

2017

IEUA FY 2016-2017 Recycled Water Annual Report

Water Smart
Thinking in Terms of Tomorrow



Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

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INTRODUCTION

The 2016/17 Recycled Water Annual Report for the Inland Empire Utilities Agency (IEUA) recycled water program provides annual delivery data by IEUA retail member agencies, by usage types, and by customers. The 2016/17 report is for IEUA's fiscal year, which runs from July 2016 to June 2017. The report summarizes the program history, describes recent construction, and gives an overview of the IEUA treatment plants. IEUA provides wastewater treatment for its seven member agencies: the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, and Upland and Cucamonga Valley Water District. Recycled water from the treatment process is generated and delivered to its retail water agencies for use in the IEUA service area.

IEUA owns and operates five wastewater recycling facilities that serve over 875,000 people. Figure 1 shows the IEUA service area, its member agencies, and the locations of IEUA's treatment plants. Of the five plants, four produce tertiary-treated, Title 22-quality recycled water. Of the treatment plants, RP-2 does not have any liquid treatment processes, and as such does not produce any recycled water. The general layout and capacities of the water recycling plants are discussed in the last section of the report. Appendices A and B contain the recycled water effluent monitoring data and recycled water compliance data, respectively, for the 2016 calendar year for the four recycled water facilities.

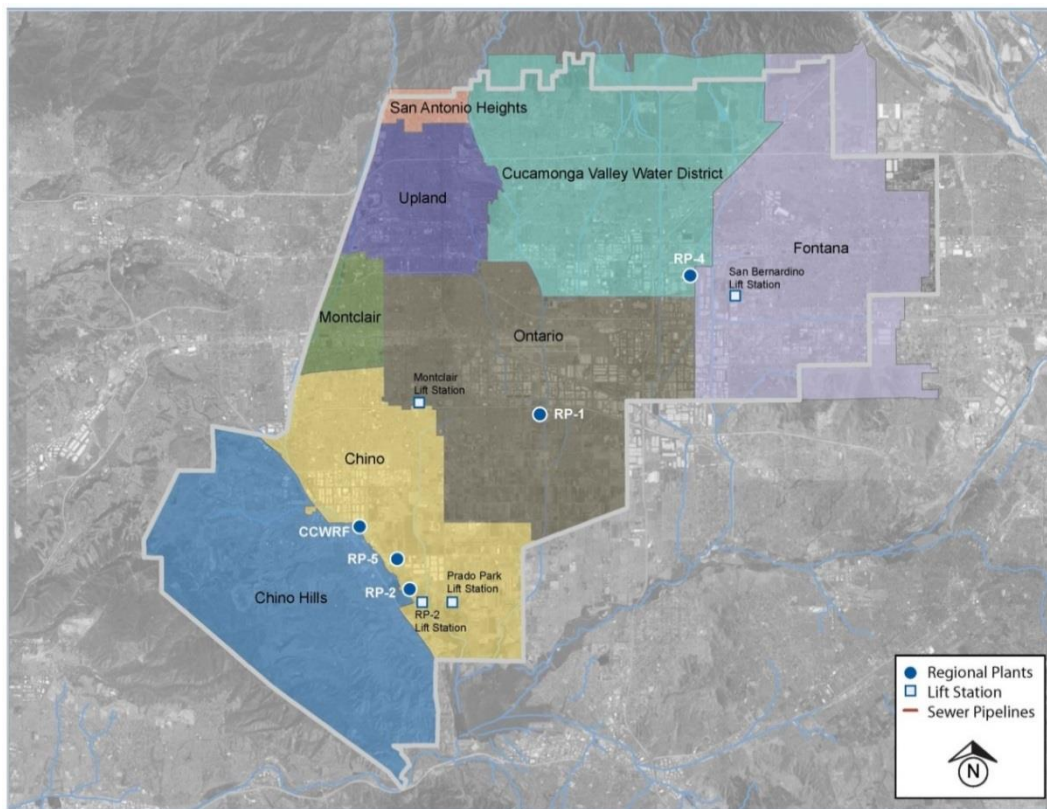


Figure 1 - IEUA Service Area

DEMANDS

During 2016/17, the average recycled water supply from IEUA's facilities was approximately 47.7 million gallons per day (MGD), or 53,467 acre-feet per year (AFY). Recycled water groundwater recharge usage was 13,934 AFY and recycled water direct usage was 19,477 AFY. Total recycled water demands during 2016/17 were 33,411 acre-feet (AF), an increase by 2.4% from the previous fiscal year. Recycled water recharge was up 5% and direct use was up 0.4%. The recycled water delivery volumes of direct use and groundwater recharge can vary seasonally and annually based on a variety of factors (e.g. the rainfall intensity, rainfall duration, and recharge basin maintenance activities). Figure 2 shows IEUA's historical direct use and groundwater recharge of recycled water for the past 10 years.

Recycled water demands for the combined direct use and recharge purposes were approximately 62 percent of the available supply. During the peak demand summer months (July through September), the total recycled water demand was approximately 90 percent of the available supply.

