ALTERNATIVE ANALYSIS EVALUATION SUMMARY

As a result of the cost-benefit analysis applied to new reaches of pipe connecting potential customers and refined alignments based on City’s input, new distribution systems were identified and developed. Hydraulic analysis was used to determine pipe diameters, determine future facilities sizing requirements, and identify new infrastructure needed to provide an adequate level of service while keeping pipe velocities and head losses in conformance with industry standards.

In the three study areas identified, the following potential recycled water systems were recommended and carried forward for further analysis in Chapter 7:

- Northeast Study Area: The Upper San Luis Rey WRF System would be expanded and serve tertiary recycled water to potential customers in the NE area of the City, including the California Brisas HOA, and the Morro Hills and Arrowood developments. In the near-term, Camp Pendleton’s SRTTP would serve tertiary recycled water to the Morro Hills and Arrowood developments. However, costs for the SRTTP system were not developed herein as an agreement is currently being developed between the City and Camp Pendleton. Identified recycled water demand to be served is 1,110 afy.
- Northwest Study Area: Camp Pendleton’s SRTTP could potentially extend their recycled water system and to replace the FPUD supply to Caltrans. It should be noted that further conversation between the City and Camp Pendleton is needed to implement this system.

- Central and Southeast Study Areas: The Lower San Luis Rey WRF System would serve tertiary recycled water to potential customers in the Central and SE areas of the City, which includes the Ocean Hills Area. In the near-term, the existing 10-inch diameter brine pipeline would convey tertiary recycled water to the Central and Ocean Hills Area. Once the 10-inch diameter brine pipeline has reached its capacity, a new 16-inch diameter pipeline would be constructed to serve additional customers in the Central and SE areas. In the near-term, two alignment alternatives to serve the SE area were evaluated and the El Camino Real alignment was chosen as the preferred alignment. Identified recycled water demand to be served in the near-term is 1,110 afy and in the long-term is 2,040 afy.

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RECOMMENDED ALTERNATIVES

This chapter presents the facilities, customers, opinion of probably costs and phasing for the recommended recycled water systems discussed in Chapter 6, including an implementation plan. A detailed phased Capital Improvement Plan (CIP) is presented in this chapter. This chapter is intended to serve as a guide for the City to expand its recycled water system and increase local supply reliability.

7.1 PROPOSED RECYCLED WATER FACILITIES

The proposed recycled water systems included in the CIP are based on the Upper and Lower San Luis Rey WRF Systems, serving the Northeast, Central and Southeast areas of the City.

For Camp Pendleton's Southern Regional Tertiary Treatment Plant (SRTTP) System in the Northeast area, infrastructure needed to serve the Morro Hills and Arrowood developments area with recycled water are assumed to be funded by Camp Pendleton based on communication with the City. Therefore, a CIP for this interim connection was not developed.

A hydraulic analysis was conducted to size pipeline alignments based on the peak hour demands, and size pump stations to serve the required pressures at the potential recycled water customer connections. The large target customers were used to develop the "backbone" for the recycled water alignment, and customers located within a reasonable distance of the backbone alignment were also incorporated as part of the recommended systems. Figure 7.1 shows the potential recycled water systems identified.

7.1.1 Upper San Luis Rey WRF System

This section describes the customers and facilities associated with the Upper San Luis Rey WRF System. This system would receive tertiary effluent from the San Luis Rey WRF and would convey it through a 20-inch diameter pipeline, parallel to the existing 10-inch diameter recycled water pipeline serving the City golf course, to recycled water customers in the northeastern area of the City. This system contains a branched network that includes pipelines ranging from 6 to 20 inches in diameter, storage tanks and two booster stations as described in the following sections. Figure 7.2 shows the customers and facilities for the Upper San Luis Rey WRF System.

7.1.1.1 Customers

The Upper San Luis Rey WRF System includes service to Arrowood Golf Course, Gilligan Groves, Rocket Farms Herbs and other agriculture and irrigation customers. The average annual and peak demands by customer that were developed in Chapter 4 are shown in Table 7.1.

Table 7.1 Upper San Luis Rey WRF System Demand Summary
Recycled Water Facilities Plan
City of Oceanside

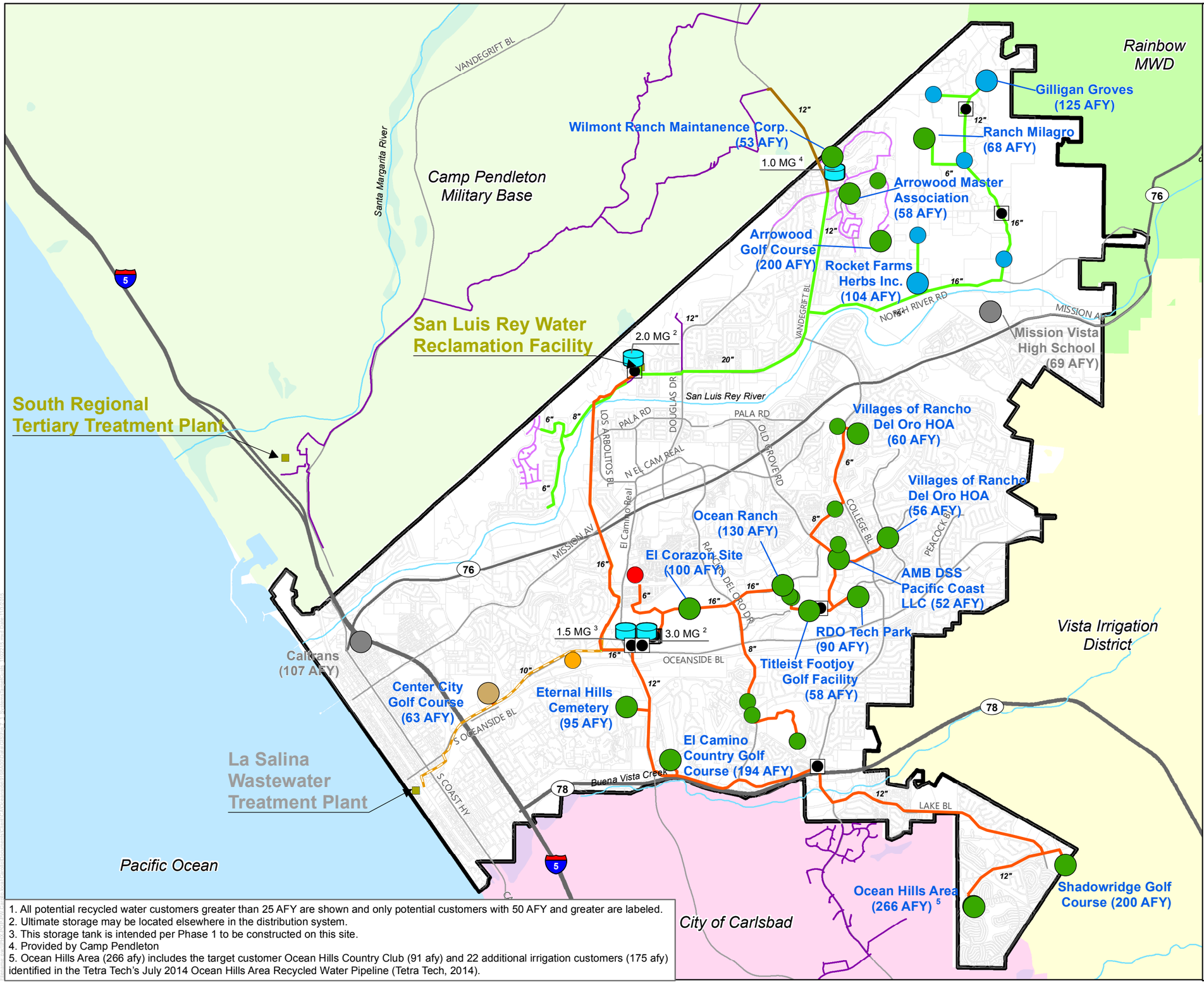
Customer Name	Average Annual Demand (afy)	Type of Use[1]	Max Day Demand (gpm)	Peak Hour Demand (gpm)
Arrowood Golf Course	200	I	248	496
Gilligan Groves	125	A-GS	155	465
Rocket Farms Herbs Inc.	104	A-CA	129	388
Rancho Milagro LLC	68	A-CA	84	251
Arrowood Master	58	I	72	216
Wilmont Ranch	53	I	66	197
Rancho Milagro LLC	49	A-CA	61	183
Armstrong Garden Center	43	A-CA	53	160
West Coast Tomato Growers	39	A-CA	49	147
Ingwersen, Jack	33	I	41	122
Rancho Milagro LLC	28	A-CA	35	104
Wanis View Estates HOA	27	I	33	99
Campbell, Richard	22	A-GS	27	81
Arrowood Master	21	I	26	78
City of Oceanside	18	I-G	22	67
DM Color Express Inc	17	A-CA	21	62
California Brisas HOA	17	I	21	62
Nagata Bros Farms Inc	16	A-RA	19	58
San Diego Auto Auction	14	I	17	52
Pacific Paradise Nursery	14	A-AS	17	52
Armstrong Garden Center	13	A-CA	15	46
Marlado - LMAD	10	I	12	36
Customers with demand of 10 AFY of less (40 customers)[2]	124	Varies	150	450
TOTAL	**1,110** [3]		**1,373**	**3,872**

Notes:

(1) A-AS: Agriculture Special Agriculture Water Rate; A-CA: Commercial Agriculture; A-GR: Grouped Agriculture/Residential; A-GS: Grouped Agriculture Special Agriculture Water Rate; A-RA: Commercial Agriculture/Residential; A-RS: Agriculture/Residential Special Agriculture Water Rate; C: Commercial; G: Government; I: Irrigation; S: Special Users

(2) These customers were selected to connect to the system based on their proximity to the backbone system. The majority of these customers are irrigation users.

(3) Rounded to the nearest tenth.



1. All potential recycled water customers greater than 25 AFY are shown and only potential customers with 50 AFY and greater are labeled.
2. Ultimate storage may be located elsewhere in the distribution system.
3. This storage tank is intended per Phase 1 to be constructed on this site.
4. Provided by Camp Pendleton
5. Ocean Hills Area (266 afy) includes the target customer Ocean Hills Country Club (91 afy) and 22 additional irrigation customers (175 afy) identified in the Tetra Tech's July 2014 Ocean Hills Area Recycled Water Pipeline (Tetra Tech, 2014).

Legend

Billing Class
- Irrigation
- Government
- Special Users
- Commercial
- Agricultural

Range
- 25-50
- >50

Potential Recycled Water Systems
- SRTTP System
- Upper San Luis Rey WRF System
- Lower San Luis Rey WRF System

Other
- Water Treatment Plant/ Water Reclamation Facility
- Operational Tank
- Potential RW Pump Station
- Existing Recycled Water Pipeline (In Use)
- Existing Recycled Water Pipeline (Inactive/Dry)
- Existing 10-inch Brine Pipeline
- Major Roads
- City of Oceanside
- Camp Pendleton
- Carlsbad MWD
- Rainbow MWD
- Vista ID
- City Parcel

0 1 2
Miles

Figure 7.1
Potential Recycled Water System Expansions
Recycled Water Facilities Plan
City of Oceanside

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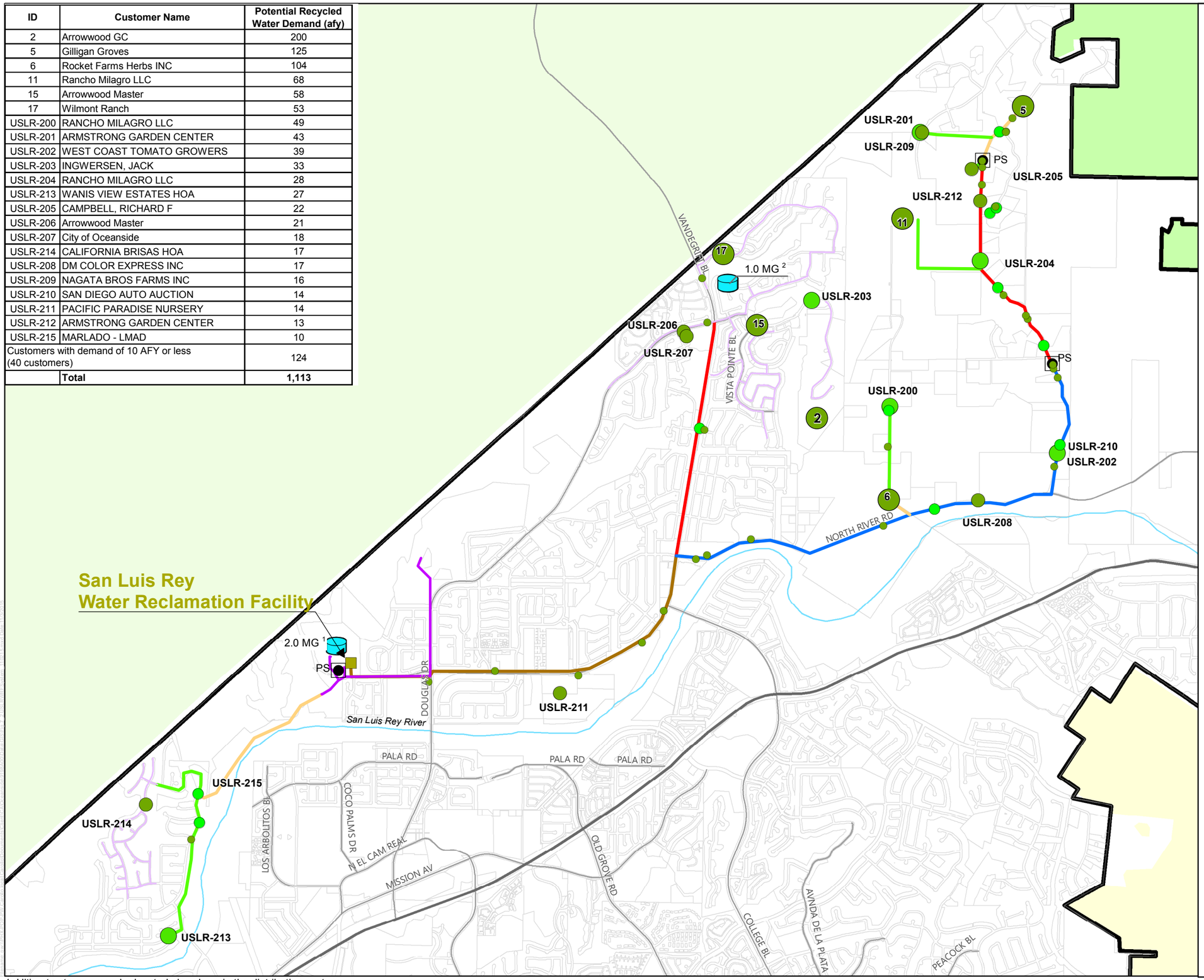
ID	Customer Name	Potential Recycled Water Demand (afy)
2	Arrowwood GC	200
5	Gilligan Groves	125
6	Rocket Farms Herbs INC	104
11	Rancho Milagro LLC	68
15	Arrowwood Master	58
17	Wilmont Ranch	53
USLR-200	RANCHO MILAGRO LLC	49
USLR-201	ARMSTRONG GARDEN CENTER	43
USLR-202	WEST COAST TOMATO GROWERS	39
USLR-203	INGWERSEN, JACK	33
USLR-204	RANCHO MILAGRO LLC	28
USLR-213	WANIS VIEW ESTATES HOA	27
USLR-205	CAMPBELL, RICHARD F	22
USLR-206	Arrowwood Master	21
USLR-207	City of Oceanside	18
USLR-214	CALIFORNIA BRISAS HOA	17
USLR-208	DM COLOR EXPRESS INC	17
USLR-209	NAGATA BROS FARMS INC	16
USLR-210	SAN DIEGO AUTO AUCTION	14
USLR-211	PACIFIC PARADISE NURSERY	14
USLR-212	ARMSTRONG GARDEN CENTER	13
USLR-215	MARLADO - LMAD	10
Customers with demand of 10 AFY or less (40 customers)		124
	Total	**1,113**



Legend

Potential Demand (AFY)

- < 5 AFY
- 5 - 10 AFY
- 10 - 25 AFY
- 25 - 50 AFY
- > 50 AFY

Potential RW Pipeline

- 6 inch.
- 8 inch.
- 12 inch.
- 16 inch.
- 20 inch.

Other

- Operational Tank
- Potential RW Pump Station
- Water Treatment Plant/ Water Reclamation Facility
- Existing Recycled Water Pipeline (In Use)
- Existing Recycled Water Pipeline (Inactive/Dry)
- Major Roads
- City Parcel

0 0.5 1
Miles

Figure 7.2
Upper San Luis Rey WRF System

Recycled Water Facilities Plan
City of Oceanside

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1. Ultimate storage may be located elsewhere in the distribution system.
2. Provided by Camp Pendleton.

7.1.1.2 Facilities

In order to serve 1,110 afy of recycled water, the San Luis Rey WRF tertiary treatment plant will need to be expanded from 0.7 mgd to 2.5 mgd. This Study assumes that the San Luis Rey WRP expansion would have a flow equalization basin and would provide flow to the operational storage volume to be located at the plant. Additionally, approximately 12 miles of new 6- to 20-inch diameter pipeline will be needed. The major facilities for the Upper San Luis Rey WRF System are shown in Table 7.2. The system is divided into three pressure zones. One major pump station is needed at the treatment plant and two booster pump stations would be needed to supply the agriculture demands in the northeastern area, which are at higher elevations.

Table 7.2 Upper San Luis Rey WRF System Facilities Summary
Recycled Water Facilities Plan
City of Oceanside

Treatment Expansion (MGD)	Pipelines		Total Storage (MG)	Pump Stations		
	Diam (in)	Length (ft)		HP	HGL	Location
2.5	6	14,100	3.0	240	355	At San Luis Rey WRF
	8	8,000		120		At San Luis Rey WRF
	12	13,300		150	635	Booster PS - At Sleeping Indian Rd & Las Tunas Dr
	16	15,500		30	730	Booster PS - At Sleeping Indian Rd (North of Las Tunas Dr)
	20	12,000				
TOTAL		**62,900**				

Notes:
HP: Horsepower; HGL: Hydraulic Grade Line

7.1.2 Lower San Luis Rey WRF System

This section describes the customers and facilities associated with the Lower San Luis Rey WRF System. This system would convey tertiary recycled water from San Luis Rey WRF to serve potential customers identified in the Central and Southeast areas. This is a branched network system that includes pipelines ranging from 6 to 20 inches in diameter, storage tanks, and five pump stations as described in the following sections. Figure 7.3 shows the customers and facilities for the Lower San Luis Rey WRF System.

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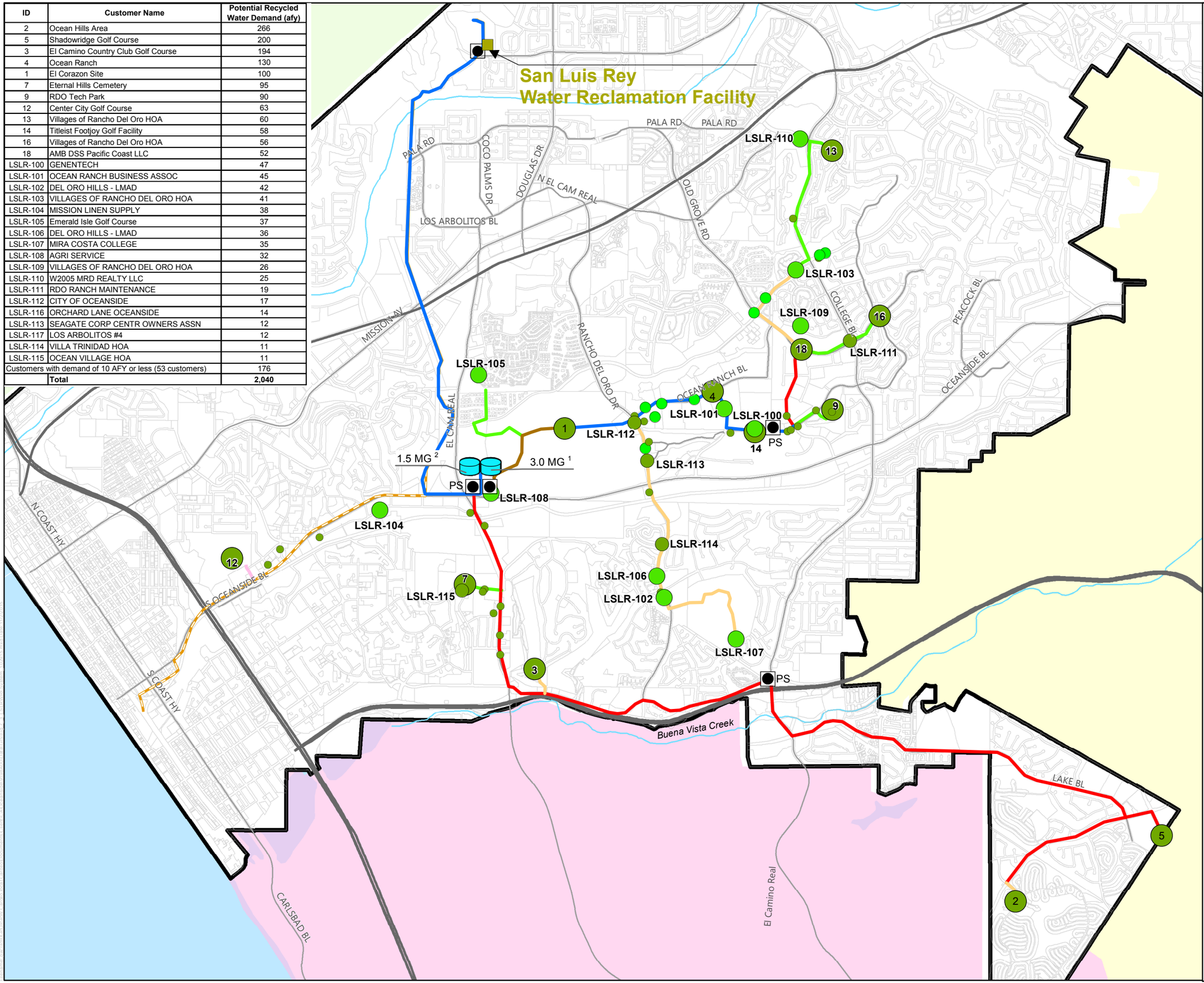
ID	Customer Name	Potential Recycled Water Demand (afy)
2	Ocean Hills Area	266
5	Shadowridge Golf Course	200
3	El Camino Country Club Golf Course	194
4	Ocean Ranch	130
1	El Corazon Site	100
7	Eternal Hills Cemetery	95
9	RDO Tech Park	90
12	Center City Golf Course	63
13	Villages of Rancho Del Oro HOA	60
14	Titleist Footjoy Golf Facility	58
16	Villages of Rancho Del Oro HOA	56
18	AMB DSS Pacific Coast LLC	52
LSLR-100	GENENTECH	47
LSLR-101	OCEAN RANCH BUSINESS ASSOC	45
LSLR-102	DEL ORO HILLS - LMAD	42
LSLR-103	VILLAGES OF RANCHO DEL ORO HOA	41
LSLR-104	MISSION LINEN SUPPLY	38
LSLR-105	Emerald Isle Golf Course	37
LSLR-106	DEL ORO HILLS - LMAD	36
LSLR-107	MIRA COSTA COLLEGE	35
LSLR-108	AGRI SERVICE	32
LSLR-109	VILLAGES OF RANCHO DEL ORO HOA	26
LSLR-110	W2005 MRD REALTY LLC	25
LSLR-111	RDO RANCH MAINTENANCE	19
LSLR-112	CITY OF OCEANSIDE	17
LSLR-116	ORCHARD LANE OCEANSIDE	14
LSLR-113	SEAGATE CORP CENTR OWNERS ASSN	12
LSLR-117	LOS ARBOLITOS #4	12
LSLR-114	VILLA TRINIDAD HOA	11
LSLR-115	OCEAN VILLAGE HOA	11
Customers with demand of 10 AFY or less (53 customers)		176
	Total	**2,040**



Legend

Potential Demand (AFY)

- < 5 AFY
- 5 - 10 AFY
- 10 - 25 AFY
- 25 - 50 AFY
- > 50 AFY

Potential RW Pipeline

- 6 inch.
- 8 inch.
- 10 inch.
- 12 inch.
- 16 inch.
- 20 inch.

Other

- Operational Tank
- Pump Station
- Water Treatment Plant/ Water Reclamation Facility
- Major Roads
- City Parcel

0 0.5 1
Miles

Figure 7.3
Lower San Luis Rey WRF System (Long-Term)

Recycled Water Facilities Plan
City of Oceanside

1. Ultimate storage may be located elsewhere in the distribution system.
2. This storage tank is intended per Phase 1 to be constructed on this site.

7.1.2.1 Customers

The Lower San Luis Rey WRF System includes service to El Corazon Site, El Camino Country Club Golf, Ocean Ranch Future Development, Ocean Hills Area and other irrigation customers. The average annual and peak demands by customers are shown in Table 7.3. The El Camino Country Club Golf Course has four ponds and, therefore, can received recycled water during the day.

