

City of Arts & Innovation

Capital Improvement Program and Rate Development Study

February 2014



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Prepared for:

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Department of Public Works
Sewer Division

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Signed: March 5, 2014



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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The City of Riverside (City) Public Works Department, Sewerage Division, is responsible for the collection and treatment of wastewater flows generated within the City, from future development in the Highgrove Community, and from the Community Services Districts (CSD) of Edgemont, Jurupa, and Rubidoux. The City's facilities include 800 miles of gravity sewers, 20 wastewater lift stations, and the Regional Water Quality Control Plant (RWQCP) that is a major facility that provides cost-effective treatment at a current rated capacity of 40 million gallons per day (mgd).

The current Capital Improvement Program (CIP) adopted in June, 2011 was a City-wide, multi-year plan that identified capital infrastructure projects from fiscal years 2011/12 through 2015/16 to allow for renovation, repair, and/or construction to meet changing conditions and future regulations. That CIP was based, in part, on the 2008 Integrated Wastewater Master Plan (IWWMP) (Carollo Engineers, 2008) that identified collection system and treatment facility improvements. That report included a financial analysis and recommended rate structure to allow for the necessary capacity expansion of the RWQCP that is now underway.

The purpose of this CIP Update and Rate Development Study is to update the City's current CIP for the collection system and to identify necessary improvements and capital projects at the RWQCP to address facilities and systems not being upgraded or rehabilitated as part of the current plant expansion, and propose a financial plan and rate structure to carry the City forward over the five year planning period spanning fiscal years 2014/15 through 2018/19.

This executive summary presents the key findings of the report related to future conditions, the collection system, RWQCP, and combined CIP and implementation schedule, and the recommended financial plan and rates.

ES.2 FUTURE CONDITIONS

Table ES-1 presents recent and projected flows to the RWQCP through 2035. The dates (years) represent January 1 of the second half of the fiscal year. Flows for the City of Riverside beyond fiscal year 2012/13 were projected using a value of 77 gallon per capita per day (gpcd). This is a lower per capita flow rate than experienced in prior years and reflects both water conservation and recent economic conditions.

The projected CSD's flows were estimated using previous planning data from the 2008 IWWMP and other available information. The previous projected rates of increase of flows generated by each CSD were applied to the actual flows measured for fiscal year 2012/13 in order to "reset" the prior projections to be consistent with the lower-than-projected flows observed from 2008 through 2013. In addition, the CSD flows to the RWQCP were capped at the current contractual capacities as follows:

- Edgemont CSD - 0.89 mgd projected by 2032
- Jurupa CSD - 4.0 mgd projected by 2018
- Rubidoux CSD - 3.06 mgd projected by 2025

The projected increases for the CSDs are several years or more old and should be revisited. The projected Highgrove Community flow for 2035 was limited to 2.2 mgd, or one-half the agreed capacity allocation of 4.4 mgd. At 46 mgd total influent flow, the City will have 38.06 mgd available capacity at the RWQCP to serve the City and future flows from the Highgrove Community area.

Table ES-1
Projected Flows to RWQCP

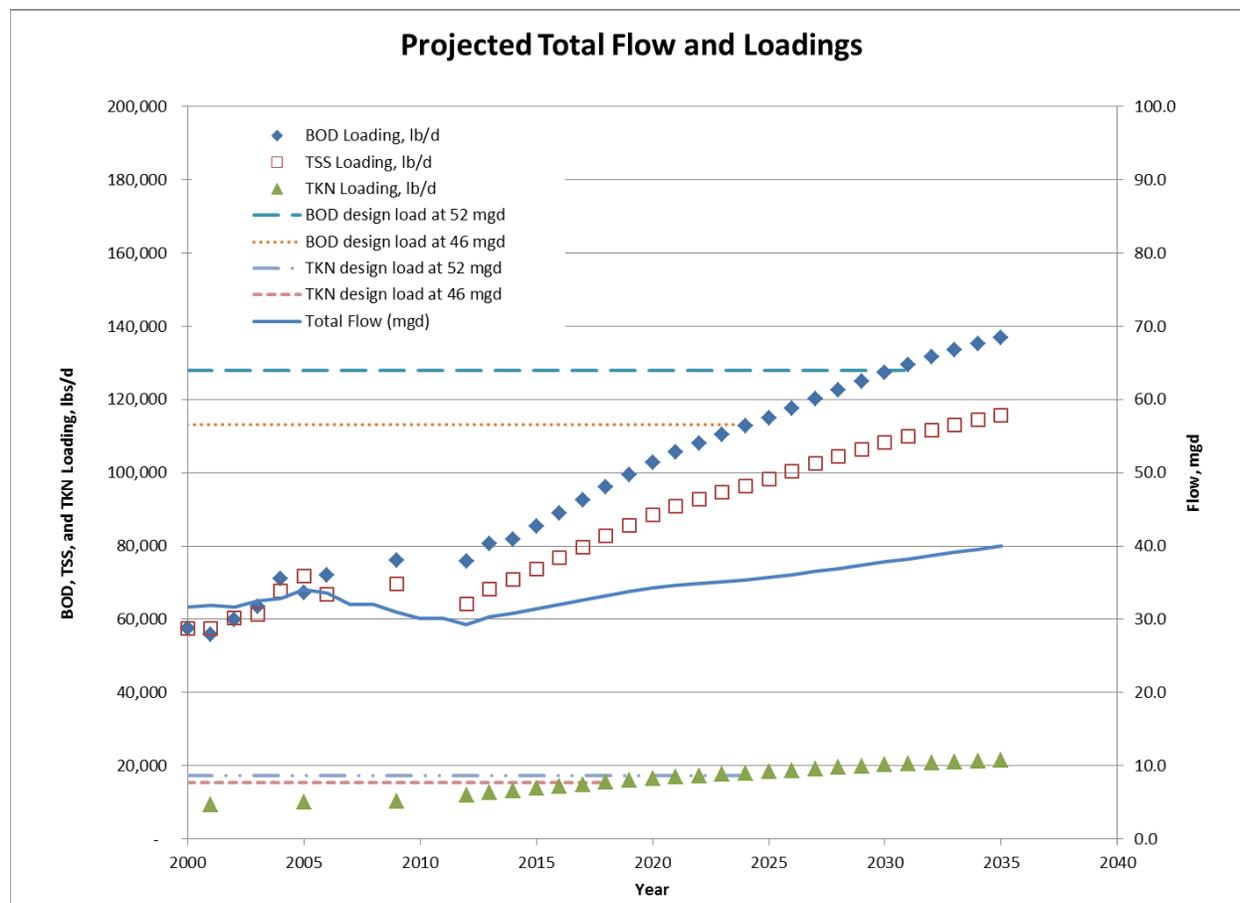
Year (Jan 1st)	City of Riverside Flow (mgd)	Edgemont CSD Flow (mgd)	Jurupa CSD Flow (mgd)	Rubidoux CSD Flow (mgd)	Highgrove Community Flow (mgd)	Total Flow (mgd)
2010	24.6	0.53	3.0	2.0	-	30.1
2011	24.7	0.52	3.0	2.0	-	30.2
2012	23.5	0.50	3.3	2.0	-	29.2
2013	24.4	0.51	3.4	2.2	-	30.4
2020	26.1	0.63	4.0 (2)	2.8	0.6	34.3
2025	26.7	0.74	4.0	3.1(3)	1.2	35.7
2030	28.2	0.86	4.0	3.1	1.7	37.8
2035	29.9	0.89(1)	4.0	3.1	2.2 (4)	40.0

Notes:

- 1) Edgemont CSD's 0.89 mgd capacity at RWQCP projected to be reached in 2032.
- 2) Jurupa CSD's 4.0 mgd capacity at RWQCP projected to be reached in 2018.
- 3) Rubidoux CSD's 3.06 mgd capacity at RWQCP projected to be reached in 2025.
- 4) Highgrove projected flow in 2035 is one-half contracted capacity at RWQCP.

The concentrations of wastewater constituents that impact treatment capacity and performance have increased 50 percent in the last 17 years. To estimate future conditions, it has been assumed that concentrations of Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and Total Kjeldahl Nitrogen (TKN) will initially increase at the historic rate of the last two decades, with a decreasing rate thereafter to gradually level off by 2035.

The flow and loading projections are graphed together and illustrated by **Figure ES-1**. The load-based-capacities presented in the Phase 1 Plant Expansion preliminary design documentation are indicated for both the Phase 1 rehabilitation and expansion to 46 mgd and Phase 2 expansion 52 mgd. On the basis of loads, the treatment capacity of the facility will be exceeded before the hydraulic limitations are reached. It is recommended that the load-based capacity of the facility be evaluated once the Phase 1 Plant project is operational to determine when and what the next capacity expansion will entail. The available data indicate that a load-capacity expansion might be required in ten years or less.



**Figure ES-1
 RWQCP Influent Flow and Load Projections**

ES.3 COLLECTION SYSTEM

City staff has maintained a collections system CIP and have updated that information on a continual basis. That data has been incorporated into this CIP Update and represents \$78 million (current dollars) in capital projects from fiscal year 2014/15 through 2018/19. Those projects include:

- SARTS Phase II and Tequesquite Phase IIB interceptors
- Upgrades to six lift stations
- Numerous pipeline projects throughout the City to alleviate capacity restrictions and reduce maintenance requirements

ES.4 RWQCP

The RWQCP is undergoing a major expansion to add or substantially improve odor control, primary clarifiers, aeration basin, membrane bioreactor (MBR) system, chlorine contact basin, solids blending station, digesters, fats-oil-grease station, digester gas holder, digester gas flare, and equalization basins. The Phase 1 Plant project will increase the overall hydraulic treatment

capacity to 46 mgd yet, while significant in scope, the project replaces, modifies, or rehabilitates only certain elements of the RWQCP.

Other onsite facilities will need improvements and rehabilitation because of their need to reliably function in a cost-effective manner for the foreseeable future. A condition assessment of the remaining existing but essential facilities left untouched by the Phase 1 Plant project was conducted for this CIP update and rate study. In conjunction with MWH and Carollo Engineers, City staff reviewed, revised, and prioritized the identified projects resulting in \$43 million in necessary capital projects from fiscal year 2014/15 through 2018/19. Additional projects were deferred to fiscal year 2019/20 and beyond. The recommended near term capital projects at the RWQCP include:

- Additional sludge dewatering equipment replacement
- Upgrade the cogeneration system to meet changing regulations
- Rehabilitate filter piping and systems, and determine long-term rehabilitation needs for that process
- Begin Phase 2 Expansion to address the predicted load limitations resulting from increasing influent concentrations
- Rehabilitate the Plant 2 Activated Sludge process
- Replace influent metering systems
- Replace two major electrical switchgear installations
- Improve site security with added lighting and perimeter fencing, and
- Improve flood protection to comply with regulatory requirements.

The need for further work beyond the initial five years of this CIP Update has been identified and capital project allocations for specific and general work at the RWQCP beyond fiscal years 2018/19 have been included.

ES.5 CIP AND IMPLEMENTATION SCHEDULE

Table ES-2 presents the combined Sewer CIP Update for the collection system and RWQCP. An additional project has been included beginning in year 6 (2019/20) that will address the salinity issues that the City is faced with. Also note that continued capital projects will be required for the collection system and RWQCP for years six through ten and beyond. For the initial five years of this CIP Update, \$122 million of specific and necessary capital projects have been identified. It should be noted that project priorities recommended by staff served to distribute the work for a relatively uniform capital outlay during fiscal years 2015/16 through 2018/19.

Table ES-2 presents the capital cost totals by year in two ways: on the basis of 2013 cost, and as escalated over time at an effective interest rate of 5% per year. These escalated costs form the base capital outlays for the financial plan.

**Table ES-2
CIP Update Sewer Capital Projects Summary**

Project Type	Basis	Prior Fiscal Years	Year 1 (14/15)	Year 2 (15/16)	Year 3 (16/17)	Year 4 (17/18)	Year 5 (18/19)	Total (Yrs 1-5)	Year 6 (19/20)	Year 7 (20/21)	Year 8 (21/22)	Year 9 (22/23)	Year 10 (23/24)	Total (Yrs 6-10)	Year 11+ (11-20)
Capital Requirements															
Phase 1 Plant Rehabilitation	2013 costs	\$43,915,667	\$61,477,084	\$18,127,607											
Plant Upgrades	2013 costs	\$2,406,564	\$930,000	\$3,550,000	\$13,400,000	\$9,570,000	\$15,250,000	\$45,106,564	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$50,000,000	\$100,000,000
Collections	2013 costs	\$6,632,130	\$0	\$23,350,000	\$19,400,000	\$17,520,000	\$12,760,000	\$79,662,130	\$16,000,000	\$16,000,000	\$16,000,000	\$16,000,000	\$16,000,000	\$80,000,000	\$160,000,000
Desalter	2013 costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000,000	\$4,000,000	\$4,000,000	\$20,000,000	\$30,000,000	\$60,000,000	\$40,000,000
Total	2013 costs	\$52,954,361	\$62,407,084	\$45,027,607	\$32,800,000	\$27,090,000	\$28,010,000	\$124,768,694	\$28,000,000	\$30,000,000	\$30,000,000	\$46,000,000	\$56,000,000	\$190,000,000	\$300,000,000
Escalated Capital Requirements															
Phase 1 Plant Rehabilitation	Escalated 5%/yr	\$43,915,667	\$64,550,938	\$19,985,687	\$0	\$0	\$0	\$84,536,625	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plant Upgrades	Escalated 5%/yr	\$2,406,564	\$976,500	\$3,913,875	\$15,512,175	\$11,632,395	\$19,463,294	\$51,498,239	\$13,400,956	\$14,071,004	\$14,774,554	\$15,513,282	\$16,288,946	\$74,048,743	\$207,892,818
Collections	Escalated 5%/yr	\$6,632,130	\$0	\$25,743,375	\$22,457,925	\$21,295,670	\$16,285,353	\$85,782,322	\$21,441,530	\$22,513,607	\$23,639,287	\$24,821,251	\$26,062,314	\$118,477,990	\$332,628,509
Desalter	Escalated 5%/yr	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,680,191	\$5,628,402	\$5,909,822	\$31,026,564	\$48,866,839	\$94,111,818	\$83,157,127
Total	Escalated 5%/yr	\$52,954,361	\$65,527,438	\$49,642,937	\$37,970,100	\$32,928,064	\$35,748,647	\$221,817,186	\$37,522,678	\$42,213,013	\$44,323,663	\$71,361,098	\$91,218,099	\$286,638,551	\$623,678,454
New Collection System and RWQCP Projects Only															
Less Phase 1 Rehab and Desalter	Escalated 5%/yr	\$9,038,694	\$976,500	\$29,657,250	\$37,970,100	\$32,928,064	\$35,748,647	\$137,280,561	\$34,842,487	\$36,584,611	\$38,413,842	\$40,334,534	\$42,351,260	\$192,526,733	\$540,521,327

ES.6 FINANCIAL PLAN AND RATES

The financial portion of the Capital Improvement Plan (CIP) Update and Rate Development Study provides a comprehensive analysis of the finances of the City's Sewer Department. The study includes a detailed financial outlook and proposed rates for a five-year study period beginning in FY 2014/15 and lasting through FY 2018/19. Less detailed projections are also provided beyond the five-year period.

The goals of the financial study included:

- The development of a funding strategy for the updated CIP
- The determination of the City's revenue requirements
- The development of cost of service based rates to fund ongoing operational and capital expenditures
- The update of the City's capacity fee (connection fee)

Capital Funding Strategy

A capital funding strategy has been developed to provide funds sufficient to implement the updated CIP. As developed, the CIP projects \$222 million (escalated) in future treatment and collections system improvements over the five-year study period. In addition to the developed CIP, cash funded capital expenditures of \$17.8 (escalated) million have been projected in the O&M budget. Furthermore, \$53 million will be required to reimburse FY 2013/14 capital expenditures. The primary source of funding for the CIP will be bond proceeds, with a small amount of funding from user rates and cash on hand.

A total of three new bond issuances will be required in the five-year study period. The first issuance will be the Phase II Bonds issuance scheduled to take place in May 2014. The Phase II Bonds will provide proceeds of \$140 million, \$53 million of which will be used to reimburse capital expenditures from FY 2013/14. The remaining \$87 million will be used to fund the completion of the ongoing plant expansion project, FY 2014/15 CIP projects, and a portion of FY 2015/16 projects.

The study assumes that the Phase III Bonds will be split into two issuances, which will be issued in May 2016 and May 2018. Each issuance will provide \$68 million in proceeds. Proceeds from the Phase III Bonds will be used to fund the CIP through the end of the five-year study period. The assumed issuance amounts reflect the best available CIP expenditure and timing data available at this time. The timing and/or sizing of the bonds may be modified as needed as CIP projects progress.

In total, the CIP includes \$795 million (2014 dollars) in treatment plant and collections systems projects between FY 2014/15 and 2035/36. Additional bond issuances will be required to fund the CIP beyond the five-year projection period.

Revenue Requirements

The revenue requirements analysis serves as a means of evaluating the Sewer Department's fiscal health and adequacy of current rate levels, and it sets the basis for near-term and long-term rate planning. If revenue projections under existing rates do not meet forecasted requirements, rates need to be adjusted. The analysis is derived from five major components including Operations and Maintenance (O&M) expenditures, Capital Funding, Annual Debt Service, Policy Requirements & Coverage, and Offsetting Revenues.

The revenue requirement analysis found that annual rate increases of 8.5 percent per year will be necessary to adequately fund the activities of the City's Sewer Department. The analysis has been performed assuming that the Community Service District (CSD) revenues are consistent with current practice. If the CSD litigation is resolved additional revenues could be used to offset rate increases to In-City customers. **Table ES-3** summarizes the results of the revenue requirement analysis.

The most important driver of required rate increases is the onset of Phase II Bond debt service payments in FY 2017/18. Debt service is projected to increase by approximately \$9.5 million in that year resulting in increased debt coverage and cash flow burden. In order to keep a favorable credit rating, the City must post positive cash flows (before cash funded capital projects), and maintain coverage without the Rate Stabilization Fund (see **Table ES-3**, highlighted row) of at least 1.0 on all debt service obligations. Based on the current cash flow projections, annual increases of 8.5 percent would meet these stipulations, and provide a small buffer in case of extenuating circumstances that increase costs or decrease revenue.

Rate increases above inflationary levels will be needed after the five-year study period. Increases will continue to be driven by debt coverage requirements as debt service for the Phase III bonds becomes due. The required rate increases for years FY 2019/20 through FY 2023/24, based in current projections, will fall within the range of 5.0 to 7.5 percent per year.

Cost of Service Analysis and Rate Increase Implementation

The purpose of a cost-of-service (COS) analysis is to provide a rational basis for distributing the full costs of Wastewater service to each customer in proportion to the demands they place on the system. Detailed cost allocations help determine the degree of equity that can be achieved in the design of the resulting user rates. This analysis yields an appropriate method for allocating costs and designing user rates.

Through cost of service analysis, the sewer user rates and sewer capacity fees are designed to distribute the cost of the operation and improvement of the RWQCP equitably among all users in accordance with California legal requirements as defined by Proposition 218 and California Government Code §66013, respectively. Annual rate increases will be implemented as across the board increases and all user categories will increase by the same percentage each year. The monthly rate for a single-family residence will increase from \$28.55 to \$30.98 in year 1, an

increase of \$2.43 per month. Proposed rates for all customer categories for each year of the study period are presented in **Table ES-4**.

**Table ES-3
Revenue Requirements Summary**

	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Proposed Rate Increase	7.50%	8.50%	8.50%	8.50%	8.50%	8.50%
Rate Revenue After Rate Increase	\$42.03	\$46.05	\$50.45	\$55.28	\$60.56	\$66.36
Offsetting Revenues	<u>5.98</u>	<u>5.98</u>	<u>6.43</u>	<u>6.81</u>	<u>7.24</u>	<u>7.64</u>
Total Revenues After Rate Increase	\$48.01	\$52.03	\$56.88	\$62.08	\$67.81	\$73.99
Less O&M Expenditures	\$30.45	\$31.68	\$33.69	\$35.06	\$36.48	\$37.97
Less Debt Service	<u>18.52</u>	<u>18.88</u>	<u>18.88</u>	<u>18.89</u>	<u>28.36</u>	<u>30.28</u>
Revenue Available for Cash Funded Sewer Projects	(\$0.96)	\$1.47	\$4.31	\$8.14	\$2.97	\$5.74
Less Cash Funded Sewer Projects	<u>\$0.00</u>	<u>\$3.02</u>	<u>\$3.17</u>	<u>\$3.33</u>	<u>\$4.65</u>	<u>\$3.67</u>
Available for Capital or (Use of Reserves)	(\$0.96)	(\$1.54)	\$1.14	\$4.81	(\$1.68)	\$2.07
Coverage w/o Rate Stabilization Fund	0.95 x	1.08 x	1.23 x	1.43 x	1.10 x	1.19 x
Coverage with Rate Stabilization Fund	1.25 x	1.25 x	1.25 x	1.43 x	1.25 x	1.25 x
Operating Fund Balance	\$31.96	\$32.75	\$36.73	\$41.95	\$36.15	\$40.52
Rate Stabilization Fund Balance	<u>5.59</u>	<u>3.24</u>	<u>0.41</u>	<u>0.00</u>	<u>4.12</u>	<u>1.83</u>
Combined Operating Reserve	\$37.54	\$36.00	\$37.14	\$41.95	\$40.27	\$42.34
Days in Reserve	280 Days	245 Days	243 Days	267 Days	212 Days	215 Days
Days of O&M Expenses	450	379	368	399	357	371

**Table ES-4
Proposed Customer Category User Rates (8.5% Annual Increase)**

Rate Code	Description	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
S800	Residence on Septic System	N/A	N/A	N/A	N/A	N/A	N/A
S474	Basic Multi-Family Dw elling Unit	\$25.77	\$27.97	\$30.35	\$32.93	\$35.73	\$38.77
S475	Basic Single Family Dw elling Unit	\$28.55	\$30.98	\$33.62	\$36.48	\$39.59	\$42.96
S590	Basic Single Family Dw elling - Pumping	\$32.97	\$35.78	\$38.83	\$42.14	\$45.73	\$49.62
S591	Basic Multi-Family Dw elling Units - Pumping	\$29.76	\$32.29	\$35.04	\$38.02	\$41.26	\$44.77
S473	Basic Commercial (Flat Rate)	\$28.55	\$30.98	\$33.62	\$36.48	\$39.59	\$42.96
S594	Basic Commercial - Pumping (Flat Rate)	\$32.97	\$35.78	\$38.83	\$42.14	\$45.73	\$49.62
S500	Department & Retail Stores	\$2.05	\$2.23	\$2.42	\$2.63	\$2.86	\$3.11
S501	Hotels & Motels	\$2.50	\$2.72	\$2.96	\$3.22	\$3.50	\$3.80
S502	Laundromats	\$2.43	\$2.64	\$2.87	\$3.12	\$3.39	\$3.68
S503	Laundries	\$3.99	\$4.33	\$4.70	\$5.10	\$5.54	\$6.02
S504	Markets	\$5.37	\$5.83	\$6.33	\$6.87	\$7.46	\$8.10
S505	Mortuaries	\$2.89	\$3.14	\$3.41	\$3.70	\$4.02	\$4.37
S506	Professional Offices	\$1.69	\$1.84	\$2.00	\$2.17	\$2.36	\$2.57
S507	Repair Shops & Service Stations	\$2.94	\$3.19	\$3.47	\$3.77	\$4.10	\$4.45
S508	Restaurants	\$5.50	\$5.97	\$6.48	\$7.04	\$7.64	\$8.29
S509	Other Commercial	\$2.42	\$2.63	\$2.86	\$3.11	\$3.38	\$3.67
S510	Hospitals	\$2.61	\$2.84	\$3.09	\$3.36	\$3.65	\$3.97
S511	Churches & Halls	\$1.32	\$1.44	\$1.57	\$1.71	\$1.86	\$2.02
S514	Schools "B"	\$0.73	\$0.80	\$0.87	\$0.95	\$1.04	\$1.13
S515	Other Commercial "A"	\$1.62	\$1.76	\$1.91	\$2.08	\$2.26	\$2.46
S516	Other Commercial "B"	\$0.81	\$0.88	\$0.96	\$1.05	\$1.14	\$1.24
S525	Department & Retail Stores - Pumping	\$2.43	\$2.64	\$2.87	\$3.12	\$3.39	\$3.68
S526	Hotels & Motels - Pumping	\$2.88	\$3.13	\$3.40	\$3.69	\$4.01	\$4.36
S527	Laundromats - Pumping	\$2.87	\$3.12	\$3.39	\$3.68	\$4.00	\$4.34
S528	Laundries - Pumping	\$4.43	\$4.81	\$5.22	\$5.67	\$6.16	\$6.69
S529	Markets - Pumping	\$5.82	\$6.32	\$6.86	\$7.45	\$8.09	\$8.78
S530	Mortuaries - Pumping	\$3.11	\$3.38	\$3.67	\$3.99	\$4.33	\$4.70
S531	Professional Offices - Pumping	\$2.03	\$2.21	\$2.40	\$2.61	\$2.84	\$3.09
S532	Repair Shops & Service Stations - Pumping	\$3.39	\$3.68	\$4.00	\$4.34	\$4.71	\$5.12
S533	Restaurants - Pumping	\$5.91	\$6.42	\$6.97	\$7.57	\$8.22	\$8.92
S534	Other Commercial - Pumping	\$2.86	\$3.11	\$3.38	\$3.67	\$3.99	\$4.33
S535	Hospitals - Pumping	\$3.03	\$3.29	\$3.57	\$3.88	\$4.21	\$4.57
S536	Churches & Halls - Pumping	\$1.54	\$1.68	\$1.83	\$1.99	\$2.16	\$2.35
S539	Schools "B" - Pumping	\$0.88	\$0.96	\$1.05	\$1.14	\$1.24	\$1.35
S540	Other Commercial "A" - Pumping	\$1.92	\$2.09	\$2.27	\$2.47	\$2.68	\$2.91
S541	Other Commercial "B" - Pumping	\$0.97	\$1.06	\$1.16	\$1.26	\$1.37	\$1.49
SPEC	Industrial Users - Non Pumping						
	Flow (per ccf)	\$1.76	\$1.91	\$2.07	\$2.25	\$2.44	\$2.65
	COD (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	TSS (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	Industrial Users - Pumping						
	Flow (per ccf)	\$2.34	\$2.54	\$2.76	\$2.99	\$3.24	\$3.52
	COD (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	TSS (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48