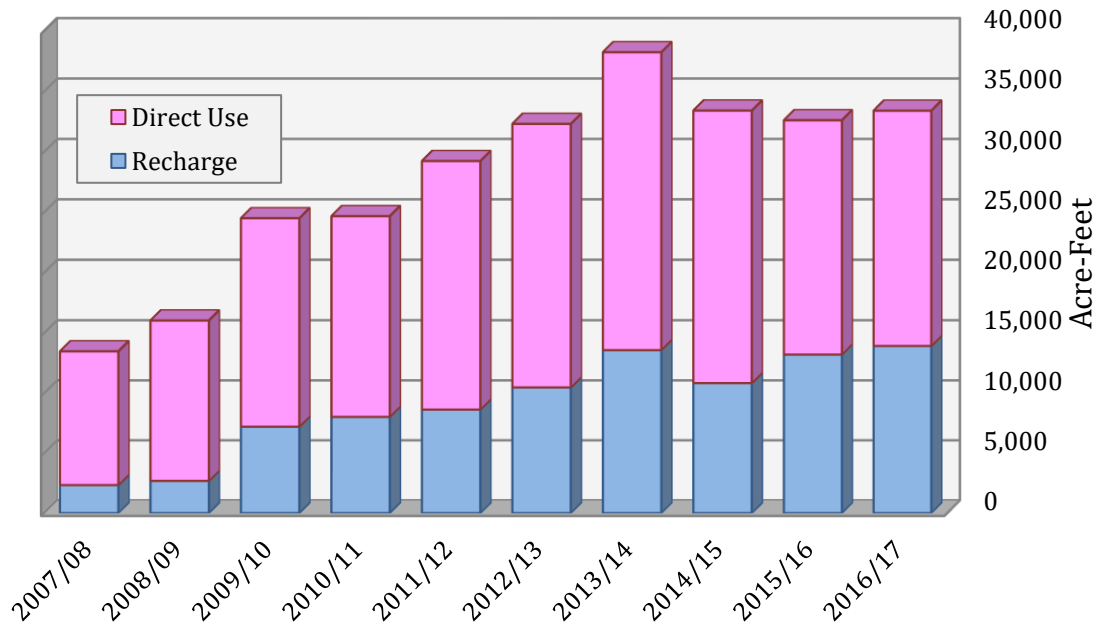


Figure 2 – Historical Recycled Water Direct Use and Groundwater Recharge

DEMANDS BY USE TYPE

Delivered recycled water was beneficially reused for a variety of applications including landscape irrigation, agricultural irrigation, industrial process water, groundwater recharge and construction. Table 1 and Figure 3 show the 2016/17 recycled water demand by use type.

Table 1 – Recycled Water Demand by Use Type for 2016/17

Type of Use	Demand (AF)	Percent of Demand
Recharge	13,934	42%
Agriculture	8,551	26%
Landscape	8,728	26%
Industrial	1,500	4%
Construction	698	2%
Total Demand	33,411	100%

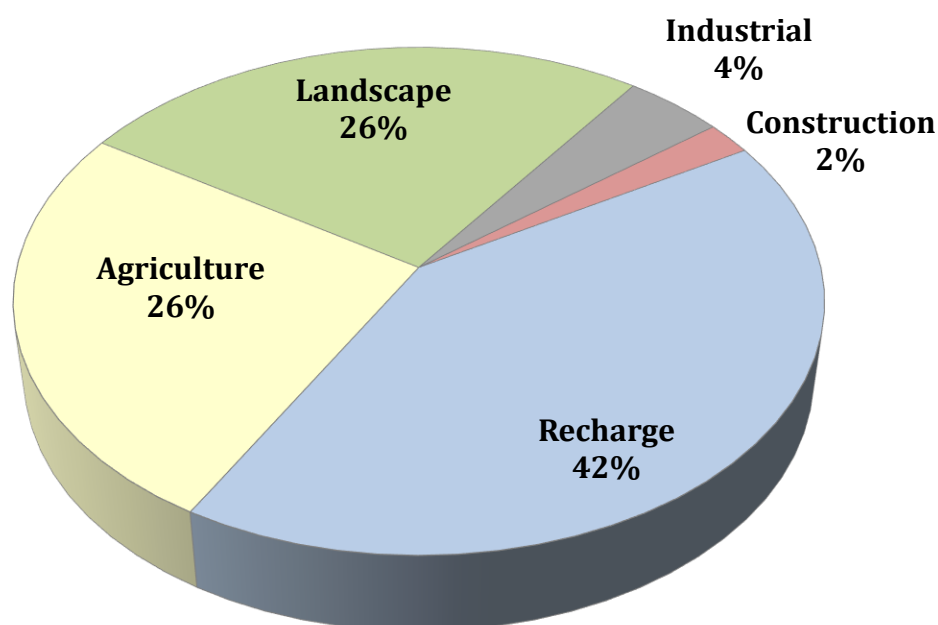


Figure 3 – Recycled Water Demand by Use Type for 2016/17

RETAIL DEMANDS

IEUA is the wholesale recycled water provider to its member agencies, which in turn are retail agencies that directly serve their customers. IEUA member agencies which served recycled water in 2016/17 include:

- City of Chino,
- City of Chino Hills,
- City of Ontario,
- Cucamonga Valley Water District (CVWD),
- Montclair (through MVWD),
- Fontana (through FWC), and
- City of Upland

Monte Vista Water District (MVWD) and Fontana Water Company (FWC) are the water retailers in the Cities of Montclair and Fontana, respectively, but are not IEUA member agencies. MVWD and FWC retail recycled water obtained from their overlying cities which are IEUA member agencies. San Bernardino County is currently a direct use customer of IEUA based on long standing historical contracts. Jurupa Community Services District (JCSD), located directly south of Fontana, is not an IEUA member agency yet will receive a recycled water groundwater recharge allocation through 2025 based on an allocation formula in a 2013 agreement between IEUA and JCSD.

Table 2 show the recycled water demand by agency. Each agency's total includes its direct use and its allocation from IEUA for recycled water groundwater recharge based on IEUA's Regional Sewage Service Contract.