Table 7.3 Lower San Luis Rey WRF System Demand Summary
Recycled Water Facilities Plan
City of Oceanside

Customer Name	Average Annual Demand (AFY)	Type of Use [1]	Max Day Demand (mgd)	Peak Hour Demand Day (gpm)	Peak Hour Demand Night (gpm)
Ocean Hills Area [2]	266	I	330	--	989
Shadowridge Golf Course [3]	200	I	248	496	--
El Camino Country Club Golf Course	194	I	241	481	--
Future 3 - Ocean Ranch	130	I	161	--	484
El Corazon Site	100	I	124	--	372
Eternal Hills Cemetery	95	I	118	--	354
RDO Tech Park	90	I	112	--	336
Center City Golf Course	63	G	67	--	200
Villages of Rancho Del Oro HOA	60	I	74	--	222
Titleist Footjoy Golf Facility	58	I	72	--	217
Villages of Rancho Del Oro HOA	56	I	70	--	209
AMB DSS Pacific Coast LLC	52	I	64	--	193
Genentech	47	S	50	99	--
Ocean Ranch Business Assoc.	45	I	56	--	168
Del Oro Hills – LMAD	42	I	44	--	132
Villages of Rancho Del Oro HOA	41	I	51	--	153
Mission Linen Supply	38	S	40	79	--
Emerald Isle Golf Course	37	C	38	--	115
Del Oro hills - lmad	36	I	38	--	114
Mira Costa College	35	I	43	--	130
Agri Service	32	I	40	--	121
Villages of Rancho Del Oro HOA	26	I	32	--	97
W2005 MRD Realty LLC	25	I	31	--	94
RDO Ranch Maintenance	19	I	24	--	72
City of Oceanside	17	I-G	18	--	53
Orchard Lane Oceanside	14	I	18	--	53

Table 7.3 Lower San Luis Rey WRF System Demand Summary Recycled Water Facilities Plan City of Oceanside					
Customer Name	**Average Annual Demand (AFY)**	**Type of Use [1]**	**Max Day Demand (mgd)**	**Peak Hour Demand Day (gpm)**	**Peak Hour Demand Night (gpm)**
Seagate Corp Center Owners Assn.	12	I	15	--	46
Los Arbolitos #4	12	I	15	--	46
Villa Trinidad HOA	11	I	14	--	42
Ocean Village HOA	11	I	14	--	41
Customers with demand of 10 AFY of less (53 customers) [4]	176	Varies	208	--	623
TOTAL	**2,040**		**2,469**	**1,155**	**5,676**

Notes:

(1) A-AS: Agriculture Special Agriculture Water Rate; A-CA: Commercial Agriculture; A-GR: Grouped Agriculture/Residential; A-GS: Grouped Agriculture Special Agriculture Water Rate; A-RA: Commercial Agriculture/Residential; A-RS: Agriculture/Residential Special Agriculture Water Rate; C: Commercial; G: Government; I: Irrigation; S: Special Users

(2) The Ocean Hills Area includes the target customer Ocean Hills Country Club (91 afy) and 22 additional irrigation customers (175 afy) identified in the Tetra Tech's July 2014 Ocean Hills Area Recycled Water Pipeline (Tetra Tech, 2014).

(3) Shadowridge Golf Course is located in Vista Irrigation District's service system (east of Ocean Hills Area) and is not part of the City's service area. Shadowridge Golf Course has storage onsite and can receive recycled water during the day.

(4) These customers were selected to connect to the system based on their proximity to the backbone system. The majority of these customers are irrigation users.

As discussed in Chapter 6, the recycled water pipeline to the Ocean Hills area could be used to provide service to the Shadowridge Golf Course at an estimated 200 afy. Shadowridge Golf Course has storage onsite and can receive recycled water during the day. Therefore, is it not necessary to increase the pipeline size to accommodate the Shadowridge Golf Course.

7.1.2.2 Facilities

In order to serve 2,040 AFY of recycled water, the San Luis Rey WRF tertiary treatment will need to be expanded by 3.75 mgd[1]. Additionally, approximately 23 miles of 6- to 20-inch diameter pipeline will be needed. The major facilities for the Lower San Luis Rey WRF System are shown in Table 7.4. The system is divided into five pressure zones. Two separate pump stations are needed at the El Corazon Recycled Water Tank, which is assumed to be the site location for both the near and long-terms operational storage volumes. One pump station would serve the demands in the southeast area and a separate pump station would serve the customers to east of the tank.

Table 7.4 Lower San Luis Rey WRF System Facilities Summary

[1] The total capacity of the tertiary treatment plant will be 6.25 mgd, which includes 2.5 mgd and 3.75 from the Upper and Lower San Luis Rey WRF systems, respectively.

Recycled Water Facilities Plan City of Oceanside						
Treatment Expansion (MGD)	**Pipelines**		**Total Storage (MG)**	**Pump Stations (HP) [1]**		
	Diam (in)	**Length (ft)**		**HP**	**HGL**	**Location**
3.75	6	16,420	4.5	330	300	At San Luis Rey WRF
				130	410	At El Corazon Tank for South System
	8	17,190		90	585	Booster PS near Vista Way and College Boulevard
	10	4,660		460	500	At El Corazon Tank for East System
	12	44,810		60	560	Booster PS at Avenidas Del Oro & De La Plata
	16	32,120				
	20	4,950				
TOTAL		**120,150**				

Notes:

HP: Horsepower; HGL: Hydraulic Grade Line

1. The exact location of the booster pump stations has not been determined. The anticipated site may require land acquisition and other operational needs beyond the scope of this Recycled Water Facilities Plan.

Due to the topography in the eastern area, and in addition to the proposed facilities, some customers will need individual booster pump stations and others will need individual pressure reducing stations in order to receive adequate service pressure for their individual recycled water use.

7.2 CAPITAL IMPROVEMENT PROJECT COSTS

As mentioned in Section 6.1.5, the cost estimates presented in this study are opinions developed from bid tabulations, cost curves, information obtained from previous studies, and Carollo Engineers, Inc. experience on other projects. The costs are based on an Engineering News Record Construction Cost Index (ENR CCI) 10,756 (Los Angeles, December 2014).

7.2.1 CONSTRUCTION UNIT COSTS

The construction costs are representative of recycled water system facilities under normal construction conditions and schedules. Costs have been estimated for public works construction.

7.2.1.1 Pipeline Unit Costs

New recycled water pipelines range in size from 6-inches to 20-inches in diameter in this Recycled Water Facilities Plan (Plan). Unit costs for the construction of pipelines are shown in Table 7.5. The construction cost estimates are based upon these unit costs. The unit costs are for "typical" field conditions with construction instable soil at a depth ranging between 10 feet to 15 feet.

Table 7.5 Unit Construction Costs - Pipelines
Recycled Water Facilities Plan
City of Oceanside

Pipe Size (inches)	Unit Construction Cost[(1)] ($/LF)
4"	$105
6"	$160
8"	$170
10"	$210
12"	$220
16"	$295
18"	$330
20"	$370
24"	$420
30"	$440
36"	$525
42"	$630
48"	$695

Note:
(1) Costs are based on ENR CCI 10,756 (Los Angeles, December 2014)

7.2.1.2 Pump Station Unit Costs

This Plan includes new pump stations to serve recycled water throughout the Study Area. Costs were generated by inputting the appropriate capacity and calculating the corresponding construction costs. Unit costs are shown in Table 7.6.

Table 7.6 Unit Construction Costs – Pump Stations
Recycled Water Facilities Plan
City of Oceanside

Station Size (HP)	Unit Construction Cost ($/HP)
100 hp	$5,000
200 – 300 hp	$4,000
350- 650 hp	$3,000
700 – 1,000 hp	$2,000
Backup Power Generator	$250,000 per PS

7.2.1.3 Storage Reservoirs Unit Costs

Operational storage for this Plan is needed to supply peak hour demands. Unit costs are shown in Table 7.7.

Table 7.7 Unit Construction Costs – Reservoir Storage
Recycled Water Facilities Plan
City of Oceanside

Volume (MG)	Unit Construction Cost ($/MG)
<1	$2.00
1 to 3	$1.50
3 to 5	$1.25
5 to 10	$1.00

7.2.1.4 Treatment Unit Costs

For this Plan, tertiary treatment cost at San Luis Rey WRF is estimated at $2.00 per gallon of treatment capacity needed. The estimated cost was obtained from the City.

7.2.2 PROJECT COSTS AND CONTINGENCIES

Project cost estimates are calculated based on elements, such as the project location, size, length, land acquisition needs, and other factors. Allowances for project contingencies consistent with an "Order of Magnitude" estimate are also included in the project costs prepared as part of this study, as outlined in this section.

7.2.2.1 Baseline Construction Cost

This is the total estimated construction cost, in dollars, of the proposed improvement projects. Baseline construction costs were calculated by multiplying the estimated number of units by the unit cost, such as length of pipeline times the average cost per lineal foot of pipeline. The majority of unit construction cost used for this Plan are presented in Section 7.2.1.

7.2.2.2 Estimated Construction Cost

Contingency costs must be reviewed on a case-by-case basis because they will vary considerably with each project. Consequently, it is appropriate to allow for uncertainties associated with the preliminary layout of a project. Unexpected construction conditions, the need for unforeseen mechanical items, and variations in final quantities are a few of the factors that can increase project costs and for which it is wise to make allowances in preliminary estimates. To assist the City in making financial decisions for these future construction projects, contingency costs will be added to the planning budget as percentages of the total construction cost, divided into two categories: Estimated Construction Cost and Capital Improvement Cost.

Since knowledge about site-specific conditions of each proposed project is limited at the master planning stage, a 30 percent contingency was applied to the Baseline Construction Cost to account for unforeseen events and unknown conditions. This contingency accounts for unknown site conditions such as poor soils, unforeseen conditions, environmental mitigations, and other unknowns and is typical for master planning projects. The Estimated Construction Cost for the proposed water system improvement consists of the Baseline Construction Cost plus the 30 percent construction contingency.

7.2.2.3 Capital Improvement Cost

Other project construction contingency costs include costs associated with project engineering, construction phase professional services, and project administration. Engineering services associated with new facilities include preliminary investigations and reports, Right of Way (ROW) acquisition, foundation explorations, preparation of drawings

and specifications during construction, surveying and staking, sampling of testing material, and start-up services. Construction phase professional services cover such items as construction management, engineering services, materials testing, and inspection during construction. Finally, there are project administration costs, which cover such items as legal fees, environmental/California Environmental Quality Act (CEQA) compliance requirements, financing expenses, administrative costs, and interest during construction.

The cost of these items can vary, but for the purpose of this study, it is assumed that the other project contingency costs will equal approximately 27.5 percent of the Estimated Construction Cost.

As shown in the following sample calculation of the capital improvement cost, the total cost of all project construction contingencies (construction, engineering services, construction management, and project administration) is 65.8 percent of the baseline construction cost. Calculation of the 65.8 percent is the overall mark-up on the baseline construction cost to arrive at the capital improvement cost. It is not an additional contingency.

Example:

Baseline Construction Cost	**$1,000,000**
Construction Contingency (30%)	$300,000
Estimated Construction Cost	**$1,300,000**
Engineering Cost (10%)	130,000
Construction Management (10%)	130,000
Project Administration (7.5%)	$97,500
Capital Improvement Cost	**$1,657,500**

7.3 PROJECT IMPLEMENTATION

Each system was refined into phases, and probable costs for each phase were developed. An implementation plan also was developed.

7.3.1 Upper San Luis Rey WRF System Phasing and Costs

The implementation of the Upper San Luis Rey WRF System was divided into three phases:

- Phase 1: The first phase would consist of the tertiary treatment expansion (0.5 mgd), operational storage (1 MG) and a tertiary pump station (240 HP) at the San Luis Rey WRF.
- Phase 2: The second phase would consist of pipelines from the San Luis Rey WRF to the most northern area, and also to the western area to connect the inactive recycled water pipelines already in place. Two booster pump stations (150 HP and 30 HP) are needed along the distribution system to serve the northeast area. A storage tank (1 MG) would also be implemented in this phase. The exact location of the booster pump

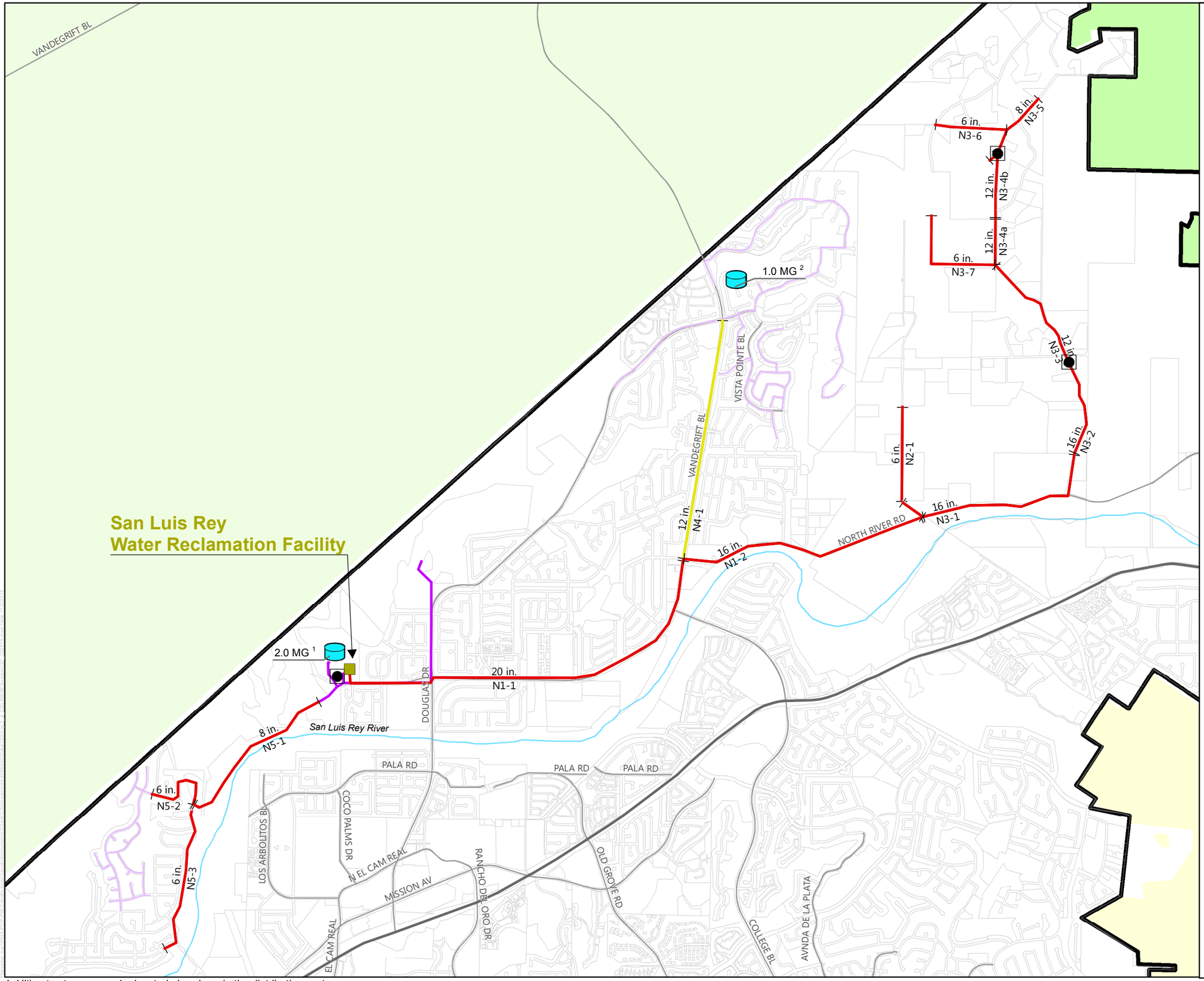
stations have not been determined. The anticipated site may require land acquisition and other operational needs beyond the scope of this Plan.

- Phase 3: The third phase would replace (if needed) the recycled water supply from Camp Pendleton's SRTTP and would consist of connecting to the existing recycled water pipelines near Arrowood Golf Course. An additional pump station (120 HP) would be needed at San Luis Rey WRF to serve Arrowood Golf Course.

Figure 7.4 shows Phases 2 and 3 of the Upper San Luis Rey WRF System with the pipeline diameters and target customer IDs. Phase 1 facilities are located at the San Luis Rey WRF. Individual capital costs for all the facilities associated with this system are presented in Table 7.8. This table identifies the necessary facilities sizes and capital improvement costs needed for the Upper San Luis Rey WRF System. The phases and implementation timeframe was based on the City's input.

The Upper San Luis Rey WRF System cost is itemized by phase in Table 7.8, which is summarized by facility type and planning phase in Table 7.9. As shown in Table 7.9, the total estimated CIP cost is $42.7 million and would offset 1,110 afy of potable water demand. Based a 50-year period and 5 percent interest, the unit lifecycle of the San Luis Rey WRF System is $2,100/af.

As shown in Table 7.9, pipeline projects account for the majority of future costs, which equate to approximately $25.8 million or 60 percent of the projected CIP cost. Treatment costs account for approximately $8.3 million or 20 percent of the projected CIP cost. The remaining $8.6 million or 20 percent of the proposed CIP is comprised of pump stations and storage reservoirs.



Legend

Potential RW Pipeline by Phase

- Phase 2
- Phase 3

Other

- Operational Tank; Tank
- Potential RW Pump Station
- Water Treatment Plant/ Water Reclamation Facility
- Existing Recycled Water Pipeline (In Use)
- Existing Recycled Water Pipeline (Inactive/Dry)
- City Parcel
- Major Roads

0 0.5 1
Miles

Figure 7.4
Upper San Luis Rey WRF System
Capital Improvement Program

Recycled Water Facilities Plan
City of Oceanside

carollo RMC water and environment

1. Ultimate storage may be located elsewhere in the distribution system.
2. Provided by Camp Pendleton.

Table 7.8 **Upper San Luis Rey WRF System Capital Improvement Program**
Recycled Water Facilities Plan
City of Oceanside

Improv. ID	Type of Improvement	Description/ Street	Pipeline Lengths/Size and Cost: New Size/ Diam. (in)	Length (ft)	Unit Cost ($)	Baseline Construction Cost ($)	Capital Improvement Cost[1],[2] ($)	Capital Improvement Phasing: Phase 1 2016-2020 ($)	Phase 2 2021-2025 ($)	Phase 3 2026-2030 ($)	Phase 4 2031-2035 ($)	Phase 5 2036-2040 ($)
Future System Improvements												
Pipelines												
N1-1	Pipe	From SLR WRF on N. River Road curving into Vandegrift Blvd	20	12,000	$ 370	$ 4,440,000	$ 7,359,000	$ -	$ 7,359,000	$ -	$ -	$ -
N1-2	Pipe	From the end of the 20" pipe on Vandegrift Blvd and N. River Rd.; along N. River Rd. to the 8" pipe on Wilshire Rd.	16	7,000	$ 295	$ 2,065,000	$ 3,423,000	$ -	$ 3,423,000	$ -	$ -	$ -
N1-3	Pipe	On Wilshire Rd from N. River Rd. until intersection with 6" pipe	8	800	$ 170	$ 136,000	$ 225,000	$ -	$ 225,000	$ -	$ -	$ -
N2-1	Pipe	From 8" pipe on Wilshire Rd.	6	2,700	$ 160	$ 432,000	$ 716,000	$ -	$ 716,000	$ -	$ -	$ -
N3-1	Pipe	On N. River Rd. between Wilshire Rd. and Sleeping Indian Rd.; along Sleeping Indian Rd	16	2,000	$ 295	$ 590,000	$ 978,000	$ -	$ 978,000	$ -	$ -	$ -
N3-2	Pipe	On Sleeping Indian Rd. to potential RW pump station	16	6,500	$ 295	$ 1,918,000	$ 3,179,000	$ -	$ 3,179,000	$ -	$ -	$ -
N3-3	Pipe	From 16" pipe on Sleeping Indian Rd. to 6" and 12" pipes cross section	12	3,300	$ 220	$ 726,000	$ 1,203,000	$ -	$ 1,203,000	$ -	$ -	$ -
N3-6	Pipe	Intersects Sleeping Indian Rd. from potential RW pump station extends southwest; along Sleeping Indian Rd before 8" pipe; west of Sleeping Indian Rd. until intersection with Wilshire Rd.	6	2,090	$ 160	$ 334,000	$ 554,000	$ -	$ 554,000	$ -	$ -	$ -
N3-7	Pipe	From 12" pipe on Sleeping Indian Rd along unnamed rd ending parallel to Wilshire Rd in agricultural fields	6	2,640	$ 160	$ 422,000	$ 699,000	$ -	$ 699,000	$ -	$ -	$ -
N3-4a	Pipe	Along Sleeping Indian Rd. from 12" and 6" pipes cross section; south of Morro Heights Rd.	12	1,300	$ 220	$ 286,000	$ 474,000	$ -	$ 474,000	$ -	$ -	$ -
N3-4b	Pipe	Along Sleeping Indian Rd.; south of potential RW pump station; passes Morro Heights Rd.	12	1,800	$ 220	$ 396,000	$ 656,000	$ -	$ 656,000	$ -	$ -	$ -
N3-5	Pipe	From 6" pipe on Sleeping Indian Rd.; ending north of Morro Heights Rd.	8	2,300	$ 170	$ 391,000	$ 648,000	$ -	$ 648,000	$ -	$ -	$ -
N4-1	Pipe	Along Vandegrift Bl. from 20" pipe until Douglas Dr.	12	6,900	$ 220	$ 1,518,000	$ 2,516,000	$ -	$ -	$ 2,516,000	$ -	$ -
N5-1	Pipe	From the existing 24" pipe at Whelan Lake to Rivertree Dr., near Ashwood Ct.	8	4,900	$ 170	$ 833,000	$ 1,381,000	$ -	$ 1,381,000	$ -	$ -	$ -
N5-2	Pipe	Along Rivertree Dr., from Ashwood Ct. to Shadow Tree Dr.	6	2,170	$ 160	$ 347,000	$ 575,000	$ -	$ 575,000	$ -	$ -	$ -
N5-2	Pipe	South on Rivertree Dr., south on Foussat Rd. and east on Benet Rd.	6	4,500	$ 160	$ 720,000	$ 1,193,000	$ -	$ 1,193,000	$ -	$ -	$ -
Subtotal				**62,900**		**$ 15,554,000**	**$ 25,779,000**	**$ -**	**$ 23,263,000**	**$ 2,516,000**	**$ -**	**$ -**
Storage Tanks												
Storage Tank - P1	Storage Tank [3, 6]		1.0 MG	-	$ 1.50	$ 1,500,000	$ 2,486,000	$ 2,486,000	$ -	$ -	$ -	$ -
Storage Tank - P2	Storage Tank [3, 6]		1.0 MG	-	$ 1.50	$ 1,500,000	$ 2,486,000	$ -	$ 2,486,000	$ -	$ -	$ -
Storage Tank - P3	Storage Tank [3]	Camp Pendleton (no cost to City)	1.0 MG	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subtotal						**$ 3,000,000**	**$ 4,972,000**	**$ 2,486,000**	**$ 2,486,000**	**$ -**	**$ -**	**$ -**
Pump Stations												
PS-SLR-Ph1	Pump Station	PS @ SLRWRP for Phases 1 & 2	1	240	$ 4,000	$ 960,000	$ 1,591,000	$ 1,591,000	$ -	$ -	$ -	$ -
PS-SLR-Ph3	Pump Station	PS @ SLRWRP for Phase 3	1	120	$ 4,000	$ 480,000	$ 796,000	$ -	$ -	$ 796,000	$ -	$ -
BPS-SLR-Ph2-1	Pump Station	Booster PS @ Sleeping Indian Rd & Las Tunas Dr	1	150	$ 4,000	$ 600,000	$ 995,000	$ -	$ 995,000	$ -	$ -	$ -
BPS-SLR-Ph2-2	Pump Station	Booster PS @ Sleeping Indian Rd	1	30	$ 5,000	$ 150,000	$ 249,000	$ -	$ 249,000	$ -	$ -	$ -
Subtotal						**$ 2,190,000**	**$ 3,631,000**	**$ 1,591,000**	**$ 1,244,000**	**$ 796,000**	**$ -**	**$ -**
Treatment												
Expansion - P1	Treatment Plant Expansion (secondary to tertiary)		0.50 MGD	-	$ 2.00	$ 1,000,000	$ 1,658,000	$ 1,658,000	$ -	$ -	$ -	$ -
Expansion - P2	Treatment Plant Expansion (secondary to tertiary)		1.00 MGD	-	$ 2.00	$ 2,000,000	$ 3,315,000	$ -	$ 3,315,000	$ -	$ -	$ -
Expansion - P3	Treatment Plant Expansion (secondary to tertiary)		1.00 MGD	-	$ 2.00	$ 2,000,000	$ 3,315,000	$ -	$ -	$ 3,315,000	$ -	$ -
Subtotal						**$ 5,000,000**	**$ 8,288,000**	**$ 1,658,000**	**$ 3,315,000**	**$ 3,315,000**	**$ -**	**$ -**
CIP Total (Future)						**$ 25,744,000**	**$ 42,670,000**	**$ 5,735,000**	**$ 30,308,000**	**$ 6,627,000**	**$ -**	**$ -**

Notes:

1. Baseline Construction Cost plus 30% to account for unforeseen events and unknown conditions.
2. Estimated Construction Cost plus 10% for Engineering, 10% for Construction Management, and 7.5% for Environmental and Legal.
3. Final location of storage tanks to be determined.
4. Land acquisition costs was not included for the treatment, storage tank, booster pumps, and pipelines.
5. Costs are based on the Engineering News Record Construction Cost Index - Greater Los Angeles of 10756 (December 2014).
6. To be conservative and absent a siting study, the two million gallons operational storage volume location was assumed at the plant and therefore, certain downstream reaches of pipeline were sized for peak-hour demands. If a tank site is determined in the future out in the distribution system, certain distribution pipelines could have smaller diameters.