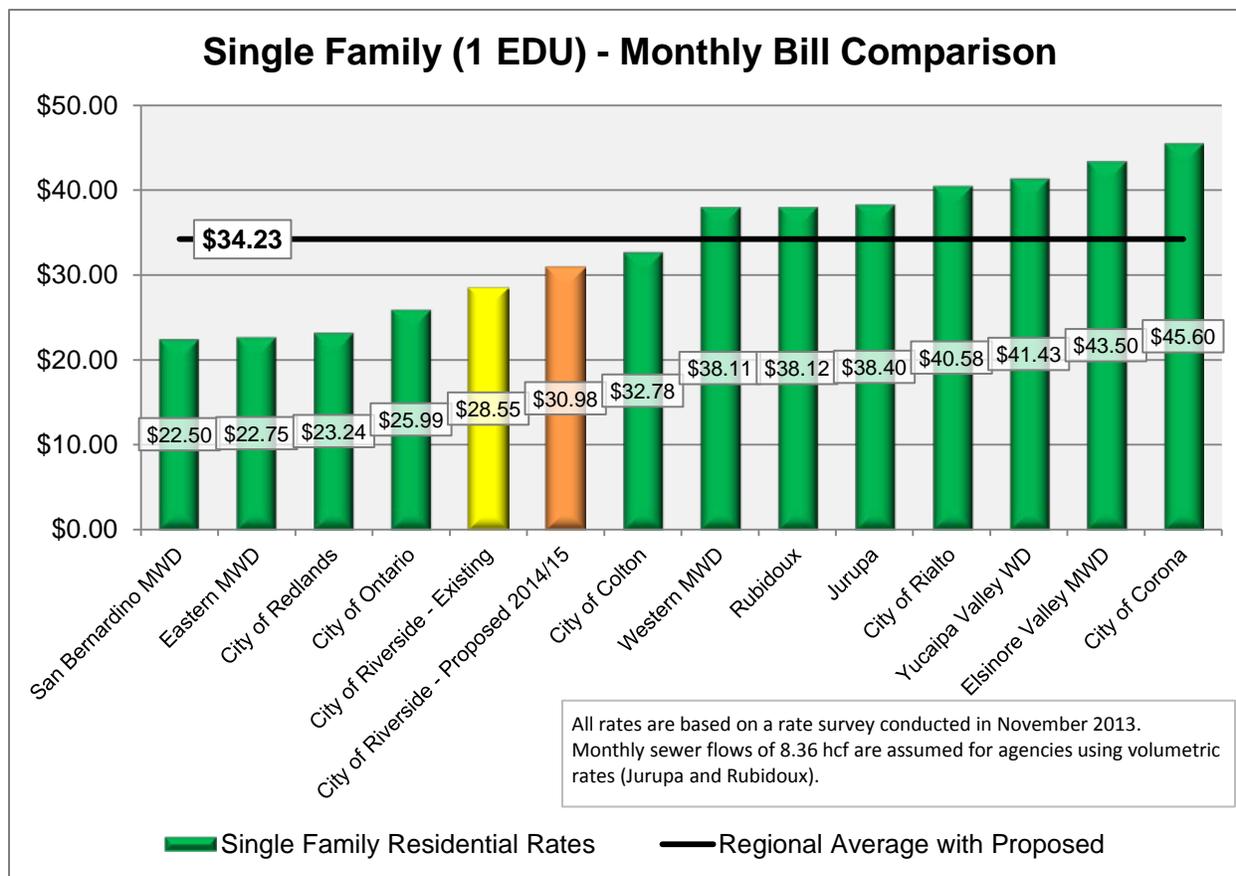


Figure ES-2
Comparison of surrounding agencies rates

Capacity Fees Update

Capacity fees are a method by which a utility can recover the costs associated with providing capacity to serve new connections to the sewer system, or changes to existing connections that result in a change in the demand placed on the system. The City currently imposes capacity fees based on an incremental cost approach. In this approach new or changed connections pay for a portion of the costs associated with capital projects that add capacity to the system.

System capacity is often expressed in Equivalent Dwelling Units (EDUs). One EDU is equal to the amount of flow and loading demand placed on the system by a single-family residential dwelling. Capacity fees are calculated and expressed as dollars per EDU.

Capacity fees are assessed based on the customer category of each new connection. Residential users pay the connection fee based on the number of EDUs associated with each new connection. Single-family residential users are charged for one EDU; multifamily residential units are assigned an EDU factor of 0.9 EDUs per unit. Commercial users are charged a connection fee per 1,000 square feet of floor space. Each commercial category has a unique capacity fee to account for the specific demand placed on the system by each type of customer. Industrial users pay connections fees based on the predicted flow and loadings associated with

each new connection as well as a monthly supplemental capacity fee if their flow and loading exceeds the maximum allowance.

The proposed capacity fees maintain the incremental cost approach and the City's existing fee structure. The fees have been updated to reflect the updated CIP and long-term flow and loading growth projections. The proposed capacity fee for FY 2014/15 is \$3,933 per EDU, representing an increase of 1.3 percent over the existing fee of \$3,882 per EDU. It is recommended that the capacity fee be adjusted annually by the Engineering News Record Construction Cost Index (ENR CCI) for Los Angeles or the 20 City Average. The ENR CCI is based on construction costs and is used as an industry standard for the escalation of capital construction costs. Escalating the capacity fee by the ENR CCI each year accounts for increases in the cost of implementing the CIP. Capacity fees for each customer category are shown in **Table ES-6**.

Capacity fees for industrial users are calculated based on each users anticipated flow, COD, and TSS using the equation shown below. Maximum flow and loadings for the capacity fee calculation are 33.5 ccf (hundred cubic feet) per day, 150 lbs COD, and 150 lbs TSS.

Industrial capacity fees are calculated using the equation shown below.

$$\text{Capacity Fee} = \left(\frac{0.55 \times F}{0.29424} + \frac{0.37 \times \text{COD}}{0.8350} + \frac{0.08 \times \text{TSS}}{0.4751} \right) \times \$/\text{EDU}$$

Where,

F = Anticipated flow from the development in ccf per day. (maximum of 33.5 ccf per day)

COD = Anticipated Chemical Oxygen Demand from the development in pounds per day. (maximum of 150 lbs per day)

TSS = Anticipated total Suspended Solids from the development in pounds per day. (maximum of 150 lbs per day)

BOD/COD = 0.50

\$/EDU = \$3,933 for FY 2014/15, adjusted annually by CPI thereafter

If a user's flow and loading exceeds the maximum allowance from the formula above, the user must pay a monthly supplemental capacity charge based on flow and loadings in excess of the maximum allowance. This Charge is to recover the costs to provide the increased collection and treatment facilities needed to carry and treat the additional flow and constituents greater than the maximum used to calculate the Capacity Charge paid at the time of receiving a building permit. Supplemental capacity fees have also been escalated by 1.3 percent to reflect the updated capacity charge. **Table ES-5** presents the supplemental capacity fees for flow, COD and TSS.

**Table ES-5
 Supplemental Capacity Fees**

Supplemental Capacity Charge	Flow (For each 1 CCF/day in excess of 33.5 CCF/day)	COD (For each 1 lb./day in excess of 150 lbs./day)	TSS (For each 1 lb./day in excess of 150 lbs./day)
Existing Fee	\$1.29	\$0.31	\$0.12
Effective July 1, 2014	\$1.31	\$0.31	\$0.12
Effective July 1, 2015	+ENR CCI	+ENR CCI	+ENR CCI
Effective July 1, 2016	+ENR CCI	+ENR CCI	+ENR CCI
Effective July 1, 2017	+ENR CCI	+ENR CCI	+ENR CCI
Effective July 1, 2018	+ENR CCI	+ENR CCI	+ENR CCI

ES.7 RECOMMENDATIONS

As this CIP Update is implemented, it is recommended that the City undertake and complete an Integrated Master Plan for collection and treatment to evaluate and address future needs beyond fiscal year 2018/19. That planning effort should address the following:

- The most recent hydraulic evaluations and models of the collection system are in some cases greater than ten years old. An updated and current system model will allow for reprioritization of future collection system improvements.
- Many of the flow and loading assumptions currently used by the City were developed over 20 years ago. Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) loading concentration assumptions for each customer category were developed in 1990. It is assumed that return to sewer factors were also developed at or near that time. It is recommended that the City conduct a sampling analysis as part of the next master plan to update BOD, TSS, and Nitrogen loadings concentrations assumptions, return to sewer factors, and the EDU definition. Ideally, sampling should be started two years before the next rate cycle so that rates and connection fees can be developed using the updated data.
- Increasing strength of influent wastewater to the RWQCP should be closely monitored and the impacts evaluated once the processes of the Phase 1 Plant rehabilitation and expansion project are on-line and operational to identify needed process load-capacity improvements.
- Up-to-date planning projections from the CSDs for their remaining available flow capacity and corresponding loads to the RWQCP.

**Table ES-6
Proposed Capacity Fees**

Capacity Fee per EDU								
		Existing	Proposed FY 2014/15	Increase per EDU FY 2014/15				
Capacity Fee per EDU		\$3,882	\$3,933	\$51	1.32%			
Residential Capacity Fees								
Rate Class	Description		Existing Fee per Unit	Fee Effective July 1, 2014	Fee Effective July 1, 2015	Fee Effective July 1, 2016	Fee Effective July 1, 2017	Fee Effective July 1, 2018
S474	Basic Multi-Family Dwelling Unit		\$3,505	\$3,551	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S475	Basic Single Family Dwelling Unit		\$3,882	\$3,933	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S590	Basic Single Family Dwelling - Pumping		\$3,882	\$3,933	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S591	Basic Multi-Family Dwelling Units - Pumping		\$3,505	\$3,551	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
Commercial Capacity Fees								
Rate Class	Description	Units	Existing Fee per Unit	Fee Effective July 1, 2014	Fee Effective July 1, 2015	Fee Effective July 1, 2016	Fee Effective July 1, 2017	Fee Effective July 1, 2018
S473 & S594	Basic Commercial	Unit	\$3,758	\$3,808	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S500 & S525	Department & Retail Stores	1,000 S.F.	\$226	\$229	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S501 & S526	Hotels & Motels (per unit)	Units	\$1,422	\$1,441	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S502 & S527	Laundromats	1,000 S.F.	\$9,678	\$9,806	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S503 & S528	Laundries	1,000 S.F.	\$8,832	\$8,949	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S504 & S529	Markets	1,000 S.F.	\$2,180	\$2,209	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S505 & S530	Mortuaries	1,000 S.F.	\$5,951	\$6,030	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S506 & S531	Professional Offices	1,000 S.F.	\$376	\$381	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S507 & S532	Repair Shops & Service Stations	1,000 S.F.	\$4,260	\$4,316	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S508 & S533	Restaurants	1,000 S.F.	\$9,395	\$9,519	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S509 & S534	Other Commercial	1,000 S.F.	\$626	\$634	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S510 & S535	Hospitals	1,000 S.F.	\$1,549	\$1,569	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S511 & S536	Churches & Halls	1,000 S.F.	\$1,579	\$1,600	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S514 & S539	Schools "B"	1,000 S.F.	\$516	\$523	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S515 & S540	Other Commercial "A"	1,000 S.F.	\$1,629	\$1,651	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S516 & S541	Other Commercial "B"	1,000 S.F.	\$389	\$394	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
	Warehouse	1,000 S.F.	\$108	\$109	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI

Notes:

- 1) Proposed FY 2014/15 capacity fees for all customer categories represent increase 1.32%.
- 2) ENR CCI - Engineering News Record Construction Cost Index for Los Angeles or 20 city Average

INTRODUCTION

1.1 BACKGROUND

The City of Riverside (City) Public Works Department is responsible for the collection and treatment of wastewater flows generated within the City, the treatment of flows from the Community Services Districts (CSDs) of Edgemont, Jurupa, and Rubidoux, and the accommodation of future flows from development in the Highgrove area. The City's collection system consists of over 800 miles of gravity sewers ranging from 6 to 51 inches in diameter and 20 wastewater lift stations that range in size from 100 to 2,000 gallons per minute (gpm). The City's Regional Water Quality Control Plant (RWQCP) provides primary, secondary and tertiary treatment for a current rated capacity of 40 million gallons per day (mgd).

The most recent major facility plan for the wastewater collection and treatment facilities was completed in 2008 and is referred to as the 2008 Integrated Wastewater Master Plan (2008 IWWMP) (Carollo Engineers, February 2008). That document incorporated or referenced other prior evaluations and planning studies conducted for the City, and available planning information for the CSDs, into a single comprehensive document with specific goals to identify needs through the year 2025. The 2008 IWWMP served as a guidance document for wastewater collection and treatment projects identified in the City's 2011 Capital Improvement Program (2011 CIP).

The City's 2011 CIP is a multi-year plan that identified capital infrastructure projects for fiscal years 2011/12 to 2015/16. The document identified projects for replacement, repair, and/or new facilities to meet projected future flows and changing regulations. Projects included collection system improvements and interceptor construction, and a major upgrade and expansion of the RWQCP. The CIP also tied projected capital needs to the required financing and timing based on when the work would need to take place.

Collection system projects identified in the City's 2011 CIP have progressed over the intervening years but with reprioritization as conditions changed. At this time, the status of current collection system pipeline and lift station projects and plans for the next five years and beyond need to be assessed and evaluated in order to reallocate priorities and funding requirements accordingly.

The RWQCP Phase 1 Plant Rehabilitation project that is currently under construction will upgrade and replace major systems, and increase the hydraulic capacity of that facility to 46 mgd. The Phase 1 project mainly addresses Plant 1 (one of two main secondary treatment process trains) and the solids handling processes. This \$200 million project will add or substantially improve odor control, primary clarifiers, aeration basin, membrane bioreactor (MBR) system, chlorine contact basin, solids blending station, digesters, fats-oil-grease station, digester gas holder, digester gas flare, and equalization basins. Construction was originally

scheduled to be complete by November 2014. The current schedule anticipates completion in the fall of 2015.

Although the RWQCP Phase 1 Plant Rehabilitation is significant in scope, other elements of the plant need improvements and rehabilitation because of their need to continue to produce 20 mgd of treated effluent in a reliable and cost-effective manner for the foreseeable future. The remaining areas of plant that need to be assessed are the head works, the Plant 2 primary and secondary treatment facilities, the tertiary filters, and solids dewatering.

1.1.1 Purpose

The purpose of this CIP Update and Rate Study is to: 1) identify current, near-term, and future projects for both the collection and treatment systems, and 2) determine the appropriate funding requirements and user rates to implement the required capital projects. Near-term projects are specifically identified for the five year period beginning with the fiscal year 2014/15. Future capital improvements to the RWQCP and collections system through fiscal year 2034/35 are broadly defined. This report includes:

- **Chapter 1 – Introduction:** background information and projected population, flow and load that the collection system and RWQCP must be able to accommodate.
- **Chapter 2 - Collection System:** identification of collection system projects to address major pipeline and lift station improvements with a specific CIP list for that work.
- **Chapter 3 - RWQCP Facilities:** summary and itemization of the existing and Phase 1 Plant Rehabilitation project facilities that comprise the RWQCP.
- **Chapter 4 - RWQCP Condition Assessment:** results of the evaluation of existing facilities to identify deficiencies and needed improvements with a specific CIP list for that work.
- **Chapter 5 - Capital Improvement Program:** summary of the combined collection system and RWQCP CIP with projected total costs presented by year along with costs for completion of the Phase I Plant Rehabilitation project and an future project to address local salinity issues.
- **Chapter 6 - Financial Plan and Rates:** methodology and findings of the rate study including the need for rate increases, multi-year revenue requirements, the proposed structure to support the process, and recommendations.

The CIP Update and Rate Study will be used as the basis for a financial plan with recommendations for a rate structure and sewer capacity charges for residential, commercial, institutional, and industrial customers that will include rate adjustments through June 2020. The current rate structure is set to expire in June 2015.

1.1.2 Approach

This study will use the 2008 IWWMP, Phase I Plant Rehabilitation project documentation, City population projections, and Sewer Division data and information to develop a CIP Update to allow for the preparation of a financial plan and rate structure to carry the City forward over the next five year planning period and beyond. It is important to note that the RWQCP Phase 1 Plant Rehabilitation only addresses new or expanded facilities to provide for 46 mgd of reliable

capacity. Although many of the existing facilities will be modified or expanded, other key facilities that will be needed to reliably maintain the facilities rated capacity are not being addressed by that project.

The CIP Update will incorporate collections system planning conducted by City staff since 2008 that includes a collections system CIP that has been updated annually.

To address RWQCP facilities that are not being modified or rehabilitated by the Phase 1 Plant Rehabilitation project, a condition assessment will be conducted. The existing RWQCP consists of a common head works, two parallel, primary/secondary treatment trains – Plants 1 and 2 – and common tertiary and solids handling facilities. The Phase 1 Plant Rehabilitation mainly addresses Plant 1 and solids handling areas of the plant. The areas of plant in need of the condition assessment consist of the head works, the Plant 2 secondary treatment facilities, the tertiary filters, and plant site improvements. Identified projects will be prioritized over the five-year period and incorporated into the CIP Update. Known longer-term improvements that are beyond the five year plan will also be included.

1.2 POPULATION, FLOW AND LOAD PROJECTIONS

The population and flow projections that were presented in the 2008 IWWMP have been updated to reflect current conditions. Updated population projections were supplied by the City of Riverside Planning Department. Other sources of information include historical flows and concentrations, and the following master plan documents from the CSDs:

- Edgemont Communities Services District, Master Sewer System Evaluation Plan (2008)
- Jurupa Communities Services District, Master Sewer Plan (2004)
- Rubidoux Communities Services District, Wastewater Facilities Master Plan (1997)

Planning-level information for the Highgrove area was provided by City staff to reflect the current status of development and infrastructure in that area.

1.2.1 Population

Table 1-1 presents available historical and projected populations for the City and CSDs from 2006-2035. The population for the City is projected to be 346,876 by 2025. Updated population data were not available for the CSDs, and the information for those districts presented below was obtained from the 2008 IWWMP. It should be noted that only a portion of the wastewater generated within the Jurupa CSD is tributary to the RWQCP.

**Table 1-1
 Historical and Projected Populations**

Area	2006	2010	2011	2012	2020	2025	2035
Riverside	287,820	303,871	310,651	313,673	339,000	346,876	387,700
Edgemont ¹	6,600	na ²	na	Na	na	na	na
Rubidoux ¹	26,000	30,300	na	Na	34,100	36,700	na
Jurupa ¹	72,000	84,840	na	Na	116,995	136,681	na

Notes

- 1) From 2008 IWWMP
- 2) Data not available

1.2.2 Flow

The annual increases in flows that were typical in the 1990s and into the 2000s have leveled off since completion of the 2008 IWWMP, and lower than projected flows have been observed over the last five years. **Table 1-2** below shows a summary of actual flow data for the City and the CSDs through fiscal year 2012/13. The dates (years) represent January 1 of the second half of the fiscal year.

Flows for the City beyond fiscal year 2012/13 were projected using a value of 77 gallons per capita per day (gpcd), which is the average of the 2012 and 2013 per capita flows, and the projected City populations of Table 1-1. Flows for the CSDs were projected from the actual 2013 flows using the previous annual flow increase for each CSD as derived from the 2008 IWWMP.

In addition, the CSD’s flows to the RWQCP were capped at the current contractual amounts (see Table 1-2 footnotes). The projected Highgrove flow for 2035 was limited to one-half of the previously agreed capacity allocation of 4.4 mgd.

Figure 1-1 illustrates the historical and projected flows for the City of Riverside and the CSDs.

**Table 1-2
Historical and Projected Flows**

Year (Jan 1st)	Riverside Flow (mgd)	Jurupa CSD Flow (mgd)	Edgemont CSD Flow (mgd)	Rubidoux CSD Flow (mgd)	Highgrove Community Flow (mgd)	Total Flow (mgd)
2000	25.7	3.3	0.7	2.0	-	31.7
2001	26	3.3	0.6	2.0	-	31.9
2002	25.9	3.2	0.6	2.0	-	31.7
2003	26.7	3.2	0.6	2.0	-	32.5
2004	27	3.2	0.6	2.1	-	32.9
2005	27.6	3.7	0.6	2.1	-	34.0
2006	27.4	3.5	0.60	2.1	-	33.6
2007	26.6	2.9	0.56	2.0	-	32.1
2008	26.6	2.9	0.56	2.0	-	32.1
2009	25.4	3.0	0.56	2.1	-	31.0
2010	24.6	3.0	0.53	2.0	-	30.1
2011	24.7	3.0	0.52	2.0	-	30.2
2012	23.5	3.3	0.50	2.0	-	29.2
2013	24.4	3.4	0.51	2.2	-	30.4
2020	26.1	4.0 ⁽¹⁾	0.63	2.8	0.6	34.3
2025	26.7	4.0	0.74	3.06 ⁽³⁾	1.2	35.7
2030	28.2	4.0	0.86	3.06	1.7	37.8
2035	29.9	4.0	0.89 ⁽²⁾	3.06	2.2 ⁽⁴⁾	40.0

Notes:

- 1) Jurupa CSD's 4.0 mgd capacity at RWQCP is projected to be reached in 2018.
- 2) Edgemont CSD's 0.89 mgd capacity at RWQCP is projected to be reached in 2032.
- 3) Rubidoux CSD's 3.06 mgd capacity at RWQCP is projected to be reached in 2025.
- 4) Highgrove projected flow in 2035 is one-half of previously agreed capacity at RWQCP.

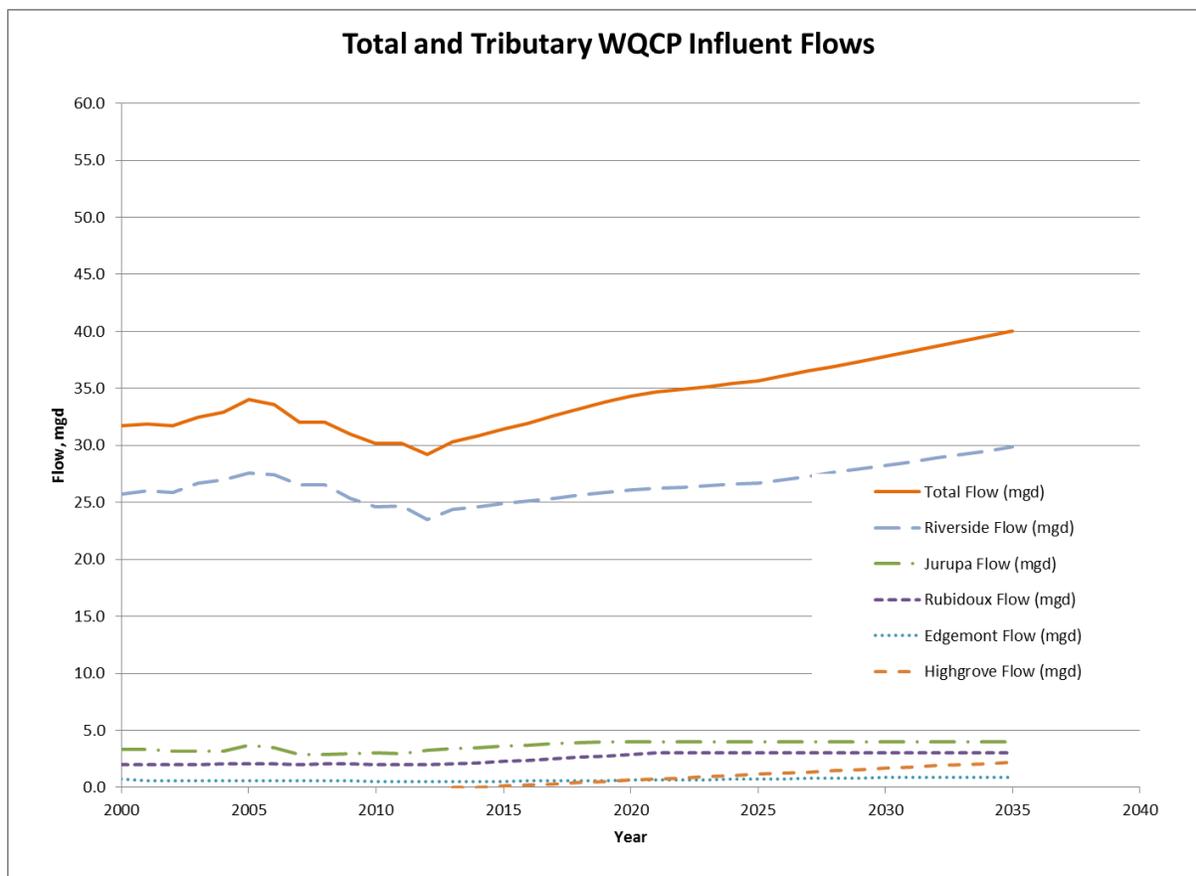


Figure 1-1
 Flow Projections

1.2.3 Loading Projections

The concentrations of Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS) and Total Kjeldahl Nitrogen (TKN) have been increasing over the years. The data presented in **Table 1-3** show an increase of 50 percent from 1995 through 2012. The increase in the wastewater strength is believed to be result, at least in part, to water conservation efforts.