Table 2 –Recycled Water Demand by Agency for 2016/17

Retail Agency	Direct Use (AF)	Recharge Allocation (AF)	Agency Total (AF)
Chino	6,447	0*	6,447
Chino Hills	1,837	1,321	3,159
CVWD	976	3,693	4,669
Fontana/FWC	52	2,764	2,816
Montclair/MVWD	305	638	943
Ontario	8,352	3,150	11,502
Upland	654	1,418	2,072
IEUA	588	0	588
San Bernardino County	265	0	265
JCSD	0	950	950
Subtotal	19,477	13,934	33,411

Chino exceeded Base Entitlement per Resolution 2016-6-17

CUSTOMERS DEMANDS

Appendix C lists the recycled water direct use customers of each retail agency and their demands for the fiscal year. Table 3 lists the top ten largest direct reuse customer sites for the fiscal year (excluding groundwater recharge sites). During 2016/17, one hundred and twenty-seven (127) new connections were made to the recycled water system with a total new demand estimated at 1,776 AFY. Connected new demand is the anticipated annual usage based on land size and previous potable water usage history.

Table 3 –Top 10 Recycled Water Customers for 2016/17

Customer	Use (AF)	Type of Use	Retailer
GH Dairy	1,387	Agricultural	Ontario
Cleveland Farm	1,190	Agricultural	Ontario
Cleveland Farm	1,180	Agricultural	Chino
WESTSTEYN DAIRY	964	Agricultural	Chino
New Indy Ontario	901	Industrial	Upland
Whispering Lakes Golf Course	677	Landscape	Ontario
Murai Farm	660	Agricultural	Ontario
Cal Poly Pomona	656	Agricultural	Chino
Los Serranos Golf Course	429	Landscape	Chino Hills
Upland Hills Country Club	383	Landscape	Upland
Subtotal	8,427		

ECONOMIC AND ENVIRONMENTAL IMPACTS

The 33,411 AF of recycled water used during the fiscal year is the equivalent of the water supply for roughly 66,800 homes. The use of recycled water reduces the need to pump State Water Project water over the Tehachapi Mountains, an equivalent net energy demand reduction of 2,657 kilowatt-hours (kWh) per AF, and an overall reduction of approximately 79 percent in carbon dioxide emissions.

IEUA's wholesale recycled water rate to its member agencies for 2016/17 was \$410/AF for direct usage and \$470/AF for recharge. Table 4 lists the IEUA retail agencies' recycled water rates in 2016/17.

Table 4 –Retail Agency Water Rates for 2016/17

City of Chino				
Source	Usage Type		Usage (HCF)	Effective Oct. 1, 2016
Potable Water	Flat Rate		1	\$2.64
Recycled Water	Non-Agricultural		1	\$1.06
	Agricultural		1	\$0.53
City of Chino Hills				
Source	Zone	Single Family Usage (HCF)	Multi-family Usage (HCF)	Effective July 1, 2016
Potable Water	Low	Tier 1 (0-12)	Tier 1 (0-7)	\$2.51
		Tier 2 (13-30)	Tier 2 (8-20)	\$2.86
		Tier 3 (>30)	Tier 3 (>21)	\$4.00
	Intermediate	Tier 1 (0-12)	Tier 1 (0-7)	\$2.72
		Tier 2 (13-30)	Tier 2 (8-20)	\$3.07
		Tier 3 (>30)	Tier 3 (>21)	\$4.21
	High	Tier 1 (0-12)	Tier 1 (0-7)	\$3.03
		Tier 2 (13-30)	Tier 2 (8-20)	\$3.40
		Tier 3 (>30)	Tier 3 (>21)	\$4.51
Recycled Water	Low	Flat Rate		\$2.10
	Intermediate			\$2.24
	High			\$2.47
	Temporary			\$2.54
City of Ontario				
Source	Usage (HCF)			Effective March 4, 2016
Potable Water	0-15			\$2.44
	>15			\$2.84
Recycled Water	Flat Rate			\$1.71
CVWD				
Source	Stage	Usage (HCF)		Effective July 1, 2016
Potable Water	Non-drought	Tier 1 (0-10)		\$1.60
		Tier 2 (11-40)		\$2.13
		Tier 3 (41-100)		\$2.66
		Tier 4 (>100)		\$3.03
Recycled Water		Flat Rate		\$1.68
MVWD				
Source	Usage Type	Tier	Usage (HCF)	Effective January 1, 2017
Potable Water	Residential	Tier 1	Allocation	\$1.95
		Tier 2	Allocation	\$2.59
		Tier 3	Allocation	\$4.95
		Tier 4	Allocation	\$5.66
	Non-residential	Domestic Water	Flat Rate	\$2.39
Recycled Water	Non-residential	Recycled Water	Flat Rate	\$1.96
Fontana Water Company				
Source	Usage Type	Usage (HCF)		Effective July 1, 2017
Potable Water	Conservation Rates	Tier 1 (0-16)		\$3.32
		Tier 2 (>16)		\$3.82
	General Rate	1		\$2.72
Recycled Water		Flat Rate		\$2.62
City of Upland				
Source	Usage Type		Usage (HCF)	Effective January 1, 2017
Potable Water	Single Family Residential Rate		Tier 1 (0-20)	\$1.52
			Tier 2 (21-50)	\$1.80
			Tier 3 (>50)	\$2.46
	Multi-Family Residential Rate		Flat Rate	\$1.87
	Rates for Other Classes	Landscape:	Flat Rate	\$2.14
		Commercial:		\$1.78
		Schools:		\$2.10
		Public Agencies:		\$1.98
	Recycled Water			Flat Rate

HISTORY

Early water recycling efforts in the 1970s by IEUA involved irrigation at the Whispering Lakes Golf Course adjacent to RP-1 in Ontario and at the El Prado Park and Golf Course in Chino. In the 1980s, recycled water continued to be an integral part of IEUA planning with implementation of the CCWRF and RP-4 recycling plants. These two recycling plants were sited specifically at higher elevations to reduce recycling plants water pumping costs. A backbone recycled water distribution system was installed in Chino and Chino Hills from CCWRF in 1997 and was initially operated by IEUA under Ordinance No. 63. This system was later turned over to the City of Chino and the City of Chino Hills and forms the core of the recycled water distribution network operated by these two cities.