Table 7.9 Upper San Luis Rey WRF System CIP Summary Recycled Water Facilities Plan City of Oceanside					
	Implementation Phase				
Facility Category	**2015-2020 ($ Million)**	**2021-2025 ($ Million)**	**2026-2030 ($ Million)**	**Total ($ Million)**	**Percentage (%)**
Pipeline	--	$ 23.3	$ 2.5	**$ 25.8**	60%
Pump Station	$ 1.6	$ 1.2	$ 0.8	**$ 3.6**	8%
Storage	$ 2.5	$ 2.5	--	**$ 5.0**	12%
Treatment Plant	$ 1.7	$ 3.3	$ 3.3	**$ 8.3**	20%
Total	**$ 5.8**	**$ 30.3**	**$ 6.6**	**$ 42.7**	**100%**
Demand (afy)	0	720	390	**1,110**	
Cumulative Demand (afy)	**0**	**720**	**1,110**		

Note:
(1) Costs are based on ENR CCI 10,756 (Los Angeles, December 2014).

7.3.2 Lower San Luis Rey WRF System Phasing and Costs

The implementation of the Lower San Luis Rey WRF System was divided into five phases and was further refined with the City's input:

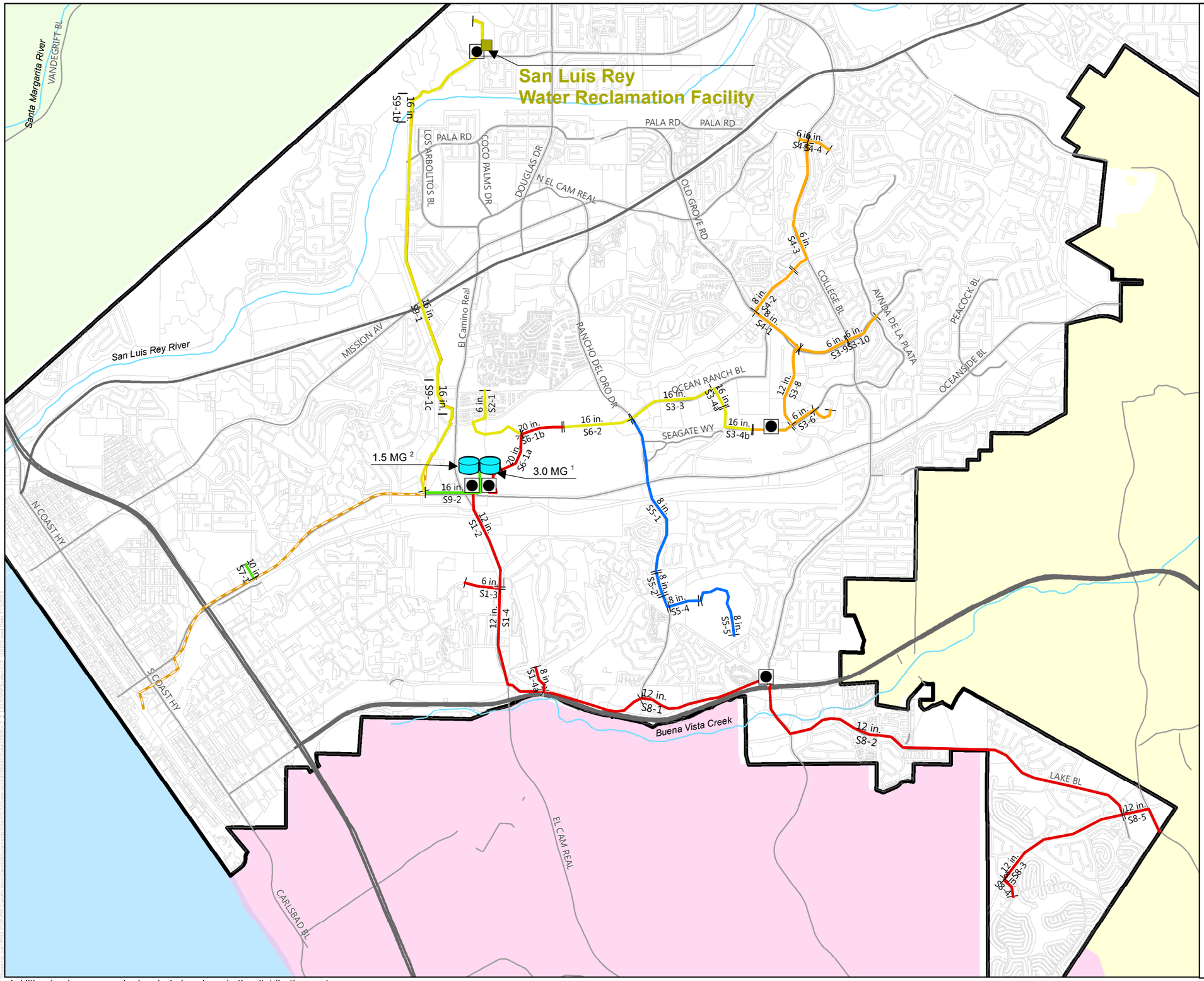
- Phase 1: The first phase would consist of supplying recycled water to Center City Golf Course. The San Luis Rey WRF would be expanded to 1.6 mgd and a 1.5 MG operation tank will be constructed at the El Corazon site. This phase includes the two pipeline alignments the City is currently constructing from the 10-inch diameter brine pipeline: 1) 3,690 linear feet of 10-inch diameter pipeline to the El Corazon Recycled Water Tank, and 2) 970 linear feet of 10-inch diameter pipeline to serve the Center City Golf Course. An existing 100 HP pump station at the San Luis Rey WRF would be used to deliver recycled water to the El Corazon Recycled Water Tank and the City Center Golf Course.
- Phase 2: The second phase would consist of serving customers in the Ocean Hills Area, the El Camino Country Golf Club, the El Corazon Site, and Eternal Hills Cemetery. This phase would consist of two pump stations at the El Corazon Recycled Water Tank. A 40 HP pump station would serve recycled water to the El Corazon Site; and a 100 HP pump station would serve the Eternal Hills Cemetery, El Camino Country Club Golf Course, and the Ocean Hills Area. A booster pump station (70 HP) near Vista Way and College Boulevard would be needed to provide an adequate level of service to the Ocean Hills Area. The exact location of the booster pump station has

not been determined. The anticipated site will require land acquisition and other operational needs beyond the scope of this Plan.

- Phase 3: The third phase would consist of a new 16-inch diameter pipeline (22,700 linear feet) from San Luis Rey WRF to the proposed El Corazon Recycled Water Tank, which includes a river crossing, a highway crossing, and a tunnel near the intersection of Ocean Boulevard and Mesa Drive. Approximately 8,000 linear feet of 16-inch diameter pipeline east of the El Corazon Recycled Water Tank would also be implemented to serve the future development in the area of Ocean Ranch. This phase includes a storage tank, a 100 HP pump station at the San Luis Rey WRF, and two pump stations at the El Corazon Recycled Water Tank (30 HP for the southern alignment and 150 HP for the eastern alignment). This phase would serve the Ocean Hills Area buildout demand of 266 afy and Shadowridge Golf Course of 200 afy. An additional 100 HP pump is needed at San Luis Rey WRF to supply recycled water through the new 16-inch diameter pipeline. This phase will also serve recycled water to the smaller customers along the new 16-inch pipeline.
- Phase 4: The fourth phase would extend the eastern alignment south to serve Mira Costa College and would consist of 11,280 linear feet of 8-inch diameter pipeline. This phase includes a storage tank, treatment expansion at SLRWRF, an additional 100 HP pump station at the San Luis Rey WRF and an additional 60 HP pump station at El Corazon Recycled Water Tank.
- Phase 5: The fifth phase would extend the eastern alignment to the north area and would consists of 20,110 linear feet of 6- to 16 inch diameter pipeline to serve recycled water to Villages of Rancho Del Oro and other customers in the this area. This phase includes a storage tank, an additional 100 HP pump station at the San Luis Rey WRF, an additional 210 HP pump station at El Corazon Recycled Water Tank and a booster pump station (60 HP) near Avenidas Del Oro and Avenidas De La Plata.

Figure 7.5 shows the phases of the Lower San Luis Rey WRF System with the pipe diameters and the target customer IDs. Individual capital costs for all the facilities associated with this system are presented in Table 7.10. This table identifies the necessary facilities sizes and capital improvement costs needed for the Lower San Luis Rey WRF System. The table also shows the phase in which the facility would be implemented. The phases and implementation timeframe was based on the City's input.

The Lower San Luis Rey WRF System cost is itemized by phase in Table 7.10, which is summarized by facility type and planning phase in Table 7.11. As shown in Table 7.11, the total estimated CIP cost is $84.1 million and would offset 2,040 afy of potable water demand. Based a 50-year period and 5 percent interest, the unit lifecycle of the Lower San Luis Rey WRF System is $2,300/af.



Legend

Potential RW Pipeline by Phase

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5

Other

- Operational Tank
- Potential RW Pump Station
- Water Treatment Plant/ Water Reclamation Facility
- Existing 10-inch Brine Pipeline
- Major Roads
- City Parcel

0 0.5 1
Miles

Figure 7.5
Lower San Luis Rey WRF System
Capital Improvement Program

Recycled Water Facilities Plan
City of Oceanside

carollo RMC water and environment

1. Ultimate storage may be located elsewhere in the distribution system.
2. This storage tank is intended per Phase 1 to be constructed on this site.

Table 7.10 **Lower San Luis Rey WRF System Capital Improvement Program**
Recycled Water Facilities Plan
City of Oceanside

Improv. ID	Type of Improvement	Description/ Street	Project Length/Size and Cost: New Size/ Diam. (in)	Length (ft)	Unit Cost ($)	Baseline Construction Cost ($)	Capital Improvement Cost[2],[3] ($)	Capital Improvement Phasing: Phase 1 2016-2020 ($)	Phase 2 2021-2025 ($)	Phase 3 2026-2030 ($)	Phase 4 2031-2035 ($)	Phase 5 2036-2040 ($)
Future System Improvements												
Pipelines												
S1-1	Pipe	From El Corazon Tank, along Town Center south to Oceanside Blvd.	20	1,530	$ 370	$ 566,000	$ 938,000	$ -	$ 938,000	$ -	$ -	$ -
S1-2	Pipe	From El Corazon Tank, along Oceanside Blvd. between Town Center and El Camino Real; south along El Camino Real between Oceanside Blvd and Fire Mountain Dr.	12	4,360	$ 220	$ 959,000	$ 1,590,000	$ -	$ 1,590,000	$ -	$ -	$ -
S1-3	Pipe	Along Fire Mountain Dr., west of El Camino Real	6	1,340	$ 160	$ 214,000	$ 355,000	$ -	$ 355,000	$ -	$ -	$ -
S1-4	Pipe	Along El Camino Real to Vista Way; along east Vista Way to Valley Glen Dr; along Valley Glen Dr. until intersection with Palmer Dr.	12	4,840	$ 220	$ 1,065,000	$ 1,765,000	$ -	$ 1,765,000	$ -	$ -	$ -
S1-4a	Pipe	Lateral to Connect El Camino Country Club	8	980	$ 170	$ 167,000	$ 277,000	$ -	$ 277,000	$ -	$ -	$ -
S2-1	Pipe	From 20" pipe to Mesa Dr.; along Mesa Dr to Pear Tree Ln; along Pear Tree Ln ending north of Dearborn St.	6	3,650	$ 160	$ 584,000	$ 968,000	$ -	$ -	$ 968,000	$ -	$ -
S3-3	Pipe	From Rancho Del Oro Dr. along Ocean Ranch Blvd. to Corporate Center Dr.	16	3,200	$ 295	$ 944,000	$ 1,565,000	$ -	$ -	$ 1,565,000	$ -	$ -
S3-4a	Pipe	From Ocean Ranch Blvd. along Corporate Center Dr.	16	770	$ 295	$ 227,000	$ 376,000	$ -	$ -	$ 376,000	$ -	$ -
S3-4b	Pipe	Along Corporate Center Dr. to Avenida De La Plata; along Avenida De La Plata	16	1,750	$ 295	$ 516,000	$ 855,000	$ -	$ -	$ 855,000	$ -	$ -
S3-5	Pipe	From 16" pipe along Avenida De La Plata to Avenida Del Oro	16	1,470	$ 295	$ 434,000	$ 719,000	$ -	$ -	$ -	$ -	$ 719,000
S3-6	Pipe	Northeast of Avenida Del Oro along Avenida De La Plata to Plaza Real	6	980	$ 160	$ 157,000	$ 260,000	$ -	$ -	$ -	$ -	$ 260,000
S3-7	Pipe	Along Plaza Real until half of cul de sac	6	920	$ 160	$ 147,000	$ 244,000	$ -	$ -	$ -	$ -	$ 244,000
S3-8	Pipe	Along Avenida Del Oro north of Avenida De La Plata until Old Grove Rd.	12	3,050	$ 220	$ 671,000	$ 1,112,000	$ -	$ -	$ -	$ -	$ 1,112,000
S3-9	Pipe	East of Avenida Del Oro along Old Grove Rd. until College Blvd.	6	1,830	$ 160	$ 293,000	$ 486,000	$ -	$ -	$ -	$ -	$ 486,000
S3-10	Pipe	Along Old Grove Rd. east of College Blvd. ending between Avenida De La Plata and Corte Verano	6	1,450	$ 160	$ 232,000	$ 385,000	$ -	$ -	$ -	$ -	$ 385,000
S4-1	Pipe	Along Old Grove Rd. northwest of Avenida Del Oro ending at Mesa Dr.	8	2,090	$ 170	$ 355,000	$ 588,000	$ -	$ -	$ -	$ -	$ 588,000
S4-2	Pipe	Along Mesa Dr. ending between Via Empresa and College Blvd.	8	2,070	$ 170	$ 352,000	$ 583,000	$ -	$ -	$ -	$ -	$ 583,000
S4-3	Pipe	From 8" pipe along Mesa Dr. until College Blvd; along College Blvd until Frazee Rd.	6	5,000	$ 160	$ 800,000	$ 1,326,000	$ -	$ -	$ -	$ -	$ 1,326,000
S4-4	Pipe	East of College Blvd. along Frazee Rd.	6	880	$ 160	$ 141,000	$ 234,000	$ -	$ -	$ -	$ -	$ 234,000
S4-5	Pipe	West of College Blvd. along Frazee Rd.	6	370	$ 160	$ 59,000	$ 98,000	$ -	$ -	$ -	$ -	$ 98,000
S5-1	Pipe	Along Rancho Del Oro Dr. south of Ocean Ranch Blvd.	8	5,900	$ 170	$ 1,003,000	$ 1,662,000	$ -	$ -	$ -	$ 1,662,000	$ -
S5-2	Pipe	Along Rancho Del Oro Dr. ending south of Cameo Dr.	8	840	$ 170	$ 143,000	$ 237,000	$ -	$ -	$ -	$ 237,000	$ -
S5-3	Pipe	Along Rancho Del Oro Dr. to Glaser Dr.	8	500	$ 170	$ 85,000	$ 141,000	$ -	$ -	$ -	$ 141,000	$ -
S5-4	Pipe	Along Glaser Dr. to Barnard Dr.	8	1,160	$ 170	$ 197,000	$ 327,000	$ -	$ -	$ -	$ 327,000	$ -
S5-5	Pipe	From north Barnard Dr. along Glaser Dr. ending in parking lot south of Barnard Dr.	8	2,880	$ 170	$ 490,000	$ 812,000	$ -	$ -	$ -	$ 812,000	$ -
S6-1a	Pipe	From Oceanside Blvd (S1-1) towards El Corazon Site, vacant lot	20	1,620	$ 370	$ 599,000	$ 993,000	$ -	$ 993,000	$ -	$ -	$ -
S6-1b	Pipe	From vacant lot to El Corazon Site	20	1,800	$ 370	$ 666,000	$ 1,104,000	$ -	$ 1,104,000	$ -	$ -	$ -
S6-2	Pipe	From El Corazon Site, crossing Town Center to Rancho Del Oro Dr.	16	2,240	$ 295	$ 661,000	$ 1,096,000	$ -	$ -	$ 1,096,000	$ -	$ -
S7-1	Pipe	Lateral to Center City Golf Course	10	970	$ 210	$ 204,000	$ 338,000	$ 338,000	$ -	$ -	$ -	$ -
S8-1	Pipe	From El Camino Golf Course along Vista Way to College Boulevard	12	10,230	$ 220	$ 2,251,000	$ 3,731,000	$ -	$ 3,731,000	$ -	$ -	$ -
S8-2	Pipe	South of College Boulevard	12	15,360	$ 220	$ 3,379,000	$ 5,601,000	$ -	$ 5,601,000	$ -	$ -	$ -
S8-3	Pipe	Cannon Road from Lake Blvd to Mystra Way	12	5,040	$ 220	$ 1,109,000	$ 1,838,000	$ -	$ 1,838,000	$ -	$ -	$ -
S8-4	Pipe	Mystra Way from Cannon Road	8	770	$ 170	$ 131,000	$ 217,000	$ -	$ 217,000	$ -	$ -	$ -
S8-5	Pipe	Cannon Road and S. Melrose Drive (Connect to VID)	12	1,930	$ 220	$ 425,000	$ 704,000	$ -	$ 704,000	$ -	$ -	$ -
S9-1a	Pipe	From San Luis Rey WRF to Oceanside Blvd. and Garrison St.	16	16,700	$ 295	$ 4,927,000	$ 8,167,000	$ -	$ -	$ 8,167,000	$ -	$ -
S9-1b (river crossing)	Pipe [1]	From San Luis Rey WRF to Oceanside Blvd. and Garrison St.	16	1,300	$ 885	$ 1,151,000	$ 1,908,000	$ -	$ -	$ 1,908,000	$ -	$ -
S9-1c (tunnel)	Pipe [1]	From San Luis Rey WRF to Oceanside Blvd. and Garrison St.	16	1,000	$ 443	$ 443,000	$ 734,000	$ -	$ -	$ 734,000	$ -	$ -
S9-2	Pipe	From 10" Brine Pipeline to El Corazon RW Tank	10	3,690	$ 210	$ 775,000	$ 1,285,000	$ 1,285,000	$ -	$ -	$ -	$ -
S9-2	Pipe	From 10" Brine Pipeline to El Corazon RW Tank	16	3,690	$ 295	$ 1,089,000	$ 1,805,000	$ -	$ -	$ 1,805,000	$ -	$ -
Subtotal				**120,150**		**$ 28,611,000**	**$ 47,424,000**	**$ 1,623,000**	**$ 19,113,000**	**$ 17,474,000**	**$ 3,179,000**	**$ 6,035,000**
Storage Tanks												

Table 7.10 **Lower San Luis Rey WRF System Capital Improvement Program**
Recycled Water Facilities Plan
City of Oceanside

Improv. ID	Type of Improvement	Description/ Street	Project Length/Size and Cost: New Size/ Diam. (in)	Length (ft)	Unit Cost ($)	Baseline Construction Cost ($)	Capital Improvement Cost[2],[3] ($)	Capital Improvement Phasing: Phase 1 2016-2020 ($)	Phase 2 2021-2025 ($)	Phase 3 2026-2030 ($)	Phase 4 2031-2035 ($)	Phase 5 2036-2040 ($)
Storage Tank - P1	Storage Tank	El Corazon RW Tank	1.5 MG	-	$ 1.50	$ 2,250,000	$ 3,729,000	$ 3,729,000	$ -	$ -	$ -	$ -
Storage Tank - P2	Storage Tank [4, 7]		0.0 MG	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Storage Tank - P3	Storage Tank [4, 7]		1.0 MG	-	$ 1.50	$ 1,500,000	$ 2,486,000	$ -	$ -	$ 2,486,000	$ -	$ -
Storage Tank - P4	Storage Tank [4, 7]		1.0 MG	-	$ 1.50	$ 1,500,000	$ 2,486,000	$ -	$ -	$ -	$ 2,486,000	$ -
Storage Tank - P5	Storage Tank [4, 7]		1.0 MG	-	$ 1.50	$ 1,500,000	$ 2,486,000	$ -	$ -	$ -	$ -	$ 2,486,000
Subtotal						**$ 6,750,000**	**$ 11,187,000**	**$ 3,729,000**	**$ -**	**$ 2,486,000**	**$ 2,486,000**	**$ 2,486,000**
Pump Stations												
PS-SLR-Ph1	Pump Station [8]	PS @ San Luis Rey WRF	0	0	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
PS-SLR-Ph3	Pump Station	PS @ San Luis Rey WRF for Phase 3	1	130	$ 4,000	$ 520,000	$ 862,000	$ -	$ -	$ 862,000	$ -	$ -
PS-SLR-Ph4	Pump Station	PS @ San Luis Rey WRF for Phase 4	1	100	$ 4,000	$ 400,000	$ 663,000	$ -	$ -	$ -	$ 663,000	$ -
PS-SLR-Ph5	Pump Station	PS @ San Luis Rey WRF for Phase 5	1	100	$ 4,000	$ 400,000	$ 663,000	$ -	$ -	$ -	$ -	$ 663,000
PS-ECS-Ph2	Pump Station	PS @ El Corazon RW Tank for Phase 2 - South	1	100	$ 4,000	$ 400,000	$ 663,000	$ -	$ 663,000	$ -	$ -	$ -
PS-ECS-Ph3	Pump Station	PS @ El Corazon RW Tank for Phase 3 - South	1	30	$ 5,000	$ 150,000	$ 249,000	$ -	$ -	$ 249,000	$ -	$ -
BPS-ECS-Ph2	Pump Station	Booster PS near Plaza Drive and College Boulevard (end of S8-2 segment)	1	70	$ 5,000	$ 350,000	$ 580,000	$ -	$ 580,000	$ -	$ -	$ -
BPS-ECS-Ph3	Pump Station	Booster PS near Plaza Drive and College Boulevard (end of S8-2 segment)	1	20	$ 5,000	$ 100,000	$ 166,000	$ -	$ -	$ 166,000	$ -	$ -
PS-ECN-Ph2	Pump Station	PS @ El Corazon RW Tank for Phase 2 - North	1	40	$ 5,000	$ 200,000	$ 332,000	$ -	$ 332,000	$ -	$ -	$ -
PS-ECN-Ph3	Pump Station	PS @ El Corazon RW Tank for Phase 3 - North	1	150	$ 4,000	$ 600,000	$ 995,000	$ -	$ -	$ 995,000	$ -	$ -
PS-ECN-Ph4	Pump Station	PS @ El Corazon RW Tank for Phase 4 - North	1	60	$ 5,000	$ 300,000	$ 497,000	$ -	$ -	$ -	$ 497,000	$ -
PS-ECN-Ph5	Pump Station	PS @ El Corazon RW Tank for Phase 5 - North	1	210	$ 4,000	$ 840,000	$ 1,392,000	$ -	$ -	$ -	$ -	$ 1,392,000
BPS-ECN-Ph5	Pump Station	Booster PS @ Avenidas Del Oro & De La Plata (end of S3-5 segment)	1	60	$ 5,000	$ 300,000	$ 497,000	$ -	$ -	$ -	$ -	$ 497,000
Subtotal						**$ 4,560,000**	**$ 7,559,000**	**$ -**	**$ 1,575,000**	**$ 2,272,000**	**$ 1,160,000**	**$ 2,552,000**
Treatment												
Expansion - P1	Treatment Plant Expansion		1.60 MGD	-	$ 3.00	$ 4,800,000	$ 7,956,000	$ 7,956,000	$ -	$ -	$ -	$ -
Expansion - P3	Treatment Plant Expansion		1.00 MGD	-	$ 3.00	$ 3,000,000	$ 4,973,000	$ -	$ -	$ 4,973,000	$ -	$ -
Expansion - P4	Treatment Plant Expansion		1.00 MGD	-	$ 3.00	$ 3,000,000	$ 4,973,000	$ -	$ -	$ -	$ 4,973,000	$ -
Subtotal						**$ 10,800,000**	**$ 17,902,000**	**$ 7,956,000**	**$ -**	**$ 4,973,000**	**$ 4,973,000**	**$ -**
CIP Total (Future)						**$ 50,721,000**	**$ 84,072,000**	**$ 13,308,000**	**$ 20,688,000**	**$ 27,205,000**	**$ 11,798,000**	**$ 11,073,000**

Notes:

1. Proposed casings size and carrier pipe size.
2. Baseline Construction Cost plus 30% to account for unforeseen events and unknown conditions.
3. Estimated Construction Cost plus 10% for Engineering, 10% for Construction Management, and 7.5% for Environmental and Legal.
4. Final location of storage tanks to be determined.
5. Land acquisition costs was not included for the treatment, storage tank, booster pumps, and pipelines.
6. Costs are based on the Engineering News Record Construction Cost Index - Greater Los Angeles of 10756 (December 2014).
7. The long term operational storage volume location was assumed at the proposed El Corazon RW tank and therefore, certain downstream reaches of pipeline were sized for peak-hour demands. If a tank site is determined in the future out in the distribution system, certain distribution pipelines could have smaller diameters.
8. San Luis Rey WRF has an existing pump station that is being modified to use for 10-inch diameter brine pipeline in Phase 1.

Table 7.11	Lower San Luis Rey WRF System CIP Summary Recycled Water Facilities Plan City of Oceanside						
	Implementation Phase						
Facility Category	2015-2020 ($M)	2021-2025 ($M)	2026-2030 ($M)	2031-2035 ($M)	2036-2040 ($M)	Total ($M)	Percentage (%)
Pipeline	$1.6	$19.1	$17.5	$3.1	$6.0	**$47.3**	56%
Pump Station	$0.0	$1.6	$2.3	$1.2	$2.5	**$7.6**	9%
Storage	$3.7	--	$2.5	$2.5	$2.5	**$11.2**	13%
Treatment Plant	$8.0	--	$5.0	$5.0	--	**$18.0**	22%
Total	**$13.3**	**$20.7**	**$27.3**	**$11.8**	**$11.0**	**$84.1**	**100%**
Demand (afy)	60	590	800	170	420	**2,040**	
Cumulative Demand (afy)	**60**	**650**	**1,450**	**1,620**	**2,040**		

Note:
(1) Costs are based on ENR CCI 10,756 (Los Angeles, December 2014).