Table 1-3
 Historical Concentrations

Parameter	1995	2001	20058	2009	2012
BOD (mg/L)	211	222	250	295	311
TSS (mg/L)	206	222	250	270	263
TKN (mg/L)	28	35	35	40	48.9

To determine the concentration projections, the data from 1995 to 2012 were first normalized by dividing the concentration of the constituent by the average concentration of the constituent. It

was assumed that concentrations will continue to increase for a time and then level off. The increase is represented by a 4 percent rate of increase compounded annually initially and then decreasing until 2035. These normalized data and projections are illustrated by **Figure 1-2**.

The flow and loading projections are graphed together and presented as **Figure 1-3**. The load-based-capacities presented in the Phase 1 Plant project preliminary design documentation are shown for both the Phase 1 project with capacity of 46 mgd and a future Phase 2 project for a capacity expansion to 52 mgd. Illustrated as horizontal lines for both BOD and TKN load capacity ratings for the Phase 1 and 2 projects, their intersection with the projected load curves indicate the year beyond which the treatment capacity will be exceeded. In each instance, the load-based capacity of the facility will be exceeded before the hydraulic limitations are reached. It is recommended that the load-based capacity of the facility be evaluated once the Phase 1 Rehabilitation is operational to determine when and what the capacity expansion will entail. The available data indicate that a load-capacity expansion might be required in ten years or less.

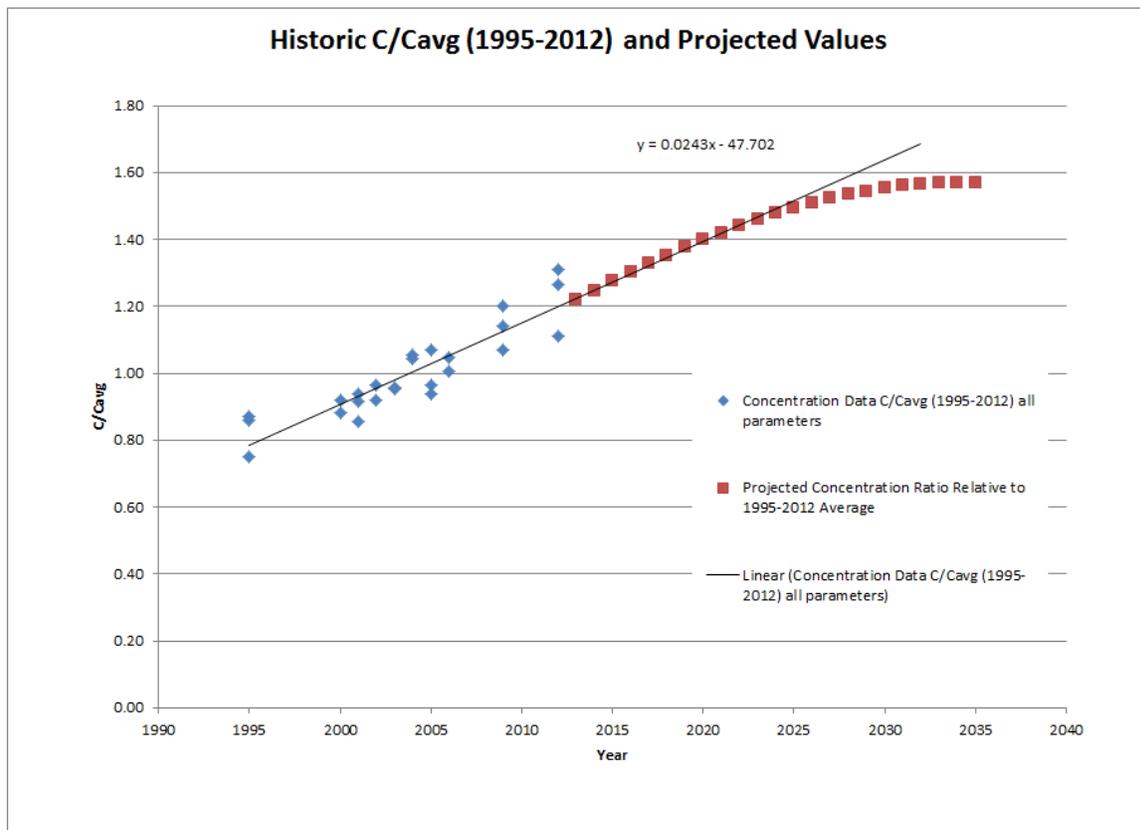
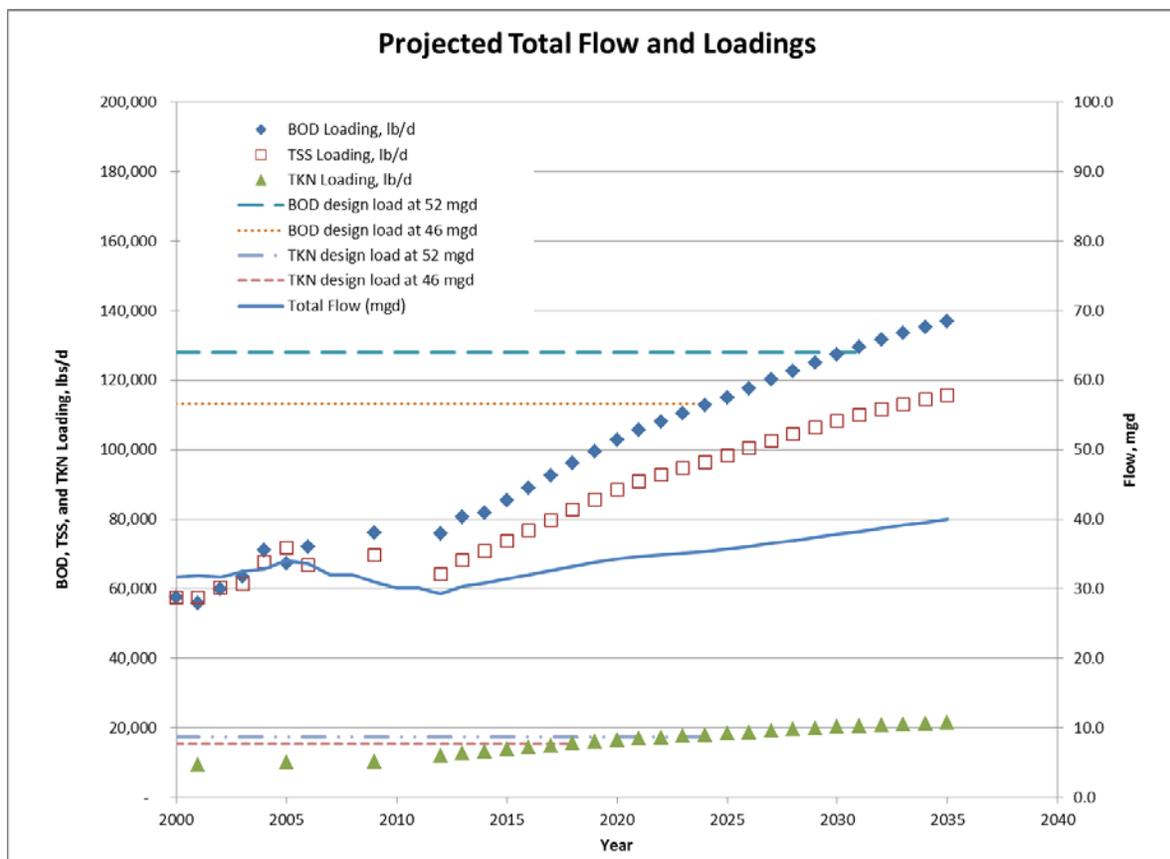


Figure 1-2
Normalized Concentration Projections



**Figure 1-3
 Influent Load Projections**

1.2.4 Peaking Factors

Planning-level influent flow peaking factors were developed for the 2008 IWWMP. These were evaluated and refined during the detailed design of the Phase I Rehabilitation project and the peak dry weather factor was determined to be less than the 1.8 assumed in the 2008 IWWMP, while the other factors remained unchanged and are:

- Peak wet weather: average annual = 2.2
- Peak dry weather: avg = 1.5
- Minimum dry weather: avg = 0.5

1.3 SUMMARY

Flow and loading projections from past planning documents were revisited. More recent population projections and measured flows were used to project future flows from the City of Riverside and CSDs currently served by the RWQCP. Corresponding load projections were made by considering the historical influent strength increases over the last 10 to 15 years.

The next three chapters will present the recommended collections system capital improvement projects, describe the existing RWQCP, and present a condition assessment of the RWQCP facilities not being upgraded by the current Phase 1 Rehabilitation with the recommended capital improvement projects to remedy identified deficiencies.

Chapter 5 combines the identified collection system and RWQCP projects into an overall Sewer System CIP that is the basis for the evaluation and development of recommended rate structure that is presented as Chapter 6.

COLLECTION SYSTEM**2.1 BACKGROUND**

City staff assembled a collection-system capital improvement projects (CIP) list for incorporation into this CIP Update to represent \$80 million (current dollars) in capital projects from fiscal year 2014/15 through 2018/19. Projects include: Santa Ana River Trail Sewer (SARTS) Phase II, the Tequesquite Arroyo Trunk Sewer (Tequesquite) Phase IIB, rehabilitation of six lift stations, and numerous upsize or replacement pipeline projects throughout the City to alleviate capacity restrictions and reduce maintenance requirements.

The 2008 Integrated Wastewater Master Plan (IWWMP) provided a CIP list to replace and rehabilitate for the collection system pipelines based on hydraulic deficiencies and on the age of the components.

In addition to the collection system CIP list, the City also prepared a Sewer System Management Plan (SSMP) (2009) to identify administrative practices and procedures to manage the collection system. The SSMP specifically identified lift stations requiring rehabilitation or replacement which were further described in the RWQCP Wastewater Lift Station Assessment (City of Riverside, 2009).

Since that time, the City has tracked potential collection system projects to use as a basis for internal planning. Actual lower growth rates have resulted in different hydraulic conditions and different system needs than those predicted in 2008. In addition, the previously recommended program to address aging infrastructure based on age as the primary consideration has been modified to address specific needs to reduce maintenance and remove hydraulic constraints.

The projects and prioritization presented in this section are based on prior planning documents, City internal CIP documentation, and workshops held with staff to identify areas of concern. The costs for all projects were estimated by the City based on local and historic construction cost knowledge. Prior planning documents referenced and considered for this CIP update include:

- Integrated Wastewater Master Plan (2008 IWWMP) (Carollo Engineers, 2008)
- Sewer System Management Plan (City of Riverside, 2009)
- City of Riverside Capital Improvement Program 2011/12 – 2015/16 (City of Riverside, 2011)
- RWQCP Wastewater Lift Station Assessment (City of Riverside, 2009).
- Woodcrest Sewer Cost Estimate – Phase I and Phase II (City of Riverside, circa 2013)
- Collections System Division CIP List (City of Riverside, 2013)

The Collections System Division CIP List was modified by City staff based on discussions of completed projects, additional infrastructure needs, project costs, and project prioritization. That

document serves as the primary basis for the collection system needs, costs, and priorities for this update.

It is important to note that the 2008 IWWMP was based on previously completed collection system sub area models that are over 10 years old. The five sub-areas that had been modelled were the Arlanza, Phoenix, Northside, Spruce, and Tequesquite basins. Neither the 2008 IWWMP nor the current study updated the five basin-specific collection system hydraulic master plan models. Reassessing the hydraulics of the entire collection system is recommended as part of the next master planning effort within the next five to ten years.

The City-maintained Collections System Division CIP List tracks all sewer projects from the City's published Capital Improvement Program 2011/12 – 2015/16. Staff added or revised projects to alleviate capacity restrictions through replacement/upsizing of existing pipelines and flow redirection projects. The list includes rankings on high, medium, and low priority projects and associated cost estimate. This list is the backbone of the collection system CIP recommendations made in this document as summarized below.

2.2 PIPELINES

The City of Riverside's 2011 Capital Improvement Program 2011/12 – 2015/16 included a list of treatment plant and sewer projects. Of the listed projects, the SARTS Phase II and Tequesquite Phase IIB interceptors are high priority. These projects have begun and require significant but necessary capital outlays through fiscal year 2016/17 and are key elements of this CIP update.

Other projects have been identified for the current five year planning period. In addition, a reassessment of projects by City staff specifically resulting in the following recent additions:

- 9th, 12th, Kansas, and Sedgwick: replace/upsized existing pipelines in downtown Riverside
- Canterbury/California: flow restriction removal
- Villa Vista/Rycroft: flow restriction removal
- Burgamont/Owari: flow restriction removal
- Mesquite Canyon/Senna: flow restriction removal
- Woodcrest Sewer Installation Phase I
- Woodcrest Sewer Installation Phase II

The 9th, 12th, Kansas, and Sedgwick project will address capacity issues in downtown Riverside. The Canterbury/California, Villa Vista/Rycroft, Burgamont/Owari, and Mesquite Canyon/Senna projects all address areas with flow capacity and grease issues that currently require significant maintenance outlays.

The Woodcrest Sewer Installation Phase I and Phase II would provide sewer service to a community that is currently on septic systems. The County of Riverside is providing funding to the City of Riverside for a large stormwater pipeline to be installed in the area, and the new sewer line would be co-located with the stormwater pipeline. Co-locating the pipelines would

reduce excavation, mobilization, paving and other costs. This project has a low priority because it does not address existing system deficiencies. Phase I and II are expected to cost \$15 million.

Smaller miscellaneous projects, including the Miscellaneous Sewer Construction, Miscellaneous Lift Station Equipment and Control Upgrades/Replacements, and Collection System Upgrades – Reduce High Frequency Maintenance that were discussed and concluded to be operations and maintenance (O&M) related were removed from the CIP but the annual costs of \$1,250,000 were accounted for in the overall financial planning.

2.3 LIFT STATIONS

The 2009 Wastewater Lift Station Assessment was reviewed with staff to update the status of the City's seventeen wastewater lift stations listed below:

- Crest/Ontario
- Western
- Arlington
- Lakewood
- Fairgrounds
- University Knolls
- Dexter
- Gardencrest
- Rivercrest
- Apostle
- MLK 1
- MLK 2
- JFK
- Bryant Park
- Antherton
- Wood Road
- Pierce Street

The Crest/Ontario, Western, Arlington, and Lakewood lift stations were priorities at the time of the 2009 report. Upgrade of the Crest /Ontario lift station is underway. Based on current conditions, upgrades to the Western lift station were removed from the list of lift station priorities while upgrades at Dexter lift station were added. City staff also identified needed system upgrades of the University Knolls, Rivercrest, and Gardencrest lift stations. Summaries of each lift station are presented below. Needed upgrades at each lift station are based on the workshop and the 2009 Wastewater Lift Station Assessment.

2.3.1 Dexter Drive Wastewater Lift Station

The Dexter Drive Wastewater Lift Station was installed in 1968. Recommended upgrades include a flow study to determine the actual flow to the station, a new submersible duplex station, PLC upgrades, and perimeter fencing. These upgrades are currently in design, and

construction costs are expected to be approximately \$1.2M. Staff rate this project high priority item.

2.3.2 Fairgrounds Wastewater Lift Station

The Fairgrounds Wastewater Lift Station was installed in 1966. Recommended upgrades include a flow study to determine the actual flow to the station, a new submersible duplex station, PLC upgrades, and perimeter fencing. These upgrades are currently in design, and construction costs are expected to be approximately \$1.2M. Staff rate this project high priority.

2.3.3 Arlington Wastewater Lift Station

The Arlington Wastewater Lift Station was installed in 1989. Recommended work includes converting the lift station to flow by gravity. Construction costs are expected to be approximately \$700,000. Staff rate this project high-to-medium priority.

2.3.4 Lakewood Wastewater Lift Station

The Lakewood Wastewater Lift Station was installed in 1989. Recommended upgrades include a flow study to determine the actual flow of the station, installation of discharge elbows and guide rails, enlargement of the wet well opening and cover, enlargement of the valve vault cover, PLC upgrades, and installation of a receptacle and tie switch for emergency generator power. Construction costs are expected to be approximately \$1.2M. Staff rate this project high-to-medium priority.

2.3.5 Rivercrest Wastewater Lift Station

The Rivercrest Wastewater Lift Station was installed in 1985. A flow study is recommended to determine if the sewer could be rearranged to flow by gravity. It is anticipated that this will be possible, and the lift station should be converted to flow by gravity. Construction costs are expected to be approximately \$700,000. This is a high-to-medium priority item.

2.3.6 Gardencrest Wastewater Lift Station

The Gardencrest Wastewater Lift Station currently operates on vacuum pumps. City staff recommends that the vacuum pumps be replaced and a traditional lift station be constructed in its place. Construction costs are expected to be approximately \$1.2M. Staff rate this project high-to-medium priority.

2.3.7 University Knolls Wastewater Lift Station

The University Knolls Wastewater Lift Station was installed in 1988. Recommended upgrades include a flow study, power upgrades, pump replacement, PLC upgrades, electrical modifications for emergency generator power, emergency pumping connection, and concrete slab and fencing. Construction costs are expected to be approximately \$1.2M. This project is a low-to-medium priority item and has been deferred to the future.

2.4 COLLECTION SYSTEM CIP

The Collection System CIP project listing with costs and prioritization that has been incorporated into this CIP Update and Rate Study is presented as **Table 2-1**.

As noted, City staff has maintained a collections system CIP and have updated that information on a continual basis to reflect priorities and budget constraints to plan for a collection system that meets the needs of the rate payers and accommodates the expected demands on the system. Although the per capita wastewater flow rates have recently decreased, potentially resulting in less capacity-related problems with the collection system, age and configuration of the system still need to be an on-going concern. To this end, future identified projects totaling \$20 million for the five years following fiscal year 2018/19, and \$16 million per year thereafter have been included in the CIP.

**Table 2-1
Collection System CIP**

Project Number	Project Type	Project Description	Prior Fiscal Years	Year 1 14/15	Year 2 15/16	Year 3 16/17	Year 4 17/18	Year 5 18/19	Total	Years 6-10	Years 11-20
Summary			\$6,632,130	\$ -	\$23,350,000	\$19,400,000	\$17,520,000	\$12,760,000	\$79,662,130	\$20,324,350	\$160,000,000
1	Pipeline	Acorn Street from Central to north of Jurupa (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,300,000	\$1,300,000	\$ -	\$ -
2	Pipeline	Arizona Avenue: Indiana Ave from Fillmore to Churchill Dr., Churchill Dr. from Norfolk Dr. to T-intersection, La Sierra Ave from Liverpool Ln to Arizona Ave (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$525,000	\$525,000	\$ -	\$ -
3	Pipeline	Harrison St. from NW of Magnolia Ave. to County Farm Rd. (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$330,000	\$330,000	\$ -	\$ -
4	Pipeline	Jackson St. from Colorado Ave to N of Delano Dr., from Delano Dr. to California Ave. (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,400,000	\$1,400,000	\$ -	\$ -
5	Pipeline	La Sierra Channel from Rancho Del Oro Ct to Golden Ave. (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,400,000	\$1,400,000	\$ -	\$ -
6	Pipeline	Central Ave from Hillside Ave to Phoenix Ave (52-1) (Phoenix priority A)	\$ -	\$ -	\$ -	\$ -	\$550,000	\$ -	\$550,000	\$ -	\$ -
7	Pipeline	Hillside Ave. from Central Ave (52-1) to Sheppard St. (37-7) (Phoenix priority A)	\$ -	\$ -	\$ -	\$ -	\$2,375,000	\$ -	\$2,375,000	\$ -	\$ -
8	Pipeline	Phoenix Ave. at Arlington Ave (52-5) (Phoenix priority A)	\$ -	\$ -	\$ -	\$ -	\$100,000	\$ -	\$100,000	\$ -	\$ -
9	Pipeline	Madison Street from Garden St (53-7) to Evans St (68-1) (Phoenix priority B)	\$ -	\$ -	\$ -	\$ -	\$420,000	\$ -	\$420,000	\$ -	\$ -
10	Pipeline	Phoenix Ave. from Central Ave. (52-1) to Arlington Ave. (52-5) (Phoenix priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,500,000	\$1,500,000	\$ -	\$ -
11	Pipeline	Eastridge Ave from Lance Dr. to River Run (73-1) (Tequesquite priority A)	\$ -	\$ -	\$ -	\$ -	\$240,000	\$ -	\$240,000	\$ -	\$ -
12	Pipeline	Eastridge Ave from Sycamore Canyon Blvd. (73-2) to River Run (73-3) (Tequesquite priority B)	\$ -	\$ -	\$ -	\$ -	\$475,000	\$ -	\$475,000	\$ -	\$ -
13	Pipeline	Trautwein Road from Orange Terrace Pkwy (87-7) to south of Boutiful St (102-1) (Tequesquite priority B)	\$ -	\$ -	\$ -	\$ -	\$460,000	\$ -	\$460,000	\$ -	\$ -
14	Pipeline	Cridge St from Victoria Ave (40-5) to Brooks St (39-6) (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$2,600,000	\$2,600,000	\$ -	\$ -
15	Pipeline	Victoria Ave from Cridge St. (40-5) to Pennsylvania Ave (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$820,000	\$820,000	\$ -	\$ -
16	Pipeline	Pennsylvania Ave from Victoria (40-5) to 14th St to Kansas Ave (40-6) (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$985,000	\$985,000	\$ -	\$ -
17	Pipeline	Martin Luther King Blvd from Kansas Ave (40-6) to Canyon Crest Dr. (41-6) (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$3,900,000	\$ -	\$3,900,000	\$ -	\$ -
18	Pipeline	Canyon Crest Dr from MLK Blvd (41-6) to Central Ave (51-1) (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$2,200,000	\$ -	\$2,200,000	\$ -	\$ -

Project Number	Project Type	Project Description	Prior Fiscal Years	Year 1 14/15	Year 2 15/16	Year 3 16/17	Year 4 17/18	Year 5 18/19	Total	Years 6-10	Years 11-20
19	Pipeline	Spruce St from Kansas Ave (25-6) to Chicago Ave (26-5) (Spruce priority B)	\$ -	\$ -	\$ -	\$ -	\$1,250,000	\$ -	\$1,250,000	\$ -	\$ -
20	Pipeline	Chicago Ave from Blaine/Third St (26-7) to Spruce St (26-5) (Spruce priority B)	\$ -	\$ -	\$ -	\$ -	\$750,000	\$ -	\$750,000	\$ -	\$ -
21	Pipeline	Fairmount Trunk from Buena Vista Ave (23-6) along Bike Path at SNA River to north of Tequesquite (38-2) (Northside priority "C")	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,900,000	\$1,900,000	\$ -	\$ -
22	Lift Station	Dexter Wastewater Lift Station	\$ -	\$ -	\$ -	\$1,200,000	\$ -	\$ -	\$1,200,000	\$ -	\$ -
23	Lift Station	Fairgrounds Wastewater Lift Station	\$ -	\$ -	\$ -	\$1,200,000	\$ -	\$ -	\$1,200,000	\$ -	\$ -
24	Lift Station	Arlington & Fairhaven Wastewater Lift station	\$ -	\$ -	\$ -	\$800,000	\$ -	\$ -	\$800,000	\$ -	\$ -
25	Lift Station	Lakewood Wastewater Lift Station	\$ -	\$ -	\$ -	\$ -	\$1,200,000	\$ -	\$1,200,000	\$ -	\$ -
26	Lift Station	Rivercrest Wastewater Lift Station	\$ -	\$ -	\$ -	\$ -	\$1,600,000	\$ -	\$1,600,000	\$ -	\$ -
27	Lift Station	Garden Crest Wastewater Lift Station	\$ -	\$ -	\$ -	\$ -	\$1,200,000	\$ -	\$1,200,000	\$ -	\$ -
28	Pipeline	9 th , 12 th , Kansas, and Sedgwick – resolve capacity issues	\$ -	\$ -	\$3,700,000	\$ -	\$ -	\$ -	\$3,700,000	\$ -	\$ -
29	Pipeline	Canterbury/California (COL-PWS-3017009) - Flow Restriction	\$ -	\$ -	\$ -	\$ -	\$200,000	\$ -	\$200,000	\$ -	\$ -
30	Pipeline	Villa Vista/Rycroft (COL-PWS-4014598) - Flow Restriction	\$ -	\$ -	\$ -	\$ -	\$200,000	\$ -	\$200,000	\$ -	\$ -
31	Pipeline	Burgamont/Owari (COL-PWS-4006682) - Flow Restriction	\$ -	\$ -	\$ -	\$ -	\$200,000	\$ -	\$200,000	\$ -	\$ -
32	Pipeline	Mesquite Canyon/Senna (COL-PWS-4013070) - Flow Restriction	\$ -	\$ -	\$ -	\$ -	\$200,000	\$ -	\$200,000	\$ -	\$ -
33	Pipeline	SARTS Phase II	\$843,000	\$ -	\$19,650,000	\$ -	\$ -	\$ -	\$20,493,000	\$ -	\$ -
34	Pipeline	Tequesquite Phase IIB	\$2,185,000	\$ -	\$ -	\$16,200,000	\$ -	\$ -	\$18,385,000	\$ -	\$ -
35	Sewer Projects	Miscellaneous Sewer Projects	\$3,604,130	\$ -	\$ -	\$ -	\$ -	\$ -	\$3,604,130	\$ -	\$ -
36	Pipeline	RWQCP Sewer (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$500,000	\$ -
37	Pipeline	Monroe St from Indiana Ave. head north under SR-91 halfway to Magnolia (67-5) (Arlanza priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$380,000	\$ -
38	Pipeline	Chicago Ave from Linden St (41-1) to Seventh St (41-1) (Spruce priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$290,000	\$ -
39	Pipeline	Marlborough Ave from La Cadena Dr. to Matthews St. (25-2) (Northside priority B)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$100,000	\$ -
40	Pipeline	Columbia Ave from Riverside Canal (26-1) to west of RR (26-2) (Northside priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,020,000	\$ -
41	Pipeline	Fairmount Blvd from Shamrock (25-1) to Strong (10-7) (Northside priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$450,000	\$ -
42	Pipeline	Wood Rd. from north of Silo St (86-8) to north of Van Buren Blvd (101-2) (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$600,000	\$ -
43	Pipeline	Brockton Ave from Tequesquite Ave. to Riverside Community Hospital sewer main (39-1) (Tequesquite priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$200,000	\$ -

Project Number	Project Type	Project Description	Prior Fiscal Years	Year 1 14/15	Year 2 15/16	Year 3 16/17	Year 4 17/18	Year 5 18/19	Total	Years 6-10	Years 11-20
44	Pipeline	Marlborough Ave from Matthew St (25-1) to Palermo Dr. (25-1); from Catania Dr. (25-2) to Riverside Canal (26-1) (Northside priority C)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$210,000	
45	Pipeline	Strong St from Fairmount Blvd (25-1) to Main St. (25-1) (Northside priority C).	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$350,000	
46	Lift Station	University Knolls Wastewater Lift Station	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,200,000	
47	Pipeline	Woodcrest Sewer - Phase I (Adams - Autobahn Ct to Hermosa Dr & Hermosa Dr- Adams to Washington St)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$6,404,375	
48	Pipeline	Woodcrest Sewer - Phase II (Jackson St - Van Buren to California & California Ave - Jackson to Monroe St & Monroe St - California to Indiana	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$8,619,975	
49	Pipeline	Future projects	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$160,000,000

EXISTING RWQCP FACILITIES

3.1 BACKGROUND

This section summarizes the existing facilities at the Riverside Regional Water Quality Control Plant (RWQCP). At the time of preparing this report, many of the existing facilities are being replaced or rehabilitated as part of recent work related to the Phase 1 Plant Rehabilitation Project and will be commissioned within the next 24 months. As such, the following section will present the existing plant with these new facilities as complete. The key projects currently under construction include the Phase 1 Plant Rehabilitation and the Biosolids Storage projects.