The first major regional pipeline was constructed in 1995 and served the dual purpose of a regional recycled water distribution pipeline and an outfall allowing RP-4 effluent to be discharged with RP-1 effluent into Cucamonga Creek. The RP-4 outfall was designed as a pressurized system so that water could be pumped up from RP-1 to RP-4 as well as flow down in the opposite direction from RP-4 to RP-1 and the creek outfall.

In 1999, IEUA began groundwater recharge with recycled water at Ely Basin. The initial Ely Basin project was followed by the Chino Basin Watermaster's (CBWM) development of the Optimum Basin Management Program (OBMP) and the region's efforts (including IEUA's) to implement the OBMP. In 2000, the OBMP identified recycled water use as a critical component in drought-proofing and maintaining the region's economic growth. With imported water rates increasing and long-term supply reliability declining, the region committed to aggressively and proactively address regional impacts. The OBMP set the path for the development of a regional recycled water distribution system and a Recycled Water Implementation Plan.

The use of recycled water presented several advantages to IEUA and its member agencies: it is one of the most significant unused local water supplies; it is reliable during drought and climate change conditions; and it requires significantly less energy than imported water to deliver to customers thus reduces greenhouse gas emissions. IEUA in partnership with its member agencies and CBWM invested approximately \$625 million since 2000 to increase the availability of local water supplies through water recycling, conservation, recharge improvements, the MWD groundwater storage and recovery project, the Chino Desalter, and other water management programs.

In 2002, IEUA Board of Directors adopted Ordinance No. 75, the Mandatory Use Ordinance, to establish incentives and encourage recycled water use from the regional distributions system. Also in 2002, the CBWM, Chino Basin Water Conservation District (CBWCD), San Bernardino County Flood Control District (SBCFCD) and IEUA joined forces to greatly expand groundwater recharge capacity through the Chino Basin Facilities Improvement Program.

In 2005, IEUA was permitted by the Regional Water Quality Control Board to operate its recycled water groundwater recharge programs at five additional recharge basins (Banana, Hickory, Etiwanda Conservation Ponds, Declez, RP3, and Turner basins). In 2007, IEUA was permitted to operate its recycled water groundwater recharge program at seven more recharge sites (Brooks, 8th Street, Victoria, Lower Day, San Sevaine, Etiwanda Spreading Grounds (later reconfigured as the Etiwanda Debris Basin) and Ely Basins. The 2007 permit was amended in 2009 to modify how IEUA tracks diluent water and recycled water blending, which effectively increased IEUA's ability to recharge using recycled water.

In November 2007, IEUA and its member agencies unanimously adopted the Three Year Recycled Water Business Plan. IEUA and its member agencies committed to implementing the plan, which laid out a focused and cost-effective approach to rapidly increase the availability and use of recycled water within IEUA's service area.

Based on the series of regional decisions since 2000, over \$350 million was invested into the implementation of a robust Recycled Water Program. The region has achieved program success by leveraging heavily on grant funding and loans. With unanimous regional support, annual recycled water use grew from approximately 5,000 AF in 2004/05 to 38,251 AF in FY 2013/14. Over the past three fiscal years, recycled water demand has fallen slightly and was 33,411 AF in 2016/17 and has been primarily driven by land use conversion from agriculture to urban.

RECYCLED WATER CAPITAL PROGRAM

IEUA currently produces nearly 48 MGD of recycled water and there are several projects under way to expand the use of recycled water within the service area. Table 5 lists the 2016/17 recycled water capital projects and their locations. The projects that were in design or construction during 2016/17 are summarized in the following paragraphs.

Table 5 - Capital Project Summary for 2016/17

Projects in Design/Construction	Engineering Budget	Total Grants	Total Loans	Total Costs to Date
Baseline RWPL Extension	\$4,950,000	\$1,435,500	\$3,514,500	\$19,748
Groundwater & Recycled Water SCADA Control Upgrades	\$932,000	\$932,000	\$0	\$621,260
East Avenue 1630 E RWP Relocation	\$890,108	\$0	\$890,108	\$519,871

RW Pressure Sustaining Valve Installation	\$850,000	\$0	\$850,000	\$32,697
SBCFCD Recycle Water Easement	\$1,210,000	\$0	\$1,210,000	\$571,280
San Sevaine Basin Improvements	\$6,460,000	\$3,625,000	\$2,835,000	\$790,148
RP-5 Bottleneck	\$2,756,637	\$0	\$2,756,637	\$378,151
Subtotal	\$18,048,745	\$5,992,500	\$12,056,245	\$2,933,155

PROJECTS COMPLETED

The East Avenue 1630 E RWP Relocation relocated about 200 LF of 1630 E. Recycled Water Pipeline on East Avenue in the City of Rancho Cucamonga. Additionally, the project relocated blow off and air release valves that are located on the East Avenue sidewalk and adjusted the elevation of the monitoring well. Under this project, we re-developed the Monitoring Well at Baseline Avenue and Northbound I-15 interchange.

PROJECTS IN CONSTRUCTION

The Groundwater and Recycled Water SCADA Control Upgrades project will upgrade five obsolete programmable logic controller (PLC) hardware and software at five recharge basins that each has an inflatable rubber dam system. The project will replace the older PLCs with newer and fully supported PLCs that will extend the reliability by 10 years and provide the initial development model when transitioning other sites to newer controllers.

PROJECTS IN DESIGN

The scope of the Baseline Recycled Water Extension project consists of the design, bid and award, and construction of approximately 6,800 lf of a 24" pipeline located along Baseline Avenue between American Way and Cherry Avenue. The design services of an engineering consultant will be acquired.