As shown in Table 7.11 and Figure 7.5, pipeline projects account for the majority of future costs, which equate to approximately $47.3 million or 56 percent of the projected CIP cost. Treatment cost account for approximately $18 million or 22 percent of the projected CIP cost. The remaining $18.8 million or 22 percent of the proposed CIP is comprised of pump stations and storage reservoirs.

7.4 CAPITAL IMPROVEMENT IMPLEMENTATION SUMMARY

The CIP was developed for the two recommended recycled water systems:

- The Upper San Luis Rey WRF System would be implemented in three phases and would have a total capital cost of $42.7 million. The Upper San Luis Rey WRF System would serve 62 customers and offset 1,110 afy of potable water. Over a 50-year period, the unit lifecycle cost of this system is $2,100.
- The Lower San Luis Rey WRF System would be implemented in five phases and would have a total cost of $84.1 million. The Lower San Luis Rey WRF System would serve 83 customers and offset 2,040 afy of potable water. Over a 50-year period, the unit lifecycle cost of this system is $2,300.

Table 7.12 summarizes the total capital cost and demands by phase for the two systems combined. As shown in Table 7.12 the total estimated CIP cost is $126.8 million, offsetting 3,486 afy of potable demands, including 336 afy of existing recycled water demand. Based a 50-year period and 5 percent interest, the unit lifecycle of both projects combined is $2,000/af. Although the capital costs and demands served vary among the two systems, the unit lifecycle costs are very close. The unit lifecycle also excludes grant funding. Therefore, the City can move forward based on recycled water customer interest.

As part of a separate study, the City is currently looking at groundwater recharge (GWR) in the Mission Basin using advanced water treatment at San Luis Rey WRF. This Indirect Potable Reuse (IPR) project is currently being investigated. Once completed, it is recommended that the City compare the findings of this Plan with the IPR project to determine the most beneficial and cost effective use of recycled water to increase the City's water supply reliability.

Table 7.12 Capital Improvement Costs and Demand Summary
Recycled Water Facilities Plan
City of Oceanside

	Implementation Phase						Total
	2013 (Ex.)	**2015-2020**	**2021-2025**	**2026-2030**	**2031-2035**	**2036-2040**	
Capital Costs ($M)							
Upper San Luis Rey WRF System	--	$ 5.8	$ 30.3	$ 6.6	--	--	**$ 42.7**
Lower San Luis Rey WRF System	--	$13.3	$20.7	$27.3	$11.8	$11.0	**$84.1**
Total ($M)	--	**$19.1**	**$51.0**	**$33.9**	**$11.8**	**$11.0**	**$126.8**
Cumulative ($M)	--	**$19.1**	**$70.1**	**$104.0**	**$115.8**	**$126.8**	--
Demands (afy)							
Upper San Luis Rey WRF System	336	--	720	390	--	--	**1,446**
Lower San Luis Rey WRF System	--	60	590	800	170	420	**2,040**
Total (afy)	**336**	**60**	**1,310**	**1,190**	**170**	**420**	**3,486**
Cumulative (afy)	**336**	**396**	**1,706**	**2,896**	**3,066**	**3,486**	--

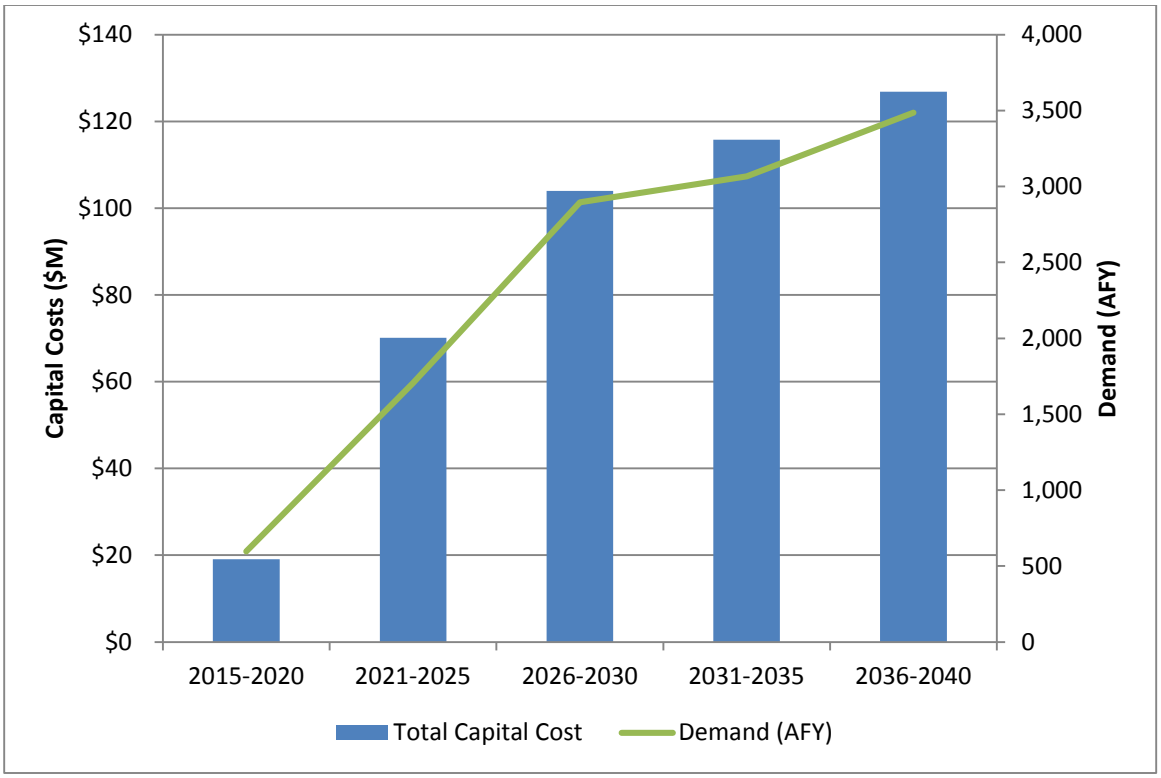


Figure 7.6 Total Capital Improvement Costs and Demands by Year

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Appendix A

REFERENCE

Carollo, 2015a: City of Oceanside Sewer Master Plan; June 2015

Carollo, 2015b: City of Oceanside Water Master Plan; June 2015

Carollo, 2011: La Salina Wastewater Treatment Plant Facility Master Plan; September 2011

Carollo, 2005: City of Oceanside Recycled Water Master Plan; October 2005

City Council, 2014: City Council Meeting held on November 12, 2014

City, 2011: Water Conservation Master Plan, June 7, 2011, Maddaus Water Management

City, 2014: Personal Communications with City of Oceanside

Infrastructure Engineering Corporation (IEC), 2011: City of Oceanside 2010 Urban Water Management Plan; July 2011

IEC, 2014: Cost Analysis of La Salina WWTP Options Technical Memorandum; October 2014

MWD, 2007: Chapter IV – Groundwater Basin Reports: San Diego County Basins – Central San Diego County
http://www.mwdh2o.com/mwdh2o/pages/yourwater/supply/groundwater/GWAS.html

RMC, 2012: North San Diego County Regional Recycled Water Facilities Plan; May 2012

RMC, 2012: El Corazon Alternative Water Supply Project – Conceptual Plan; October 2012

SANDAG 2050 Regional Growth Forecast

Tetra Tech, 2014: Ocean Hills Area Recycled Water Pipeline, July 2014

Appendix B

CUSTOMER LIST

- **B-1**: All the potential recycled water customers grouped by their billing class
- **B-2**: All the potential recycled water customers grouped by their demand range

Appendix B-1: Potential Recycled Water Customers (Existing Customers) - Grouped by Billing Class
Recycled Water Facilities Plan
City of Oceanside

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
1191834	PACIFIC PARADISE NURSERY	A-AS	28	50%	14	1
67121853	TRUST, FRANK	A-AS	11	50%	5	1
W01387104	SLAGLE, DR R G	A-AS	6	50%	3	1
59259495	BUEHLER, JACK	A-AS	5	50%	3	1
66882121	SCHURMEIER, H M	A-AS	5	50%	3	1
W01402887	GRIMM, CRAIG E	A-AS	5	50%	3	1
65794836	SABOSKY, SANDRA LEE	A-AS	4	50%	2	1
59259497	HOWE, WILLIAM B	A-AS	4	50%	2	1
W01334537	WHYTE, ROBERTA J	A-AS	4	50%	2	1
58514946	TAYLOR, RONALD C	A-AS	3	50%	2	1
67121867	HINSHAW, O E	A-AS	2	50%	1	1
66891684	Rocket Farms Herbs INC	A-CA	209	50%	104	5
67810559	Rancho Milagro LLC	A-CA	135	50%	68	2
W26241341	RANCHO MILAGRO LLC	A-CA	98	50%	49	2
65794822	ARMSTRONG GARDEN CENTER	A-CA	86	50%	43	2
W01210697	WEST COAST TOMATO GROWERS	A-CA	79	50%	39	1
70562692	RANCHO MILAGRO LLC	A-CA	56	50%	28	1
62510107	DM COLOR EXPRESS INC	A-CA	33	50%	17	1
1553024	EVERGREEN DISTRIBUTORS INC	A-CA	33	50%	17	1
69761666	ARMSTRONG GARDEN CENTER	A-CA	25	50%	13	1
W40187269	MELLANO & COMPANY	A-CA	25	50%	13	4
65794817	CMA GROWERS	A-CA	22	50%	11	2
8694506	PETERSON, ANDREA	A-CA	17	50%	9	1
65672933	TRAVERS, BARBARA	A-CA	16	50%	8	1
65794820	RODEE, DONALD C	A-CA	16	50%	8	1
65794826	OKSNEE, SCOTT & ANGELA P	A-CA	15	50%	8	1
W01387851	WAWRZYNSKI, DAVID B	A-CA	14	50%	7	1
W01403896	GALLANT, PHIL	A-CA	13	50%	7	2
67121909	LOPEZ, J C	A-CA	13	50%	6	1
67121911	RANCHO VERA	A-CA	12	50%	6	1
W01235834	FEE, JOHN F	A-CA	12	50%	6	1
65794819	VANCE, JACK O	A-CA	12	50%	6	1
W01412424	PERARO, FABIO	A-CA	10	50%	5	1
66951314	FONS, MICHAEL T	A-CA	10	50%	5	1
73104318	HERBTHYME FARMS INC	A-CA	9	50%	5	1
W01232384	EARLEY, WILLIAM R	A-CA	7	50%	3	1
W44132183	KASH, SAM	A-CA	7	50%	3	1
W01264892	KOKKE, ANTOINE & TERESA	A-CA	7	50%	3	1
W23843280	ROCKET FARMS HERBS INC	A-CA	6	50%	3	1
W47780055	LINTHURST, JOHN	A-CA	6	50%	3	1
W01334535	CAREY, NEAL & DORA	A-CA	4	50%	2	1
W42022479	KENNEY, PHILLIP	A-CA	3	50%	2	1
58514944	CURTIS, BARBARA	A-CA	3	50%	2	1
W01453776	WALL, MARK	A-CA	3	50%	2	1
67121912	GASHENAO, LUDA	A-CA	2	50%	1	1
69658694	ALISON, KIMBERLY	A-CA	2	50%	1	1
1237606	RUBINYI, JEANNETTE	A-CA	2	50%	1	1
44053766	DEANE, PHILIP J	A-CA	2	50%	1	1
66168234	SANDLIN, KENT	A-CA	2	50%	1	1
65672937	HENDRICKS, RICHARD	A-CA	2	50%	1	1
67167293	MCDOWELL, SHELLEY K	A-CA	2	50%	1	1
65672932	ANDERSON, WILLIAM G	A-CA	2	50%	1	1
W01179575	JOLLY, LARRY	A-CA	2	50%	1	1
W45909277	SAUCEDO, GUADALUPE	A-CA	2	50%	1	1
33756582	FLINN, LAURA A	A-CA	1	50%	1	1
1422818	WEST COAST TOMATO GROWERS	A-CA	1	50%	0	1
65672930	PENDLETON FARMS	A-CA	1	50%	0	1
67667057	MATURZAK, DAVID & AMY	A-CA	1	50%	0	1
W01229955	BALMA, L M	A-GR	22	50%	11	1
73104317	Gilligan Groves	A-GS	250	50%	125	3
W01109787	CAMPBELL, RICHARD F	A-GS	43	50%	22	1
1309571	BALMA, L M	A-GS	19	50%	9	1
65794840	LOUCHIOS, VICTOR	A-GS	18	50%	9	2

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W01237556	HIGGINS, VICTORIA	A-GS	14	50%	7	2
67667059	NAGATA BROS FARMS INC	A-RA	31	50%	16	1
67121917	DM COLOR EXPRESS INC	A-RA	17	50%	9	1
W45909269	LOGAN, HELEN A	A-RA	12	50%	6	1
66024569	DM COLOR EXPRESS INC	A-RA	11	50%	6	1
41191688	LI, JING	A-RA	6	50%	3	1
61241073	MURAD, PETER	A-RA	2	50%	1	1
W036368800	PENSEYRES, PETER	A-RS	6	50%	3	1
W66768401	OZAR, LEONARD	A-RS	6	50%	3	1
68292265	PORAT, GAYLE	A-RS	6	50%	3	1
1566505	MCDOWELL, WILLIAM W	A-RS	5	50%	3	1
65794829	MARTINEK, DENNIS	A-RS	5	50%	2	1
W01334536	MAURER, PHILIP R	A-RS	4	50%	2	1
W01307693	HEGER, ALEX	A-RS	3	50%	2	1
Agriculture Billing Class		77	**1,596**		**800**	**93**
W01371835	Emeral Isle Golf Course	C	41	90%	37	1
1319148	TRI CITY HOSPITAL	C	114	25%	28	1
1518718	MIRA COSTA COLLEGE	C	48	10%	5	1
1157243	MOUNTAIN WATER ICE	C	44	10%	4	1
1372531	OCEANSIDE UNIFIED SCHOOL DIST	C	33	10%	3	1
1520198	OCEANSIDE UNIFIED SCHOOL DIST	C	30	10%	3	1
1471845	PRINCE OF PEACE ABBEY	C	20	10%	2	1
1544214	OCEANSIDE UNIFIED SCHOOL DIST	C	17	10%	2	1
1564597	GILEAD SCIENCES	C	15	10%	2	1
73481353	NORTH COUNTY TRANSIT DISTRICT	C	14	10%	1	1
69099716	OCEANSIDE UNIFIED SCHOOL DIST	C	14	10%	1	1
65990616	OCEANSIDE UNIFIED SCHOOL DIST	C	12	10%	1	1
65397632	OCEANSIDE UNIFIED SCHOOL DIST	C	11	10%	1	1
66891682	CAL MAT COMPANY	C	11	10%	1	1
64204948	ITALIAN MAPLE HOLDINGS LLC	C	11	10%	1	1
64204947	OCEANSIDE UNIFIED SCHOOL DIST	C	9	10%	1	1
1567846	CIRCLE K # 2709478	C	8	10%	1	1
23500892	OCEANSIDE UNIFIED SCHOOL DIST	C	8	10%	1	1
67062001	CJK INTERNATIONAL LLC	C	7	10%	1	1
1522902	OCEANSIDE UNIFIED SCHOOL DIST	C	7	10%	1	1
1517821	ROWLEY'S PETROLEUM CORP	C	7	10%	1	1
54505103	ROSE, R DAN	C	6	10%	1	1
W01435455	CHEVRON PRODUCTS CO	C	5	10%	1	1
W32041443	COAST CAR WASH	C	5	10%	1	1
64265442	RJ EL CAMINO PLAZA INVESTORS	C	4	10%	0	1
Commercial Billing Class Subtotal		25	**498**		**100**	**25**
W23843286	City Center Golf Course	G	70	90%	63	1
66860860	CITY OF OCEANSIDE	G	48	90%	43	1
69045669	CITY OF OCEANSIDE	G	13	90%	12	1
1538020	CITY OF OCEANSIDE	G	12	90%	11	1
61349496	CITY OF OCEANSIDE	G	7	90%	6	1
1277131	CITY OF OCEANSIDE	G	4	90%	4	1
56599728	EAST PARKWAY N/O MONTEREY	G	3	90%	2	2
61294930	CITY OF OCEANSIDE	G	2	90%	2	1
W01387844	CITY OF OCEANSIDE	G	2	90%	2	1
W50504213	PKWY LANDSCAPING AND MEDIAN	G	2	90%	2	2
61294931	CITY OF OCEANSIDE	G	2	90%	1	1
68325226	CITY OF OCEANSIDE	G	13	10%	1	1
W01306295	CITY OF OCEANSIDE	G	12	10%	1	1
1436458	CITY OF OCEANSIDE	G	1	90%	1	1
64213931	CITY OF OCEANSIDE	G	8	10%	1	1
39872580	CITY OF OCEANSIDE - M BRUCE	G	1	90%	1	1
01235841	CITY OF OCEANSIDE	G	10	0%	0	1
21586355	CITY OF OCEANSIDE	G	6	0%	0	1
W1333698	CITY OF OCEANSIDE	G	6	0%	0	1
68404171	CITY OF OCEANSIDE - SLR NEW	G	147	0%	0	1
Government Billing Class Subtotal		20	**368**		**153**	**22**
W01442934	El Camino Country Club Golf Course	I	194	100%	194	3
71308439	Eternal Hills Association	I	95	100%	95	3
65188576	Ocean Hills Country Club	I	91	100%	91	1
60149641	RDO Tech Park	I	90	100%	90	19
71686116	Mission Vista High School	I	70	100%	70	4

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W01327649	Villages of Rancho Del Oro HOA	I	60	100%	60	18
1471844	Titleist Footjoy Golf Facility	I	58	100%	58	1
66024565	Arrowood Master Association 01	I	58	100%	58	11
W38254406	Villages of Rancho Del Oro HOA	I	56	100%	56	10
1611491	Wilmont Ranch Maintanence Corp.	I	53	100%	53	6
68003992	AMB DSS Pacific Coast LLC	I	52	100%	52	11
60149640	OCEAN RANCH BUSINESS ASSOC	I	45	100%	45	7
1244654	CAL TRANS	I	43	100%	43	1
W35038109	MURRAY MISSION	I	42	100%	42	18
1562464	DEL ORO HILLS - LMAD	I	42	100%	42	16
W001320393	VILLAGES OF RANCHO DEL ORO HOA	I	41	100%	41	11
W01257433	PRIME MESA LP	I	39	100%	39	6
1564594	DEL ORO HILLS - LMAD	I	36	100%	36	14
64213984	MIRA COSTA COLLEGE	I	35	100%	35	1
1388950	INGWERSEN, JACK	I	33	100%	33	1
W01235833	AGRI SERVICE	I	32	100%	32	1
35852159	WHELAN RANCH COMMUNITY ASSOC	I	30	100%	30	9
W01231509	PRESIDIO AT RANCHO DEL ORO	I	28	100%	28	6
61294907	WANIS VIEW ESTATES HOA	I	27	100%	27	6
56599671	VILLAGES OF RANCHO DEL ORO HOA	I	26	100%	26	16
62029829	GENENTECH	I	26	100%	26	5
1567851	W2005 MRD REALTY LLC	I	25	100%	25	3
1466155	GATLIN DEVELOPMENT	I	25	100%	25	7
W1333789	MISSION POINT MASTER ASSOC	I	21	100%	21	8
62756341	ARROWOOD MASTER ASSOCIATION 02	I	21	100%	21	5
W1431749	RDO TOWN CENTER ASSOC	I	20	100%	20	5
69658686	OCEANSIDE UNIFIED SCHOOL DIST	I	20	100%	20	1
1559150	OCEANSIDE UNIFIED SCHOOL DIST	I	20	100%	20	1
W1303438	RDO RANCH MAINTENANCE	I	19	100%	19	2
66024567	OCEANSIDE UNIFIED SCHOOL DIST	I	19	100%	19	1
W01311020	FRANK MISSION MARKETPLACE	I	18	100%	18	3
W01457151	BAYSHORE SOUTH HOA	I	18	100%	18	6
W03124793	WASATCH PROPERTY MGT	I	18	100%	18	6
W01307700	PRIME CASSANNA LP	I	18	100%	18	4
1528708	SANTA FE MESA - LMAD	I	17	100%	17	16
W01217519	OCEANSIDE UNIFIED SCHOOL DIST	I	17	100%	17	1
61995939	OCEANSIDE UNIFIED SCHOOL DIST	I	17	100%	17	1
W01391839	CALIFORNIA BRISAS HOA	I	17	100%	17	6
67121868	OGBP MASTER ASSN PARCEL II	I	17	100%	17	4
62756339	VILLAGES OF RANCHO DEL ORO HOA	I	16	100%	16	12
61196282	BONSALL UNIF SCHOOL DISTRICT	I	16	100%	16	1
66860861	PIAZZA D'ORO LLC	I	16	100%	16	1
67062010	CAL TRANS DISTRICT #11	I	16	100%	16	4
W01418258	RIVERDALE HOA	I	16	100%	16	4
W01457768	PAN PACIFIC RETAIL PROPERTIES	I	16	100%	16	3
60149643	VISTA UNIFIED SCHOOL DISTRICT	I	15	100%	15	1
W22391725	OCEANSIDE MANOR HOA	I	15	100%	15	9
67167305	BANK OF THE WEST	I	15	100%	15	1
73921135	OCEANSIDE UNIFIED SCHOOL DIST	I	15	100%	15	1
W01436451	CREST AT WHELAN RANCH HOA	I	15	100%	15	6
W001406504	ORCHARD LANE OCEANSIDE	I	14	100%	14	3
1566503	SAN DIEGO AUTO AUCTION	I	14	100%	14	4
66951317	QUAIL RIDGE HOA	I	14	100%	14	9
W01431755	EMERALD ESTATES	I	13	100%	13	6
W01387846	ALACIMA HOA	I	13	100%	13	2
W01250835	VISTA WAY VILLAGE ASSOCIATION	I	13	100%	13	2
1587893	CHURCH OF ST THOMAS MORE	I	13	100%	13	1
W01264887	LAKEVIEW HOA	I	13	100%	13	2
W01377529	GUAJOME MEADOWS HOA	I	13	100%	13	4
66024558	SEAGATE CORP CENTR OWNERS ASSN	I	12	100%	12	2
67680710	LOS ARBOLITOS #4	I	12	100%	12	2
1611035	OCEANSIDE UNIFIED SCHOOL DIST	I	12	100%	12	1
56599672	RIVER RANCH MAINTENCE CORP	I	12	100%	12	6
W22720327	EL CAMINO VILLA UNIT NO 1	I	12	100%	12	4
67062007	CAL TRANS	I	12	100%	12	1
W01332743	DOUGLAS PARK - LMAD	I	12	100%	12	9
66894543	PAULSON PROPERTY MANAGEMENT	I	12	100%	12	3
W01267569	IVEY GLENN HOA	I	12	100%	12	6