The RWQCP site consists of approximately 121 acres of land. The main entrance to the plant is on Acorn Street, and plant boundaries include Van Buren Road on the west, Jurupa Avenue on the south, Payton Road on the east, and the Santa Ana River on the north. Buffer zones are limited around the plant, except by the Santa Ana River to the north. There are businesses to the immediate east and south of the plant boundary.

The treatment facility began operation in 1944 serving a small growing community using trickling filters and anaerobic digestion. Numerous upgrades occurred over the years to expand capacity and employ increasingly modern technology such as activated sludge. The RWQCP began operation as a regional facility in 1978.

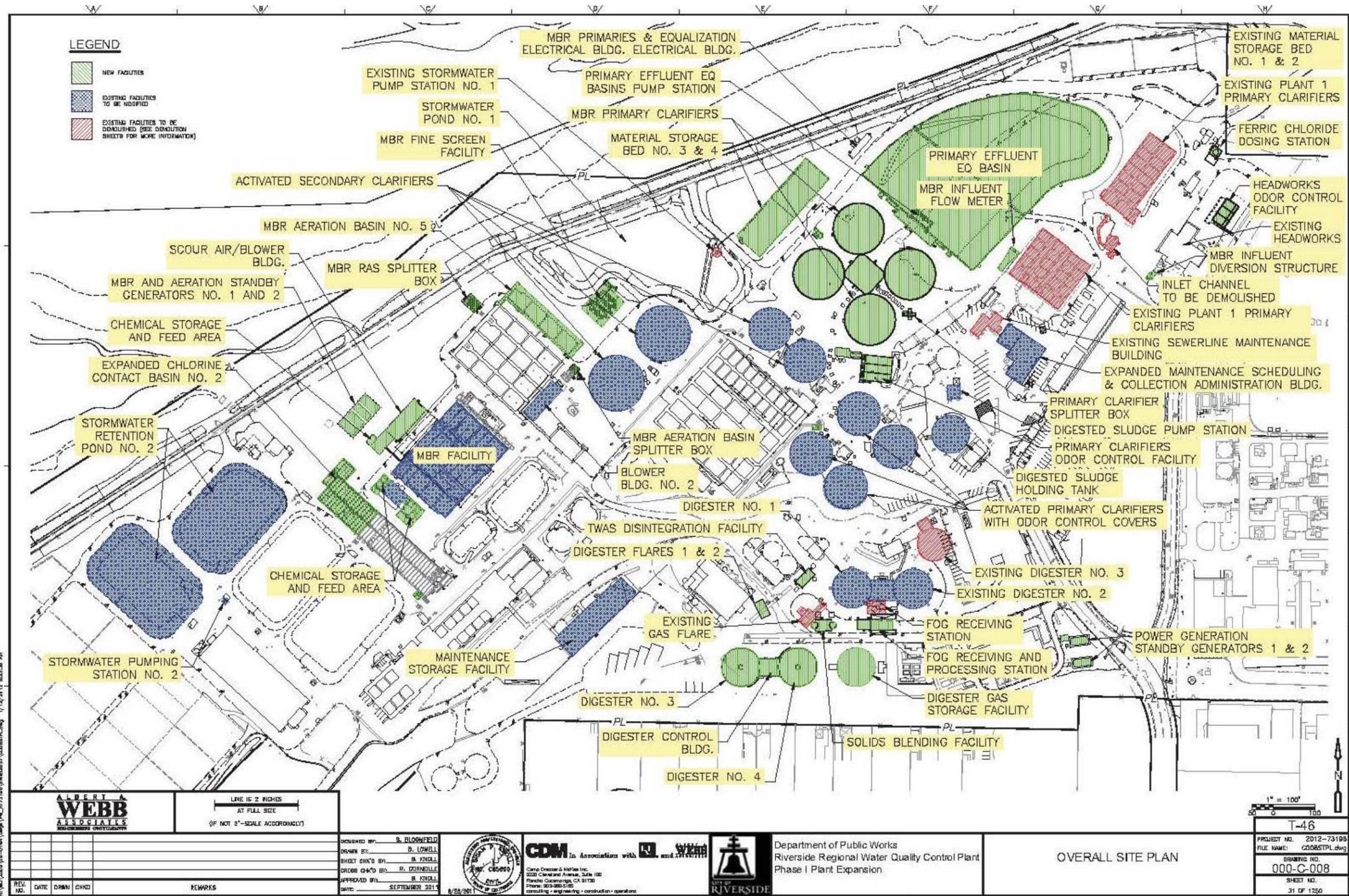
The plant includes primary, secondary, and tertiary treatment and provides wastewater treatment for the Edgemont, Jurupa, and Rubidoux Community Service Districts (CSDs) in addition to the City of Riverside (City) and the unincorporated Highgrove area. The RWQCP currently has an annual average hydraulic capacity of 40 mgd, and can convey peak flows up to 104 mgd.

In addition to treatment facilities, the RWQCP has a laboratory and administration building. The Laboratory Services Program provides technical support for the Sewerage Systems Service Program and for the CSDs. Analytical services provided include chemical, biological, and microbiological analyses.

3.1.1 Existing Treatment Facilities

The RWQCP prior to the Phase 1 Plant Rehabilitation consisted of headworks, two liquid activated sludge secondary and tertiary treatment trains that operate in parallel, and a common solids handling facility. Historically, these trains have been termed Plant 1 and Plant 2. However, the Phase 1 Plant Rehabilitation project will upgrade Plant 1 into a membrane bioreactor and Plant 2 will essentially remain unchanged. **Figure 3-1** shows the layout of the existing facilities once current construction activity is complete. This figure, in part, and others in this chapter are reproductions from the Phase 1 construction contract documents issued for bid.

Figure 3-1
Site Plan



The City renamed the plants the Membrane Bioreactor Treatment Train (MBRTT) (formerly Plant 1) and the Activated Treatment Train (ATT) (formerly Plant 2). This change has been incorporated into documentation, operations manuals, and asset management systems.

Flow enters the plant through five separate lines that ultimately combine at the headworks influent box. Flow is screened through coarse bar screens and is then de-gritted with vortex grit separators. The flow is then split between the MBR and Activated Treatment Trains using throttling flow controllers. The flow is split 45 percent to the MBR and 55 percent to the Activated Treatment Trains.

The MBR Treatment Train (MBRTT) has four new circular primary clarifiers; a new fine screen facility, five rectangular aeration basins, eight membrane trains, and dedicated chlorine contact basin (CCB) No. 2. Recycled water is pumped from CCB No. 2.

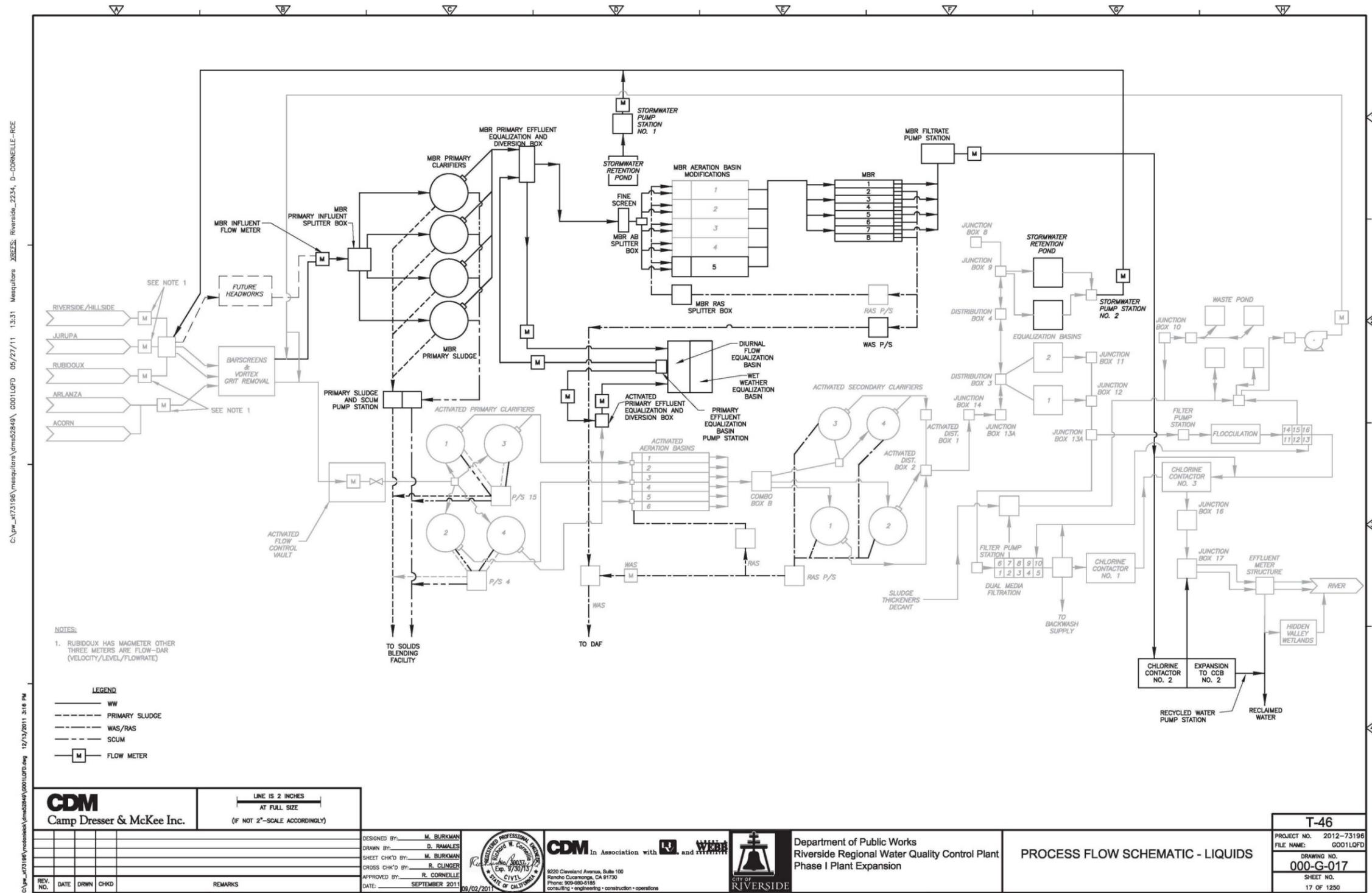
The Activated Treatment Train (ATT) has four circular primary clarifiers, six rectangular aeration basins, and four circular secondary clarifiers. Secondary effluent from the ATT flows to two equalization ponds. The equalized secondary effluent feeds into two tertiary filter trains, where it receives further treatment. Tertiary effluent flows through Chlorine Contact Basin No. 1 (CCB1) and Chlorine Contact Basin No. 3 (CCB3) for disinfection.

Disinfected effluent from both the MBRTT and ATT processes is discharged to the Santa Ana River following dechlorination..

The RWQCP has been upgraded to increase its rated capacity from 40 mgd to 46 mgd. Some process units within the liquids and solids treatment systems are rated at 52 mgd. **Figures 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, and 3-9** present flow schematics for the liquids, solids, and gas treatment systems, and the hydraulic profiles

The sections that follow describe the major treatment processes in further detail.

Figure 3-2
Process Flow Schematic - Liquids



**Figure 3-3
Process Flow Schematic - Solids**

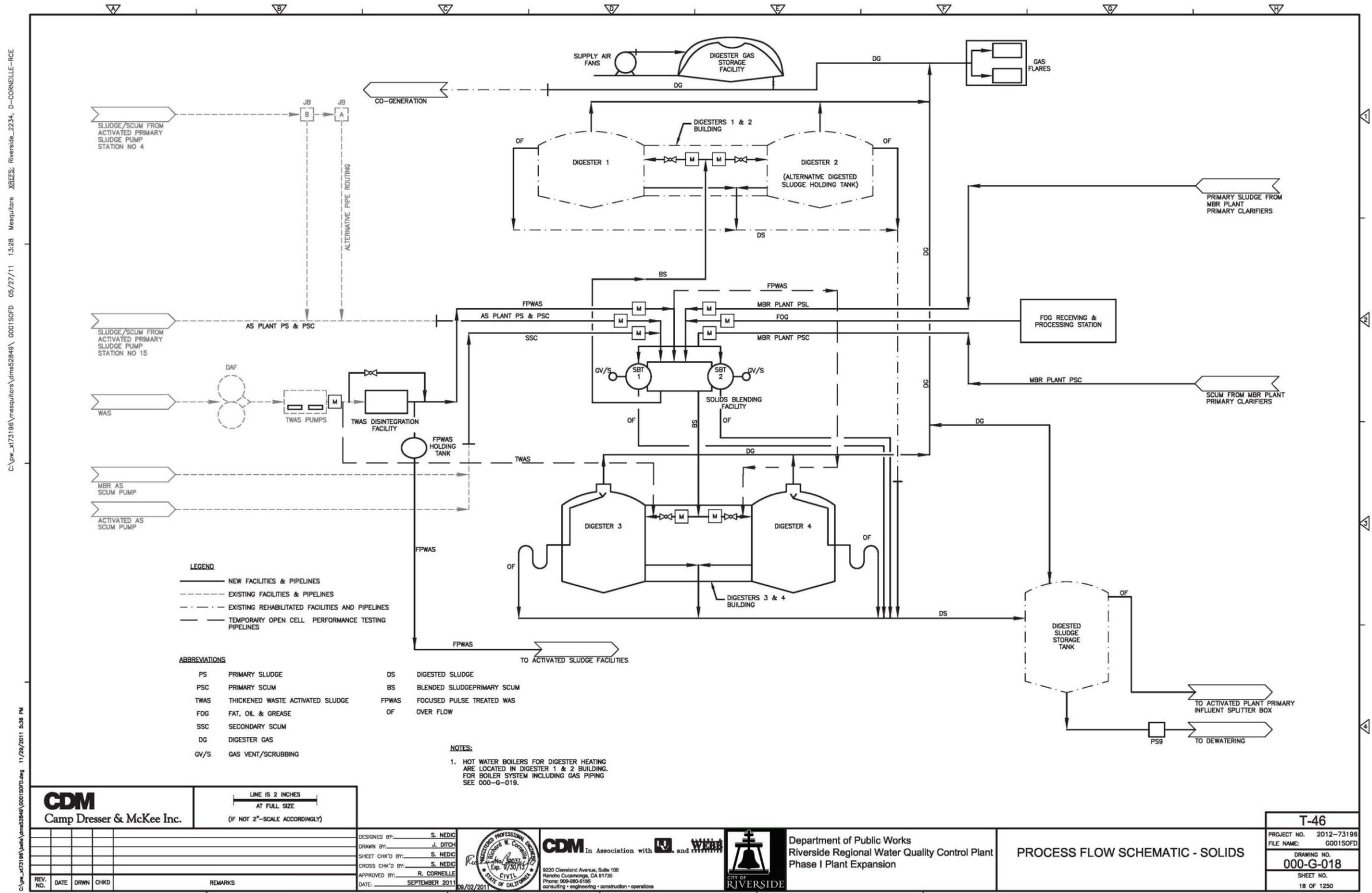
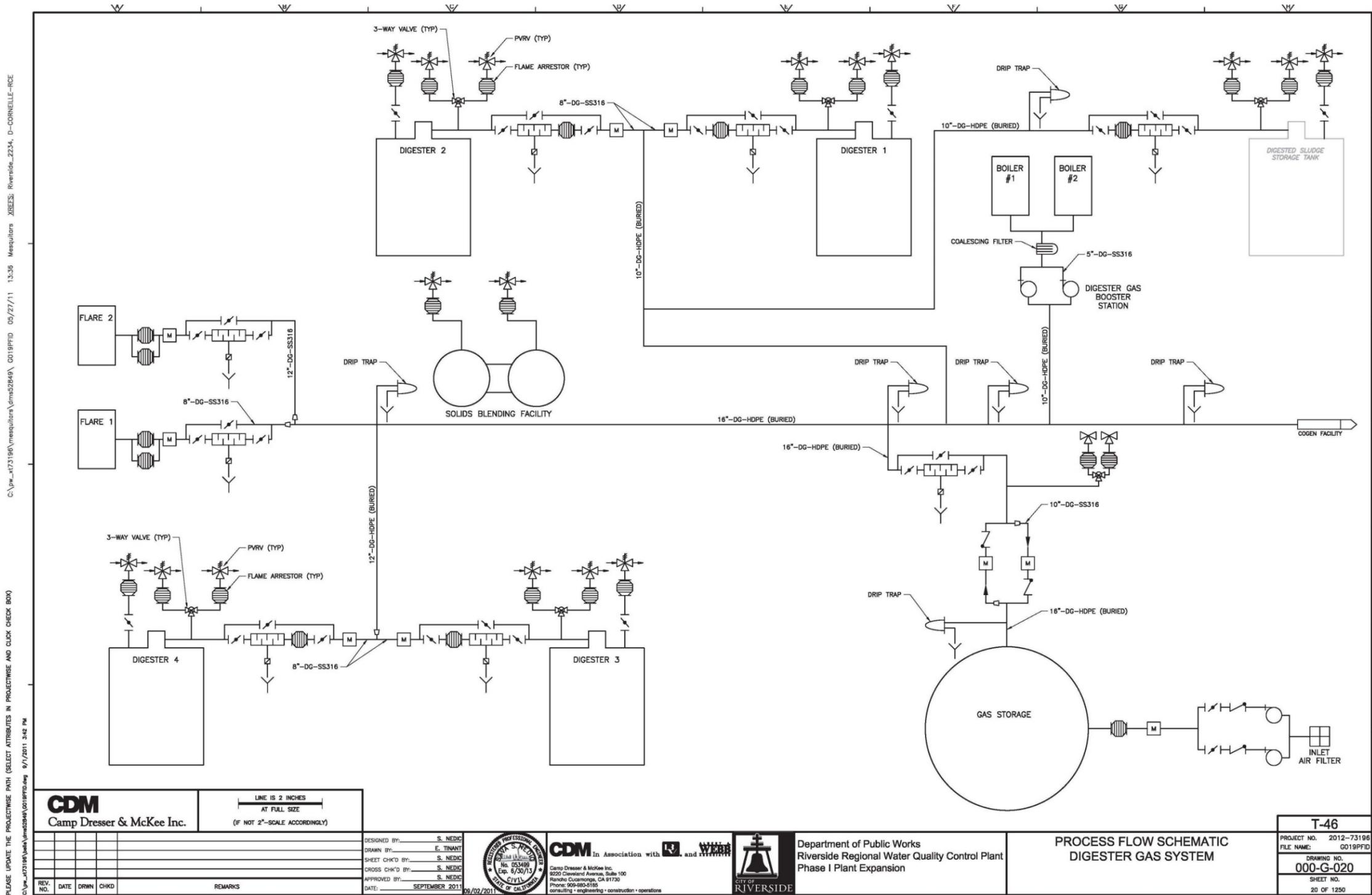


Figure 3-4
Process Flow Schematic – Gas



C:\p_w\173196\mesqulora\gms2849\019PFD 05/27/11 1:336 Mesqulora_XREFS: Riverside_2234, D-CORNILLE-RCE

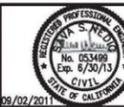
PLEASE UPDATE THE PROJECTWISE PATH (SELECT ATTRIBUTES IN PROJECTWISE AND CLICK CHECK BOX) C:\p_w\173196\mesqulora\gms2849\019PFD.rvt 9/7/2011 3:42 PM

CDM
Camp Dresser & McKee Inc.

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2" SCALE ACCORDINGLY)

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: S. NEDIC
DRAWN BY: E. TINAMIT
SHEET CHK'D BY: S. NEDIC
GROSS CHK'D BY: S. NEDIC
APPROVED BY: S. NEDIC
DATE: SEPTEMBER 2011



CDM In Association with **WSP** and **WSP**

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9220 Cleveland Avenue, Suite 100
Riverside, California, CA 91730
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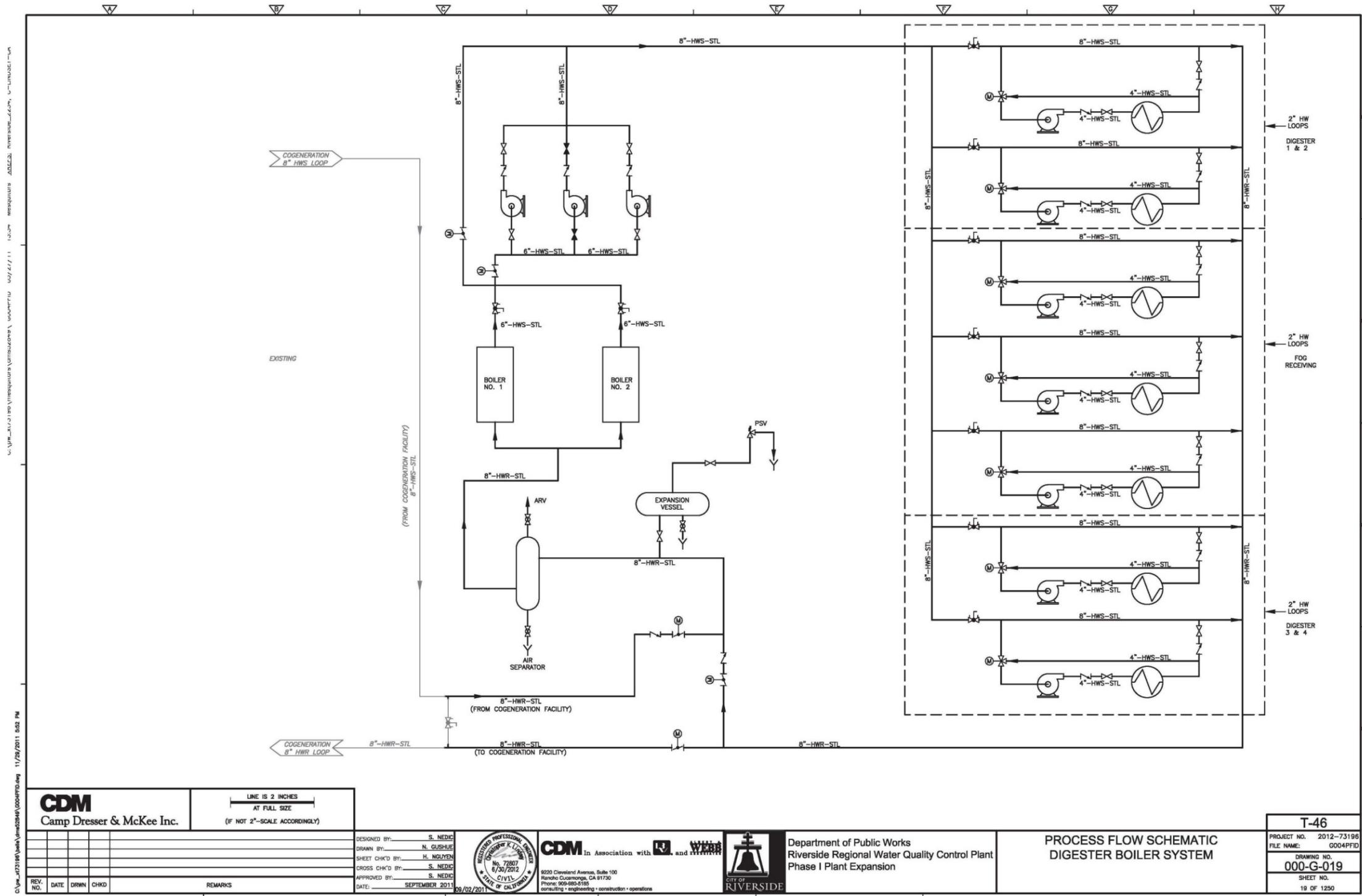
CITY OF RIVERSIDE

Department of Public Works
Riverside Regional Water Quality Control Plant
Phase I Plant Expansion