The RP-5 RW Pipeline Bottleneck evaluates the existing recycled water piping bottlenecks within the RP-5 facility and upsizes the 14" pipeline system downstream of the RW pump station to a 24"-30" pipeline; confirms future demands and pipe sizes. All buried RW valves will be replaced in addition to installing new valves in strategic locations. Surge analysis to RW piping system at RP-5 revealed presence of occasional surges which will cause damage to the piping system therefore a surge control system will be installed to mitigate any surge issues. An outside consultant will be hired by the Agency to provide necessary consulting engineering services during design and construction.

The scope of work of the RW Pressure Sustaining Valve Installation project is to install 17 pressure sustaining valves at various locations on high volume users of recycled water to maintain system pressure in the regional recycled water system.

The San Sevaine Basin Improvements project recently completed preliminary design and solicited proposals for final design and construction services. The project will construct a pump station in basin 5 and a recycled water conveyance pipeline to recharge the upper basins 1 through 3. The project is anticipating up to 4,700 acre-feet per year of new groundwater recharge yield.

SBCFCD Recycled Water Easement project will fund the easement acquisitions for the regional RW pipelines located in San Bernardino Flood Control District right of way. For recycled water pipelines, ten (10) perpetual, non-exclusive easements will be acquired after the property appraisals are approved by San Bernardino County Real Estate Services. IEUA and the County mutually agreed upon a 30% valuation of the unit cost/square foot to be determined in the appraisal reports.

FUTURE REUSE PROJECTS

IEUA and its member agencies desire to increase the use of recycled water within IEUA's boundary. By implementing the Recycled Water Program Strategy, recycled water projects will increase the development of recycled water delivery, groundwater recharge, and the reliability of potable supplies for residents and customers. Future recycled water projects will allow IEUA and its member agencies to continue to provide a reliable alternate water supply to its customers to offset the demand for imported water for non-potable uses.

IEUA submitted an application for the State Water Resources Control Board Proposition 1 grant funding for water recycling projects. The projects identified in the application were: RP-1 1158 Recycled Water Pump Station Upgrades, RP-5 Recycled Water Pipeline Bottleneck, RP-1 Parallel Outfall Pipeline, Baseline Pipeline Extension, Napa Lateral, and Recycled Water Pressure Sustaining Valve Installation. IEUA received a response from the SWRCB early 2017 indicating that no grant funding will be awarded, but would be eligible for State Revolving Fund (SRF) low-interest loans.

TREATMENT PLANTS

IEUA owns and operates five regional water recycling facilities: RP-1, RP-2, RP-4, RP-5, and CCWRF. Of the treatment plants, RP-2 does not have any liquid treatment processes, and as such does not produce any recycled water. The combined treatment capacity of the remaining four plants is approximately 85 MGD.

Regional Water Recycling Plant No. 1

RP-1 is located in the city of Ontario and has been in operation since 1948. The plant has undergone several expansions to increase the design hydraulic domestic sewage (wastewater) treatment capacity to 44 MGD. The plant serves areas of Chino, Fontana, Montclair, Ontario, Rancho Cucamonga, Upland, and solids removed from RP-4, located in Rancho Cucamonga. The plant treats an average influent wastewater flow of approximately 23 MGD. The plant is divided into two separate treatment sections: liquids and solids.

The liquid treatment section consists of preliminary screening and grit removal, primary clarification, secondary treatment by aeration basins and clarification, tertiary treatment by filtration and disinfection, and dechlorination. Wastewater liquid is treated to California Department of Public Health Title 22 Code of Regulations standards for disinfected tertiary recycled water. The solids treatment section begins with thickening the solids removed from the primary and secondary clarification processes. The thickened solids are pumped to anaerobic digestion and then to the centrifuges for dewatering. Wastewater solids are digested to a minimum Class B biosolids standard, as defined by the United States Environmental Protection Agency Code of Federal Regulations. After dewatering, the biosolids are hauled to the Inland Empire Regional Composting Facility in the City of Rancho Cucamonga for further treatment to produce Class A compost. Figure 4 illustrates the RP-1 treatment processes.

Regional Water Recycling Plant No. 1

Plant Capacity:	44.0 MGD
2016/17 Influent Flow:	22.1 MGD
2016/17 RW Delivery:	15.0 MGD
2016/17 Creek Discharge:	10.8 MGD*

**RP-1 and RP-4 have a combined effluent outfall; therefore, creek discharge reported for RP-1 is for both plants combined.*