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
61995991	QUARRY CREEK-NORTH OA	I	12	100%	12	3
61996000	RANCHO ROSE HOMEOWNERS ASSN	I	12	100%	12	2
W35038108	SHADOW WAY APARTMENTS LP	I	12	100%	12	3
W31663632	3883 SAN RAMON LLC	I	12	100%	12	2
W01271902	VILLA TRINIDAD HOA	I	11	100%	11	3
1529548	RIO VISTA LANDSCAPE MAINT ASSC	I	11	100%	11	3
W01308957	VISTA UNIFIED SCHOOL DISTRICT	I	11	100%	11	1
68193512	OCEAN VILLAGE HOA	I	11	100%	11	3
W01377406	MISSION GARDENS HOA	I	11	100%	11	2
W1363360	PARK LANE HOA	I	11	100%	11	1
1567856	VILLAGES OF RANCHO DEL ORO HOA	I	11	100%	11	5
01235837	EL CAMINO CLUB ESTATES	I	11	100%	11	4
1566515	VILLA TRIESTE MASTER HOA	I	11	100%	11	3
W01329883	PEACOCK MEADOWS HOA	I	10	100%	10	2
1529545	LATTER DAY SAINTS CHURCH	I	10	100%	10	1
W1327651	VISTA UNIFIED SCHOOL DISTRICT	I	10	100%	10	1
66024554	MONTELENA HOA	I	10	100%	10	2
W01308965	VISTA CAPRI ASSOC	I	10	100%	10	4
W01176700	RANCH MAINT-AM NATL FUND CORP	I	10	100%	10	2
W43226159	MARLADO - LMAD	I	10	100%	10	6
67062017	OCEAN HILLS COUNTRY CLUB HOA	I	10	100%	10	1
62756318	PANORAMA RIDGE HOA	I	9	100%	9	1
68325240	CARRIAGE SQ EST HOA	I	9	100%	9	4
W1420435	AVALON HOA	I	9	100%	9	6
61196286	WINDWARD COMMUNITY ASSOCIATION	I	9	100%	9	1
W1391833	NEW VENTURE CHRISTIAN FLSHP	I	9	100%	9	1
1516540	MISSION SAN LUIS REY PARISH	I	9	100%	9	1
5794833	VERSAILLES IVEY RANCH HOA	I	9	100%	9	1
73921136	PRO KIDS GOLF	I	9	100%	9	1
W01108877	OCEAN HILLS COUNTRY CLUB HOA	I	9	100%	9	1
W01267645	VISTA UNIFIED SCHOOL DISTRICT	I	9	100%	9	1
W01267564	OCEAN HILLS COUNTRY CLUB HOA	I	9	100%	9	1
1465627	OCEAN HILLS COUNTRY CLUB HOA	I	9	100%	9	1
W01303432	OCEANSIDE UNIFIED SCHOOL DIST	I	9	100%	9	1
1564599	ORD WAY LLC	I	9	100%	9	1
W01178124	MISSION MEADOWS HOA	I	9	100%	9	2
W01235862	VISTA UNIFIED SCHOOL DISTRICT	I	9	100%	9	1
61135742	PAULSON PROPERTY MANAGEMENT	I	8	100%	8	1
67305400	OCEAN HILLS COUNTRY CLUB HOA	I	8	100%	8	1
60149654	USA PROPERTIES	I	8	100%	8	2
W01250244	RANCHO DEL ORO RMA	I	8	100%	8	3
W1402886	SEAWIND OSIDE HOA	I	8	100%	8	3
W01309539	SUNSET VIEW OCEANSIDE ASSC LLC	I	8	100%	8	1
1418263	MILAN REAL ESTATE INVESTMENTS	I	8	100%	8	2
W01305627	OCEANSIDE UNIFIED SCHOOL DIST	I	8	100%	8	1
1436462	OCEAN HILLS COUNTRY CLUB HOA	I	8	100%	8	1
70414416	OCEAN HILLS COUNTRY CLUB HOA	I	8	100%	8	1
1611033	LIGHTHOUSE CHRISTIAN CHURCH	I	8	100%	8	1
61617753	ETERNAL HILLS CEMETERY	I	8	100%	8	1
66024548	LA PACIFICA LP	I	8	100%	8	1
62756345	SEACLIFF OWNERS ASSOCIATION	I	7	100%	7	2
W01308700	OCEAN HILLS COUNTRY CLUB HOA	I	7	100%	7	1
1611488	LOWES STORE	I	7	100%	7	2
64462600	VOC REALTY INVESTMENTS INC	I	7	100%	7	1
1586452	OCEAN HILLS COUNTRY CLUB HOA	I	7	100%	7	1
01574593	AEGIS ASSISTED LIVING PROP	I	7	100%	7	1
65403812	SAINT MALO VILLAGE	I	7	100%	7	2
68141775	OCEANSIDE AMER LITTLE LEAGUE	I	7	100%	7	2
66024552	COCA COLA BOTTLING CO	I	7	100%	7	1
67801685	ROIC CALIFORNIA LLC	I	7	100%	7	2
W1567849	ROSEDALE HOA	I	7	100%	7	4
1587913	VISTA UNIFIED SCHOOL DISTRICT	I	7	100%	7	1
W01179576	BAUTISTA, CASTELLANO	I	7	100%	7	1
W01237609	OCEAN TERRACE OWNERS ASSN	I	7	100%	7	1
1588223	MISSION TERRACE OWNERS ASSOC	I	6	100%	6	1
1611489	OLD GROVE GARP LLC	I	6	100%	6	1
W01250845	VPM/VILLAGE VIEW LP	I	6	100%	6	3
1436460	OCEAN HILLS COUNTRY CLUB HOA	I	6	100%	6	1

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1588221	VISTA UNIFIED SCHOOL DISTRICT	I	6	100%	6	1
W01237583	VISTA UNIFIED SCHOOL DISTRICT	I	6	100%	6	1
W01309554	CALIFORNIA CREST HOA	I	6	100%	6	3
59878096	VILLAS AT MISSION POINT	I	6	100%	6	2
W01333782	VERSAILLES IVEY RANCH HOA	I	6	100%	6	2
W1403897	OCEANSIDE UNIFIED SCHOOL DIST	I	6	100%	6	1
01235840	BROKEN YOLK CAFE	I	6	100%	6	1
41587633	COLE OF OCEANSIDE CA LP	I	6	100%	6	1
69761668	OCEANSIDE UNIFIED SCHOOL DIST	I	6	100%	6	1
71686111	TAYLOR MORRISON	I	6	100%	6	1
W01311417	GUAJOME RIDGE - LMAD	I	6	100%	6	4
1570203	FAIRWINDS IVEY RANCH	I	6	100%	6	1
6863620	QUARRY CREEK INVESTORS LLC	I	6	100%	6	1
70388814	OCEANSIDE COLLEGE WAY 1 INC	I	6	100%	6	1
W01271906	SUPERIOR READY MIX	I	6	100%	6	1
1436461	OCEAN HILLS COUNTRY CLUB HOA	I	6	100%	6	1
W01308970	LAKEVIEW ESTATES HOA	I	6	100%	6	2
1567857	SONOMA HILLS HOA	I	6	100%	6	1
64091568	NITTO DENKO TECHNICAL CORP	I	6	100%	6	1
67167347	MS KEARNY CPB 2 LLC	I	6	100%	6	1
W01239025	OCEAN TERRACE OWNERS ASSN	I	6	100%	6	1
1611478	THE WORLDMARK CLUB	I	5	100%	5	2
W01264889	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01264891	VISTA UNIFIED SCHOOL DISTRICT	I	5	100%	5	1
W01320405	MARBELLA COMMUNITY ASSOCIATION	I	5	100%	5	2
W01325489	MISSIONS AT IVEY RANCH HOA	I	5	100%	5	3
W01475185	VISTA DEL CAMINO VILLAGE HOA	I	5	100%	5	3
W01308709	OCEAN HILLS SUMMIT ASSOCIATION	I	5	100%	5	1
61294894	4010 OCEAN RANCH VENTURE LLC	I	5	100%	5	1
61294927	VCC OCEAN RANCH CONDO ASSOC	I	5	100%	5	1
61349498	MISSION WELLS HOMEOWNERS	I	5	100%	5	2
68325219	OCEANSIDE UNIFIED SCHOOL DIST	I	5	100%	5	1
W01308705	ACP OCEANSIDE INVESTORS LLC	I	5	100%	5	1
W01173066	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
1517822	CAM COMMERCIAL PROPERTIES	I	5	100%	5	1
1566506	BEACHWOOD HOA	I	5	100%	5	1
60149667	PARKVIEW COMMUNITY ASSOCIATION	I	5	100%	5	1
61995940	PELICAN COVE HOA	I	5	100%	5	1
67121918	OCEANSIDE UNIFIED SCHOOL DIST	I	5	100%	5	1
68325211	PACIFIC COAST BUSINESS PARK B	I	5	100%	5	2
72282512	WEST COAST TOMATO GROWERS	I	5	100%	5	1
W01250248	OCEANSIDE ASSOCIATES	I	5	100%	5	2
W01266792	MONTEGO VILLAGE HOA	I	5	100%	5	2
W01239027	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01135658	RIDGEVIEW COMMUNITY ASSOC	I	5	100%	5	1
W01173064	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01257426	BROADMOOR HILLS HOA	I	5	100%	5	1
W01311412	MISSION DEL ORO HOA	I	5	100%	5	3
69849478	SAINT MALO HEIGHTS HOA	I	5	100%	5	2
W01236228	TIBERON OWNERS ASSOCIATION	I	5	100%	5	4
W01237619	SIENA AT MISION HOA	I	5	100%	5	1
W01380444	SPRUCE GROVE INC	I	5	100%	5	1
W01176696	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01231826	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01334529	VISTA CALAVERA HOA 1	I	5	100%	5	2
W1377553	LAKEROSE PROPERTIES	I	5	100%	5	1
62756328	HANSON AGGREGATES	I	5	100%	5	1
W01239024	OCEAN TERRACE HOA	I	5	100%	5	1
W01237613	TERRA MAR HOA	I	5	100%	5	1
1377499	SD COUNTY GEN SVCS	I	5	100%	5	1
60149684	MISSION VIEW ESTATES MAINT	I	5	100%	5	2
61294897	SIERRA RIDGE HOA	I	5	100%	5	4
W01231829	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
60149689	MISSION GROVE HOUSING	I	4	100%	4	2
69770627	HAMANN CONSTRUCTION	I	4	100%	4	4
W01267575	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
62954639	THE CASITAS AT SPRING CREEK	I	4	100%	4	1
W26086335	RANCHO HERMOSA - LMAD	I	4	100%	4	2

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W48805636	SOBH, MIKE	I	4	100%	4	1
W01231825	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
61995938	PAOLONE BROTHERS OCEANSIDE LLC	I	4	100%	4	1
62756321	CALVARY CHAPEL	I	4	100%	4	1
64091528	LONE TREE EMPIRE LLC	I	4	100%	4	1
01538019	THE SUMMIT	I	4	100%	4	1
W01239028	MISSION DOUGLAS INVEST LLC	I	4	100%	4	2
W01271936	COLLEGE OCEANSIDE SW LLC	I	4	100%	4	1
67680750	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W1333700	U S POSTMASTER	I	4	100%	4	1
1526263	RDO PLAZA PARTNERSHIP	I	4	100%	4	1
62756346	GRACE CHURCH NORTH COUNTY	I	4	100%	4	1
W01458176	LATTER DAY SAINTS CHURCH	I	4	100%	4	1
W01308699	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01320391	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W47780050	KING OF KINGS	I	4	100%	4	1
1570201	PDO VENTURE LLC	I	4	100%	4	1
66894554	OTPC	I	4	100%	4	1
W1574591	LYONS REALTY WEST LLC	I	4	100%	4	1
W01320390	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01325488	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01237617	TERRA MAR HOA	I	4	100%	4	1
67121849	VISTA SAN LUIS REY HOA	I	4	100%	4	1
W01235016	RANCHO SAN LUIS REY HOA INC	I	4	100%	4	1
W01380471	SEABREEZE HOA	I	4	100%	4	1
1436459	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
69045654	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01207543	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
68581419	BROADMOOR HILLS HOA	I	4	100%	4	1
1588269	VILLAGES OF RANCHO DEL ORO HOA	I	4	100%	4	1
63967387	VISTA MONTANA HOA	I	4	100%	4	2
67167308	MAJ INVESTORS LP	I	4	100%	4	1
W01135693	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
1528717	PEACOCK HILLS - LMAD	I	3	100%	3	2
1611490	LOWES STORE	I	3	100%	3	1
65492089	ST MARGARET PARISH	I	3	100%	3	1
65794824	MESA PINES HOMEOWNERS ASSOC	I	3	100%	3	4
67351015	CAMINO REAL ASSOC	I	3	100%	3	3
68292267	PEPPERWOOD HOA	I	3	100%	3	1
W01176138	ST MARY'S STAR OF THE SEA	I	3	100%	3	1
W01267563	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01320396	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01320397	OCEAN TERRACE OWNERS ASSN	I	3	100%	3	1
1611483	CANYON CREST MAINTENANCE CORP	I	3	100%	3	2
61241071	DIENER, DOUGLAS	I	3	100%	3	1
64820995	RDO/RANCH MAINTENANCE	I	3	100%	3	1
W01239479	LIMITED COLLEGE PLAZA	I	3	100%	3	1
W01324808	6TH AND K LTD	I	3	100%	3	1
67062012	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01305636	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01236868	HAHLBOHM, WILLIAM	I	3	100%	3	1
1567852	LAMVIN INC	I	3	100%	3	1
56599666	SUMMIT VILLAGE HOA	I	3	100%	3	1
66013448	OCEANSIDE NIERMAN LP	I	3	100%	3	1
70731646	PACIFIC MARINE CREDIT UNION	I	3	100%	3	1
W01308710	THE SUMMIT	I	3	100%	3	1
1523492	VISTA PACIFICA ASSOCIATES	I	3	100%	3	1
1523493	RANCHO CALIF CENTER	I	3	100%	3	1
1538008	ARBOR COVE HOA	I	3	100%	3	2
1567855	RDO RANCH MAINTENANCE	I	3	100%	3	1
1567860	HOME DEPOT STORE #1018	I	3	100%	3	1
61349502	NORTH COAST UNITED METHODIST	I	3	100%	3	1
65878479	SEAGATE CORP CENTR OWNERS ASSN	I	3	100%	3	1
W01326245	PALMILLA DEL ORO HOA	I	3	100%	3	1
W01207541	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
1611031	SYCAMORE SPRINGS HOA	I	3	100%	3	2
55998185	CITY OF VISTA	I	3	100%	3	1
66869529	FIRE MOUNTAIN HOA	I	3	100%	3	3

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1237618	MISSION AVENUE INVESTERS	I	3	100%	3	2
34547388	VILLA CAMINO APTS	I	3	100%	3	1
65672935	HEARTLAND MAINTANCE CORP	I	3	100%	3	1
65908644	OCEANIC BUSINESS PARK SOUTH	I	3	100%	3	3
W01271927	SKY HAVEN POINT 2	I	3	100%	3	2
68581418	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
68581424	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01108878	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
70414414	BROADMOOR HILLS HOA	I	3	100%	3	1
60149659	WAL MART STORES INC	I	3	100%	3	1
71686112	NORTH RIVER VILLAGE CONDO ASSO	I	3	100%	3	2
W44890578	SAN LUIS REY UNITED METHODIST	I	3	100%	3	1
1332118	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01331157	RIDGEVIEW COMM ASSOC	I	3	100%	3	1
1333012	1702 OCEANSIDE ASSOCIATES LTD	I	3	100%	3	1
1380465	INGWERSEN, JACK	I	3	100%	3	1
66024573	CASA DE AMPARO	I	3	100%	3	1
W01271907	RDO RANCH MAINTENANCE	I	3	100%	3	1
67680749	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01237612	TERRA MAR HOA	I	3	100%	3	1
1264899	EMERITUS	I	3	100%	3	1
52504583	MELROSE LLC	I	3	100%	3	1
56599677	ONESOURCE DISTRIBUTORS,LLC	I	3	100%	3	1
68299936	HOME DEPOT STORE #0679	I	3	100%	3	1
W01300533	ONA MISSION PARTNERS LP	I	3	100%	3	1
W01303427	MEADOW CREEK HOA	I	3	100%	3	2
W01308974	CHEMI-SOURCE INC	I	3	100%	3	1
W01311406	RIVERPOINTE HOA	I	3	100%	3	1
63967385	3186 VISTA WAY LP	I	2	100%	2	1
66894545	NCTD	I	2	100%	2	1
66894546	OCEANSIDE HOUSING PARTNERS LP	I	2	100%	2	1
66951315	JAMES BREE ENTERPRISES	I	2	100%	2	1
67061993	RESIDENCE INN BY MARRIOTT OSID	I	2	100%	2	1
W01303433	TERRA MAR HOA	I	2	100%	2	1
1588813	VISTAMONTE AT SAN LUIS REY	I	2	100%	2	1
54505110	CLIFFORD BRISTOL BUS OWNERS	I	2	100%	2	1
65878476	NORTH RIVER INVESTMENTS LLC	I	2	100%	2	1
66951316	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
54043797	EXTENDED STAY CA INC 75-TADM	I	2	100%	2	1
58514994	SHEPHERD OF THE VALLEY CHURCH	I	2	100%	2	1
65672940	COURTYARD BY MARRIOTT #3131G	I	2	100%	2	1
W01324804	FAMILY FELLOWSHIP CHURCH	I	2	100%	2	1
W01377435	CAMINO COLONY APARTMENTS	I	2	100%	2	1
W1412425	MISSION VISTA CONDO ASSN	I	2	100%	2	3
W01264888	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
68325239	LOMA ALTA VILLAGE OWNERS ASSOC	I	2	100%	2	1
W01303429	PLAZA REAL TECH CIRCLE ASSN	I	2	100%	2	1
W01334531	INGWERSEN, JANE A	I	2	100%	2	1
W48343638	KILYA PROPERTIES	I	2	100%	2	1
W01320399	OCEAN TERRACE OWNERS ASSN	I	2	100%	2	1
51784106	HENIE HILLS HOA	I	2	100%	2	3
55998186	AMERILLUM	I	2	100%	2	1
56599657	OSON, EDWARD	I	2	100%	2	1
W01271048	EXTRA SPACE STORAGE 0645	I	2	100%	2	1
W01308693	OCEANSIDE SQUARE LLC	I	2	100%	2	1
W01422686	IVEY RANCH PARK ASSN	I	2	100%	2	1
W01436455	CANINE COMPANION	I	2	100%	2	1
W37217260	A-1 QUALITY SELF STORAGE	I	2	100%	2	1
W44890574	SALVATION ARMY	I	2	100%	2	1
W66024555	NIHON SEIMEN	I	2	100%	2	1
55998180	LIL JACKSON SENIOR COMMUNITY	I	2	100%	2	1
61294892	ARROWOOD MASTER ASSOCIATION 03	I	2	100%	2	1
64265440	GARNER, CHARLES H	I	2	100%	2	1
66881898	NCTD	I	2	100%	2	1
66881901	NCTD	I	2	100%	2	1
68617122	MENTAL HEALTH SYSTEMS INC	I	2	100%	2	1
67121905	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
67667058	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1

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W01305637	OCEAN HILLS COUNTRY CLUB HOALV	I	2	100%	2	1
W1391840	SEAGATE TERRACE HOA	I	2	100%	2	1
56599654	CORNWELL BUSINESS CENTER	I	2	100%	2	1
56599697	OCEANIC BUS PARK OWNERS ASSOC	I	2	100%	2	1
56599713	GSM LLC	I	2	100%	2	1
56599721	CALIFORNIA COAST CREDIT UNION	I	2	100%	2	1
W01309550	SOUTHWEST GREENE INT'L	I	2	100%	2	1
W01320386	RDO RANCH MAINTENANCE	I	2	100%	2	1
W48343639	MONTEREY FINANCIAL SERVICES	I	2	100%	2	1
W48343641	OCEANS ELEVEN CASINO	I	2	100%	2	1
W01176698	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
52504572	SR COMMERCIAL	I	2	100%	2	1
68299933	VOIT OCEANSIDE PARTNERS LLC	I	2	100%	2	1
W01377414	UNION BANK	I	2	100%	2	1
W01380467	LA MONTANA HOA	I	2	100%	2	1
1538005	SOUTHRIDGE OCEANSIDE HOA	I	2	100%	2	1
W01267177	SOUTHRIDGE OCEANSIDE HOA	I	2	100%	2	1
1611493	JOE & MARY MOTTINO FAMILY YMCA	I	2	100%	2	1
66881899	NCTD	I	2	100%	2	1
W01271947	WARREN, JOHN	I	2	100%	2	1
W01135694	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
W01173067	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
66869642	WORMS, MARIA	I	2	100%	2	1
W37047361	ALL SAINTS CEMETERY ASSOC	I	2	100%	2	1
W01257425	BROADMOOR HILLS HOA	I	2	100%	2	1
67121904	TERRA MAR HOA	I	2	100%	2	1
69658692	TERRA MAR HOA	I	2	100%	2	1
055531157	LANDMARK MANUFACTURING INC	I	1	100%	1	1
55487060	HALLMARK CLASSIC II HOA	I	1	100%	1	1
55998143	RORICK JR, DAVID	I	1	100%	1	1
56599704	CHEW, WALTER B	I	1	100%	1	1
65908597	HUMANE SOCIETY AND SPCA	I	1	100%	1	1
66406375	MIRA COSTA COLLEGE	I	1	100%	1	1
66951313	OCEANSIDE UNIFIED SCHOOL DIST	I	1	100%	1	1
68325210	LIBBY LAKE OWNERS ASSOC	I	1	100%	1	1
54505090	RECEIVERSHIP OMBC	I	1	100%	1	1
54901376	76 & DOUGLAS PARTNERSHIP	I	1	100%	1	1
56599649	VANDEGRIFT - LMAD	I	1	100%	1	2
65908591	BALDA HK PLASTICS	I	1	100%	1	1
70329927	SEA VILLAGE HOA	I	1	100%	1	1
W01305628	LA PETITE ACADEMY SITE #0256	I	1	100%	1	1
W01326217	PACIFIC PALM APARTMENTS	I	1	100%	1	1
W01320398	OCEAN TERRACE OWNERS ASSN	I	1	100%	1	1
1566516	RADHA DAMODOR LLC	I	1	100%	1	1
56599664	AT & T SERVICES INC	I	1	100%	1	1
56599707	NATIVE BOUQUET	I	1	100%	1	1
58514993	9 VISTA MONTEMAR LP	I	1	100%	1	1
67710141	DEUTSCH CO	I	1	100%	1	1
69770634	CARTIN, ROBERT	I	1	100%	1	1
W01235844	OCEANSIDE PLAZA LLC	I	1	100%	1	1
W01250245	FIRST PRESBYTERIAN CHURCH	I	1	100%	1	1
W01431751	NO SD COUNTY TRANSIT DEV CO	I	1	100%	1	1
W01135684	OCEAN HILLS COUNTRY CLUB HOA	I	1	100%	1	1
W01231830	OCEAN HILLS COUNTRY CLUB HOA	I	1	100%	1	1
W1391841	SEAGATE TERRACE HOA	I	1	100%	1	1
W01308708	SOUTHRIDGE OCEANSIDE HOA	I	1	100%	1	1
50091430	VISTA UNIFIED SCHOOL DISTRICT	I	1	100%	1	1
54505097	D2-LLC	I	1	100%	1	1
56599673	OCEANSIDE LA COSTA VILLAS LLC	I	1	100%	1	1
56786125	COBAS, MICHAEL	I	1	100%	1	1
61965887	VIA VERA CRUZ LLC	I	1	100%	1	1
66869662	OCEAN HEIGHTS COMMUNITY ASSC	I	1	100%	1	1
66881896	HANK DIKEY CHEVRON USA	I	1	100%	1	1
W01250837	YVONNE ASHLEY	I	1	100%	1	1
1567480	KING, BRUCE A	I	1	100%	1	1
1612198	CASA VISTA APTS	I	1	100%	1	1
47262644	ALLSTATE MOVING SYSTEMS	I	1	100%	1	1
55252730	UNION BANK #	I	1	100%	1	1

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56599682	DE LA PLATA LLC	I	1	100%	1	1
61294900	LU, JOHN	I	1	100%	1	1
W29173721	LAKE VILLAGE OWNER ASSOCIATION	I	1	100%	1	2
W47780056	WESTERN DENTAL	I	1	100%	1	1
W48455705	TIMPSON, LAUREL M	I	1	100%	1	2
W01377554	LAKEROSE PROPERTIES	I	1	100%	1	1
W48343642	MCDONALD'S	I	1	100%	1	1
W01303439	SOUTHRIDGE OCEANSIDE HOA	I	1	100%	1	1
W01320395	LORAH FAMILY TRUST	I	1	100%	1	1
1564598	GILEAD SCIENCES	I	1	100%	1	1
60149677	SANDOVAL ENTERPRISES INC	I	1	100%	1	1
60149690	LEN'S AUTO BODY	I	1	100%	1	1
62934174	WINDWARD COMMUNITY ASSOCIATION	I	1	100%	1	1
66894544	WALGREENS #9433	I	1	100%	1	1
69849480	MISSION MEADOW - LMAD	I	1	100%	1	1
7822948	VINE STREET PLAZA	I	1	100%	1	1
W29813541	GILDRED DEVELOPMENT	I	1	100%	1	1
W49675373	NORLING, SHARON	I	1	100%	1	1
W01266789	SOUTHRIDGE OSIDE HOA	I	1	100%	1	1
1465628	WASTE MANAGEMENT OF NORTH CNTY	I	1	100%	1	1
54505098	GREENE & GREENE 3 LLC	I	1	100%	1	1
56599668	GATEWAY SEABREEZE LLC	I	1	100%	1	1
56599723	J A S & M TRUST	I	1	100%	1	1
60572154	SAINT MALO HOA	I	1	100%	1	1
61196268	MAC ACQUISITION LLC	I	1	100%	1	1
66343985	CAMINO CREST HOA	I	1	100%	1	1
66869487	ZMARKET	I	1	100%	1	1
W47780064	ALBERTOS	I	1	100%	1	1
W01326216	THE SUMMIT	I	1	100%	1	1
01235001	PASEO VISTA APARTMENTS	I	1	100%	1	1
1611041	EATON CT HOA	I	1	100%	1	1
55531179	PACIFIC VIEW HOMES HOA	I	1	100%	1	1
55935513	MC LAUGHLIN, HIEU T	I	1	100%	1	1
56599658	KFC	I	1	100%	1	1
56599689	ROBERT MANN PACKAGING INC	I	1	100%	1	1
64462605	COASTAL TOWNLOFT MAINT. HOA	I	1	100%	1	1
NOT IN GIS	DEL ORO HILLS - LMAD	I	1	100%	1	1
W01232398	MILLER, TRACY N	I	1	100%	1	1
W35406929	ECP-FM INC	I	1	100%	1	1
W39416370	SCHDC	I	1	100%	1	1
W01431754	SOUTHRIDGE HOA	I	1	100%	1	1
1190546	AT & SF RAILROAD CO	I	1	100%	1	1
1232390	FIRST BAPTIST CHURCH	I	1	100%	1	1
1538018	RNH&J PROPERTIES	I	1	100%	1	1
1588817	PACIFIC COAST INN LLC	I	1	100%	1	1
56220097	SOUTHWEST GREENE INT'L	I	1	100%	1	1
56599692	RAYO WHOLESALE	I	1	100%	1	1
56599710	CALIFORNIA CREATIVE FOODS INC	I	1	100%	1	1
56599735	NOBEL LEARNING COMMUNITY	I	1	100%	1	1
62756323	SIMBA INTERNATIONAL	I	1	100%	1	1
65908642	KB HOMES	I	1	100%	1	1
66024549	OCEANSIDE VAC OWNRS ASSOC INC	I	1	100%	1	1
66881908	CJK INTERNATIONAL LLC	I	1	100%	1	1
67801681	RIVERDALE HOA	I	1	100%	1	1
W001108847	SUNRISE CAPITAL LLC	I	1	100%	1	1
W33241054	OCEANSIDE COMMUNITY ASSN	I	1	100%	1	1
W47734364	GANATOL LAND COMPANY	I	1	100%	1	1
1567870	RK EXCEL AMERICA	I	1	100%	1	1
56599711	WILCOX, ROBERT A	I	1	100%	1	1
61965829	DAYS INN	I	1	100%	1	1
65403811	VISTA DEL RIO - LMAD	I	1	100%	1	1
65672939	PANORAMA RIDGE II @ DARWIN DR	I	1	100%	1	1
65908614	PACIFIC AVENUE HOA	I	1	100%	1	1
67680655	RANCHO SAN GERONIMO HOA	I	1	100%	1	1
70329929	RITE AID CORPORATION	I	1	100%	1	1
74281142	MERITAGE HOMES OF CALIFORNIA	I	1	100%	1	1
8550597	MCDONALDS CORPORATION	I	1	100%	1	1
W01250841	WINEHILL HOA	I	1	100%	1	1