**PROCESS FLOW SCHEMATIC
DIGESTER GAS SYSTEM**

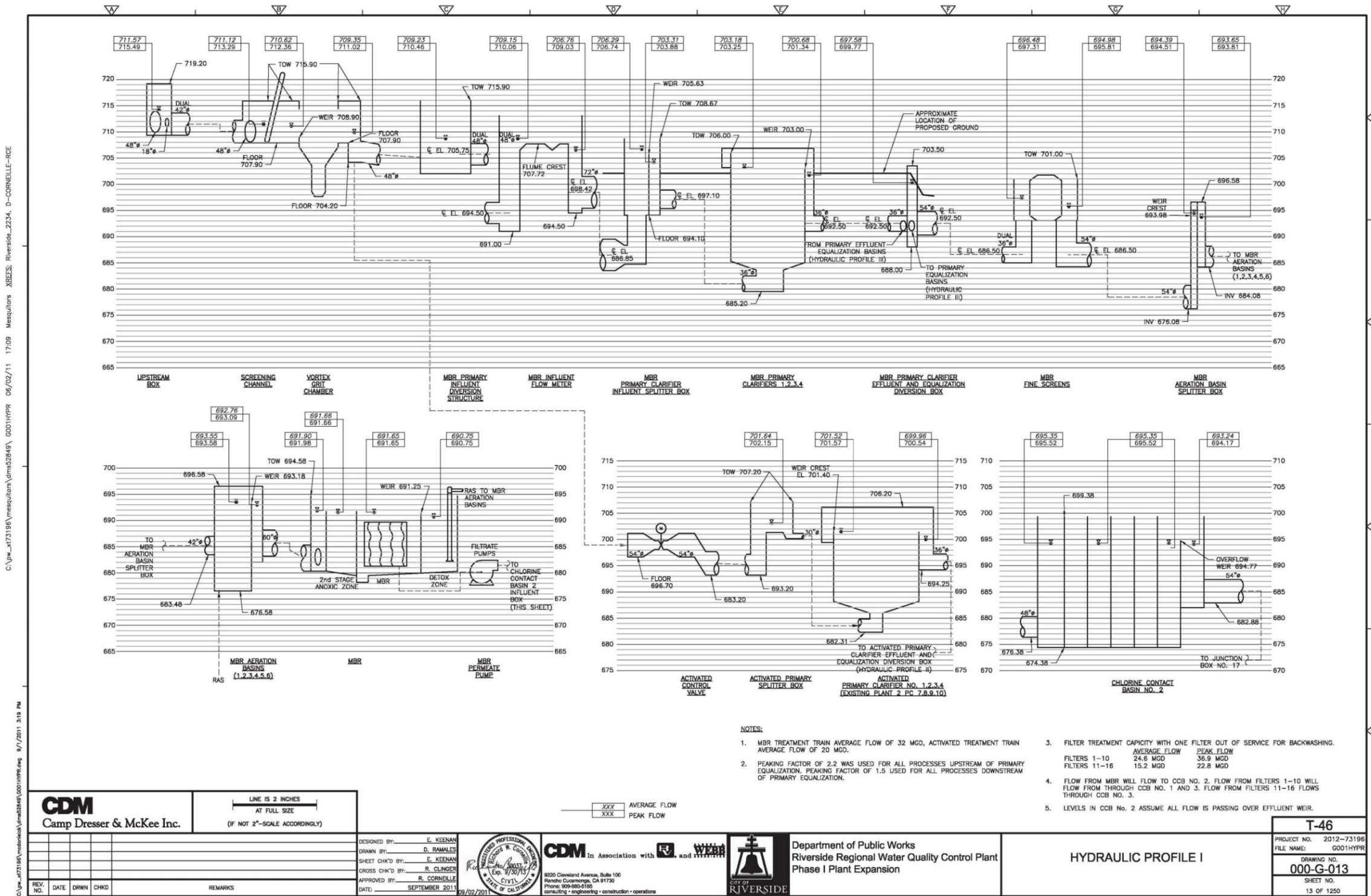
T-46
PROJECT NO. 2012-73196
FILE NAME: G019PFD
DRAWING NO. 000-G-020
SHEET NO. 20 OF 1250

Figure 3-5
Process Flow Schematic – Gas (continued)



		LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)	DESIGNED BY: S. NEDIC DRAWN BY: N. GUSHUE SHEET CHK'D BY: H. NGUYEN CROSS CHK'D BY: S. NEDIC APPROVED BY: S. NEDIC DATE: SEPTEMBER 2011				Department of Public Works Riverside Regional Water Quality Control Plant Phase I Plant Expansion	PROCESS FLOW SCHEMATIC DIGESTER BOILER SYSTEM	T-46 PROJECT NO. 2012-73196 FILE NAME: G004PFD DRAWING NO. 000-G-019 SHEET NO. 19 OF 1250	
REV. NO.	DATE	DRWN	CHKD	REMARKS						

Figure 3-6
Hydraulic Profile (Sheet 1)

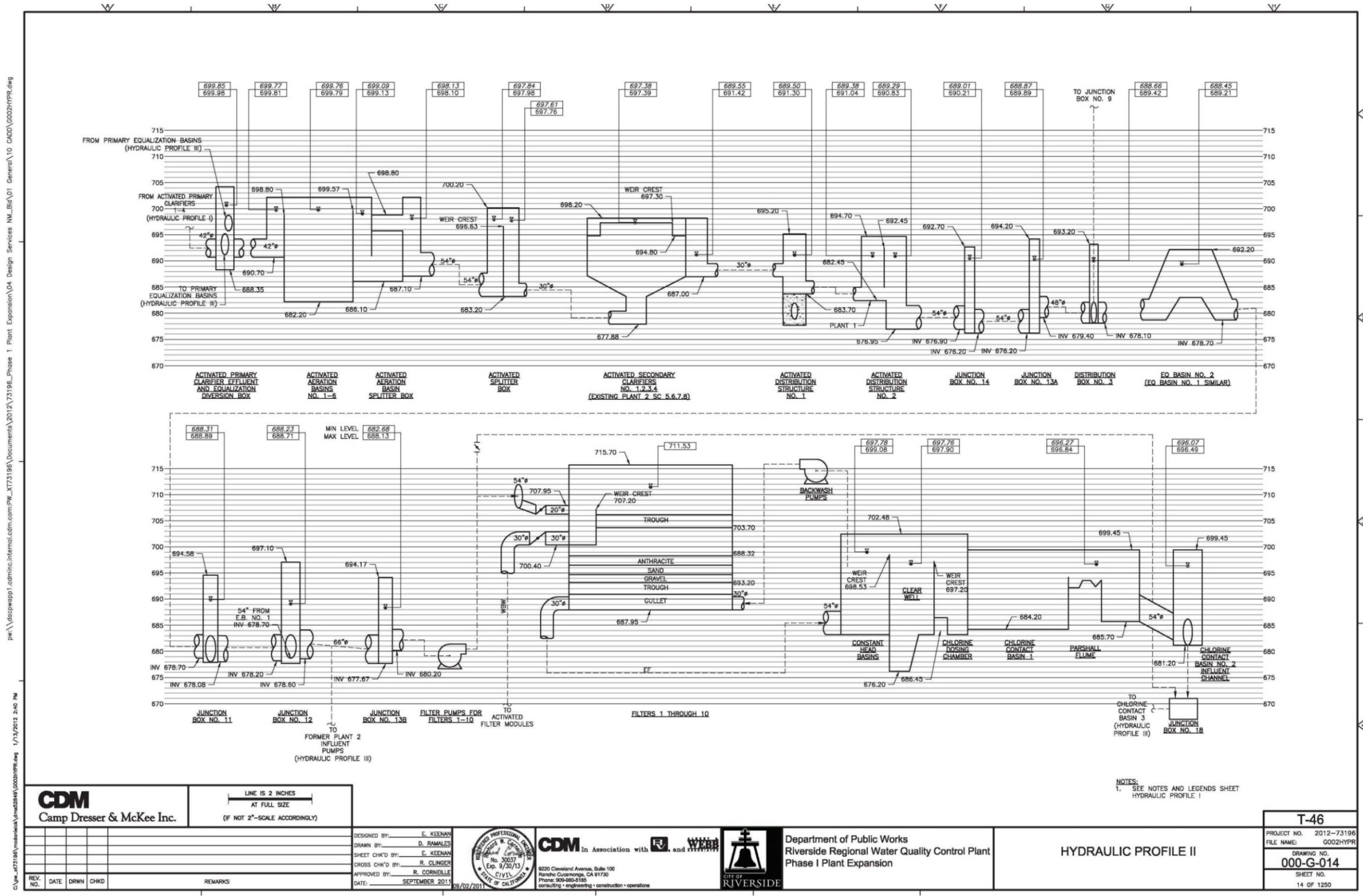


- NOTES:
1. MBR TREATMENT TRAIN AVERAGE FLOW OF 32 MGD, ACTIVATED TREATMENT TRAIN AVERAGE FLOW OF 20 MGD.
 2. PEAKING FACTOR OF 2.2 WAS USED FOR ALL PROCESSES UPSTREAM OF PRIMARY EQUALIZATION. PEAKING FACTOR OF 1.5 USED FOR ALL PROCESSES DOWNSTREAM OF PRIMARY EQUALIZATION.
 3. FILTER TREATMENT CAPACITY WITH ONE FILTER OUT OF SERVICE FOR BACKWASHING.

FILTERS	AVERAGE FLOW	PEAK FLOW
FILTERS 1-10	24.5 MGD	35.9 MGD
FILTERS 11-16	15.2 MGD	22.8 MGD
 4. FLOW FROM MBR WILL FLOW TO CCB NO. 2. FLOW FROM FILTERS 1-10 WILL FLOW FROM THROUGH CCB NO. 1 AND 3. FLOW FROM FILTERS 11-16 FLOWS THROUGH CCB NO. 3.
 5. LEVELS IN CCB NO. 2 ASSUME ALL FLOW IS PASSING OVER EFFLUENT WEIR.

		LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)		AVERAGE FLOW (Solid line) PEAK FLOW (Dashed line)	
DESIGNED BY: E. KEENAN DRAWN BY: D. RAMALES SHEET CHK'D BY: E. KEENAN CROSS CHK'D BY: R. CLINGER APPROVED BY: R. CORNELLE DATE: SEPTEMBER 2011				in Association with and	
DEPARTMENT OF PUBLIC WORKS RIVERSIDE REGIONAL WATER QUALITY CONTROL PLANT Phase I Plant Expansion		HYDRAULIC PROFILE I		T-46 PROJECT NO. 2012-73196 FILE NAME: 0001HYPR DRAWING NO. 000-G-013 SHEET NO. 13 OF 1250	

Figure 3-7
Hydraulic Profile (Sheet 2)



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LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"-SCALE ACCORDINGLY)

DESIGNED BY: E. KEENAN
DRAWN BY: D. RAMALES
SHEET CHECKED BY: E. KEENAN
CROSS CHECKED BY: R. CLINGER
APPROVED BY: R. CORNELIE
DATE: SEPTEMBER 2011



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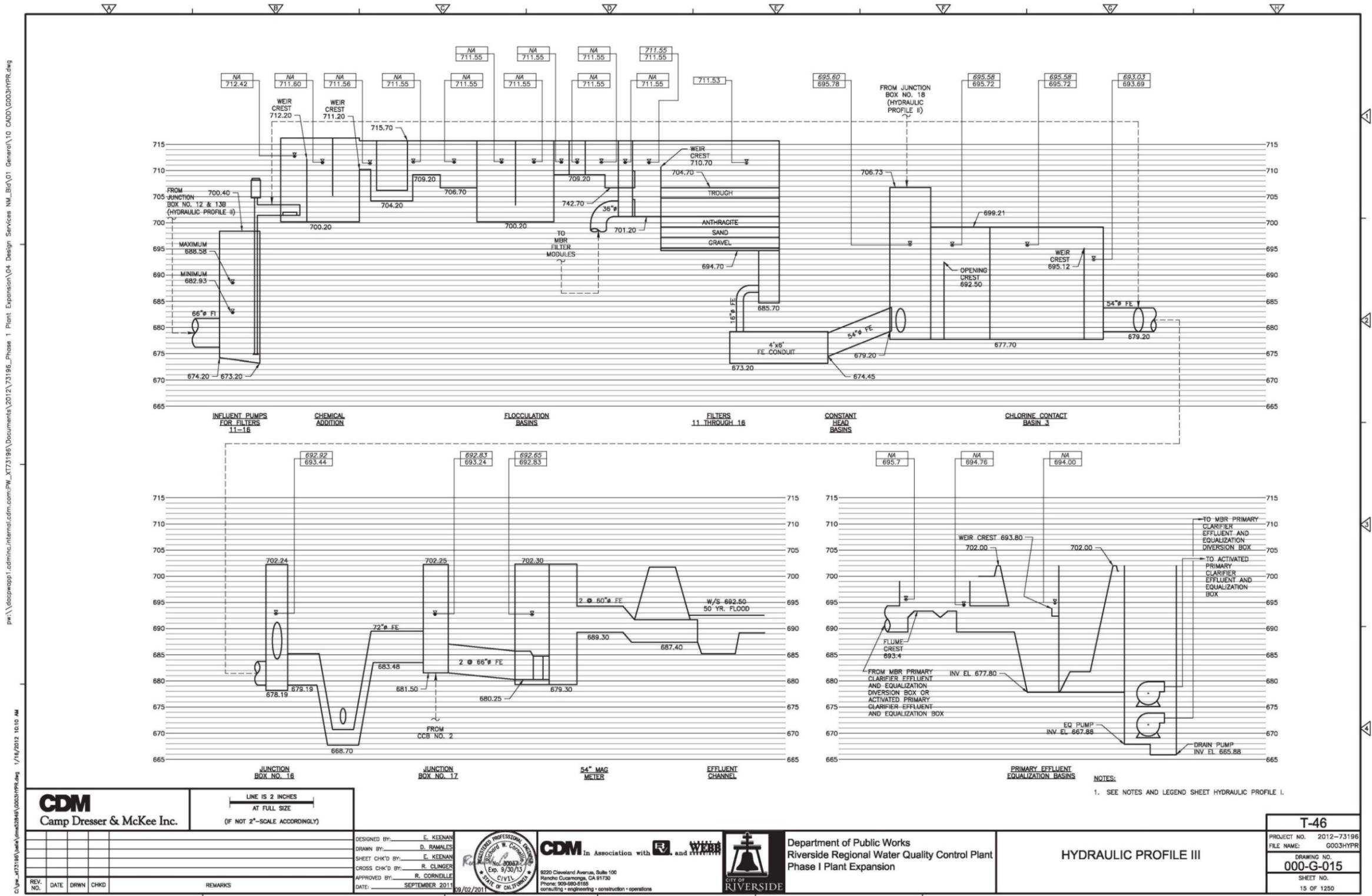
Department of Public Works
Riverside Regional Water Quality Control Plant
Phase I Plant Expansion

HYDRAULIC PROFILE II

T-46
PROJECT NO. 2012-73196
FILE NAME: G002HYPR
DRAWING NO. 000-G-014
SHEET NO. 14 OF 1250

REV. NO.	DATE	DRWN	CHKD	REMARKS

Figure 3-8
Hydraulic Profile (Sheet 3)



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LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: E. KEENAN
DRAWN BY: D. RAMALES
SHEET CHK'D BY: E. KEENAN
CROSS CHK'D BY: R. CLINGER
APPROVED BY: R. CORNELLE
DATE: SEPTEMBER 2011



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CITY OF RIVERSIDE

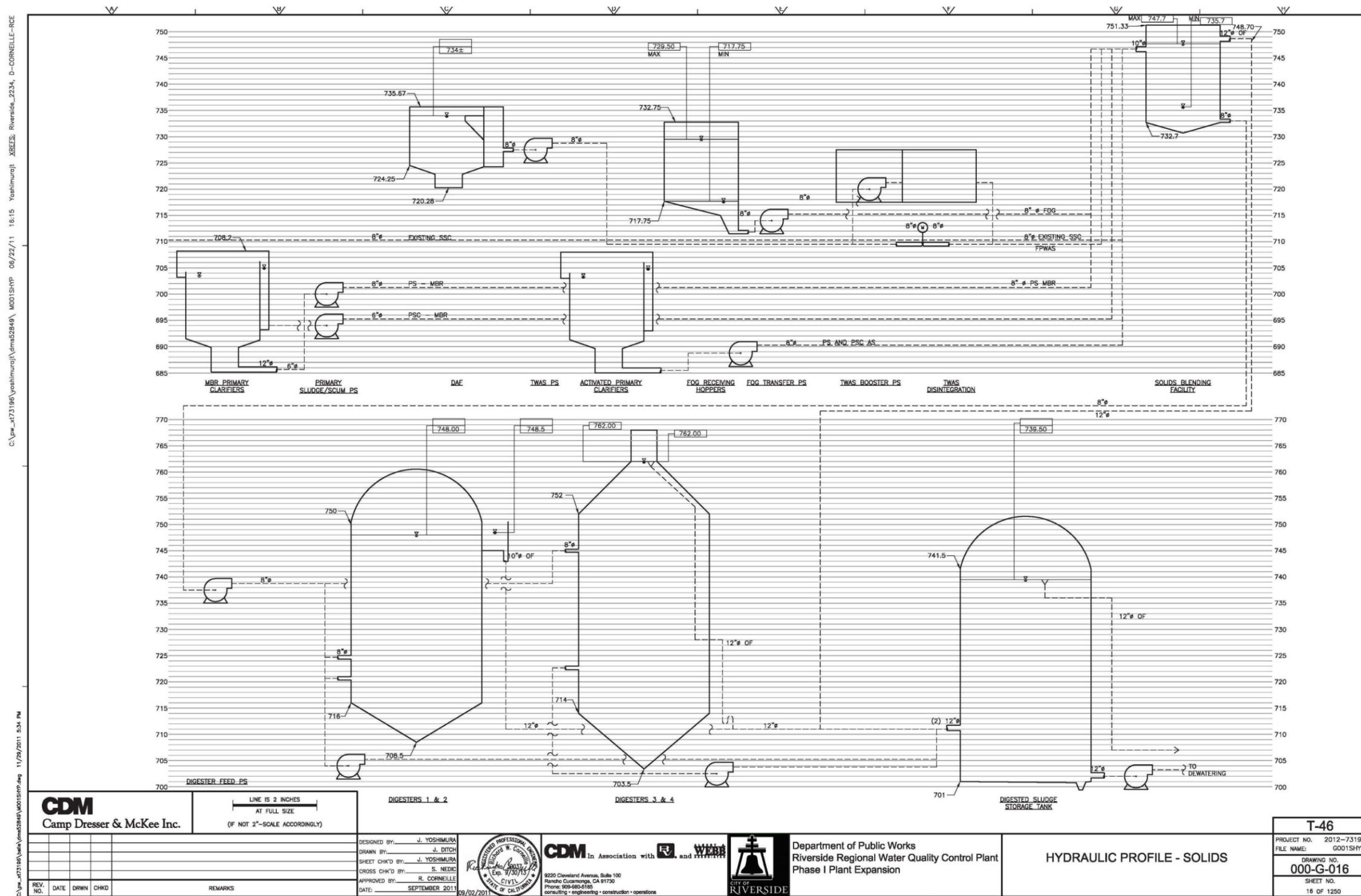
Department of Public Works
Riverside Regional Water Quality Control Plant
Phase I Plant Expansion

HYDRAULIC PROFILE III

T-46

PROJECT NO. 2012-73196
FILE NAME: G003HYPR
DRAWING NO. 000-G-015
SHEET NO. 15 OF 1250

Figure 3-9
Hydraulic Profile (Sheet 4)



3.1.1.1 Influent Sewers

The RWQCP receives influent from five lines. The Santa Ana trunk, the Jurupa and Rubidoux force mains, the Arlanza trunk, and the Acorn trunk. Each line is metered and sampled for 5-day Biochemical Oxygen Demand (BOD₅), suspended solids, ammonia nitrogen, and other parameters. The City and each of the CSDs are responsible for the operation and maintenance of their own collection facilities. The City is currently upgrading the influent metering facilities to obtain more accurate information on flows entering the plant. **Table 3-1** describes the meter types and trunk line sizes.

**Table 3-1
 Influent Sewers**

Influent line	Proposed Meter Type	Proposed Meter Type	Trunk size (in)	Status ¹
Santa Ana ⁽¹⁾	Flow-DAR	Magnetic	[54]	In design
Jurupa	Magnetic Flume		18	In design
Rubidoux	Magnetic		18	Existing
Arlanza	Flow-DAR ⁽²⁾	Magnetic	51	In design
Acorn	Flow-DAR ⁽²⁾	Magnetic	36	In design

Notes:

1. The Riverside and Hillside trunks were combined 2 miles off-site under Bid 6884 forming the Santa Ana trunk sewer.
2. Arlanza and Acorn flows currently are combined and use a common meter.

3.1.1.2 Headworks Facilities

The purpose of the headworks facilities is to protect the plant's equipment by removing large materials and grit influent wastewater. Headworks facilities include screening and grit removal as well as a biofilter for odor control (**Table 3-2**). Both screenings and grit are washed, dewatered, and sent to a sanitary landfill. The headworks facility combines the flow from the incoming sewers, including the CSDs. The combined flow is passed through four parallel screens and two vortex grit removal basins. Screened and de-gritted flow it is divided between the MBRTT and the ATT for additional treatment.

The Phase I Plant Rehabilitation included the replacement of the headworks biofilter and the ferric dosing station. The new biofilter is a multi-cell, moisture-controlled biofilter that uses synthetic media.

Ferric chloride is added to the influent vault immediately upstream of the influent channel to assist with the control of hydrogen sulfide in the atmosphere. Sulfide levels are reduced from within the headworks building, primary clarifier headspace and further downstream at the digesters.

**Table 3-2
 Headworks Facilities**

Description	Value	Status
<i>Influent Bar Screens</i>		
Number	4	Existing
Type	Climber	Existing
Width, ft	3.5	Existing
Clear Opening, inch	0.5	Existing
<i>Wet Screenings Conveyor</i>		
Number	2	Existing
Type	Shaftless Screw	Existing
<i>Screenings Washing Compactor Units</i>		
Number	2	Existing
Type	Shaftless Screw	Existing
Model	AugerMonster	Existing
<i>Dry Screenings Conveyor</i>		
Number	2	Existing
Type	Shaftless Screw	Existing
<i>Grit Chambers</i>		
Number	2	Existing
Type	Vortex	Existing
Model	Jeta 2000	Existing
Diameter, ft	20	Existing
Capacity, each, mgd	50	Existing
Grit removal > 50 mesh, %	95 ⁽¹⁾	Existing
Grit removal >70 > 50 mesh, %	85 ⁽¹⁾	Existing
Grit removal >100 > 70 mesh, %	75 ⁽¹⁾	Existing
<i>Grit Pumps</i>		
Number per chamber	1	Existing
Type	Centrifugal Recessed Impeller	Existing
Capacity, gpm	250	Existing
Head, ft	45	Existing
<i>Grit Classifiers</i>		
Number	2	Existing
Type	Hydraulic Vortex	Existing
Model	Teacup	Existing
Diameter, inch	42	Existing
Capacity, gpm/each	250	Existing

Description	Value	Status
Grit/Screenings Conveyor		
Number	2	Existing
Type	Shaftless Screw	Existing
Flow Split Control		
Number	2	New ⁽²⁾
Type	Flow control knife gate	New ⁽²⁾
Diameter, inch	24	New ⁽²⁾
Biofilter		
Number of cells	3	New
Type	Synthetic media	New
Bed Depth, ft	6	New
Effective Bed Residence Time, s	30	New
Foul Air Blowers		
Number	2	New
Type	Centrifugal	New
Capacity, scfm	13,800	New
Foul Air blower, each	2	New
Foul Air Fans		
Number	2 (1+1)	New
Type	Centrifugal	New
Capacity, scfm	14,000	New
Ferric Chloride Dosing Station		
Number of Tanks	1	New
Volume, gal	8,000	New
Number of Pumps	2 (1+1)	New
Pump Capacity, gpm	80	New

Notes:

- 1) Grit performance provided by manufacturer as guaranteed performance up to 50 mgd capacity.
- 2) ATT flow split control valves upgraded by plant maintenance.

3.1.1.3 Primary Treatment

The purpose of the primary clarifiers is to remove settleable organic materials from the wastewater. Primary clarifiers typically remove about 70 percent of the incoming total suspended solids (TSS) and about half of the biochemical oxygen demand (BOD). The primary effluent from the primaries flows by gravity to the aeration basins of each plant with a variable flow diverted to the primary effluent equalization basins. **Table 3-3** presents the primary treatment system criteria.

The MBRTT primary sedimentation facilities are newly constructed. The design of the MBRTT primary clarifiers allows for enhanced thickening of primary sludge to a concentration of 4 percent. The old rectangular primaries were configured to pump settled solids to the primary influent splitter box at the ATT. It is important to mention this because the practice provided the ATT with surplus readily biodegradable COD to optimize the removal of nitrogen. The review of process data up to the commissioning of the new primary clarifiers must consider this process configuration. Plant operations capitalized on the enhanced nitrogen removal capacity by diverting centrate/filtrate flow to the ATT.

The MBRTT primary clarifiers have a dedicated primary sludge and scum pump station. The primary sludge pump station is fitted with three sludge pumps (two duty and one standby) for each set of two clarifiers for a total of six sludge pumps. In addition, the primary sludge pump station is fitted with three scum pumps for each set of two clarifiers, for a total of six scum pumps similar to the sludge pumps. Sludge and scum is piped separately and pumped to the solids handling system.