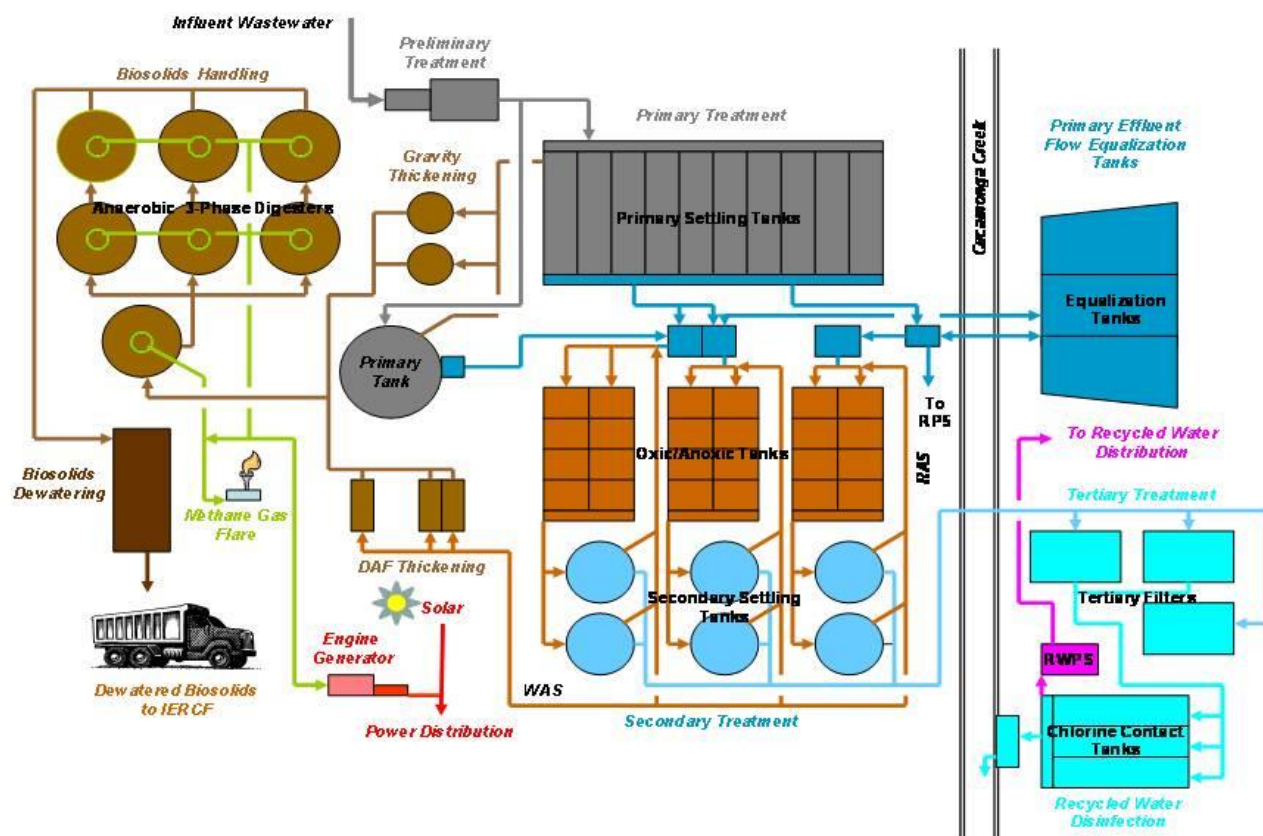


Figure 4 - RP-1 Treatment Process

Regional Water Recycling Plant No. 4

RP-4 is located in the city of Rancho Cucamonga and has been in operation since 1997. The plant has undergone an expansion to increase the design hydraulic domestic sewage (wastewater) treatment capacity to 14 MGD. The plant serves areas of Fontana, Rancho Cucamonga, and San Bernardino County. The plant treats the liquid portion of an average influent wastewater flow of approximately 10 MGD.

The liquid treatment section consists of preliminary screening and grit removal, primary clarification, secondary treatment by aeration basins and clarification, and tertiary treatment by filtration and disinfection. Wastewater liquid is treated to California Department of Public Health Title 22 Code of Regulations standards for disinfected tertiary recycled water. The solids removed from RP-4 are conveyed by gravity through the regional sewer system to the influent of RP-1 for thickening, anaerobic digestion, and dewatering. Figure 5 illustrates the RP-4 treatment process. Tertiary water from RP-1 and RP-4 that is not utilized for direct sales or groundwater recharge is discharged to Cucamonga Creek at RP-1.

Regional Water Recycling Plant No. 4

Plant Capacity:	14.0 MGD
2016/17 Influent Flow:	9.7 MGD
2016/17 RW Delivery:	8.8 MGD
2016/17 Creek Discharge:	0.0 MGD*

**RP-1 and RP-4 have a combined effluent outfall; therefore, creek discharge reported for RP-1 is for both plants combined.*