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W01309552	NEW SONG COMMUNITY CHURCH	I	1	100%	1	1
W01332737	SANTA FE MESA - LMAD	I	1	100%	1	1
58202611	NEPTUNE POINTE	I	0	100%	0	1
65908590	NEVADA MANOR MAINTENANCE CORP	I	0	100%	0	1
71133871	SFG OCEANSIDE, LLC	I	0	100%	0	1
W44890576	JEHOVAH'S WITNESSES	I	0	100%	0	1
1591839	VANDEGRIFT - LMAD	I	0	100%	0	1
69849479	VANDEGRIFT - LMAD	I	0	100%	0	1
7822945	PACIFIC ANIMAL HOSPITAL	I	0	100%	0	1
8136239	TOLL BROTHERS INC	I	0	100%	0	1
W30966046	BERNARD, BILL	I	0	100%	0	1
67121860	SUNSET HILLS - LMAD	I	0	100%	0	1
52504582	OUTBACK STEAKHOUSE	I	0	100%	0	1
8135350	BELESIS FAMILY TRUST 12-29-93	I	0	100%	0	1
1546831	CITY OF OCEANSIDE	I-G	22	100%	22	1
60149638	CITY OF OCEANSIDE	I-G	18	100%	18	1
61349494	CITY OF OCEANSIDE	I-G	17	100%	17	1
68391142	CITY OF OCEANSIDE	I-G	15	100%	15	1
W1132895	CITY OF OCEANSIDE	I-G	12	100%	12	1
W01135594	CITY OF OCEANSIDE	I-G	11	100%	11	1
W34547386	CITY OF OCEANSIDE	I-G	10	100%	10	1
1308706	CITY OF OCEANSIDE	I-G	9	100%	9	1
1475192	CITY OF OCEANSIDE	I-G	9	100%	9	1
W01377547	CITY OF OCEANSIDE	I-G	7	100%	7	1
W01271356	CITY OF OCEANSIDE	I-G	7	100%	7	1
W01138284	CITY OF OCEANSIDE	I-G	7	100%	7	1
67121857	CITY OF OCEANSIDE	I-G	7	100%	7	1
W01271352	CITY OF OCEANSIDE	I-G	7	100%	7	1
68325221	CITY OF OCEANSIDE	I-G	6	100%	6	1
W01377528	CITY OF OCEANSIDE	I-G	6	100%	6	1
W01377527	CITY OF OCEANSIDE	I-G	6	100%	6	1
W1380423	CITY OF OCEANSIDE	I-G	5	100%	5	1
66894556	CITY OF OCEANSIDE	I-G	5	100%	5	1
01235851	CITY OF OCEANSIDE	I-G	5	100%	5	1
1570196	CITY OF OCEANSIDE	I-G	4	100%	4	1
68325241	CITY OF OCEANSIDE	I-G	4	100%	4	1
66894541	FIRE STATION #7 LANDSCAPE	I-G	3	100%	3	1
67305393	PKWY SLOPES N/W OF MEADOWBROOK	I-G	3	100%	3	1
1435464	CITY OF OCEANSIDE	I-G	3	100%	3	1
W1380424	CITY OF OCEANSIDE	I-G	2	100%	2	1
1570189	CITY OF OCEANSIDE	I-G	2	100%	2	1
42378602	CITY OF OCEANSIDE	I-G	2	100%	2	1
W01377496	PKWY SLOPES AT OSIDE BL/PCK	I-G	2	100%	2	1
W01264895	MEDIAN & PKWY SLOPES NE MEADOW	I-G	2	100%	2	1
W01377555	MEDIANS AT ECR & FIREMOUNTAIN	I-G	1	100%	1	1
W31966420	PKWY PLANTER AREAS N PACIFIC	I-G	1	100%	1	2
62934177	CITY OF OCEANSIDE	I-G	1	100%	1	1
61965831	CITY OF OCEANSIDE	I-G	1	100%	1	1
1567847	PARKING LOT LANDSCAPE	I-G	1	100%	1	1
W43226196	PARKING LOT PLANTER & TURF #26	I-G	1	100%	1	1
56599651	CITY OF OCEANSIDE	I-G	1	100%	1	1
W01264897	SLOPES AT CRESTVIEW N/O DARWIN	I-G	1	100%	1	1
54043802	PKWY & MED E/O RR TRACKS NCH	I-G	1	100%	1	1
70414422	PARKING LOT PLANTER BREAKWATER	I-G	1	100%	1	1
W01230953	MEDIAN LANDSCAPE E/O COLLEGE	I-G	1	100%	1	1
7822888	CITY OF OCEANSIDE	I-G	0	100%	0	1
W43226197	PARKING LOT PLANTERS MYERS/OAK	I-G	0	100%	0	1
Irrigation Billing Class Subtotal		538	**3,862**		**3,862**	**979**
61136028	GENENTECH	S	189	25%	47	1
1157335	MISSION LINEN SUPPLY	S	75	50%	38	1
W01371298	HYDRANAUTICS	S	300	0%	0	2
65623606	DEUTSCH CO	S	72	0%	0	1
1611039	GILEAD SCIENCES	S	40	0%	0	2
Special Users Billing Class Subtotal		5	**676**		**85**	**7**
	Total	**665**	**7,001**		**4,999**	**1,126**

Appendix B-2: Potential Recycled Water Customers (Existing Customers) - Grouped by Potential Recycled Water Demand
Recycled Water Facilities Plan
City of Oceanside

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W01442934	El Camino Country Club Golf Course	I	194	100%	194	3
73104317	Gilligan Groves	A-GS	250	50%	125	3
66891684	Rocket Farms Herbs INC	A-CA	209	50%	104	5
71308439	Eternal Hills Association	I	95	100%	95	3
65188576	Ocean Hills Country Club	I	91	100%	91	1
60149641	RDO Tech Park	I	90	100%	90	19
71686116	Mission Vista High School	I	70	100%	70	4
67810559	Rancho Milagro LLC	A-CA	135	50%	68	2
W23843286	City Center Golf Course	G	70	90%	63	1
W01327649	Villages of Rancho Del Oro HOA	I	60	100%	60	18
1471844	Titleist Footjoy Golf Facility	I	58	100%	58	1
66024565	Arrowood Master Association 01	I	58	100%	58	11
W38254406	Villages of Rancho Del Oro HOA	I	56	100%	56	10
1611491	Wilmont Ranch Maintanence Corp.	I	53	100%	53	6
68003992	AMB DSS Pacific Coast LLC	I	52	100%	52	11
	Greater than 50 afy Subtotal	**15**	**1,541**		**1,237**	**98**
W26241341	RANCHO MILAGRO LLC	A-CA	98	50%	49	2
61136028	GENENTECH	S	189	25%	47	1
60149640	OCEAN RANCH BUSINESS ASSOC	I	45	100%	45	7
66860860	CITY OF OCEANSIDE	G	48	90%	43	1
65794822	ARMSTRONG GARDEN CENTER	A-CA	86	50%	43	2
1244654	CAL TRANS	I	43	100%	43	1
W35038109	MURRAY MISSION	I	42	100%	42	18
1562464	DEL ORO HILLS - LMAD	I	42	100%	42	16
W001320393	VILLAGES OF RANCHO DEL ORO HOA	I	41	100%	41	11
W01371835	Emeral Isle Golf Course	C	41	90%	37	1
W01210697	WEST COAST TOMATO GROWERS	A-CA	79	50%	39	1
W01257433	PRIME MESA LP	I	39	100%	39	6
1157335	MISSION LINEN SUPPLY	S	75	50%	38	1
1564594	DEL ORO HILLS - LMAD	I	36	100%	36	14
64213984	MIRA COSTA COLLEGE	I	35	100%	35	1
1388950	INGWERSEN, JACK	I	33	100%	33	1
W01235833	AGRI SERVICE	I	32	100%	32	1
35852159	WHELAN RANCH COMMUNITY ASSOC	I	30	100%	30	9
1319148	TRI CITY HOSPITAL	C	114	25%	28	1
70562692	RANCHO MILAGRO LLC	A-CA	56	50%	28	1
W01231509	PRESIDIO AT RANCHO DEL ORO	I	28	100%	28	6
61294907	WANIS VIEW ESTATES HOA	I	27	100%	27	6
56599671	VILLAGES OF RANCHO DEL ORO HOA	I	26	100%	26	16
62029829	GENENTECH	I	26	100%	26	5
1567851	W2005 MRD REALTY LLC	I	25	100%	25	3
1466155	GATLIN DEVELOPMENT	I	25	100%	25	7
	25 - 50 afy Subtotal	**26**	**1,360**		**927**	**139**
1546831	CITY OF OCEANSIDE	I-G	22	100%	22	1
W01109787	CAMPBELL, RICHARD F	A-GS	43	50%	22	1
W1333789	MISSION POINT MASTER ASSOC	I	21	100%	21	8
62756341	ARROWOOD MASTER ASSOCIATION 02	I	21	100%	21	5
W1431749	RDO TOWN CENTER ASSOC	I	20	100%	20	5
69658686	OCEANSIDE UNIFIED SCHOOL DIST	I	20	100%	20	1
1559150	OCEANSIDE UNIFIED SCHOOL DIST	I	20	100%	20	1
W1303438	RDO RANCH MAINTENANCE	I	19	100%	19	2
66024567	OCEANSIDE UNIFIED SCHOOL DIST	I	19	100%	19	1
W01311020	FRANK MISSION MARKETPLACE	I	18	100%	18	3
60149638	CITY OF OCEANSIDE	I-G	18	100%	18	1
W01457151	BAYSHORE SOUTH HOA	I	18	100%	18	6
W03124793	WASATCH PROPERTY MGT	I	18	100%	18	6
W01307700	PRIME CASSANNA LP	I	18	100%	18	4
1528708	SANTA FE MESA - LMAD	I	17	100%	17	16
W01217519	OCEANSIDE UNIFIED SCHOOL DIST	I	17	100%	17	1
61995939	OCEANSIDE UNIFIED SCHOOL DIST	I	17	100%	17	1
W01391839	CALIFORNIA BRISAS HOA	I	17	100%	17	6
67121868	OGBP MASTER ASSN PARCEL II	I	17	100%	17	4
61349494	CITY OF OCEANSIDE	I-G	17	100%	17	1

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
62510107	DM COLOR EXPRESS INC	A-CA	33	50%	17	1
1553024	EVERGREEN DISTRIBUTORS INC	A-CA	33	50%	17	1
62756339	VILLAGES OF RANCHO DEL ORO HOA	I	16	100%	16	12
61196282	BONSALL UNIF SCHOOL DISTRICT	I	16	100%	16	1
66860861	PIAZZA D'ORO LLC	I	16	100%	16	1
67062010	CAL TRANS DISTRICT #11	I	16	100%	16	4
67667059	NAGATA BROS FARMS INC	A-RA	31	50%	16	1
W01418258	RIVERDALE HOA	I	16	100%	16	4
W01457768	PAN PACIFIC RETAIL PROPERTIES	I	16	100%	16	3
60149643	VISTA UNIFIED SCHOOL DISTRICT	I	15	100%	15	1
68391142	CITY OF OCEANSIDE	I-G	15	100%	15	1
W22391725	OCEANSIDE MANOR HOA	I	15	100%	15	9
67167305	BANK OF THE WEST	I	15	100%	15	1
73921135	OCEANSIDE UNIFIED SCHOOL DIST	I	15	100%	15	1
W01436451	CREST AT WHELAN RANCH HOA	I	15	100%	15	6
W001406504	ORCHARD LANE OCEANSIDE	I	14	100%	14	3
1191834	PACIFIC PARADISE NURSERY	A-AS	28	50%	14	1
1566503	SAN DIEGO AUTO AUCTION	I	14	100%	14	4
66951317	QUAIL RIDGE HOA	I	14	100%	14	9
W01431755	EMERALD ESTATES	I	13	100%	13	6
W01387846	ALACIMA HOA	I	13	100%	13	2
W01250835	VISTA WAY VILLAGE ASSOCIATION	I	13	100%	13	2
1587893	CHURCH OF ST THOMAS MORE	I	13	100%	13	1
W01264887	LAKEVIEW HOA	I	13	100%	13	2
W01377529	GUAJOME MEADOWS HOA	I	13	100%	13	4
69761666	ARMSTRONG GARDEN CENTER	A-CA	25	50%	13	1
W40187269	MELLANO & COMPANY	A-CA	25	50%	13	4
66024558	SEAGATE CORP CENTR OWNERS ASSN	I	12	100%	12	2
67680710	LOS ARBOLITOS #4	I	12	100%	12	2
1611035	OCEANSIDE UNIFIED SCHOOL DIST	I	12	100%	12	1
56599672	RIVER RANCH MAINTENCE CORP	I	12	100%	12	6
W22720327	EL CAMINO VILLA UNIT NO 1	I	12	100%	12	4
67062007	CAL TRANS	I	12	100%	12	1
W01332743	DOUGLAS PARK - LMAD	I	12	100%	12	9
66894543	PAULSON PROPERTY MANAGEMENT	I	12	100%	12	3
W01267569	IVEY GLENN HOA	I	12	100%	12	6
W1132895	CITY OF OCEANSIDE	I-G	12	100%	12	1
61995991	QUARRY CREEK-NORTH OA	I	12	100%	12	3
61996000	RANCHO ROSE HOMEOWNERS ASSN	I	12	100%	12	2
W35038108	SHADOW WAY APARTMENTS LP	I	12	100%	12	3
69045669	CITY OF OCEANSIDE	G	13	90%	12	1
W31663632	3883 SAN RAMON LLC	I	12	100%	12	2
W01271902	VILLA TRINIDAD HOA	I	11	100%	11	3
1529548	RIO VISTA LANDSCAPE MAINT ASSC	I	11	100%	11	3
W01308957	VISTA UNIFIED SCHOOL DISTRICT	I	11	100%	11	1
68193512	OCEAN VILLAGE HOA	I	11	100%	11	3
W01135594	CITY OF OCEANSIDE	I-G	11	100%	11	1
W01377406	MISSION GARDENS HOA	I	11	100%	11	2
65794817	CMA GROWERS	A-CA	22	50%	11	2
W01229955	BALMA, L M	A-GR	22	50%	11	1
W1363360	PARK LANE HOA	I	11	100%	11	1
1567856	VILLAGES OF RANCHO DEL ORO HOA	I	11	100%	11	5
1538020	CITY OF OCEANSIDE	G	12	90%	11	1
01235837	EL CAMINO CLUB ESTATES	I	11	100%	11	4
1566515	VILLA TRIESTE MASTER HOA	I	11	100%	11	3
W01329883	PEACOCK MEADOWS HOA	I	10	100%	10	2
1529545	LATTER DAY SAINTS CHURCH	I	10	100%	10	1
W1327651	VISTA UNIFIED SCHOOL DISTRICT	I	10	100%	10	1
W34547386	CITY OF OCEANSIDE	I-G	10	100%	10	1
66024554	MONTELENA HOA	I	10	100%	10	2
W01308965	VISTA CAPRI ASSOC	I	10	100%	10	4
W01176700	RANCH MAINT-AM NATL FUND CORP	I	10	100%	10	2
W43226159	MARLADO - LMAD	I	10	100%	10	6
67062017	OCEAN HILLS COUNTRY CLUB HOA	I	10	100%	10	1
	10 - 25 afy Subtotal	**84**	**1,313**		**1,179**	**256**
62756318	PANORAMA RIDGE HOA	I	9	100%	9	1
1309571	BALMA, L M	A-GS	19	50%	9	1
68325240	CARRIAGE SQ EST HOA	I	9	100%	9	4

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W1420435	AVALON HOA	I	9	100%	9	6
61196286	WINDWARD COMMUNITY ASSOCIATION	I	9	100%	9	1
W1391833	NEW VENTURE CHRISTIAN FLSHP	I	9	100%	9	1
1308706	CITY OF OCEANSIDE	I-G	9	100%	9	1
1516540	MISSION SAN LUIS REY PARISH	I	9	100%	9	1
5794833	VERSAILLES IVEY RANCH HOA	I	9	100%	9	1
73921136	PRO KIDS GOLF	I	9	100%	9	1
W01108877	OCEAN HILLS COUNTRY CLUB HOA	I	9	100%	9	1
W01267645	VISTA UNIFIED SCHOOL DISTRICT	I	9	100%	9	1
W01267564	OCEAN HILLS COUNTRY CLUB HOA	I	9	100%	9	1
65794840	LOUCHIOS, VICTOR	A-GS	18	50%	9	2
1475192	CITY OF OCEANSIDE	I-G	9	100%	9	1
1465627	OCEAN HILLS COUNTRY CLUB HOA	I	9	100%	9	1
W01303432	OCEANSIDE UNIFIED SCHOOL DIST	I	9	100%	9	1
67121917	DM COLOR EXPRESS INC	A-RA	17	50%	9	1
8694506	PETERSON, ANDREA	A-CA	17	50%	9	1
1564599	ORD WAY LLC	I	9	100%	9	1
W01178124	MISSION MEADOWS HOA	I	9	100%	9	2
W01235862	VISTA UNIFIED SCHOOL DISTRICT	I	9	100%	9	1
61135742	PAULSON PROPERTY MANAGEMENT	I	8	100%	8	1
67305400	OCEAN HILLS COUNTRY CLUB HOA	I	8	100%	8	1
60149654	USA PROPERTIES	I	8	100%	8	2
W01250244	RANCHO DEL ORO RMA	I	8	100%	8	3
W1402886	SEAWIND OSIDE HOA	I	8	100%	8	3
W01309539	SUNSET VIEW OCEANSIDE ASSC LLC	I	8	100%	8	1
1418263	MILAN REAL ESTATE INVESTMENTS	I	8	100%	8	2
65672933	TRAVERS, BARBARA	A-CA	16	50%	8	1
65794820	RODEE, DONALD C	A-CA	16	50%	8	1
W01305627	OCEANSIDE UNIFIED SCHOOL DIST	I	8	100%	8	1
1436462	OCEAN HILLS COUNTRY CLUB HOA	I	8	100%	8	1
70414416	OCEAN HILLS COUNTRY CLUB HOA	I	8	100%	8	1
1611033	LIGHTHOUSE CHRISTIAN CHURCH	I	8	100%	8	1
65794826	OKSNEE, SCOTT & ANGELA P	A-CA	15	50%	8	1
61617753	ETERNAL HILLS CEMETERY	I	8	100%	8	1
66024548	LA PACIFICA LP	I	8	100%	8	1
62756345	SEACLIFF OWNERS ASSOCIATION	I	7	100%	7	2
W01377547	CITY OF OCEANSIDE	I-G	7	100%	7	1
W01308700	OCEAN HILLS COUNTRY CLUB HOA	I	7	100%	7	1
W01387851	WAWRZYNSKI, DAVID B	A-CA	14	50%	7	1
1611488	LOWES STORE	I	7	100%	7	2
W01271356	CITY OF OCEANSIDE	I-G	7	100%	7	1
64462600	VOC REALTY INVESTMENTS INC	I	7	100%	7	1
W01138284	CITY OF OCEANSIDE	I-G	7	100%	7	1
1586452	OCEAN HILLS COUNTRY CLUB HOA	I	7	100%	7	1
01574593	AEGIS ASSISTED LIVING PROP	I	7	100%	7	1
W01237556	HIGGINS, VICTORIA	A-GS	14	50%	7	2
65403812	SAINT MALO VILLAGE	I	7	100%	7	2
67121857	CITY OF OCEANSIDE	I-G	7	100%	7	1
68141775	OCEANSIDE AMER LITTLE LEAGUE	I	7	100%	7	2
W01403896	GALLANT, PHIL	A-CA	13	50%	7	2
66024552	COCA COLA BOTTLING CO	I	7	100%	7	1
67801685	ROIC CALIFORNIA LLC	I	7	100%	7	2
W01271352	CITY OF OCEANSIDE	I-G	7	100%	7	1
W1567849	ROSEDALE HOA	I	7	100%	7	4
1587913	VISTA UNIFIED SCHOOL DISTRICT	I	7	100%	7	1
W01179576	BAUTISTA, CASTELLANO	I	7	100%	7	1
W01237609	OCEAN TERRACE OWNERS ASSN	I	7	100%	7	1
1588223	MISSION TERRACE OWNERS ASSOC	I	6	100%	6	1
1611489	OLD GROVE GARP LLC	I	6	100%	6	1
W01250845	VPM/VILLAGE VIEW LP	I	6	100%	6	3
67121909	LOPEZ, J C	A-CA	13	50%	6	1
61349496	CITY OF OCEANSIDE	G	7	90%	6	1
1436460	OCEAN HILLS COUNTRY CLUB HOA	I	6	100%	6	1
1588221	VISTA UNIFIED SCHOOL DISTRICT	I	6	100%	6	1
W01237583	VISTA UNIFIED SCHOOL DISTRICT	I	6	100%	6	1
W01309554	CALIFORNIA CREST HOA	I	6	100%	6	3
67121911	RANCHO VERA	A-CA	12	50%	6	1
59878096	VILLAS AT MISSION POINT	I	6	100%	6	2

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W01333782	VERSAILLES IVEY RANCH HOA	I	6	100%	6	2
W45909269	LOGAN, HELEN A	A-RA	12	50%	6	1
68325221	CITY OF OCEANSIDE	I-G	6	100%	6	1
W1403897	OCEANSIDE UNIFIED SCHOOL DIST	I	6	100%	6	1
01235840	BROKEN YOLK CAFE	I	6	100%	6	1
41587633	COLE OF OCEANSIDE CA LP	I	6	100%	6	1
69761668	OCEANSIDE UNIFIED SCHOOL DIST	I	6	100%	6	1
71686111	TAYLOR MORRISON	I	6	100%	6	1
W01311417	GUAJOME RIDGE - LMAD	I	6	100%	6	4
W01377528	CITY OF OCEANSIDE	I-G	6	100%	6	1
1570203	FAIRWINDS IVEY RANCH	I	6	100%	6	1
6863620	QUARRY CREEK INVESTORS LLC	I	6	100%	6	1
70388814	OCEANSIDE COLLEGE WAY 1 INC	I	6	100%	6	1
W01271906	SUPERIOR READY MIX	I	6	100%	6	1
W01235834	FEE, JOHN F	A-CA	12	50%	6	1
65794819	VANCE, JACK O	A-CA	12	50%	6	1
W01377527	CITY OF OCEANSIDE	I-G	6	100%	6	1
1436461	OCEAN HILLS COUNTRY CLUB HOA	I	6	100%	6	1
W01308970	LAKEVIEW ESTATES HOA	I	6	100%	6	2
66024569	DM COLOR EXPRESS INC	A-RA	11	50%	6	1
1567857	SONOMA HILLS HOA	I	6	100%	6	1
64091568	NITTO DENKO TECHNICAL CORP	I	6	100%	6	1
67167347	MS KEARNY CPB 2 LLC	I	6	100%	6	1
W01239025	OCEAN TERRACE OWNERS ASSN	I	6	100%	6	1
1611478	THE WORLDMARK CLUB	I	5	100%	5	2
W01264889	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01264891	VISTA UNIFIED SCHOOL DISTRICT	I	5	100%	5	1
67121853	TRUST, FRANK	A-AS	11	50%	5	1
W01320405	MARBELLA COMMUNITY ASSOCIATION	I	5	100%	5	2
W01325489	MISSIONS AT IVEY RANCH HOA	I	5	100%	5	3
W01475185	VISTA DEL CAMINO VILLAGE HOA	I	5	100%	5	3
W01308709	OCEAN HILLS SUMMIT ASSOCIATION	I	5	100%	5	1
61294894	4010 OCEAN RANCH VENTURE LLC	I	5	100%	5	1
61294927	VCC OCEAN RANCH CONDO ASSOC	I	5	100%	5	1
61349498	MISSION WELLS HOMEOWNERS	I	5	100%	5	2
68325219	OCEANSIDE UNIFIED SCHOOL DIST	I	5	100%	5	1
W01308705	ACP OCEANSIDE INVESTORS LLC	I	5	100%	5	1
W1380423	CITY OF OCEANSIDE	I-G	5	100%	5	1
W01173066	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01412424	PERARO, FABIO	A-CA	10	50%	5	1
1517822	CAM COMMERCIAL PROPERTIES	I	5	100%	5	1
1566506	BEACHWOOD HOA	I	5	100%	5	1
60149667	PARKVIEW COMMUNITY ASSOCIATION	I	5	100%	5	1
61995940	PELICAN COVE HOA	I	5	100%	5	1
67121918	OCEANSIDE UNIFIED SCHOOL DIST	I	5	100%	5	1
68325211	PACIFIC COAST BUSINESS PARK B	I	5	100%	5	2
72282512	WEST COAST TOMATO GROWERS	I	5	100%	5	1
W01250248	OCEANSIDE ASSOCIATES	I	5	100%	5	2
W01266792	MONTEGO VILLAGE HOA	I	5	100%	5	2
W01239027	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01135658	RIDGEVIEW COMMUNITY ASSOC	I	5	100%	5	1
66951314	FONS, MICHAEL T	A-CA	10	50%	5	1
W01173064	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01257426	BROADMOOR HILLS HOA	I	5	100%	5	1
W01311412	MISSION DEL ORO HOA	I	5	100%	5	3
69849478	SAINT MALO HEIGHTS HOA	I	5	100%	5	2
W01236228	TIBERON OWNERS ASSOCIATION	I	5	100%	5	4
W01237619	SIENA AT MISION HOA	I	5	100%	5	1
W01380444	SPRUCE GROVE INC	I	5	100%	5	1
W01176696	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
W01231826	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
1518718	MIRA COSTA COLLEGE	C	48	10%	5	1
66894556	CITY OF OCEANSIDE	I-G	5	100%	5	1
W01334529	VISTA CALAVERA HOA 1	I	5	100%	5	2
W1377553	LAKEROSE PROPERTIES	I	5	100%	5	1
01235851	CITY OF OCEANSIDE	I-G	5	100%	5	1
62756328	HANSON AGGREGATES	I	5	100%	5	1
W01239024	OCEAN TERRACE HOA	I	5	100%	5	1