**Table 3-3
 Primary Treatment**

Description	Value	Status
<i>MBR Primaries</i>		
Number	4	New
Type	Circular, center feed, peripheral weir	New
Diameter, ft	120	New
Side wall depth, ft	12	New
Volume, gals, each	1,012,900	New
Surface Area, ft ² , each	11,310	New
<i>MBR Sludge Pumps</i>		
Number	6 (4+2)	New
Type	Progressive Cavity	New
Size, gpm/each	365 gpm	New
<i>MBR Scum Pumps</i>		
Number	4 (2+2)	New
Type	Horizontal Chopper	New
Size, gpm/each	230	New
<i>Activated Primaries</i>		
Number	4	Refurbished
Type	Circular, center feed, peripheral weir	Refurbished
Diameter, ft	95	Refurbished
Side wall depth, ft	12	Refurbished
Volume, gals, each	530,000	Refurbished
Surface Area, ft ² each	7,085	Refurbished

Description	Value	Status
Activated Sludge Pump PS-4		
Number	3 (2+1) ⁽¹⁾	Existing
Type	Progressive Cavity	Existing
Size, gpm/each	100	Existing
Activated Sludge Pump PS-15		
Number	3 (2+1) ⁽²⁾	Existing
Type	Progressive Cavity	Existing
Size, gpm/each	100	Existing
Biofilter		
Number of cells	4	New
Type	Synthetic media	New
Bed Depth, ft	6	New
Effective Bed Residence Time, s	30	New
Foul Air Fans		
Number	2 (1+1)	New
Type	Centrifugal	New
Capacity, scfm	44,000	New

Notes:

- 1) PS-4 services primary clarifier 2 and 4 with 2 sludge pumps (1+1) and one scum pump.
- 2) PS-15 services primary clarifier 1 and 3 with 2 sludge pumps (1+1) and one scum

The Activated primary clarifiers were refurbished with the Phase 1 Plant Rehabilitation. The primary clarifiers received all new internal equipment.

Ferric was previously added upstream of the primary clarifiers to keep the hydrogen sulfide levels within the South Coast Air Quality Management District (SCAQMD) limits. However, with the new configuration primary sludge goes directly from the MBRTT clarifiers to the solids handling area. Therefore ferric dosing was moved upstream to the headwork’s influent vault.

A primary biofilter was added as part of the Phase1 Plant Expansion project. Foul air is extracted from the headspace within the covered MBR and Activated primary clarifiers and treated through the biofilters.

3.1.1.4 Primary Effluent Equalization

The purpose of primary effluent equalization is to dampen the flow and loading placed on the downstream secondary and tertiary treatment processes. The flow dampening is also important for the membrane bioreactor as it is able to reduce the peak flow design capacity of the membrane system, and provide capital and operation cost savings through less equipment and more uniform loading. **Table 3-4** presents the design criteria for this system.

**Table 3-4
 Primary Effluent Equalization**

Description	Value	Status
Diurnal Basin		
Number	1	New
Volume, MG	5	New
Wet Weather Basin		
Number	1	New
Volume, MG	5	New
Pump Station		
Number	6 (5+1)	New
Type	Submersible	New
Size, gpm/each	6,400	New
Time to Empty Basins, hrs	6	New

3.1.1.5 MBRTT Fine Screen Facility

The purpose of the MBR fine screen facility is to protect the downstream membranes from fouling by fibers present within the primary effluent. The fine screens use a 2mm perforated plate and the rotary drum screens have a capacity of 16 mgd each. For Phase 1 peak flow of 39 mgd, three units plus one standby would be installed providing 9 mgd of surplus capacity. No additional screen units are required for the Phase 2 peak flow of 48 mgd. The screens have built-in screening compaction. **Table 3-5** presents the design criteria for this system.

**Table 3-5
 MBR Fine Screening**

Description	Value	Status
Number	4 (3+1)	New
Type	Rotary Drum	New
Model	ROTAMAT® 2600x2	New
Diameter, ft	8'6"	New
Opening, mm	2	New
Capacity, mgd, each	16	New

3.1.1.6 MBRTT and ATT Secondary Treatment

3.1.1.6.1 Aeration Basins

The purpose of the aeration basins is to provide biological treatment. Wastewater is actively mixed with a large concentration of microorganisms that break down the soluble organic matter and ammonia nitrogen and convert it to carbon dioxide and nitrate. The general term for this mixture of microorganisms and wastewater is mixed liquor. The aeration basins include one or two anoxic zones for denitrification, depending on the process configuration, and account for approximately 25 to 30 percent of the total aeration tank volume. The aeration basins include

high volume mixed liquor recycle pumps that allow for a more effective use of the primary anoxic zones by recycling the nitrates formed in the primary aerobic zone to this section. **Table 3-6** presents the design criteria for this system.

**Table 3-6
 Aeration Basins Overview**

Description	Value	Status
<i>MBRTT</i>		
Number of Basins	5	Refurbished
Volume, MG Total	7.84	Refurbished
Primary Anoxic Zone, MG	1.26	Refurbished
Primary Aerobic Zone, MG	3.94	Refurbished
Secondary Anoxic Zone, MG	0.92	Refurbished
Membrane Zone, MG	1.15	Refurbished
Deoxygenation Zone, MG	0.56	Refurbished
Internal Recycle Capacity, mgd	56	Refurbished
<i>ATT</i>		
Number of Basins	6	Existing
Volume, MG Total	7.85	Existing
Anoxic Zone, MG	1.96	Existing
Aerobic Zone, MG	5.89	Existing
Internal Recycle Capacity, mgd	80	Existing
<i>Blower Nos. 1, 2, and 3</i>		
Number	3 (2+1) ⁽¹⁾	Existing
Type	Single-Stage Centrifugal	Existing
Capacity, scfm, each	12,500	Existing
<i>Blower Nos. 4 and 5</i>		
Type	Single-Stage Centrifugal	Existing
Capacity, scfm, each	9,000	Existing
<i>Blower Nos. 6</i>		
Type	Single-Stage Centrifugal	New
Capacity, scfm, each	9,000	New

Notes:

1) Blower 3 serves as a shared standby blower to Blower 4, 5 and 6 that service the MBRTT. Blowers 1 and 2 service the ATT.

The MBRTT has a secondary anoxic zone after the primary anoxic zone for additional denitrification. This is followed by the membrane zone, which is considered a secondary aerobic zone. The membrane zone is followed by a deoxygenation zone to reduce dissolved oxygen prior to the mixed liquor being returned to the primary anoxic zone.

Oxygen for the activated sludge process is supplied by six blowers housed in Blower Buildings 1 and 2. Blower Nos. 4, 5, and 6 are used for supplying variable volumes of air to the aeration

basins for the MBRTT. Blower Nos. 1 and 2 are used for supplying variable volumes of air to the aeration basins for the ATT. Blower No. 3, serves as a “swing”/standby blower. All five blowers are motor driven, single-stage centrifugal, vertical split type. Blowers No. 1 to 5 are housed in Blower Building 1. Blower No. 6 and the future Blower No. 7 are housed in the re-commissioned Blower Building 2. Blower No. 7 is planned for installation as part of the Phase 2 Plant Rehabilitation from 46 to 52 mgd.

3.1.1.6.2 Microfiltration and Clarification

The purpose of the membrane filters and secondary clarifiers are to separate the mixed liquor into microorganism (solid) and oxidized effluent (liquid) phases. The solids separated by the membranes or clarifiers, referred to as return activated sludge (RAS), are returned to the aeration basins to maintain the mixed liquor concentration.

Activated sludge is a biological process where the mass of microorganisms within the aeration basin increase daily. In order to maintain a balanced population, a portion of mixed liquor, known as waste activated sludge (WAS), is wasted out of the system daily. The WAS is thickened in the dissolved air flotation (DAF) thickeners before being sent to anaerobic digestion.

The MBRTT receives its name from the membrane system. The membranes are microfiltration membranes with a nominal pore size of 0.04 micron. The technology is common in the industry due to its high quality product water and compact size. The membrane system was provided by GE/Zenon Environmental. The design uses the new D-500 cassettes and the latest technology in air scour known as the “Low Energy Agitation Process” LEAPmbr™. The Phase 1 Plant Rehabilitation project converted the four existing rectangular secondary clarifiers into secondary anoxic, membrane and deoxygenation zones. The associated RAS pump station was converted to serve as the tank drain pump station.

The MBRTT is divided into 8 trains. Each train has the ability to house up to 20 cassettes to provide an additional 6 mgd of capacity. Scour air is supplied from the Scour Air Blower Building that initially houses four high-speed turbo blowers with a fifth planned for the 6 mgd expansion. The adjacent chemical feed and storage area houses the citric acid and sodium hypochlorite dosing stations used for the membrane clean-in-place protocols.

The ATT has four circular secondary clarifiers. The clarifiers were refurbished during the Phase 1 Plant Expansion project. The clarifiers are center feed, hydraulic suction, with peripheral launders and Stamford baffles. The effluent launders are fitted with covers that contain odors (released by the cascade of effluent over the weir) and eliminate algae growth. **Table 3-7** and

Table 3-8 present the design criteria for these systems.

**Table 3-7
 Microfiltration – MDRTT**

Description	Value	Status
<i>MBR Membranes</i>		
Capacity, ADF, mgd	26	New
Number of Trains	8	New
Cassettes per Train	14	New
Spare connections per train	6	New
Type	Hollow Fiber	New
Surface Area per Train, ft ²	248,625	New
Total Surface Area, installed, ft ²	1,989,000	New
<i>MBR Filtrate Pumps</i>		
Number	8	New
Type	Vertical End Suction Centrifugal	New
Capacity, each, gpm	4,167	New
<i>MBR Scour Air Blowers</i>		
Number	4 (3+1)	New
Capacity, scfm	7,520	New
<i>MBR Backpulse Pumps</i>		
Number	3 (2+1)	New
Type	Horizontal Centrifugal Split Case	New
Capacity, each, gpm	2,600	New
<i>MBR Recycle Pumps</i>		
Number	3 (2+1)	New
Type	Vertical Axial Flow	New
Capacity, each, gpm	18,000	New
<i>MBR WAS Pumps</i>		
Number	3 (2+1)	New
Type	Non-clog Centrifugal	New
Capacity, each, gpm	440	New
<i>MBR Drain Pumps (PS 22)⁽¹⁾</i>		
Number	3 (2+1)	New
Type	Non-clog Centrifugal	New
Capacity, each, gpm	2,830	New

Notes:

- 1) PS 22 is the old RAS pump station converted to a drain pump station.

**Table 3-8
 Clarification – ATT**

Description	Value	Status
Activated Secondary Clarifiers		
Number of Basins	4	Refurbished
Type	Hydraulic lift, peripheral weir	Refurbished
Diameter, No. 1 & 2, ft	130	Refurbished
Sidewater Depth, ft	13	Refurbished
Surface Area, No. 1 & 2, each, ft ²	13,300	Refurbished
Diameter, No. 3 & 4, ft	100	Refurbished
Sidewater Depth, ft	12	Refurbished
Surface Area, No. 3 & 4, each, ft ²	7,825	Refurbished
Surface Area, Total all 4, ft ²	42,250	Refurbished
Activated RAS Pumps (PS 10)⁽¹⁾		
Number	3 (2+1)	Existing
Type	Centrifugal	Existing
Capacity, each, gpm	5,700	Existing
Activated WAS Pumps (PS 6)⁽¹⁾		
Number	2 (1+1)	Existing
Type	Centrifugal	Existing
Capacity, each, gpm	300	Existing
Activated RAS Pumps (PS 16)⁽²⁾		
Number	3 (2+1)	Existing
Type	Centrifugal	Existing
Capacity, each, gpm	3,000	Existing
Activated WAS Pumps (PS 16)⁽²⁾		
Number	4 (2+2)	Existing
Type	Centrifugal	Existing
Capacity, each, gpm	315 / 480	Existing

Notes:

- 1) PS 10 and PS 6 services Secondary Clarifiers 3 and 4.
- 2) PS 16 services Secondary Clarifiers 1 and 2.

3.1.1.7 Secondary Effluent Flow Equalization

The purpose of the secondary effluent flow equalization is to further reduce the daily variations in flow to the tertiary filters. The secondary effluent flow equalization basins are dedicated to the ATT. Secondary effluent from the four secondary clarifiers flows by gravity into the two basins. The secondary effluent is pumped from the basins to the tertiary filters. **Table 3-9** presents the design criteria for this system.

**Table 3-9
 Secondary Effluent Equalization**

Description	Value	Status
Number of Units	2	Existing
Volume, Each, MG	1.5	Existing

3.1.1.8 Tertiary Filtration

The purpose of tertiary filtration is to remove suspended solids that are not eliminated by settling, which reduces the chlorine demand of the water and improves the disinfection process. The RWQCP has 16 filters that receive secondary effluent from the ATT. The filters are divided into two systems, East and West, with shared backwash piping but separate filtered effluent piping. All filters are of the dual-media type utilizing coarse anthracite overlying fine sand. Design criteria are listed in **Table 3-10**.

Filters 1 to 8 were constructed as part of the original tertiary filter facility with dual-media beds and water backwash. Filters 9 and 10 were added soon after, but include air scour in the backwash sequence. Filters 1 to 10 are considered part of the East filter system. Filters 11 to 16 were added at a later stage and employ more recent filtration technology. These filters use combined air-water backwash. These filters have pre-flocculation chambers but they are not needed to obtain the required filter performance and are no longer in use.

**Table 3-10
 Tertiary Filtration**

Description	Value	Status
<i>Tertiary Filters</i>		
Number of Filters	16	Existing
Anthracite depth, inches	24	Existing
Silica Sand Depth, inches	15	Existing
Surface Area, Each, ft ² Filters 1-10	552	Existing
Surface Area, Each ft ² Filters 11-16	650	Existing
<i>Filter Influent Pumps</i>		
East Side, Number	3 (2+1)	Existing
East Side, Capacity, gpm	13,050	Existing
West Side, Number	3 (2+1)	Existing
West Side, Capacity, gpm	8,000	Existing
<i>Flocculation Basins</i>		
Number	10	Existing
Number of stages, each	2	Existing
Volume per basin, gallons	178,000	Existing

Description	Value	Status
Backwash Pumps		
Number	3 (2+1)	Existing
Capacity, gpm	3,200	Existing
Backwash Storage Tanks		
Number	2	Existing
Volume, MG (each)	0.66	Existing
Polyaluminum Chloride Station		
Number of Tanks	1	Repurposed
Volume, gal	12,000	Repurposed
Number of Pumps	1	New
Pump Capacity, gph	1.7	New

The plant uses polyaluminum chloride as a flocculation/coagulant aid that is dosed to the influent to the secondary effluent equalization basins. The dosing of chemical aids immediately prior to the filters is no longer practiced due its tendency to encourage mud-ball formation within the filter beds. The chemical systems were upgraded by the Phase 1 Plant Rehabilitation. A new sodium hypochlorite and sodium bisulfite dosing station was built and the old sodium bisulfite station was converted to serve as the polyaluminum chloride dosing station.

3.1.1.9 Disinfection

The purpose of disinfection is to destroy the remaining pathogens in the filtered effluent. This is accomplished by adding sodium hypochlorite and providing adequate contact time. The disinfected water is then dechlorinated by adding sodium bisulfite to remove the excess chlorine for the protection of aquatic life prior to discharge to the Santa Ana River. Dechlorination is achieved at the effluent end of the Chlorine Contact Basins. Disinfection system design criteria are listed in **Table 3-11**.

There are three Chlorine Contact Basins. The East filters discharge to CCB1. The West filters discharge into CCB3. CCB1 discharges to CCB3 as well. There is an emergency provision to pipe CCB1 to CCB2 should CCB3 be out of service. CCB2 is dedicated to the MBRTT and receives pumped flow from the MBR filtrate pumps. There is an emergency provision for the MBRTT to bypass CCB2 and pump directly to CCB3.

Sodium hypochlorite is dosed at the head of CCB1 and again at the head of CCB3. Sodium bisulfite is dosed at the end of CCB3. A secondary sodium bisulfite dosing point is located downstream in Junction Box 17. For CCB2, sodium hypochlorite is dosed at the new connection to CCB2. Sodium bisulfite is dosed at a weir in the overflow box. A secondary sodium bisulfite dosing point is located downstream at Junction Box 17.

**Table 3-11
Disinfection**

Description	Value	Status
CCB1		
Volume, gallons	448,320	Existing
Length to Width ratio	18.5:1	Existing
CCB3		
Volume, gallons	2,900,000	Existing
Length to Width ratio	48:01:00	Existing
CCB2		
Volume, gallons	3,240,000	Refurbished
Length to Width ratio	[110:1]	Refurbished
Contact Time, peak flow, min.	90	Refurbished
Sodium Hypochlorite Station		
Number of Tanks	3 ⁽¹⁾	1 New
Volume, gal	20,000	1 New
Delivery concentration, %	12.5	New
Number of Pumps	5 ⁽²⁾	New
Pump Capacity, gph	300	New
Sodium Bisulfite Station		
Number of Tanks	2	New
Volume, gal	12,000	New
Delivery concentration, %	38	New
Number of Pumps	4 ⁽³⁾	New
Pump Capacity, gph	160	New

Notes:

- 1) Two tanks were relocated from the old chlorine station.
- 2) There are five pumps installed. CCB1 and CCB3 have a duty pump each and a shared standby. CCB2 has its own duty and standby pump
- 3) There are four pumps installed. CCB3 and CCB2 have a duty pump each and a shared standby. Junction Box 17 has its own duty pump.

3.1.1.10 Dissolved Air Flotation Thickening

The Dissolved Air Flotation (DAF) thickeners are the first process unit in the solids handling area. The purpose of DAF is to thicken the WAS generated by the biological treatment process, reducing its volume for more efficient processing. WAS from the membrane reactor and the secondary clarifiers are combined and thickened in the DAF thickeners to a solids concentration of over 5 percent. There are two DAF thickeners located adjacent to the sludge dewatering building. Thickened WAS (TWAS) is pumped to the waste sludge disintegration system or directly to the Solids Blending Tank. The DAF thickeners have been recently rehabilitated and polymer usage optimized resulting in substantial improvements in performance of the existing DAFTs. Under current plant flow conditions of 30 mgd, only one DAFT is needed. The second DAFT unit is maintained as a stand by unit. Design criteria are presented by **Table 3-12**.

**Table 3-12
 DAF Thickening**

Description	Value	Status
<i>DAF Thickeners</i>		
Number	2	Existing
Diameter	36	Existing
Gross Surface Area (ft ² each)	1,018	Existing
<i>TWAS Transfer Pumps</i>		
Number	2 ⁽¹⁾	Existing
Type	Progressive Cavity	Existing
Capacity, gpm/each	150	Existing
<i>Recycle Pressurization Pumps</i>		
Number	2 ⁽¹⁾	Existing
Type	Duplex, Centrifugal	Existing
Flow Rate, gpm/each	1,000	Existing

Notes:

- 1) There is one pump assigned to each DAF

3.1.1.11 TWAS Disintegration

WAS is more difficult to digest than primary sludge and consequently yields less gas production. In addition, WAS from the MBRTT is more difficult to digest when compared to WAS from the ATT. To compensate for this deficiency, a focused pulsed sludge disintegration process treats the TWAS prior to entering the Solids Blending Facility.

The TWAS Disintegration Building houses two Focused Pulsed equipment trains each consisting of a sludge feed pump, sludge grinder/chopper, modulator with reacting chamber, high voltage electric panel, and chiller for cooling water. See **Table 3-13** for this system’s design criteria.

3.1.1.12 FOG Receiving and Processing Station

Fats, oil and grease (FOG) are a valuable resource to maximize the production of digester gas. The facility includes two FOG receiving stations, pumped recirculation mixing systems, heat exchangers, and FOG transfer pumps (**Table 3-14**)

FOG arrives by tanker and is screened and ground to remove larger solids and reduce the average size of any remaining solids. The FOG then discharges to hoppers that are below-grade for temporary storage. The hoppers have the capacity to store half a day of FOG. Each hopper has a dedicated pumped recirculation system to maintain the FOG in a homogenous and fluid state. The recirculation flow rate provides for a one hour turnover. Each FOG hopper recirculation system includes a heat exchanger to maintain the temperature at 100°F – 110°F. Transfer pumps will convey the FOG from the hopper to the Solids Blending Tanks.

**Table 3-13
 TWAS Disintegration**

Description	Value	Status
<i>TWAS Booster Pump</i>		
Number of pumps, per train	1	New
Capacity, gpm	40	New
Type	Rotary Lobe	New
<i>TWAS Disintegration Unit</i>		
Number of Process Trains	2	New
Capacity per process train, gpm	16 – 40	New
Total System Capacity, gpm	16 - 80	New
Manufacturer	OpenCEL	New
Model	FP-150	New
Voltage Rectifier, V	30,000	New
Modulator, microseconds	0-20 ⁽¹⁾	New
Treatment chamber, kV per cm	10-40 pulses	New
<i>Cooling System Chiller</i>		
Number	1	New
Type	Closed-loop, glycol	New
Capacity, ton	15	New
Capacity, BTU/Hr	180,000	New
<i>FPWAS Holding Tank</i>		
Diameter, ft	8.5	New
Material	Steel	New
Capacity, gallons	4,000	New
<i>FPWAS Transfer Pumps</i>		
Number	5	New
Capacity, each gpm	10	New
Type	Rotary Lobe	New

Notes:

1) DC power at pulse duration of 0-20 microseconds at an interval of 0-15 kilohertz.

Table 3-14
FOG Receiving and Processing Station

Description	Value	Status
<i>FOG Receiving System</i>		
System Capacity, gpd	600,00 ⁽¹⁾	New
Number of Downloading Stations	2	New
<i>Hoppers</i>		
Number	2	New
Storage Volume, per Hopper, gal	15,000	New
FOG Temperature, °F	95-100	New
<i>Screen</i>		
Number	2	New
Capacity, gpm	500	New
<i>Heat Exchanger</i>		
Number, per Hopper	1	New
Type	Spiral Plate	New
Capacity, MMBTU/Hr	1.375	New
<i>Transfer Pumps</i>		
Number, per Hopper	1	New
Type	Progressive Cavity	New
Capacity, each, gpm	167	New

Notes:

- 1) Capacity is the maximum amount of FOG that can be loaded while producing stable digester operation at 52 mgd plant capacity.

3.1.1.13 Solids Blending Facility

Sludge, scum, and FOG blending upstream of the anaerobic digesters improves digester performance. Blending homogenizes the multiple residual streams, reduces the daily digester loading fluctuations, and improves digestion stability. The sludge blending system includes two Solids Blending Tanks, pumped recirculation systems, and digester feed pumps.

The Solids Blending Tanks are equipped with pumped recirculation systems to rapidly mix the sludge and produce a homogenized feed for the digesters. The digester feed pumps transfer sludge from the sludge blending tanks to the anaerobic digesters. Design criteria are presented in **Table 3-15**.

**Table 3-15
 Solids Blending Facility**

Description	Value	Status
<i>Solids Blending Tanks</i>		
Number	2	New
Type	Reinforced Concrete	New
Diameter, ft	15	
Storage Volume, per Tank, gal	21,000	New
HRT at 52 mgd, hrs	1.15	New
<i>Mixing Pumps</i>		
Number, per Tank	1	New
Type	Horizontal Chopper	New
Capacity, each, gpm	776	New
<i>Transfer Pumps</i>		
Number	3 (2+1)	New
Type	Progressive Cavity	New
Capacity, Digester 1&2, gpm	150	New
Capacity, Digester 3&4, gpm	200	New
<i>Ferric Chloride Dosing Station</i>		
Number of Tanks	2	New
Volume, gal	250	New
Number of Pumps	2 (2+0)	New
Pump Capacity, gph	50	New

3.1.1.14 Anaerobic Digesters

The purpose of anaerobic digestion is to treat the solids that merge into the Solids Blending Facility in a heated and oxygen free reactor. This reduces the solids volume, stabilizes the sludge, and produces methane gas as a byproduct that can be burned to produce energy.

The existing anaerobic digestion process consists of four digesters ranging in size from 1.55 to 1.99 million gallons. The digestion system is sized to provide 15 days hydraulic residence time (HRT) at maximum month load at a 52 mgd plant capacity. After digestion, the stabilized solids are transferred into the Digested Sludge Storage Tank, which serves as a holding tank for the screw presses and centrifuges. The Digested Sludge Storage Tank is sized to provide 4 days HRT at maximum month load at 52 mgd plant capacity. Design criteria for this system is listed in **Table 3-16**.

**Table 3-16
 Anaerobic Digesters**

Description	Value	Status
<i>Digesters 1 and 2</i>		
Number	2	Refurbished
Type	Reinforced Concrete	Refurbished
Cover	Gas Cover Dome	Refurbished
Diameter, ft	90	Refurbished
Volume, each, MG	1.552 ⁽¹⁾	Refurbished
<i>Mixers⁽²⁾</i>		
Number, per digester	1	New
Type	Linear Motion	New
Horsepower	20	New
<i>Digesters 3 and 4</i>		
Number	2	New
Type	Pre-stressed Concrete	New
Cover	Submerged Fixed Dome	New
Diameter, ft	90	New
Volume, each, MG	1.99 ⁽¹⁾	New
<i>Mixers⁽³⁾</i>		
Number, per digester	1	New
Type	Linear Motion	New
Horsepower	25	New
<i>Digested Sludge Holding Tank</i>		
Number	1	Refurbished
Type	Reinforced Concrete	Refurbished
Cover	Fixed Roof	Refurbished
Diameter, ft	88	Refurbished
Volume, MG	1.75 ⁽¹⁾	Refurbished
<i>Mixing Pumps</i>		
Number	1	New
Type	Vortex Centrifugal	New
Capacity, gpm	6,600	New
<i>Transfer Pumps</i>		
Number	4 (4+0) ⁽⁴⁾	New
Type	Horizontal Chopper	New
Capacity	110 / 180 / 410 / 570	New

Notes:

- 1) Volume excludes bottom cone.
- 2) The old pump mix system was retained as a standby system.
- 3) A pump mix system was partially installed as a backup to the LM Mixer.
- 4) Pump sizing is based on allowing various dewatering plant operating strategies.

3.1.1.15 Sludge Dewatering Facilities

The purpose of sludge dewatering is to reduce the moisture content of sludge through a mechanical process. The City initially utilized belt presses in the late 1980s but then shifted to centrifuges in the following decade due to their ability to achieve significantly higher dry solids content and reduce hauling and disposal costs.

In 2012, the City studied screw presses and decided to adopt this new technology in a staged fashion. Two screw presses are in the progress of being installed at the time of this study separate from the Phase 1 Plant Rehabilitation project. The existing centrifuges will initially act as a backup to the screw presses, but will be phased out as additional screw presses are installed. The original belt presses will then be decommissioned and removed. The City plans to install a total of six screw presses to handle the plant’s rated capacity of 52 mgd. Design criteria are listed in **Table 3-17**.