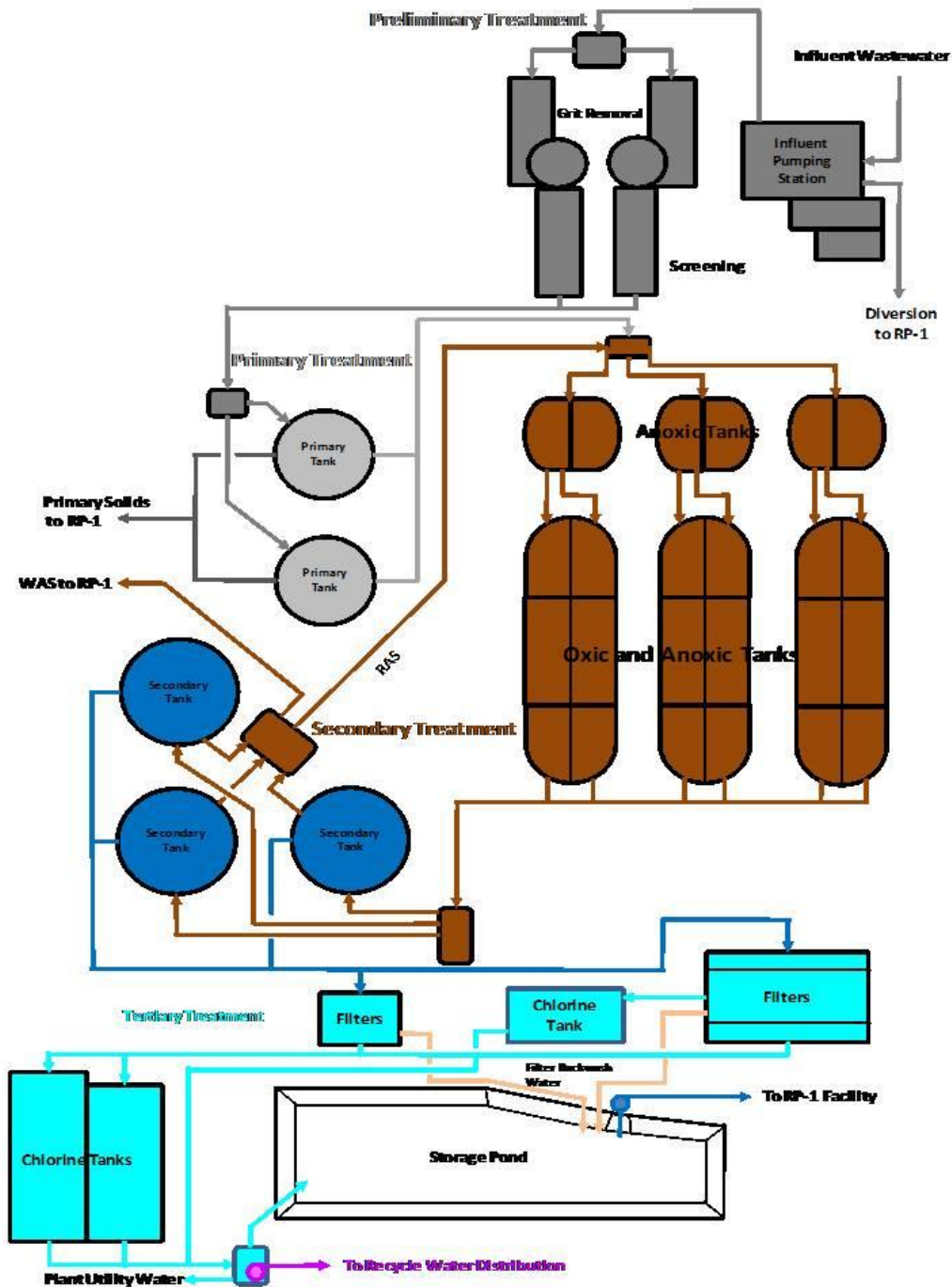


Figure 5 - RP-4 Treatment Process

Carbon Canyon Water Recycling Facility

CCWRF is located in the city of Chino and has been in operation since 1992. The design hydraulic domestic sewage (wastewater) treatment capacity was 11.4 million gallons per day until April 2014 when the facility's design capacity was re-rated based on an updated filter loading rate, which removed the tertiary filters as the bottleneck in the plant. The re-rating increased the plant capacity to 12.0 MGD. The updated capacity will be included in the 2015 NPDES permit renewal. The plant serves areas of Chino, Chino Hills, Montclair and Upland. The plant treats the liquid portion of an average influent wastewater flow of approximately 7 MGD.

The liquid treatment section consists of preliminary screening and grit removal, primary clarification, secondary treatment by aeration basins and clarification, tertiary treatment by filtration and disinfection, and dechlorination. Wastewater liquid is treated to California Department of Public Health Title 22 Code of Regulations standards for disinfected tertiary recycled water. The solids removed from CCWRF are pumped to RP-2 for thickening, anaerobic digestion, and dewatering. Figure 6 illustrates the CCWRF treatment process.

Carbon Canyon Water Recycling Facility

Plant Capacity:	12.0 MGD
2016/17 Influent Flow:	8.1 MGD
2016/17 RW Delivery:	4.2 MGD
2016/17 Creek Discharge:	3.4 MGD