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W01237613	TERRA MAR HOA	I	5	100%	5	1
73104318	HERBTHYME FARMS INC	A-CA	9	50%	5	1
1377499	SD COUNTY GEN SVCS	I	5	100%	5	1
60149684	MISSION VIEW ESTATES MAINT	I	5	100%	5	2
61294897	SIERRA RIDGE HOA	I	5	100%	5	4
W01231829	OCEAN HILLS COUNTRY CLUB HOA	I	5	100%	5	1
5 - 10 afy Subtotal		**145**	**1,108**		**930**	**202**
60149689	MISSION GROVE HOUSING	I	4	100%	4	2
69770627	HAMANN CONSTRUCTION	I	4	100%	4	4
W01267575	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
1157243	MOUNTAIN WATER ICE	C	44	10%	4	1
62954639	THE CASITAS AT SPRING CREEK	I	4	100%	4	1
W26086335	RANCHO HERMOSA - LMAD	I	4	100%	4	2
W48805636	SOBH, MIKE	I	4	100%	4	1
W01231825	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
61995938	PAOLONE BROTHERS OCEANSIDE LLC	I	4	100%	4	1
62756321	CALVARY CHAPEL	I	4	100%	4	1
64091528	LONE TREE EMPIRE LLC	I	4	100%	4	1
01538019	THE SUMMIT	I	4	100%	4	1
1570196	CITY OF OCEANSIDE	I-G	4	100%	4	1
W01239028	MISSION DOUGLAS INVEST LLC	I	4	100%	4	2
W01271936	COLLEGE OCEANSIDE SW LLC	I	4	100%	4	1
67680750	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W1333700	U S POSTMASTER	I	4	100%	4	1
1277131	CITY OF OCEANSIDE	G	4	90%	4	1
1526263	RDO PLAZA PARTNERSHIP	I	4	100%	4	1
62756346	GRACE CHURCH NORTH COUNTY	I	4	100%	4	1
W01458176	LATTER DAY SAINTS CHURCH	I	4	100%	4	1
W01308699	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01320391	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W47780050	KING OF KINGS	I	4	100%	4	1
1570201	PDO VENTURE LLC	I	4	100%	4	1
66894554	OTPC	I	4	100%	4	1
68325241	CITY OF OCEANSIDE	I-G	4	100%	4	1
W1574591	LYONS REALTY WEST LLC	I	4	100%	4	1
W01320390	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01325488	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01237617	TERRA MAR HOA	I	4	100%	4	1
67121849	VISTA SAN LUIS REY HOA	I	4	100%	4	1
W01235016	RANCHO SAN LUIS REY HOA INC	I	4	100%	4	1
W01380471	SEABREEZE HOA	I	4	100%	4	1
1436459	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
69045654	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01207543	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
68581419	BROADMOOR HILLS HOA	I	4	100%	4	1
1588269	VILLAGES OF RANCHO DEL ORO HOA	I	4	100%	4	1
63967387	VISTA MONTANA HOA	I	4	100%	4	2
67167308	MAJ INVESTORS LP	I	4	100%	4	1
W01135693	OCEAN HILLS COUNTRY CLUB HOA	I	4	100%	4	1
W01232384	EARLEY, WILLIAM R	A-CA	7	50%	3	1
W44132183	KASH, SAM	A-CA	7	50%	3	1
1528717	PEACOCK HILLS - LMAD	I	3	100%	3	2
1611490	LOWES STORE	I	3	100%	3	1
65492089	ST MARGARET PARISH	I	3	100%	3	1
65794824	MESA PINES HOMEOWNERS ASSOC	I	3	100%	3	4
67351015	CAMINO REAL ASSOC	I	3	100%	3	3
68292267	PEPPERWOOD HOA	I	3	100%	3	1
W01176138	ST MARY'S STAR OF THE SEA	I	3	100%	3	1
W01267563	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01320396	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01320397	OCEAN TERRACE OWNERS ASSN	I	3	100%	3	1
1372531	OCEANSIDE UNIFIED SCHOOL DIST	C	33	10%	3	1
W01264892	KOKKE, ANTOINE & TERESA	A-CA	7	50%	3	1
1611483	CANYON CREST MAINTENANCE CORP	I	3	100%	3	2
61241071	DIENER, DOUGLAS	I	3	100%	3	1
64820995	RDO/RANCH MAINTENANCE	I	3	100%	3	1
66894541	FIRE STATION #7 LANDSCAPE	I-G	3	100%	3	1
W01239479	LIMITED COLLEGE PLAZA	I	3	100%	3	1

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W01324808	6TH AND K LTD	I	3	100%	3	1
67062012	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01305636	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W036368800	PENSEYRES, PETER	A-RS	6	50%	3	1
W66768401	OZAR, LEONARD	A-RS	6	50%	3	1
W01236868	HAHLBOHM, WILLIAM	I	3	100%	3	1
68292265	PORAT, GAYLE	A-RS	6	50%	3	1
1567852	LAMVIN INC	I	3	100%	3	1
56599666	SUMMIT VILLAGE HOA	I	3	100%	3	1
66013448	OCEANSIDE NIERMAN LP	I	3	100%	3	1
70731646	PACIFIC MARINE CREDIT UNION	I	3	100%	3	1
W01308710	THE SUMMIT	I	3	100%	3	1
W01387104	SLAGLE, DR R G	A-AS	6	50%	3	1
W23843280	ROCKET FARMS HERBS INC	A-CA	6	50%	3	1
1523492	VISTA PACIFICA ASSOCIATES	I	3	100%	3	1
1523493	RANCHO CALIF CENTER	I	3	100%	3	1
1538008	ARBOR COVE HOA	I	3	100%	3	2
1567855	RDO RANCH MAINTENANCE	I	3	100%	3	1
1567860	HOME DEPOT STORE #1018	I	3	100%	3	1
61349502	NORTH COAST UNITED METHODIST	I	3	100%	3	1
65878479	SEAGATE CORP CENTR OWNERS ASSN	I	3	100%	3	1
W01326245	PALMILLA DEL ORO HOA	I	3	100%	3	1
W01207541	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
1520198	OCEANSIDE UNIFIED SCHOOL DIST	C	30	10%	3	1
1611031	SYCAMORE SPRINGS HOA	I	3	100%	3	2
55998185	CITY OF VISTA	I	3	100%	3	1
66869529	FIRE MOUNTAIN HOA	I	3	100%	3	3
67305393	PKWY SLOPES N/W OF MEADOWBROOK	I-G	3	100%	3	1
41191688	LI, JING	A-RA	6	50%	3	1
1237618	MISSION AVENUE INVESTERS	I	3	100%	3	2
34547388	VILLA CAMINO APTS	I	3	100%	3	1
65672935	HEARTLAND MAINTANCE CORP	I	3	100%	3	1
65908644	OCEANIC BUSINESS PARK SOUTH	I	3	100%	3	3
W01271927	SKY HAVEN POINT 2	I	3	100%	3	2
68581418	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
68581424	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01108878	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
70414414	BROADMOOR HILLS HOA	I	3	100%	3	1
W47780055	LINTHURST, JOHN	A-CA	6	50%	3	1
1566505	MCDOWELL, WILLIAM W	A-RS	5	50%	3	1
60149659	WAL MART STORES INC	I	3	100%	3	1
71686112	NORTH RIVER VILLAGE CONDO ASSO	I	3	100%	3	2
W44890578	SAN LUIS REY UNITED METHODIST	I	3	100%	3	1
1332118	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01331157	RIDGEVIEW COMM ASSOC	I	3	100%	3	1
59259495	BUEHLER, JACK	A-AS	5	50%	3	1
1333012	1702 OCEANSIDE ASSOCIATES LTD	I	3	100%	3	1
1380465	INGWERSEN, JACK	I	3	100%	3	1
1435464	CITY OF OCEANSIDE	I-G	3	100%	3	1
66024573	CASA DE AMPARO	I	3	100%	3	1
W01271907	RDO RANCH MAINTENANCE	I	3	100%	3	1
67680749	OCEAN HILLS COUNTRY CLUB HOA	I	3	100%	3	1
W01237612	TERRA MAR HOA	I	3	100%	3	1
66882121	SCHURMEIER, H M	A-AS	5	50%	3	1
W01402887	GRIMM, CRAIG E	A-AS	5	50%	3	1
1264899	EMERITUS	I	3	100%	3	1
52504583	MELROSE LLC	I	3	100%	3	1
56599677	ONESOURCE DISTRIBUTORS,LLC	I	3	100%	3	1
68299936	HOME DEPOT STORE #0679	I	3	100%	3	1
W01300533	ONA MISSION PARTNERS LP	I	3	100%	3	1
W01303427	MEADOW CREEK HOA	I	3	100%	3	2
W01308974	CHEMI-SOURCE INC	I	3	100%	3	1
W01311406	RIVERPOINTE HOA	I	3	100%	3	1
63967385	3186 VISTA WAY LP	I	2	100%	2	1
66894545	NCTD	I	2	100%	2	1
66894546	OCEANSIDE HOUSING PARTNERS LP	I	2	100%	2	1
66951315	JAMES BREE ENTERPRISES	I	2	100%	2	1
67061993	RESIDENCE INN BY MARRIOTT OSID	I	2	100%	2	1

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W01303433	TERRA MAR HOA	I	2	100%	2	1
65794829	MARTINEK, DENNIS	A-RS	5	50%	2	1
56599728	EAST PARKWAY N/O MONTEREY	G	3	90%	2	2
1588813	VISTAMONTE AT SAN LUIS REY	I	2	100%	2	1
54505110	CLIFFORD BRISTOL BUS OWNERS	I	2	100%	2	1
65878476	NORTH RIVER INVESTMENTS LLC	I	2	100%	2	1
66951316	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
W01334535	CAREY, NEAL & DORA	A-CA	4	50%	2	1
54043797	EXTENDED STAY CA INC 75-TADM	I	2	100%	2	1
58514994	SHEPHERD OF THE VALLEY CHURCH	I	2	100%	2	1
65672940	COURTYARD BY MARRIOTT #3131G	I	2	100%	2	1
W01324804	FAMILY FELLOWSHIP CHURCH	I	2	100%	2	1
W01377435	CAMINO COLONY APARTMENTS	I	2	100%	2	1
W1412425	MISSION VISTA CONDO ASSN	I	2	100%	2	3
W01264888	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
65794836	SABOSKY, SANDRA LEE	A-AS	4	50%	2	1
68325239	LOMA ALTA VILLAGE OWNERS ASSOC	I	2	100%	2	1
W01303429	PLAZA REAL TECH CIRCLE ASSN	I	2	100%	2	1
W01334531	INGWERSEN, JANE A	I	2	100%	2	1
W48343638	KILYA PROPERTIES	I	2	100%	2	1
W01320399	OCEAN TERRACE OWNERS ASSN	I	2	100%	2	1
W01334536	MAURER, PHILIP R	A-RS	4	50%	2	1
61294930	CITY OF OCEANSIDE	G	2	90%	2	1
W01387844	CITY OF OCEANSIDE	G	2	90%	2	1
1471845	PRINCE OF PEACE ABBEY	C	20	10%	2	1
51784106	HENIE HILLS HOA	I	2	100%	2	3
55998186	AMERILLUM	I	2	100%	2	1
56599657	OSON, EDWARD	I	2	100%	2	1
W01271048	EXTRA SPACE STORAGE 0645	I	2	100%	2	1
W01308693	OCEANSIDE SQUARE LLC	I	2	100%	2	1
W01422686	IVEY RANCH PARK ASSN	I	2	100%	2	1
W01436455	CANINE COMPANION	I	2	100%	2	1
W1380424	CITY OF OCEANSIDE	I-G	2	100%	2	1
W37217260	A-1 QUALITY SELF STORAGE	I	2	100%	2	1
W44890574	SALVATION ARMY	I	2	100%	2	1
W66024555	NIHON SEIMEN	I	2	100%	2	1
59259497	HOWE, WILLIAM B	A-AS	4	50%	2	1
55998180	LIL JACKSON SENIOR COMMUNITY	I	2	100%	2	1
61294892	ARROWOOD MASTER ASSOCIATION 03	I	2	100%	2	1
64265440	GARNER, CHARLES H	I	2	100%	2	1
66881898	NCTD	I	2	100%	2	1
66881901	NCTD	I	2	100%	2	1
68617122	MENTAL HEALTH SYSTEMS INC	I	2	100%	2	1
67121905	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
67667058	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
W01305637	OCEAN HILLS COUNTRY CLUB HOALV	I	2	100%	2	1
W1391840	SEAGATE TERRACE HOA	I	2	100%	2	1
W01334537	WHYTE, ROBERTA J	A-AS	4	50%	2	1
1570189	CITY OF OCEANSIDE	I-G	2	100%	2	1
42378602	CITY OF OCEANSIDE	I-G	2	100%	2	1
56599654	CORNWELL BUSINESS CENTER	I	2	100%	2	1
56599697	OCEANIC BUS PARK OWNERS ASSOC	I	2	100%	2	1
56599713	GSM LLC	I	2	100%	2	1
56599721	CALIFORNIA COAST CREDIT UNION	I	2	100%	2	1
W01309550	SOUTHWEST GREENE INT'L	I	2	100%	2	1
W01320386	RDO RANCH MAINTENANCE	I	2	100%	2	1
W48343639	MONTEREY FINANCIAL SERVICES	I	2	100%	2	1
W48343641	OCEANS ELEVEN CASINO	I	2	100%	2	1
W01176698	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
52504572	SR COMMERCIAL	I	2	100%	2	1
68299933	VOIT OCEANSIDE PARTNERS LLC	I	2	100%	2	1
W01377414	UNION BANK	I	2	100%	2	1
W01377496	PKWY SLOPES AT OSIDE BL/PCK	I-G	2	100%	2	1
W01380467	LA MONTANA HOA	I	2	100%	2	1
1538005	SOUTHRIDGE OCEANSIDE HOA	I	2	100%	2	1
W01267177	SOUTHRIDGE OCEANSIDE HOA	I	2	100%	2	1
1544214	OCEANSIDE UNIFIED SCHOOL DIST	C	17	10%	2	1
W42022479	KENNEY, PHILLIP	A-CA	3	50%	2	1

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1611493	JOE & MARY MOTTINO FAMILY YMCA	I	2	100%	2	1
66881899	NCTD	I	2	100%	2	1
W01271947	WARREN, JOHN	I	2	100%	2	1
W01135694	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
W01173067	OCEAN HILLS COUNTRY CLUB HOA	I	2	100%	2	1
58514946	TAYLOR, RONALD C	A-AS	3	50%	2	1
W50504213	PKWY LANDSCAPING AND MEDIAN	G	2	90%	2	2
58514944	CURTIS, BARBARA	A-CA	3	50%	2	1
W01307693	HEGER, ALEX	A-RS	3	50%	2	1
66869642	WORMS, MARIA	I	2	100%	2	1
W01264895	MEDIAN & PKWY SLOPES NE MEADOW	I-G	2	100%	2	1
W37047361	ALL SAINTS CEMETERY ASSOC	I	2	100%	2	1
W01257425	BROADMOOR HILLS HOA	I	2	100%	2	1
67121904	TERRA MAR HOA	I	2	100%	2	1
69658692	TERRA MAR HOA	I	2	100%	2	1
1564597	GILEAD SCIENCES	C	15	10%	2	1
W01453776	WALL, MARK	A-CA	3	50%	2	1
61294931	CITY OF OCEANSIDE	G	2	90%	1	1
73481353	NORTH COUNTY TRANSIT DISTRICT	C	14	10%	1	1
055531157	LANDMARK MANUFACTURING INC	I	1	100%	1	1
55487060	HALLMARK CLASSIC II HOA	I	1	100%	1	1
55998143	RORICK JR, DAVID	I	1	100%	1	1
56599704	CHEW, WALTER B	I	1	100%	1	1
65908597	HUMANE SOCIETY AND SPCA	I	1	100%	1	1
66406375	MIRA COSTA COLLEGE	I	1	100%	1	1
66951313	OCEANSIDE UNIFIED SCHOOL DIST	I	1	100%	1	1
68325210	LIBBY LAKE OWNERS ASSOC	I	1	100%	1	1
69099716	OCEANSIDE UNIFIED SCHOOL DIST	C	14	10%	1	1
68325226	CITY OF OCEANSIDE	G	13	10%	1	1
54505090	RECEIVERSHIP OMBC	I	1	100%	1	1
54901376	76 & DOUGLAS PARTNERSHIP	I	1	100%	1	1
56599649	VANDEGRIFT - LMAD	I	1	100%	1	2
65908591	BALDA HK PLASTICS	I	1	100%	1	1
70329927	SEA VILLAGE HOA	I	1	100%	1	1
W01305628	LA PETITE ACADEMY SITE #0256	I	1	100%	1	1
W01326217	PACIFIC PALM APARTMENTS	I	1	100%	1	1
W01320398	OCEAN TERRACE OWNERS ASSN	I	1	100%	1	1
W01306295	CITY OF OCEANSIDE	G	12	10%	1	1
61241073	MURAD, PETER	A-RA	2	50%	1	1
67121912	GASHENAO, LUDA	A-CA	2	50%	1	1
1566516	RADHA DAMODOR LLC	I	1	100%	1	1
56599664	AT & T SERVICES INC	I	1	100%	1	1
56599707	NATIVE BOUQUET	I	1	100%	1	1
58514993	9 VISTA MONTEMAR LP	I	1	100%	1	1
67710141	DEUTSCH CO	I	1	100%	1	1
69770634	CARTIN, ROBERT	I	1	100%	1	1
W01235844	OCEANSIDE PLAZA LLC	I	1	100%	1	1
W01250245	FIRST PRESBYTERIAN CHURCH	I	1	100%	1	1
W01377555	MEDIANS AT ECR & FIREMOUNTAIN	I-G	1	100%	1	1
W01431751	NO SD COUNTY TRANSIT DEV CO	I	1	100%	1	1
W31966420	PKWY PLANTER AREAS N PACIFIC	I-G	1	100%	1	2
W01135684	OCEAN HILLS COUNTRY CLUB HOA	I	1	100%	1	1
W01231830	OCEAN HILLS COUNTRY CLUB HOA	I	1	100%	1	1
W1391841	SEAGATE TERRACE HOA	I	1	100%	1	1
W01308708	SOUTHRIDGE OCEANSIDE HOA	I	1	100%	1	1
65990616	OCEANSIDE UNIFIED SCHOOL DIST	C	12	10%	1	1
69658694	ALISON, KIMBERLY	A-CA	2	50%	1	1
65397632	OCEANSIDE UNIFIED SCHOOL DIST	C	11	10%	1	1
66891682	CAL MAT COMPANY	C	11	10%	1	1
1237606	RUBINYI, JEANNETTE	A-CA	2	50%	1	1
50091430	VISTA UNIFIED SCHOOL DISTRICT	I	1	100%	1	1
54505097	D2-LLC	I	1	100%	1	1
56599673	OCEANSIDE LA COSTA VILLAS LLC	I	1	100%	1	1
56786125	COBAS, MICHAEL	I	1	100%	1	1
61965887	VIA VERA CRUZ LLC	I	1	100%	1	1
62934177	CITY OF OCEANSIDE	I-G	1	100%	1	1
66869662	OCEAN HEIGHTS COMMUNITY ASSC	I	1	100%	1	1
66881896	HANK DIKEY CHEVRON USA	I	1	100%	1	1

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
W01250837	YVONNE ASHLEY	I	1	100%	1	1
64204948	ITALIAN MAPLE HOLDINGS LLC	C	11	10%	1	1
44053766	DEANE, PHILIP J	A-CA	2	50%	1	1
66168234	SANDLIN, KENT	A-CA	2	50%	1	1
65672937	HENDRICKS, RICHARD	A-CA	2	50%	1	1
67121867	HINSHAW, O E	A-AS	2	50%	1	1
67167293	MCDOWELL, SHELLEY K	A-CA	2	50%	1	1
1567480	KING, BRUCE A	I	1	100%	1	1
1612198	CASA VISTA APTS	I	1	100%	1	1
47262644	ALLSTATE MOVING SYSTEMS	I	1	100%	1	1
55252730	UNION BANK #	I	1	100%	1	1
56599682	DE LA PLATA LLC	I	1	100%	1	1
61294900	LU, JOHN	I	1	100%	1	1
W29173721	LAKE VILLAGE OWNER ASSOCIATION	I	1	100%	1	2
W47780056	WESTERN DENTAL	I	1	100%	1	1
W48455705	TIMPSON, LAUREL M	I	1	100%	1	2
W01377554	LAKEROSE PROPERTIES	I	1	100%	1	1
W48343642	MCDONALD'S	I	1	100%	1	1
W01303439	SOUTHRIDGE OCEANSIDE HOA	I	1	100%	1	1
65672932	ANDERSON, WILLIAM G	A-CA	2	50%	1	1
W01320395	LORAH FAMILY TRUST	I	1	100%	1	1
64204947	OCEANSIDE UNIFIED SCHOOL DIST	C	9	10%	1	1
1564598	GILEAD SCIENCES	I	1	100%	1	1
60149677	SANDOVAL ENTERPRISES INC	I	1	100%	1	1
60149690	LEN'S AUTO BODY	I	1	100%	1	1
61965831	CITY OF OCEANSIDE	I-G	1	100%	1	1
62934174	WINDWARD COMMUNITY ASSOCIATION	I	1	100%	1	1
66894544	WALGREENS #9433	I	1	100%	1	1
69849480	MISSION MEADOW - LMAD	I	1	100%	1	1
7822948	VINE STREET PLAZA	I	1	100%	1	1
W29813541	GILDRED DEVELOPMENT	I	1	100%	1	1
W49675373	NORLING, SHARON	I	1	100%	1	1
W01266789	SOUTHRIDGE OSIDE HOA	I	1	100%	1	1
1436458	CITY OF OCEANSIDE	G	1	90%	1	1
1567846	CIRCLE K # 2709478	C	8	10%	1	1
W01179575	JOLLY, LARRY	A-CA	2	50%	1	1
1465628	WASTE MANAGEMENT OF NORTH CNTY	I	1	100%	1	1
1567847	PARKING LOT LANDSCAPE	I-G	1	100%	1	1
54505098	GREENE & GREENE 3 LLC	I	1	100%	1	1
56599668	GATEWAY SEABREEZE LLC	I	1	100%	1	1
56599723	J A S & M TRUST	I	1	100%	1	1
60572154	SAINT MALO HOA	I	1	100%	1	1
61196268	MAC ACQUISITION LLC	I	1	100%	1	1
66343985	CAMINO CREST HOA	I	1	100%	1	1
66869487	ZMARKET	I	1	100%	1	1
W43226196	PARKING LOT PLANTER & TURF #26	I-G	1	100%	1	1
W47780064	ALBERTOS	I	1	100%	1	1
W01326216	THE SUMMIT	I	1	100%	1	1
64213931	CITY OF OCEANSIDE	G	8	10%	1	1
23500892	OCEANSIDE UNIFIED SCHOOL DIST	C	8	10%	1	1
W45909277	SAUCEDO, GUADALUPE	A-CA	2	50%	1	1
67062001	CJK INTERNATIONAL LLC	C	7	10%	1	1
01235001	PASEO VISTA APARTMENTS	I	1	100%	1	1
1611041	EATON CT HOA	I	1	100%	1	1
55531179	PACIFIC VIEW HOMES HOA	I	1	100%	1	1
55935513	MC LAUGHLIN, HIEU T	I	1	100%	1	1
56599651	CITY OF OCEANSIDE	I-G	1	100%	1	1
56599658	KFC	I	1	100%	1	1
56599689	ROBERT MANN PACKAGING INC	I	1	100%	1	1
64462605	COASTAL TOWNLOFT MAINT. HOA	I	1	100%	1	1
NOT IN GIS	DEL ORO HILLS - LMAD	I	1	100%	1	1
W01232398	MILLER, TRACY N	I	1	100%	1	1
W35406929	ECP-FM INC	I	1	100%	1	1
W39416370	SCHDC	I	1	100%	1	1
W01431754	SOUTHRIDGE HOA	I	1	100%	1	1
1522902	OCEANSIDE UNIFIED SCHOOL DIST	C	7	10%	1	1
1517821	ROWLEY'S PETROLEUM CORP	C	7	10%	1	1
39872580	CITY OF OCEANSIDE - M BRUCE	G	1	90%	1	1