The screw press dewaterers biosolids through pressure applied by a rotating auger. The speed of rotation of the auger is several orders of magnitude lower than the speed of rotation of a centrifuge. A reduction in speed-of-rotation means that significantly less power is required to operate the screw press, and that the screw press is subject to less wear and tear during normal operation. Based on manufacturer’s claims, less polymer is required to dewater biosolids with a screw press than would be required if a centrifuge was used.

Table 3-17
Sludge Dewatering

Description	Value	Status
Screw Press		
Number	2 ⁽¹⁾	New
Type	Conical Shaft with Cylindrical Sleeve	Existing
Manufacturer	Huber ROTAMAT	Existing
Capacity, dry tons per day	26	Existing
Centrifuge		
Number	1	Existing
Type	High G	Existing
Manufacturer	Centrisys	Existing
Capacity, dry tons per day	19.5	Existing
Centrifuge		
Number	1	Existing
Type	High G	Existing
Manufacturer	Alfa-Laval	Existing
Capacity, dry tons per day	16	Existing

Description	Value	Status
<i>Polymer System</i>		
<i>Polymer Bulk Transfer Pumps</i>		
Number	2 (1+1)	Existing
Type	Constant Speed, Progressive Cavity	Existing
Capacity, gpm	10 (20 to 50% Solution)	Existing
<i>Polymer Recirculation Pump</i>		
Number	1	Existing
Type	Constant Speed, Progressive Cavity	Existing
Capacity, gpm	10 (20 to 50% Solution)	Existing
<i>Polymer Solution Transfer Pumps</i>		
Number	1 duty + 1 standby	Existing
Type	Constant Speed, Progressive Cavity	Existing
Capacity, gpm	140	Existing
<i>Polymer Solution Feed Pumps</i>		
Number	1 duty + 1 standby	Existing
Type	Variable Speed, Progressive Cavity	Existing
Capacity, gpm	4 to 25	Existing
<i>Storage Tanks</i>		
Number	2	Existing
Type	Fiberglass	Existing
Diameter, ft	10	Existing
Nominal Capacity, gallons	6,000	Existing
<i>Dewatered Cake Pumps</i>		
Numbers	2	Existing
Type	High solids progressive cavity	Existing
Capacity, gpm	55	Existing
<i>Storage Silos</i>		
Number	2	Existing
Type	Steel	Existing
Diameter, ft	16'-5"	Existing
Height, Shell, ft	25	Existing
Volume, each, cu. yd	196	Existing
Working Volume, per, cu. yd	150	Existing
Nominal Capacity, each, ton	139 ⁽²⁾	Existing

Notes:

- 1) Two screw presses currently being installed. An additional two will be required for 52 mgd capacity and two more will be provided as standby units for a total of six units. The old pump mix system was retained as a standby system.
- 2) The storage silos can be increased to 208-ton capacity by adding an extension to the top of the silo.

Polymer is added to the feed-sludge as a dewatering aide. The dry polymer system expansion will be phased for a total of three systems for the planned six screw presses.

Dewatered biosolids are pumped to two, 150 cubic yard storage silos. The silos provide storage capacity for the hauling operations. The silos are sized to meet the future 52 mgd biosolids production projections. However, if in the future additional storage is needed, the silos can be expanded 6 ft in height at that time.

3.1.1.16 Solids Disposal

The RWQCP currently produces "Class B" sludge by providing a minimum solids residence time of 15 days. The City currently contracts the hauling and disposal of the biosolids to a third party. The biosolids are hauled to alfalfa and cotton farms in Arizona as soil amendment.

3.1.1.17 Digester Gas Holder

The purpose of the digester gas holder is to balance out the variability of the gas being produced by the digesters and to provide storage for variable gas demands. The digester gas holder is located downstream of the digester gas collection piping. **Table 3-18** summarizes the design criteria.

Table 3-18
Digester Gas Holder

Description	Value	Status
<i>Dome</i>		
Number	1	New
Type	Dual Membrane	New
Capacity, CF	175,000	New
Diameter, ft	92	
Operating Temperature, °F	2,000-2,200	New
<i>Blower</i>		
Number	2 (1+1)	New
Type	Centrifugal	New
Capacity, cfm	1,100	New

3.1.1.18 Digester Gas Flare

Digester gas that is not consumed by cogeneration and boilers requires burning in a gas flare. The gas flare is required to meet strict regulations set forth by the SCAQMD. Two gas flares are provided to cover the complete range of possible gas flaring scenarios. The the smaller of the two has a capacity of 288 scfm, and the larger is rated at 980 scfm (**Table 3-19**). Under normal operation, the smaller gas flare will handle day to day demands. The larger flare is sized to

handle emergency conditions when digester gas is not being used on-site and it must all be flared. The largest flare is sized for maximum day production at 52 mgd plant capacity.

**Table 3-19
 Digester Gas Flares**

Description	Value	Status
Flare 1		
Number	1	New
Type	Low Emission	New
Capacity, scfm	288	New
Burning Power, MMBTU/Hr	2.65-12	New
Operating Temperature, °F	2,000-2,200	New
Flare 2		
Number	1	New
Type	Low Emission	New
Capacity, scfm	980	New
Burning Power, MMBTU/Hr	8.5-40	New
Operating Temperature, °F	2,000-2,200	New

3.1.1.19 Cogeneration

The purpose of cogeneration is to burn the gas produced from the anaerobic digesters to provide a reliable and inexpensive electrical power supply. By definition, cogeneration is the simultaneous production of two useful forms of energy from the same fuel source. Along with the power generation, recovered waste heat is used to meet the plants thermal demands.

The RWQCP has two cogeneration facilities, a large 2.5 MW internal combustion (IC) engine facility and a 1.2 MW Fuel Cell facility. The IC engines provide the most reliable operation of the two facilities. The high pressure gas delivery compressors were recently upgraded and the engines are maintained regularly. The fuel cells have proven to be unreliable in operation. The reduced output from the stack and the operation of the gas pretreatment skid continues to prevent reliable operation of the fuel cells.

The digester gas is sweetened with natural gas as the fuel source for the cogeneration. The practice to blend landfill gas from the City-owned Tequesquite Landfill has ceased due to the variable calorific value of the landfill gas interfering with the lean-burning engine operation.

3.1.1.20 Shared Facilities

3.1.1.20.1 Stormwater

Stormwater management is an important feature at the RWQCP. All rainfall that collects on the site and all stormwater that enters onto the site is captured, stored and passed through the treatment process.

The RWQCP has two stormwater retention basins and two pump stations (**Table 3-20**). Basin 1 is located near the Fine Screen Facility with a volume of 2.38 MG. Basin 2 consists of repurposed tertiary equalization ponds with total volume of 2.66 MG. Stormwater Basins 1 and 2 are hydraulically connected. Stormwater from Basin 1 is pumped by Storm Water Pump Station (SWPS) 1 through a force main back to an influent junction structure. Storm water is pumped from Basin 2 by SWPS 2 and connects to the discharge of SWPS 1.

Table 3-20
Stormwater

Description	Value	Status
Stormwater Retention Basins		
Number of Ponds	2	New
Volume Basin 1, MG	2.38	New
Volume Basin 2, MG ⁽¹⁾	2.66	Repurposed
Pump Station 1		
Number	2	New
Capacity, gpm	500	New
Pump Station 2		
Number	2	New
Capacity, gpm	800	New

Notes:

1) Stormwater basin 2 was created by repurposing tertiary equalization basins 3 and 4.

3.1.1.20.2 Recycled Water System

The City has upgraded the recycled water system with a backbone piping network to supply needs at the plant. Recycled water is pumped from the new Recycled Water Pump Station located in the last bay of CCB2. The pump station is ready to receive an additional two pumps to provide a total of five pumps. Criteria are presented in **Table 3-21**. The ultimate pump station build out is up to ten pumps but a second MCC room would be required. The backbone runs west to east across the site and branches out to other areas of the plant that were upgraded during the Phase 1 Plant Rehabilitation project.

The recycled water system provides water for on- and off-site irrigation, cooling water (for the adjacent peaking plant operated by Riverside Public Utilities), seal water for pumps, foam spray in aeration basins, wash-down water, makeup water for process operation, and recycled water hydrants throughout plant site.

**Table 3-21
 Recycled Water System**

Description	Value	Status
Number of Units Installed	3	Existing
Type	Vertical Turbine	Existing
Capacity, each, gpm at 117 psi	2,600	
Additional Units	2 (5 total)	Future
Capacity of 2 pumps, gpm at 117 psi	5,200	Existing
Capacity of 2 pumps, gpm at 134 psi	4,300	Existing
Capacity of 3 pumps, gpm at 117 psi	7,800	Existing
Capacity of, 3 pumps, gpm at 134 psi	6,500	Existing

3.1.1.20.3 Standby Generators

Standby generators allow the RWQCP to continue to operate should the main power feed from the Riverside Public Utilities Electric Department to the plant fail. The generators are sized to power the plant up to a capacity of 52 mgd.

Three sets of generators serve various parts of the plant (**Table 3-22**). One set is back-up for the process air blowers. The second set powers the MBR area and the third set serves the balance of plant.

**Table 3-22
 Standby Generators**

Description	Value	Status
Blower System		
Number	2	New
Size, kW	1,500	New
Output, kW	4.16	New
Demand, kW	27, 46 ⁽¹⁾	New
MBR		
Number	2	New
Size, kW	1,500	New
Output, V	480	New
Demand, kW	27, 70 ⁽¹⁾	New
Balance of Plant		
Number	2	New
Size, kW	2,000	New
Output, V	480	New
Demand, kW	35, 99 ⁽¹⁾	New

Notes:

1) Total peak demand with 1.25 Starting Factor.

RWQCP CONDITION ASSESSMENT

As presented in Chapter 3, many of the existing facilities at the Riverside Regional Water Quality Control Plant (RWQCP) are being replaced or rehabilitated as part of current work related to the Phase 1 Plant Rehabilitation and will be in operation within the next two years. There existing facilities that were outside the scope of the Phase 1 Rehabilitation will need to be assessed and upgraded as necessary to maintain reliable service for decades to come. This chapter presents a condition assessment of these existing facilities based on needs and deficiencies as identified by plant staff and as determined through visual inspection. The recommended improvements are tabulated as a Plant Capital Improvement Program (CIP) list.

The RWQCP consists of headworks, two liquid treatment trains that operate in parallel, and a common solids handling facility. Historically, these trains have been termed Plant 1 and Plant 2. With the Phase 1 Rehabilitation project, Plant 1 received major upgrades for conversion into a membrane-bioreactor activated sludge process, while Plant 2 essentially remained unchanged. The City renamed the two plants the MBR Treatment Train (MBRTT) (formerly Plant 1) and the Activated Treatment Train (ATT) (formerly Plant 2).

4.1 PRELIMINARY AND PRIMARY TREATMENT

Headworks facilities include screening and grit removal as well as a biofilter for odor control. Both screenings and grit are washed, dewatered, and sent to a sanitary landfill. The headworks facility combines the flow from the incoming sewers, including the Community Service Districts (CSDs) of Jurupa, Rubidoux, and Edgemont. The combined flow is passed through four parallel screens and two vortex grit removal basins. Once the influent wastewater has been screened and dewatered, it is divided between the MBRTT and the ATT for additional treatment.

The Phase I Plant Rehabilitation includes the replacement of the headworks biofilter and the ferric dosing station. The new biofilter is a multi-cell, moisture controlled biofilter that uses synthetic media.

The RWQCP receives influent from five sewer lines: The Santa Ana trunk, the Jurupa and Rubidoux force mains, the Arlanza trunk, and the Acorn trunk. Each line is metered and the City is currently upgrading the influent metering facilities to obtain more accurate information on flows entering the plant. These improvements will be incorporated into the CIP.

The headworks have been subjected to overflows from the bar screen inlet channels during extreme wet weather events and power outages. Four concepts were identified to lower the hydraulic profile at the screens or otherwise contain the channel flows. The options were:

- 1) Construct bypass channel in the headworks (difficult construction, non-passive operation)
- 2) Construct by-pass channel (passive operation, large structure required with long weir to limit head loss, less than 114 mgd capacity)
- 3) Replace one screen with a coarse rack to serve as a by-pass, and

- 4) Curb the area to direct overflows directly into the grit chambers (less than 114 mgd capacity)

Any option that doesn't achieve 114 mgd peak estimated flow capacity that corresponds to a 52 mgd average flow should be excluded, thus eliminating the second and fourth options. It is recommended that the CIP include the by-pass channel of Option 1 and include an evaluation to determine the best course of action before design and implementation.

The bar screen electrical harness sets require frequent replacement, but that is a maintenance item and not a capital project.

Grit system performance has been in question because of the presence of settled grit-like material in the influent end of the primary clarifiers. The 2008 IWWMP indicated the capacity of the grit chambers was 37 mgd (average flow). The manufacturer indicated 50 mgd as the system's capacity.

It was recommended that the deposits in the primary clarifiers be sampled so that material can be examined to see if it is more grit-like, or more like primary sludge. That sampling was conducted and the material didn't have an over-abundance of grit, thus no further recommendations or improvements are warranted at this time.

The existing primary clarifiers were rehabilitated under the Phase 1 Plant Rehabilitation project. The associated primary sludge pump station needs to be rehabilitated because of the decades of service of the mechanical and instrumentation systems. That and other potential pump station projects are discussed later in this chapter.

4.2 SECONDARY TREATMENT

The Activated Treatment Train (ATT) has four circular primary clarifiers, six rectangular aeration basins, and four circular secondary clarifiers. The capacity of that train will be 20 mgd on an average daily flow basis. The primary and secondary clarifiers have been rehabilitated. Both the primary and secondary clarifiers for ATT (formerly Plant 2) were recently rehabilitated under City Projects HR-86 and T-22.

4.2.1 ATT Aeration Basins

In the ATT aeration basins, the existing redwood baffles require replacement with a longer lasting material such as fiberglass-reinforced plastic (FRP). Much of the mechanical equipment also requires replacement due to wear and age. This includes six submersible anoxic mixers, six submersible internal recycled activated sludge pumps, and all air diffusers and associated instrumentation. The ATT aeration basins will have been in service (in their current configuration to remove BOD and nitrogen) for 20 years before the end of the 5 year CIP period. In addition, because of the trend of increasing concentrations in the influent to the RWQCP, improvements might be required well before the hydraulic capacity of the RWQCP is reached. That work could include alternative baffle configurations, greater internal recycle pumping rates, and additional diffusers..

Staff noted that some of the existing general access lights on the ATT aeration basins and secondary clarifiers are very difficult to access. It is recommended that lighting at those locations be replaced with, for example, hinged light standards that exist elsewhere on the site.

4.2.2 ATT Pump Stations

There are six pump stations (PS) associated with this activated sludge system and they are: PS 4, 10, 15, 16, 17, and 18. Because of the age and critical functions of the RAS/WAS and primary sludge pumping facilities, it is recommended to replace all valves, pumps, VFDs, and instrumentation devices of PS 4, 10, 15, and 16. **Table 4-1** summarizes these four pump stations. PS 16 is located in the basement of the decommissioned blower building and the ventilation system needs to be upgraded to meet current code standards.

Table 4-1
ATT (formerly Plant 2) Pump Stations

Pump Station ID No.	Service	Pump Type
4	Primary Sludge	Progressing cavity
10	Recycled Activated Sludge	Centrifugal
15	Primary Sludge	Progressing cavity
16	Recycled Activated Sludge, Waste Activated Sludge	Centrifugal

The ATT includes four circular secondary clarifiers that were refurbished during the Phase 1 Plant Rehabilitation project. The clarifiers are center-fed with hydraulic-suction and peripheral launders with covers for odor containment.

4.3 TERTIARY TREATMENT

The RWQCP has 16 granular, dual-media filters. The filters are divided into two systems with shared backwash piping but separate filtered effluent piping. Filters 1 to 8 (1978 design) were constructed as part of the original tertiary filter facility with dual-media beds and water backwash. Filters 9 and 10 (1982 design) were added but incorporated an air scour backwash. Filters 1 to 10 are considered part of the East filter system. Filters 11 to 16 are referred to as the West filter system. Table 4-2 lists the design criteria for the East and West filters.

Figure 4-1 illustrates the existing tertiary filtration and disinfection configuration of the existing RWQCP. Upon completion of the Phase 1 Plant Rehabilitation, the tertiary filters will process secondary effluent from only the ATT (formerly Plant 2) as illustrated by **Figure 4-2**.

The backwash system storage tanks (1987 design) are fed from the East filters but supply backwash water to both the East and West filters.

Filters 11 to 16 (1992 design) were then added and employ combined air-water backwash. These are referred to as the West filters and include pre-filtration flocculation. The flocculation system has not been operated for many years because filter performance has been acceptable without that treatment step. The flocculation system will remain in place but no work is warranted other than to make repairs to the preceding rapid mix station as noted below.

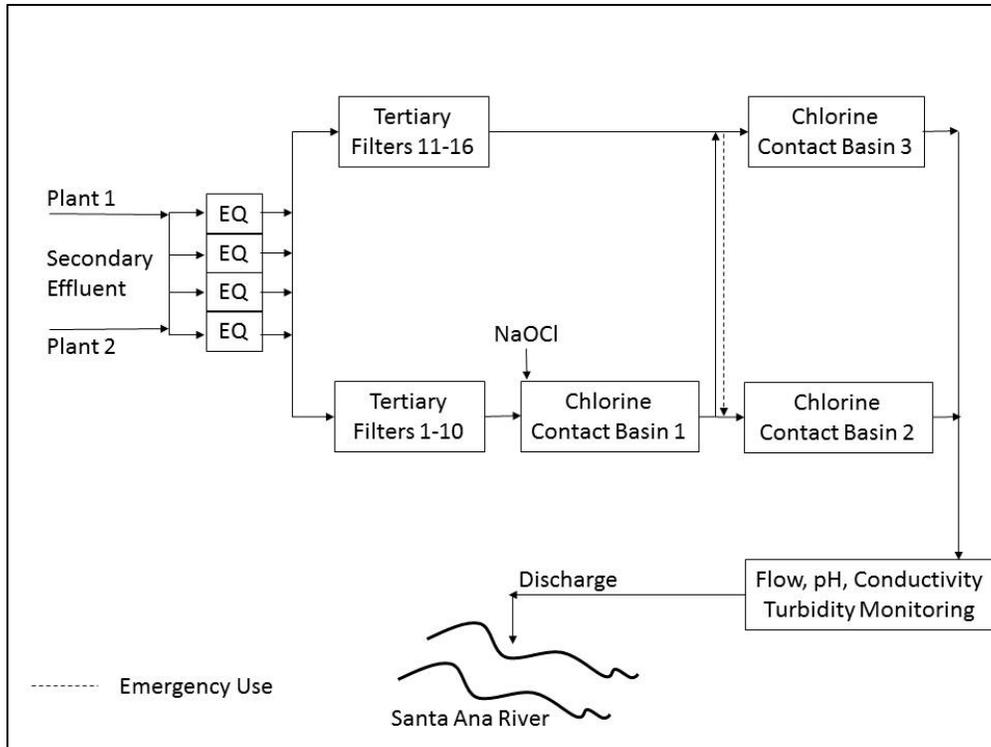


Figure 4-1
Existing Tertiary Treatment Filtration and Disinfection Systems

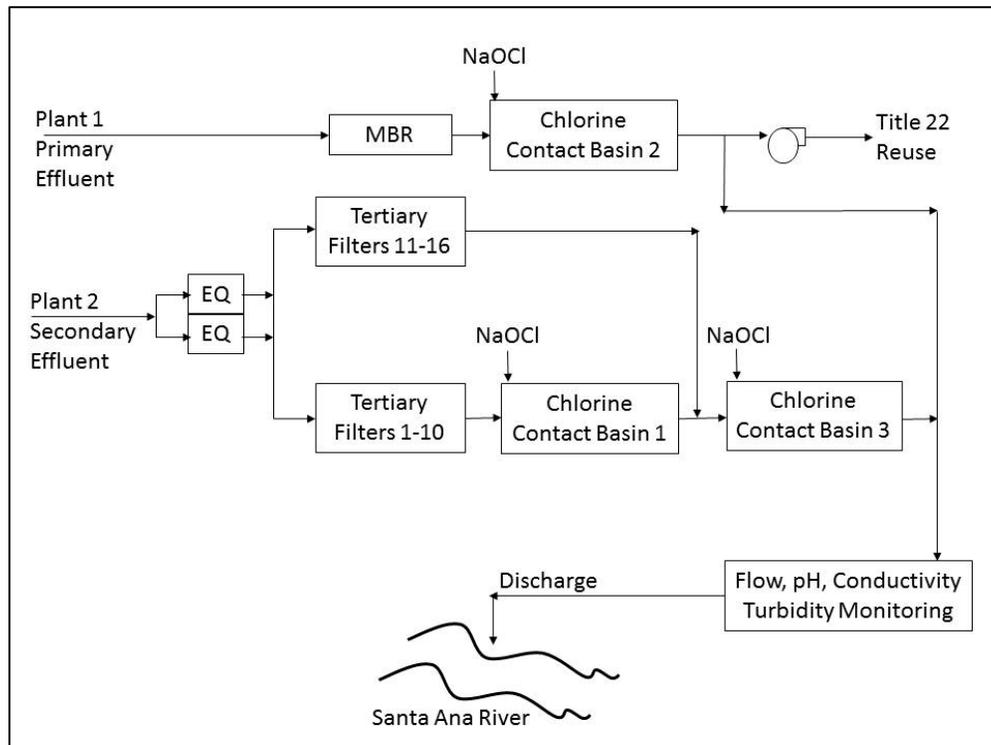


Figure 4-2
Tertiary Treatment Systems upon completion of Phase 1 Plant Expansion

**Table 4-2
 Tertiary Filters**

Filters	East: 1 to 10	West: 11 to 16
Area, ft ²	552	650
Peak capacity each, mgd, at 5 gpm/ft ²	4	4.7
No. of cells	10	6
No. of cells in service	8	5
Total peak capacity including BW, mgd	31.8	23.4
BW flow, percent	5%	5%
Peak effluent capacity each, mgd, at 5 gpm/ft ²	30.2	22.2
Tertiary Peaking Factor	1.5	1.5
Average effluent capacity, mgd	20.1	14.8
Average filtration rate, gpm/ft ²	3.2	3.2

Because of age and continuous use, the East filters are in need of rehabilitation. Fiberglass components within the filter boxes are no longer sealed. The filter under drain installations should be inspected, and the media sampled and evaluated. The West filters need new washing system components. Other observed and noted deficiencies and improvements include:

- Add actuator to air scour blower cross-over interconnection
- Add actuator to BW supply piping valve that isolates the east and west sides
- Configure drains for air blow-off valves in galleries to eliminate standing water
- Rehabilitate subsurface wash system filters 11-16 and replace failed plastic hubs with brass components
- Replace instrumentation older than 10 years
- Provide “concrete equipment pads/curbs” for east filter pipe penetrations through floors.
- Rehabilitate backwash system valves
- Repair PVC lining at West filter rapid mix
- Replace East filter feed meters
- Replace waste backwash valves in filters 9 and 10

The required average filtration capacity is 20 mgd, with the ability to handle peak flows. As indicated in the following table, the East filters have that capacity. Those filters are, however, the oldest and staff indicated that they don’t perform as well as the newer West filters. The West filters can only process an average of 14.8 mgd. Three of the East filters would need to be operated for 20 mgd average capacity with one filter out of service.

Both filtration complexes have dedicated feed pumps. The East filter pumping systems have or are being rehabilitated by staff. Staff reported no problems or concerns with the West filter feed pumps, or with the backwash supply pumps.

An evaluation for the entire filtration system is recommended to determine the best long-term option to achieve a reliable 20-mgd filtration system. Options might include rehabilitation of a portion or all of the East filters, or expand the West filters by adding two filter cells (the system was designed for the addition of two cells). Inspection and testing of the filter media and under drain systems is recommended as part of the evaluation.

The existing backwash water (BW) supply system should be evaluated as well because the tanks haven't been inspected and or recoated since they were constructed more than 20 years ago. For comparison, potable water storage tank inspection and coating is recommended every five years. Further, the existing system requires the East filters to remain in operation and an alternative BW supply source to allow for east filters to be off-line (or operate at reduced flows). A new redundant BW supply pump system at West filters could alleviate that constraint. And, the seismic restraints for storage tanks should be evaluated because of the critical nature of this component of the tertiary facilities.

The effluent from the East filters flows through chlorine contact basin (CCB)1 and then into CCB3. Deficiencies in CCB3 and the associated chemical feed systems are being addressed by the Phase 1 Plant Rehabilitation, and no additional work has been identified for the other elements of the disinfection system.

4.4 SOLIDS HANDLING

The Phase 1 Plant Rehabilitation added two additional anaerobic digesters to the RWQCP and a separate project replaced the original solids loading system with a new truck loading facility. The dissolved air flotation thickeners (DAFT) and biosolids dewatering systems will require improvements to bring those up to a level compatible with the facilities addressed by the Phase 1 Plant Rehabilitation.

4.4.1 Dissolved Air Flotation Thickening

There are two existing DAFTs. One DAFT can handle the current loads. In the event of a major equipment failure, the ability of the RWQCP to produce Class B digested solids could be at risk. Although not included in the updated CIP, an analysis should to be conducted to determine the current loadings in light of the increased influent concentrations and resulting solids handling system capacity. That analysis should also evaluate the DAFT air and polymer systems for possible rehabilitation or replacement.

It is not known if the waste activated sludge (WAS) handling systems that were originally sized for the former Plant 1 activated sludge process was evaluated for new service associated with the MBRTT. It is, however, expected that the WAS quantity and concentrations will be similar. WAS pump station rehabilitation has been recommended herein and required capacity can be confirmed or revised at that time. Increasing concentrations as discussed in Chapter 1 might have an impact on future solids handling requirements, and that situation can be evaluated at that time as well.