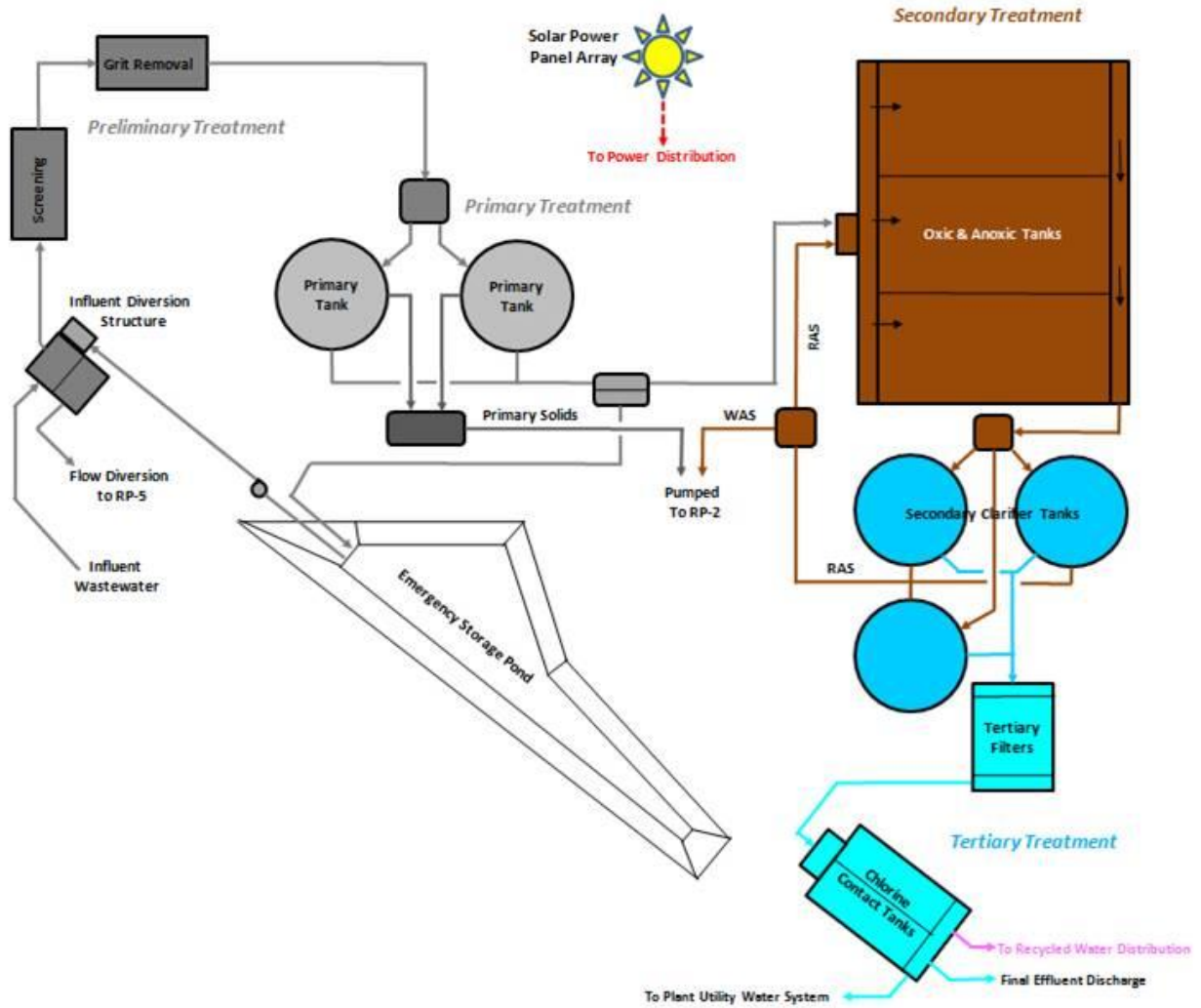


Figure 6 - CCWRF Treatment Process

Regional Water Recycling Plant No. 5

RP-5 is located in the city of Chino and has been in operation since 2004. The design hydraulic domestic sewage (wastewater) treatment capacity is 15 MGD, which includes 1.3 MGD of solids processing returned from RP-2. The plant serves areas of Chino, Chino Hills, and Ontario. The plant treats the liquid portion of an average influent wastewater flow, including RP-2 returned flow, of approximately 8 MGD.

The liquid treatment section consists of preliminary screening and grit removal, primary clarification, secondary treatment by aeration basins and clarification, tertiary treatment by filtration and disinfection, and dechlorination. Wastewater liquid is treated to California Department of Public Health Title 22 Code of Regulations standards for disinfected tertiary recycled water. The solids removed from RP-5 are pumped to RP-2 for thickening, anaerobic digestion, and dewatering. Figure 7 illustrates the RP-5 treatment process.

Regional Water Recycling Plant No. 5

Plant Capacity:	15.0 MGD
2016/17 Influent Flow:	7.8 MGD
2016/17 RW Delivery:	3.9 MGD
2016/17 Creek Discharge:	2.7 MGD



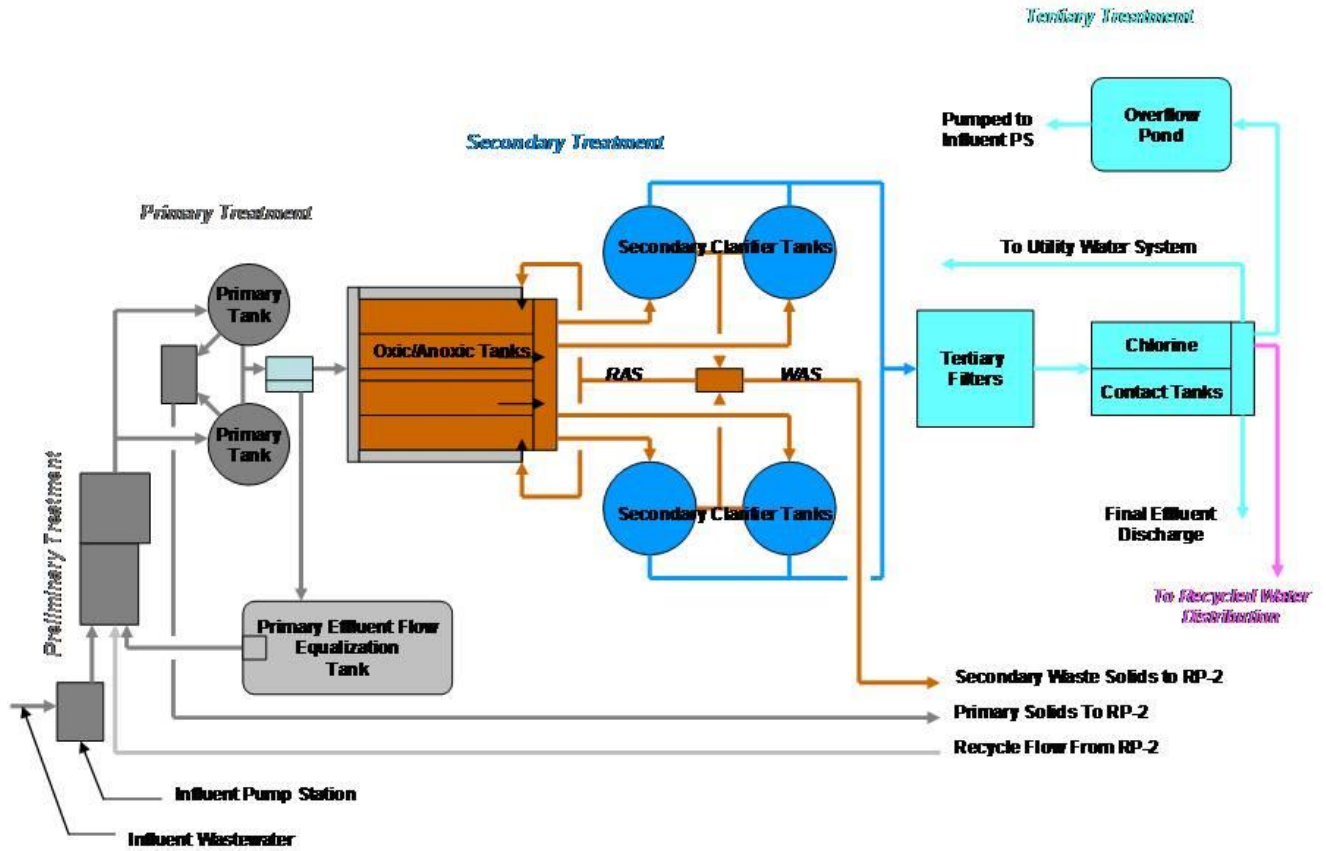


Figure 7 - RP-5 Treatment Process



Inland Empire Utilities Agency

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