Main Meter No.	Customer Name	Billing Class	Average Potable Demand from 2010-2012 (afy)	Recycled Water (% of Potable Water)	Potential Recycled Water Demand (afy)	No. of Meters
54505103	ROSE, R DAN	C	6	10%	1	1
1190546	AT & SF RAILROAD CO	I	1	100%	1	1
1232390	FIRST BAPTIST CHURCH	I	1	100%	1	1
1538018	RNH&J PROPERTIES	I	1	100%	1	1
1588817	PACIFIC COAST INN LLC	I	1	100%	1	1
56220097	SOUTHWEST GREENE INT'L	I	1	100%	1	1
56599692	RAYO WHOLESALE	I	1	100%	1	1
56599710	CALIFORNIA CREATIVE FOODS INC	I	1	100%	1	1
56599735	NOBEL LEARNING COMMUNITY	I	1	100%	1	1
62756323	SIMBA INTERNATIONAL	I	1	100%	1	1
65908642	KB HOMES	I	1	100%	1	1
66024549	OCEANSIDE VAC OWNRS ASSOC INC	I	1	100%	1	1
66881908	CJK INTERNATIONAL LLC	I	1	100%	1	1
67801681	RIVERDALE HOA	I	1	100%	1	1
W001108847	SUNRISE CAPITAL LLC	I	1	100%	1	1
W01264897	SLOPES AT CRESTVIEW N/O DARWIN	I-G	1	100%	1	1
W33241054	OCEANSIDE COMMUNITY ASSN	I	1	100%	1	1
W47734364	GANATOL LAND COMPANY	I	1	100%	1	1
W01435455	CHEVRON PRODUCTS CO	C	5	10%	1	1
W32041443	COAST CAR WASH	C	5	10%	1	1
1567870	RK EXCEL AMERICA	I	1	100%	1	1
54043802	PKWY & MED E/O RR TRACKS NCH	I-G	1	100%	1	1
56599711	WILCOX, ROBERT A	I	1	100%	1	1
61965829	DAYS INN	I	1	100%	1	1
65403811	VISTA DEL RIO - LMAD	I	1	100%	1	1
65672939	PANORAMA RIDGE II @ DARWIN DR	I	1	100%	1	1
65908614	PACIFIC AVENUE HOA	I	1	100%	1	1
67680655	RANCHO SAN GERONIMO HOA	I	1	100%	1	1
70329929	RITE AID CORPORATION	I	1	100%	1	1
70414422	PARKING LOT PLANTER BREAKWATER	I-G	1	100%	1	1
74281142	MERITAGE HOMES OF CALIFORNIA	I	1	100%	1	1
8550597	MCDONALDS CORPORATION	I	1	100%	1	1
W01230953	MEDIAN LANDSCAPE E/O COLLEGE	I-G	1	100%	1	1
W01250841	WINEHILL HOA	I	1	100%	1	1
W01309552	NEW SONG COMMUNITY CHURCH	I	1	100%	1	1
W01332737	SANTA FE MESA - LMAD	I	1	100%	1	1
33756582	FLINN, LAURA A	A-CA	1	50%	1	1
58202611	NEPTUNE POINTE	I	0	100%	0	1
65908590	NEVADA MANOR MAINTENANCE CORP	I	0	100%	0	1
71133871	SFG OCEANSIDE, LLC	I	0	100%	0	1
7822888	CITY OF OCEANSIDE	I-G	0	100%	0	1
W43226197	PARKING LOT PLANTERS MYERS/OAK	I-G	0	100%	0	1
W44890576	JEHOVAH'S WITNESSES	I	0	100%	0	1
64265442	RJ EL CAMINO PLAZA INVESTORS	C	4	10%	0	1
1422818	WEST COAST TOMATO GROWERS	A-CA	1	50%	0	1
65672930	PENDLETON FARMS	A-CA	1	50%	0	1
67667057	MATURZAK, DAVID & AMY	A-CA	1	50%	0	1
1591839	VANDEGRIFT - LMAD	I	0	100%	0	1
69849479	VANDEGRIFT - LMAD	I	0	100%	0	1
7822945	PACIFIC ANIMAL HOSPITAL	I	0	100%	0	1
8136239	TOLL BROTHERS INC	I	0	100%	0	1
W30966046	BERNARD, BILL	I	0	100%	0	1
67121860	SUNSET HILLS - LMAD	I	0	100%	0	1
52504582	OUTBACK STEAKHOUSE	I	0	100%	0	1
8135350	BELESIS FAMILY TRUST 12-29-93	I	0	100%	0	1
01235841	CITY OF OCEANSIDE	G	10	0%	0	1
21586355	CITY OF OCEANSIDE	G	6	0%	0	1
W1333698	CITY OF OCEANSIDE	G	6	0%	0	1
W01371298	HYDRANAUTICS	S	300	0%	0	2
68404171	CITY OF OCEANSIDE - SLR NEW	G	147	0%	0	1
65623606	DEUTSCH CO	S	72	0%	0	1
1611039	GILEAD SCIENCES	S	40	0%	0	2
	Less than 5 afy Subtotal	395	**1,679**		**726**	**431**
	Total	**665**	**7,001**		**4,999**	**1,126**

Appendix C

RECYCLED WATER CUSTOMER OUTREACH SURVEY

CITY OF OCEANSIDE – RECYCLED WATER CUSTOMER OUTREACH

Non-Potable Site: **Mission Linen Supply**
Contact Person: **Randy Garrett** Phone #: **760-757-9099** Email: **rgarrett@missionlinen.com**

Initial Customer Conversion Assessment Rating*	**"C"**
Estimated Non-Potable Demand	**87 AFY**

*For the purposes of assessing relative ease of retrofitting existing customers for recycled water use, the following classification system was developed:
"A" – Easy Conversion: An "A" user would be one that is relatively easy to connect to the system and would not have any water quality issues or any stringent pressure or time of use concerns. An example of an "A" user might be a new park site.
"B" – Moderate Conversion: A "B" user would be one that is moderately difficult to connect and may have other concerns/issues relative to water quality, pressure, or time of use. An example of a "B" user might be an older golf course.
"C" – Difficult Conversion: A "C" user would be one that is perceived to be difficult or unlikely that will ever connect. The difficulty could be related to water quality, pressure, complexity of conversion, an innovative use or some other factor. An example of a "C" user might be a commercial fabric dyer in which there is no proven history of successful operation.

Summary:
The following is a summary of key discussion items from a call with Mission Linen Supply on 4/2/2014.

- RMC led a discussion with Randy Garrett (rgarrett@missionlinen.com, 760-757-9099) and Chris Blackmon (cblackmon@missionlinen.com) regarding the City of Oceanside's current development of the Recycled Water Master Plan to expand the use of recycled water within the City. The goal of this discussion was to investigate specific potential customers for use of recycled water and discuss level interest and the feasibility of converting non-potable uses from potable water to recycled water.
- **Non-Potable Uses**: Commercial laundry for hospitality linens only. Do not wash any medical linens.
- **Non-Potable Demand:** Average 97,000 GPD. Monthly water usage (3/31/2014) was 3180 units (2,378,640 gallons) (76,730 GPD) (85 AFY on average).
- **Storage:** There is no onsite storage. Rinse tank is approximately 8'x'6' by 6' deep (2,000 gallons). Heated recirculation water (5,000 gallons).
- **Operations/Use Period:** Currently reclaim last rinse for first wash. Water softening. Potable water passes through the following processes before entering the laundry units: Polishing/Filtration, Softeners, Boilers (120 psi max), Stack economizer and Heated water storage (5,000 gallon tank).
- **Potable Water Uses**: Sanitary uses and Fire suppression sprinkler system.
- **Water Quality**: WQ concerns: alkalinity, TDS (which they are already fighting), Potassium, and Chlorine residual. No water quality consistency issues.
- **Water Pressure**: Water pressure at meter is 65 psi. At softeners is 90 psi.
- **General**:
    - Been in service at that location for 50 years; no plans to move or expand.
    - Have record drawings for site utilities
    - Boilers are cleaned annually in May.
    - Interested in learning more about the City's brineline disposal; can they buy into it?
    - Wanted to make note that the City should be clearing the creek more; it floods their property.
    - General concern with potential water quality impact and out of pocket costs for the conversion.

A Site Survey was conducted with Mission Linen Supply on 4/11/2014. See attached Industrial Survey Form, Site Map and water billing data provided by the customer. As an outcome of the site survey, Mission Linen Supply staff indicated that in order for use of recycled water to work at their site the following items would need to be addressed:

- Lower TDS. Raise alkalinity and neutralize. Possibly add chlorine and chloroform.
- Discuss and address impact of discharge limits to the sewer
- Address potential public outreach concerns of using recycled water for table linens (napkins). During the meeting it was suggested that a second potable water loop could be used for the final rinse. However, that potable water loop would need to be softened and heated.
- It was noted that the current major cost Mission Linen Supply is dealing with is the haul away of brine which is 4 times that cost of potable water.

CITY OF OCEANSIDE – RECYCLED WATER CUSTOMER OUTREACH QUESTIONS

Potential Non-Potable Site Name: **West Coast Tomato Growers**
Contact Person Name: Orven Veragoza Phone #: **760-305-5335** Email: **orven@westcoastvineripe.com**

Initial Customer Conversion Assessment Rating*	**"B"**
Estimated Non-Potable Demand	**155 AFY**

*For the purposes of assessing relative ease of retrofitting existing customers for recycled water use, the following classification system was developed:
"A" – Easy Conversion: An "A" user would be one that is relatively easy to connect to the system and would not have any water quality issues or any stringent pressure or time of use concerns. An example of an "A" user might be a new park site.
"B" – Moderate Conversion: A "B" user would be one that is moderately difficult to connect and may have other concerns/issues relative to water quality, pressure, or time of use. An example of a "B" user might be an older golf course.
"C" – Difficult Conversion: A "C" user would be one that is perceived to be difficult or unlikely that will ever connect. The difficulty could be related to water quality, pressure, complexity of conversion, an innovative use or some other factor. An example of a "C" user might be a commercial fabric dyer in which there is no proven history of successful operation.

Summary:

The following is a summary of key discussion items from a call with West Coast Tomato Growers on 5/12/2014.

- RMC led a discussion with Orven Veragoza regarding the City of Oceanside's current development of the Recycled Water Master Plan to expand the use of recycled water within the City. The goal of this discussion was to investigate specific potential customers for use of recycled water and discuss level interest and the feasibility of converting non-potable uses from potable water to recycled water.
- **Non-Potable Uses**: Commercial agriculture growing fresh ripened tomatoes.
- **Non-Potable Demand:**
- **Groundwater:** Use a mix of groundwater and potable water. They have several wells and rely most on groundwater. Currently use just a sand filter on the their groundwater wells.
- **Operations/Use Period:** daytime using drip systems only.
- **Potable Water Uses**: Have to use potable water (domestic) for final pump-wash packaging of tomatoes.
- **Water Quality**: Chloride and salts are the biggest concerns. Will need to verify water quality limits.
- **Water Pressure**: not discussed.

CITY OF OCEANSIDE – RECYCLED WATER CUSTOMER OUTREACH QUESTIONS

Potential Non-Potable Site Name: **Rocket Farms Herbs**
Contact Person Name: **Christina Smith** Phone #: **760-450-5204** Email: **NA**

Initial Customer Conversion Assessment Rating*	**"B"**
Estimated Non-Potable Demand	**130 AFY**

*For the purposes of assessing relative ease of retrofitting existing customers for recycled water use, the following classification system was developed:
"A" – Easy Conversion: An "A" user would be one that is relatively easy to connect to the system and would not have any water quality issues or any stringent pressure or time of use concerns. An example of an "A" user might be a new park site.
"B" – Moderate Conversion: A "B" user would be one that is moderately difficult to connect and may have other concerns/issues relative to water quality, pressure, or time of use. An example of a "B" user might be an older golf course.
"C" – Difficult Conversion: A "C" user would be one that is perceived to be difficult or unlikely that will ever connect. The difficulty could be related to water quality, pressure, complexity of conversion, an innovative use or some other factor. An example of a "C" user might be a commercial fabric dyer in which there is no proven history of successful operation.

Summary:

The following is a summary of key discussion items from a call with Rocket Farm Herbs on 5/5/2014.

- RMC led a discussion with Christina Smith regarding the City of Oceanside's current development of the Recycled Water Master Plan to expand the use of recycled water within the City. The goal of this discussion was to investigate specific potential customers for use of recycled water and discuss level interest and the feasibility of converting non-potable uses from potable water to recycled water.
- **Non-Potable Uses**: Commercial agriculture growing herbs that are a 'fresh product'. These fresh market herbs that are not washed.
- **Non-Potable Demand:** not known
- **Groundwater:** Site has a groundwater well(s) at the lower portion of the site.
- **Operations/Use Period:** Daytime using spray or drip systems.
- **Potable Water Uses**: not discussed
- **Water Quality**: Herbs are very sensitive to water quality. Currently have an RO unit to treat TDS levels down to 300 ppm from around 600 ppm.
- **Water Pressure**: not discussed
- **General**:
    - Rocket Farms also has a 2nd property at 297 Wilshire that they operate. They lease both properties through 2015; but after that they do not know. Property near them was recently sold to be an apartment development.
    - Overall: if water quality is comparable and no issues with Dept of Public Health approval for not washed herbs, than okay. If an issue, may need to look into dual-sourcing site for potable water to specific not washed herbs.

CITY OF OCEANSIDE – RECYCLED WATER CUSTOMER OUTREACH QUESTIONS

Non-Potable Site: **Gilligan Groves**
Contact Person: **Patty Hughes** Phone #: **760-941-6180** Email: **N/A**

Initial Customer Conversion Assessment Rating*	**"B"**
Estimated Non-Potable Demand	**26 AFY**

*For the purposes of assessing relative ease of retrofitting existing customers for recycled water use, the following classification system was developed:
"A" – Easy Conversion: An "A" user would be one that is relatively easy to connect to the system and would not have any water quality issues or any stringent pressure or time of use concerns. An example of an "A" user might be a new park site.
"B" – Moderate Conversion: A "B" user would be one that is moderately difficult to connect and may have other concerns/issues relative to water quality, pressure, or time of use. An example of a "B" user might be an older golf course.
"C" – Difficult Conversion: A "C" user would be one that is perceived to be difficult or unlikely that will ever connect. The difficulty could be related to water quality, pressure, complexity of conversion, an innovative use or some other factor. An example of a "C" user might be a commercial fabric dyer in which there is no proven history of successful operation.

Summary:

The following is a summary of key discussion items from a call with Gilligan Groves on 4/2/2014.

- RMC led a discussion with Patty Hughes regarding the City of Oceanside's current development of the Recycled Water Master Plan to expand the use of recycled water within the City. The goal of this discussion was to investigate specific potential customers for use of recycled water and discuss level interest and the feasibility of converting non-potable uses from potable water to recycled water.
- **Non-Potable Uses**: Commercial agriculture growing avocados.
- **Non-Potable Demand:** Current water bill was estimated by Patty at $20,000/month but did not know demand.
- **Groundwater:** Patty was unsure if they had any groundwater wells, but indicated they probably do.
- **Operations/Use Period:** Irrigation is performed manually during day time hours by spray irrigation only.
- **Potable Water Uses**: Patty indicated that is it a very large site and there are residences on the site with septic systems. Current potable water is from the City and also from Rainbow Water District. Patty indicated they have more potable water meters/services than they use. Currently using only 3 of the 5 or 6 water services.
- **Water Quality**: not discussed
- **Water Pressure**: not discussed
- **General**:
    - She has a meeting with other managers once a week and will get back to RMC regarding a potential site visit (note, she returned my inquiry request on 4/22; need to verify with other customers to consolidate site visits.

Appendix D

STORAGE CALCULATIONS FOR LOWER SAN LUIS REY WRF SYSTEM

Analysis of Hourly Supply/Demand/Storage Requirements

PROJECT: City of Oceanside - Reservoir analysis for 10-inch Brine Pipeline System
SCENARIO: Phase 1 System
STORAGE: >>>>> 2 >>>>>> Without seasonal storage
SUPPLY: >>>>>>> 1 >>>>>> Maximum WRP supply; Other supply as req'd for demand
DEMAND: Irrigation = existing RWD RW seasonal variation; Other = EME power plant seasonal variation

Velocity in 10-inch is 3.1 fps
Demand does not include Shadowridge Golf Course (200 afy)

	Supply					Demand			Operational Storage / Unused			
Hour	Diur. Var. ratio (a)	WRP GPM (b)	Other GPM (c)	Seas. Stor. GPM (d)	Total GPM	Irrigation GPM (e)	Other GPM (f)	Total GPM	Stor. I/O GPH	Addit. Stor. GPH	Unus. Flow GPH	Res. Stor. Total Gal (g)
1	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	269,259
2	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	215,583
3	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	161,908
4	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	108,232
5	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	54,557
6	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	0
7	1.00	809	0	0	809	0	0	0	48,541	0	0	48,541
8	1.00	809	0	0	809	0	481	481	19,677	0	0	68,218
9	1.00	809	0	0	809	0	481	481	19,677	0	0	87,895
10	1.00	809	0	0	809	0	481	481	19,677	0	0	107,571
11	1.00	809	0	0	809	0	481	481	19,677	0	0	127,248
12	1.00	809	0	0	809	0	481	481	19,677	0	0	146,925
13	1.00	809	0	0	809	0	481	481	19,677	0	0	166,601
14	1.00	809	0	0	809	0	481	481	19,677	0	0	186,278
15	1.00	809	0	0	809	0	481	481	19,677	0	0	205,954
16	1.00	809	0	0	809	0	481	481	19,677	0	0	225,631
17	1.00	809	0	0	809	0	481	481	19,677	0	0	245,308
18	1.00	809	0	0	809	0	481	481	19,677	0	0	264,984
19	1.00	809	0	0	809	0	481	481	19,677	0	0	284,661
20	1.00	809	0	0	809	0	0	0	48,541	0	0	333,202
21	1.00	809	0	0	809	0	0	0	48,541	0	0	381,744
22	1.00	809	0	0	809	0	0	0	48,541	0	0	430,285
23	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	376,610
24	1.00	809	0	0	809	1,704	0	1,704	(53,675)	0	0	322,934
	24.00	1.165	0.000	0.000	1.165	0.818	0.346	1.164	0.001	0.000	0.000	
		Total, MGD										

INPUT

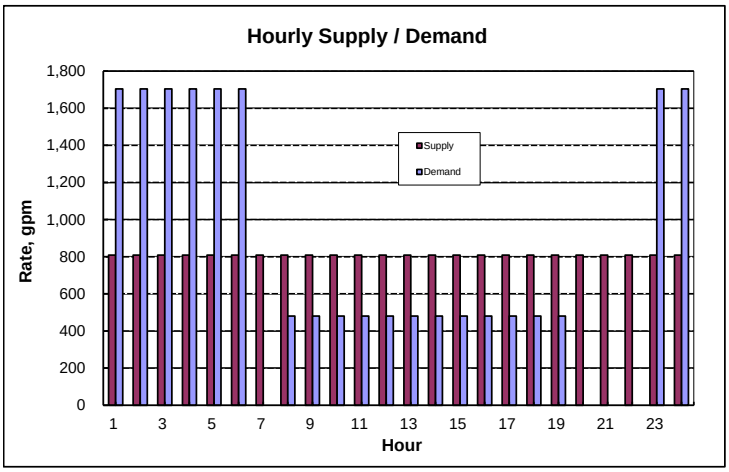
a)	hourly	= diurnal varia. based on full flow equalization (no units)
b)	1	= 1: WRP supply per max month; 2: As req'd per demand
	8,000	= maximum-hour WRP supply available (gpm) @ 50% COI
c)	0	= maximum-hour well supply available (gpm)
d)	0	= maximum-hour seasonal storage supply available (gpm)
e)	1,704	= hrly. irriga. demand for max. tot. dem. mo (MTDM) (gpm)
	8	= duration of irrigation demand (hours)
	23	= time of initial irrigation demand (hour)
f)	481	= hourly other demand for maximum day of MTDM (gpm)
	12	= duration of other demand (hours)
	8	= time of initial other demand (hour)
g)	0	= initial (minimum) reservoir volume (gal)
	6	= time of initial (minimum) reservoir volume (hour)
	5,000,000	= maximum reservoir working storage available (gal)

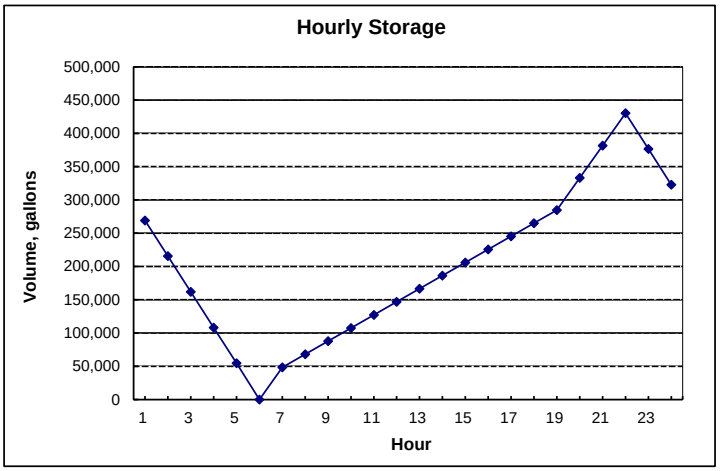
LIMITS

n/a
n/a
8,000
800
n/a
n/a
n/a
n/a
n/a
n/a
n/a
n/a
?

OUTPUT

1)	809	= maximum-hour WRP supply used (gpm)
2)	0	= maximum-hour well supply used (gpm)
3)	809	= maximum total supply used (gpm)
4)	1,704	= hourly irrigation demand for MTDM (gpm)
5)	481	= hourly other demand for maxamum day MTDM (gpm)
6)	1,704	= maximum hourly total demand (gpm)
7)	1.00	= total supply/demand ratio (no units)
8)	809	= maximum flow to storage (gpm)
9)	895	= maximum flow from storage (gpm)
10)	0	= additional storage needed (gal)
11)	0	= unused flow available (gal)
12)	430,285	= maximum reservoir working storage used (gal)
13)	**0.5**	MGD with 2 feet of board and 1 foot of base
		Rounded to the nearest 0.25





Analysis of Hourly Supply/Demand/Storage Requirements

PROJECT: City of Oceanside - Reservoir analysis for new 16-inch pipeline system
SCENARIO: Buildout System
STORAGE: >>>>> 2 >>>>>> Without seasonal storage
SUPPLY: >>>>>>> 1 >>>>>> Maximum WRP supply; Other supply as req'd for demand
DEMAND: Irrigation = existing RWD RW seasonal variation; Other = EME power plant seasonal variation

	Supply					Demand			Operational Storage / Unused			
Hour	Diur. Var. ratio (a)	WRP GPM (b)	Other GPM (c)	Seas. Stor. GPM (d)	Total GPM	Irrigation GPM (e)	Other GPM (f)	Total GPM	Stor. I/O GPH	Addit. Stor. GPH	Unus. Flow GPH	Res. Stor. Total Gal (g)
1	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	985,222
2	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	788,711
3	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	592,199
4	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	395,688
5	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	199,177
6	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	0
7	1.00	2,531	0	0	2,531	0	0	0	151,874	0	0	151,874
8	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	232,479
9	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	313,084
10	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	393,689
11	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	474,294
12	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	554,899
13	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	635,504
14	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	716,109
15	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	796,714
16	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	877,319
17	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	957,924
18	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	1,038,529
19	1.00	2,531	0	0	2,531	0	1,188	1,188	80,605	0	0	1,119,133
20	1.00	2,531	0	0	2,531	0	0	0	151,874	0	0	1,271,007
21	1.00	2,531	0	0	2,531	0	0	0	151,874	0	0	1,422,882
22	1.00	2,531	0	0	2,531	0	0	0	151,874	0	0	1,574,756
23	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	1,378,244
24	1.00	2,531	0	0	2,531	5,806	0	5,806	(196,511)	0	0	1,181,733
	24.00	3.645	0.000	0.000	3.645	2.787	0.855	3.642	0.003	0.000	0.000	
		Total, MGD										

INPUT

a)	hourly	= diurnal varia. based on full flow equalization (no units)	n/a
b)	1	= 1: WRP supply per max month; 2: As req'd per demand	n/a
	8,000	= maximum-hour WRP supply available (gpm) @ 50% COI	8,000
c)	0	= maximum-hour well supply available (gpm)	800
d)	0	= maximum-hour seasonal storage supply available (gpm)	n/a
e)	5,806	= hrly. irriga. demand for max. tot. dem. mo (MTDM) (gpm)	n/a
	8	= duration of irrigation demand (hours)	n/a
	23	= time of initial irrigation demand (hour)	n/a
f)	1,188	= hourly other demand for maximum day of MTDM (gpm)	n/a
	12	= duration of other demand (hours)	n/a
	8	= time of initial other demand (hour)	n/a
g)	0	= initial (minimum) reservoir volume (gal)	n/a
	6	= time of initial (minimum) reservoir volume (hour)	n/a
	5,000,000	= maximum reservoir working storage available (gal)	?

OUTPUT

1)	2,531	= maximum-hour WRP supply used (gpm)
2)	0	= maximum-hour well supply used (gpm)
3)	2,531	= maximum total supply used (gpm)
4)	5,806	= hourly irrigation demand for MTDM (gpm)
5)	1,188	= hourly other demand for maxamum day MTDM (gpm)
6)	5,806	= maximum hourly total demand (gpm)
7)	1.00	= total supply/demand ratio (no units)
8)	2,531	= maximum flow to storage (gpm)
9)	3,275	= maximum flow from storage (gpm)
10)	0	= additional storage needed (gal)
11)	0	= unused flow available (gal)
12)	1,574,756	= maximum reservoir working storage used (gal)
13)	**1.75**	MGD with 2 feet of board and 1 foot of base
		Rounded to the nearest 0.25