There is an apparent hydraulic constraint related to the flow meter in the WAS conveyance system, and that is listed in the CIP.

4.4.2 Sludge Dewatering Facilities

The existing dewatering equipment includes two belt filter presses and two centrifuges. The belt presses were the original machines installed. The City added the two centrifuges, at different times, for increased dewatering efficiency, while retaining the belt filter presses as back-up. The older of the two centrifuges has since been decommissioned because of high maintenance costs and parts not readily available. Currently the newer centrifuge is the primary device used, with one belt press operated to meet the demands, and the second belt press remains as backup.

In 2012, the City studied screw presses and decided to adopt this new technology in a staged fashion. Two screw presses are in the progress of being installed at the time of this study. This is a separate project undertaken by staff and is independent of the Phase 1 Plant Rehabilitation project. The City plans to install a total of six screw presses ultimately (four duty and two backup) to handle a capacity of 52 mgd (or a lower average flow resulting from the increasing influent concentrations to the RWQCP).

Two screw presses have been purchased and the money for the installation has been allocated. Two additional screw presses are needed within five years because of the poor condition of the one operational centrifuge.

The Dewatering Building houses polymer feed systems, sludge pumps, and the dewatering machines. The condition of the building is such that rehabilitation is recommended to include:

- Sand blasting and recoated the roof deck ceiling and steel roof trusses
- At the same time that the steel is cleaned and recoated, the lighting should be replaced with high efficiency lighting and skylights added.

The building ventilation needs a major reconfiguration to add supply fans to meet current National Fire Protection Association (NFPA) regulations. The ventilation system is currently not operated but rather the doors are left open for natural ventilation. The doors need to be evaluated since they are normally kept open and haven't been exercised and openings on the west wall will be closed off for the ventilation reconfiguration. Odors are not a current concern, but with the planned conversion to enclosed screw presses, a new conveyor with cover can contain nuisance odors.

The CIP for the dewatering building stages the improvements based on process needs and criticality. The first two stages will install four screw presses. The third stage will address:

- Ventilation
- Coating
- Lighting and skylights
- New dry polymer unit and controller
- Relocation of ferric chloride feed system (for hydrogen sulfide control)
- WAS hydraulic constraint

4.5 COGENERATION

The sludge that is generated at the RWQCP is digested and the gas that is generated during this digestion process is collected and used for the cogeneration engines to generate electricity and for the boilers. Any excess gas is burned by the waste gas flare. The Phase 1 Plant Rehabilitation includes upgrades to the solids and cogeneration systems: These are new digesters, new digester gas storage, upgrades to the hot water heating loops and heat exchangers, replacement boilers and additional backup generators.

The City retained HDR to evaluate the balance of the cogeneration system for remaining useful life, compliance with regulations and conduct an energy assessment. The draft report (HDR, Mar 2013) evaluated the following systems:

- Three Caterpillar Model 3606, gas-fired, lean-burn reciprocating engine generators, each with a name plate rating of 1.1 megawatts of electricity
- Fuel cell power plant consisting of a Fuel Cell Energy Model DFC 1500A
- Digester gas treatment system for the fuel cell
- Boilers
- Gas compression and conveyance system
- Heat recovery system
- Electrical interconnections

Based on the evaluation conducted by HDR it was determined the existing cogeneration units are not in compliance with South Coast Air Quality Management District (SCAQMD) Rule 1110.2 and would require modifications to reduce NO_x, CO and VOC emissions. The CIP includes a project for the co-generation system based on an upgrade to the existing engines to meet the regulations and with the following elements:

- Detailed evaluation and 10-percent level design
- Three new engine generators
- Site modifications for new engines
- SCR system
- Siloxane and H₂S removal system
- New ancillary equipment (heat exchangers)
- Mechanical, electrical and instrumentation modifications

4.6 PLANT UTILITIES AND SUPPORT FACILITIES

This section describes the proposed improvements for RWQCP utilities and support facilities.

4.6.1 Architectural and Protective Coating

The City has noted that many parts of the RWQCP are in need of coating. The City would like to initiate a plant-wide coating program on a five-year cycle. The goal of the program would be to re-coat all applicable parts of the plant once every five years.

4.6.2 Flow Metering Stations

As described in the Chapter 3, the City is currently designing replacements for the existing influent flow metering stations. The flow meters measure influent flow from the Santa Ana, Arlanza, and Acorn trunk sewer lines. It is anticipated that construction of the flow meter replacements will be accomplished in two phases: Phase A and Phase B. As such, each phase is listed separately in the Plant CIP list.

4.6.3 Levee Improvements

In July 2011, Albert A. Webb Associates produced the *Water Quality Control Plant Levee Deficiency Analysis* for the City, which identified deficiencies in the levee that protects the RWQCP against flooding from the Santa Ana River. At the time of the study, the performance benchmark for the levee was protection against 100-year flooding. The City also wished to obtain Federal Emergency Management Agency (FEMA) certification for the levee to remove it from FEMA's 100-year floodplain.

In March 2013, Albert A. Webb Associates produced the *Riverside Water Quality Control Plant Levee Enhancement Project Revised Alternative Analysis Study, Summary of Initial Findings*, which evaluated alternatives for improving the levee under three levels of protection: FEMA-certified 100-year flood protection, Non-FEMA-certified 100-year flood protection, and 50-year flood protection. The improvement alternatives are categorized by the major components of the levee: toe, armor, and freeboard. Final design of the levee improvements has not commenced yet.

An allocation in the CIP is provided for the freeboard component of the levee improvements, which includes a levee wall, fencing, and lighting for the span of the levee adjacent to the RWQCP. Armoring a segment of the levee to limit scour is included in the CIP as a deferred consideration for the future.

4.6.4 Potable Water Backup

The existing seal water systems for pumps at the RWQCP are fed from the Recycled Water Pump Station at Chlorine Contact Basin 2. The City wishes to provide potable water back-up to the seal water systems to increase reliability and operational flexibility. Potable water connections will be made by constructing laterals from the existing potable water system to the pump stations. Appropriate valves and backflow protection devices will be included.

4.6.5 Recycled Water System Phase 2

As part of the Phase 1 Plant Rehabilitation project, a backbone recycled water distribution system will be constructed to deliver recycled water to various areas of the MBRTT (formerly Plant 1), as shown on **Figure 4-3**. The City wishes to expand that recycled water distribution system to other areas of the plant, and specifically to the ATT (formerly Plant 2). This work will require the installation of 2,000 linear feet of 12-inch diameter PVC piping.

4.6.6 Perimeter Fencing Replacement

Over the last few years, the City has experienced increased frequency in vandalism and burglary at the RWQCP. In an effort to increase security, the City would like to install a wrought-iron fence along the north and south reaches of the plant perimeter. The western reach already has that style of fencing, and the eastern reach borders the RPU power station and is adequately protected. The total amount of fencing required is approximately 13,200 feet.

4.6.7 Site Concrete and Drainage

Outside of the Phase 1 Plant Rehabilitation project areas, there are various locations within the RWQCP where there is damaged asphalt or concrete, or poor stormwater drainage. This CIP allocation addresses these issues. Specific project details will be provided at a later time when these issues are to be addressed. It is assumed that 2,000 square feet of site work is required.

4.6.8 Site Security Lighting Masts

The City is currently undertaking a study to provide additional lighting at the RWQCP for increased security. The preliminary lighting plan includes 16 lighting masts for large-scale area lighting throughout the Plant. This is related to additional lighting discussed below, but is itemized separately for phased installation.

4.6.9 Site Security Perimeter Lighting

As mentioned in the previous subsection, the City is currently undertaking a study to provide additional lighting at the RWQCP. The cost of the study is included in this CIP item. The preliminary lighting plan includes 16 street light fixtures, with most being located along the northern border of the Plant and several fixtures located along the southern edge of the Plant, adjacent to Digester 3 & 4. This item is itemized separately from the Lighting Masts for phased installation wherein the perimeter lights might be installed with levee improvements discussed above.

4.6.10 Off-Site Stormwater Diversion

Currently, a significant amount of stormwater enters the Plant's system from the Acorn Street entrance on the south side of the RWQCP. The City would like to divert this flow elsewhere. Preliminary discussions focused on two options: 1) coordinate with Riverside Public Utilities (RPU) to divert stormwater to the adjacent Riverside Energy Resource Center, where it will be managed using existing infrastructure, or 2) capture the stormwater with catch basins upstream of the Plant entrance and convey it to the Santa Ana River via a new pipeline to be located under the road along the eastern border of the RWQCP. The CIP allocation for this project includes costs for a preliminary study, design, and construction of the second option.

4.6.11 Administration/Laboratory Building HVAC

Staff indicated that the Administration/Laboratory Building HVAC should be evaluated for potential replacement replaced with a preceding study to evaluate the existing and potential new systems. This was deferred by staff but is included in the Plant CIP list as a future project to consider.

4.6.12 Landscaping

Consistent with the City's intent, an allocation for general landscaping of the areas of the RWQCP visible to the public has been included later in the near-term CIP.

4.7 MAJOR PROJECTS

Construction of the RWQCP Phase 1 Plant Rehabilitation project will increase the hydraulic capacity of the plant to 46 mgd. The preliminary design for that work contemplated a Phase 2 Plant Expansion to increase the plant's hydraulic capacity to 52 mgd. The Phase 2 Plant Expansion would provide additional membrane elements for the secondary treatment process, , expand the chlorine contact basin, and add additional odor control facilities. **Figure 4-4** depicts the existing facilities, Phase 1 Plant Rehabilitation facilities, and the future Phase 2 Plant Expansion facilities.

4.7.1 RWQCP Phase 2 Expansion

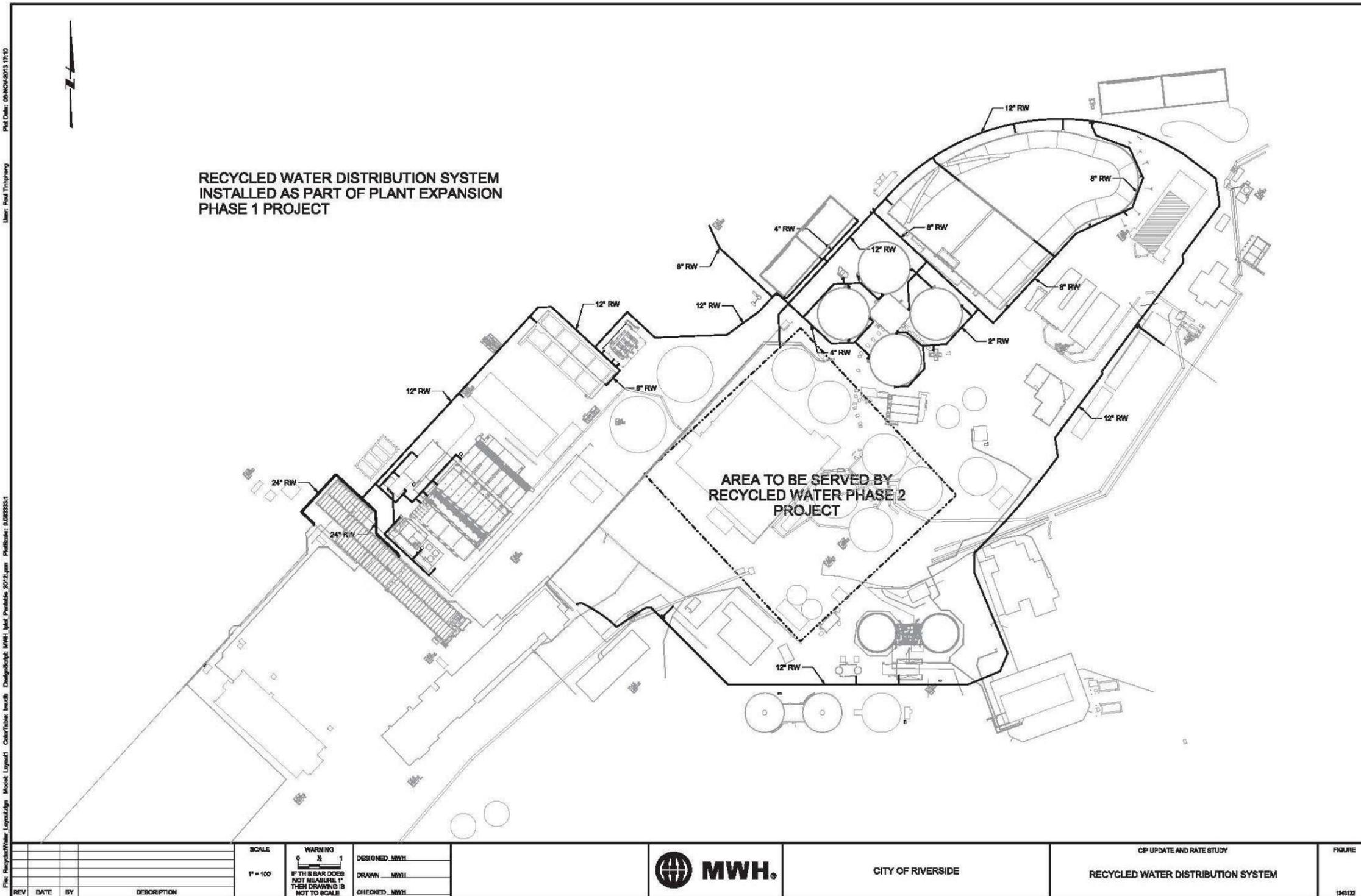
Because of the increasing concentrations of the influent wastewater constituents of concern observed over the last 10 to 15 years, it is recommended that loads as well as flows be routinely tracked and monitored. As discussed in Chapter 1, the load processing capacity of the facility to adequately treat solids, BOD and nitrogen compounds following the Phase 1 Plant Rehabilitation project might be reached well before the hydraulic capacity nears its limit. The load processing capacity of the RWQCP is directly related to the capability of the secondary treatment and solids handling processes. The Phase 2 Plant Expansion might therefore be phased to accommodate the load and hydraulic capabilities separately as follows:

- Phase 2A – add an aeration basin to the MBRTT
- Phase 2B – add additional membranes at the MBRTT to increase the hydraulic capacity of the facility to 52 mgd average daily flow.

The Plant CIP reflects a two-phased expansion from 46 to 52 mgd. It is recommended that the new facilities be closely monitored and evaluated after they are placed into service to determine their performance characteristics under actual conditions.

It is also recommended that a complete integrated master plan be undertaken before completion of the planned five-year CIP to evaluate the elements and timing for Phase 2 Expansion. This will reassess needs identified herein, but that were deferred to the future. That plan should assess infiltration and inflow (I/I) for possible cost-effective reductions, and include a sampling program to better understand and plan for the discharges expected from residential, business, and each of the Community Services Districts.

Figure 4-3
Recycled Water Distribution System



It is also recommended that a complete integrated master plan be undertaken before completion of the planned five-year CIP to evaluate the elements and timing for Phase 2 Expansion. This will reassess needs identified herein, but that were deferred to the future. That plan should assess infiltration and inflow (I/I) for possible cost-effective reductions, and include a sampling program to better understand and plan for the discharges expected from residential, business, and each of the Community Services Districts.

4.7.2 Salinity Remediation

Because of the region-wide issue of high total dissolved solids (TDS) in potable water supplies, a study is currently underway (Carollo) to evaluate alternative remediation measures. Preliminary results are that a desalting facility will be required. Although it will be located elsewhere, it has been included into the overall CIP as a future project (See Chapter 5).

4.8 RWQCP CAPITAL IMPROVEMENT PROGRAM

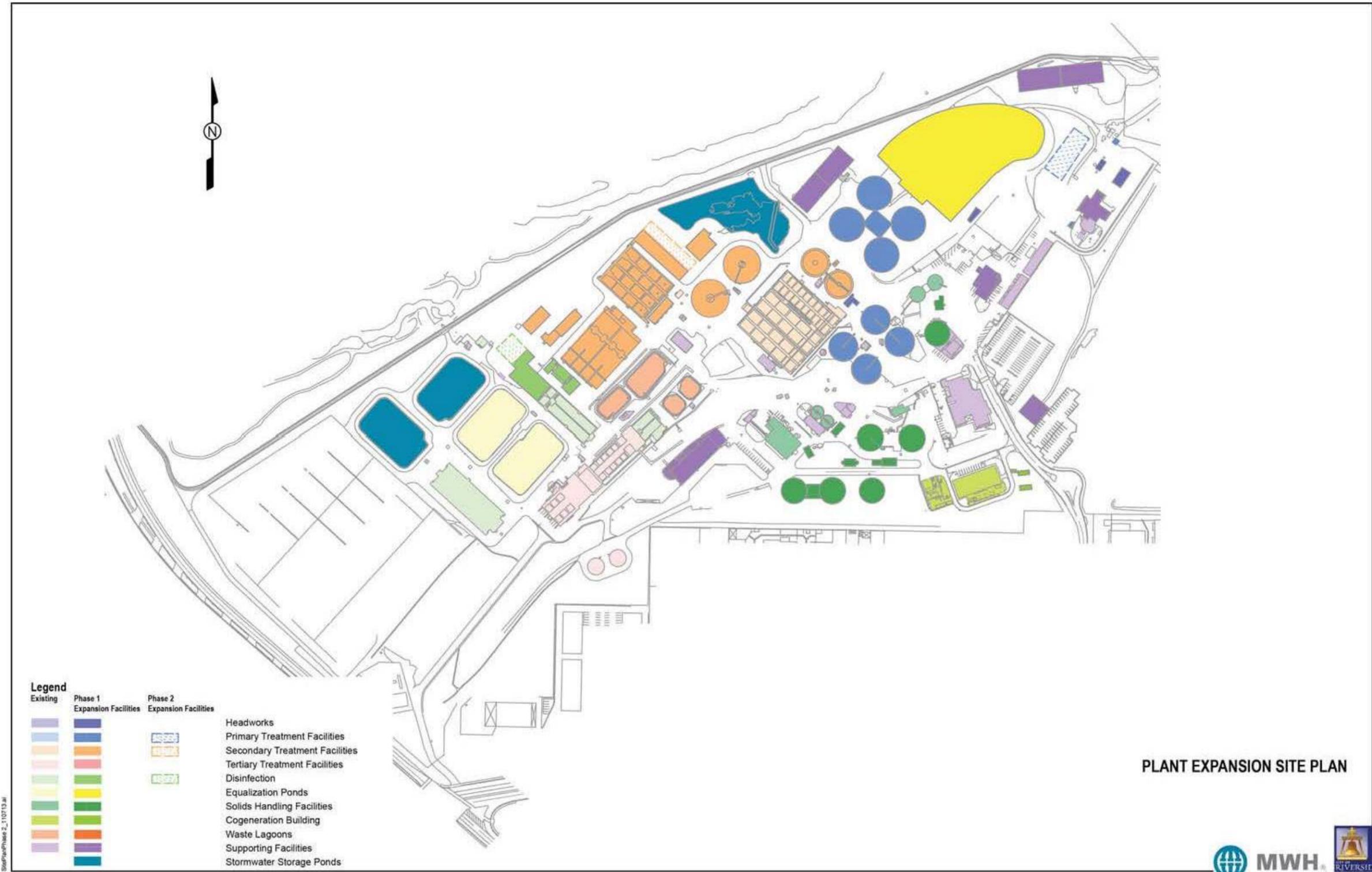
The updated Plant CIP is delineated by **Table 4-3** and presents the schedule for implementation based on capital expenditures. In most cases, small percentage expenditures will be required in advance of the outlays as scheduled for evaluation and engineering.

It is important to note that all of the possible improvements and projects suggested and discussed were critically evaluated and considered by staff in conjunction with MWH and Carollo Engineers. Inclusion of a potential project in the CIP was made on the basis of need and anticipated available funding in order to provide services that meet regulatory requirements in a safe, responsible, and environmentally sound manner.

Future projects will be required but are unidentified at this time. Allocations have been added as required to result in of \$10 million per year of capital projects at the RWQCP for year 6 through year 20 for rehabilitation as existing facilities age or otherwise become obsolete.

Table 4-4 presents additional detail as the basis for the estimated costs of the identified projects. The estimated costs are presented as Association for the Advancement of Costs Engineering (AACE) International CLASS 5 Cost Estimates. Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. Typically, engineering is from 2% to 10% complete. They are often prepared for strategic planning purposes, market studies, assessment of viability, project location studies, and long range capital planning. Virtually all Class 5 estimates use stochastic estimating methods such as cost curves, capacity factors, and other parametric techniques. Expected accuracy ranges are from –20% to –50% on the low side and +30% to 100% on the high side, depending on technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances. As little as 1 hr or less to perhaps more than 200 hours may be spent preparing the estimate based on the project and estimating methodology (AACE International Recommended Practices and Standards).

Figure 4-4
Plant Expansion Site Plan



**Table 4-3
RWQCP CIP**

Project Number	Project Type	Project Description	Prior Fiscal Years (Year -1)	Year 1 (14/15)	Year 2 (15/16)	Year 3 (16/17)	Year 4 (17/18)	Year 5 (18/19)	Total (Yrs 1-5)	Year 6 (19/20)	Year 7 (20/21)	Year 8 (21/22)	Year 9 (22/23)	Year 10 (23/24)	Year 6 (6-10)	Year 11 (11-20)
		Totals	\$2,406,564	\$930,000	\$3,550,000	\$13,400,000	\$9,570,000	\$15,250,000	\$45,106,564	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$50,000,000	\$100,000,000
1A	Biosolids	Inspect structural ceiling, blast and recoat. Add skylights. Replace lights. Close west openings and replace roll-up doors.	\$ -	\$ -	\$ -	\$ -	\$400,000	\$ -	\$400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1B	Biosolids	Procure and install Screw Presses 3 and 4	\$ -	\$ -	\$1,250,000	\$ -	\$ -	\$ -	\$1,250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1C	Biosolids	Procure and install Screw Presses 5 and 6. Add new dry-polymer feed system.	\$ -	\$ -	\$ -	\$1,500,000	\$ -	\$ -	\$1,500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1D	Biosolids	Replace Dewatering Building ventilation. Evaluate and cover or replace conveyor for odor control.	\$ -	\$ -	\$ -	\$ -	\$400,000	\$ -	\$400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1E	Biosolids	Replace dry-polymer feed system and controls	\$ -	\$ -	\$ -	\$ -	\$200,000	\$ -	\$200,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1F	Biosolids	Replace ferric storage and feed system. Relocate to point of use.	\$ -	\$ -	\$ -	\$ -	\$400,000	\$ -	\$400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1G	Biosolids	WAS Yard Piping Constraint	\$ -	\$ -	\$ -	\$ -	\$100,000	\$ -	\$100,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1H	Biosolids	Procurement and Install of Screw Presses 1 & 2	\$250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1I	Biosolids	Add DAFT no. 3	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$2,990,000	\$ -	\$ -	\$ -	\$2,990,000	\$ -
	Biosolids	SUBTOTAL	\$250,000	\$0	\$1,250,000	\$1,500,000	\$1,500,000	\$ -	\$4,500,000	\$ -	\$2,990,000	\$ -	\$ -	\$ -	\$2,990,000	\$ -
2A	Cogeneration	Upgrade	\$ -	\$500,000	\$ -	\$4,900,000	\$4,000,000	\$4,400,000	\$13,800,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Cogeneration	SUBTOTAL	\$ -	\$500,000	\$ -	\$4,900,000	\$4,000,000	\$4,400,000	\$13,800,000	\$ -						
3B	Disinfection	Recycled Water Upgrade - add two pumps	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$650,000	\$ -	\$650,000	\$ -
3C	Disinfection	Rehabilitate CCB 3 instrumentation and analyzers. (Part of Plant Expansion)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0	\$ -	\$ -	\$ -
3D	Disinfection	Rehabilitate CCB 3 Gates. Replace key effluent gate. Re-caulk all joints. (Part of Plant Expansion)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0	\$ -	\$ -	\$ -
	Disinfection	Replace hypochlorite feed system to equalization basin. (Part of Plant Expansion)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0	\$ -	\$ -	\$ -
	Disinfection	SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$650,000	\$ -	\$650,000	\$ -
4A	Filters	Add actuator to air scour blower cross-over interconnection	\$ -	\$ -	\$ -	\$50,000	\$ -	\$ -	\$50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4B	Filters	Add actuator to BW supply piping valve that isolates the east and west sides.	\$ -	\$ -	\$ -	\$50,000	\$ -	\$ -	\$50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4C	Filters	Configure drains for air blow-off valves in galleries	\$ -	\$ -	\$ -	\$50,000	\$ -	\$ -	\$50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4D	Filters	Inspect and test all under drains and media.	\$ -	\$ -	\$ -	\$ -	\$400,000	\$ -	\$400,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4E	Filters	Rehab subsurface wash system filters 11-16. Replace plastic hubs with brass. "A"	\$ -	\$ -	\$ -	\$50,000	\$ -	\$ -	\$50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Project Number	Project Type	Project Description	Prior Fiscal Years (Year -1)	Year 1 (14/15)	Year 2 (15/16)	Year 3 (16/17)	Year 4 (17/18)	Year 5 (18/19)	Total (Yrs 1-5)	Year 6 (19/20)	Year 7 (20/21)	Year 8 (21/22)	Year 9 (22/23)	Year 10 (23/24)	Year 6 (6-10)	Year 11 (11-20)
4F	Filters	West Filters - Replace instrumentation > 10 years old ("A")	\$ -	\$ -	\$ -	\$ -	\$ -	\$150,000	\$150,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4G	Filters	Tertiary Study	\$ -	\$ -	\$ -	\$ -	\$ -	\$500,000	\$500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4D	Filters	Demo old eddy current cabinets in east filter MCC room (Part of Expansion of Filters)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4E	Filters	Demo unused control room on deck East Filters (Part of Expansion of Filters)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4F	Filters	Demo/formally decommission floc basins (Part of Expansion of Filters)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4G	Filters	East Filter - Replace instrumentation > 10 years old (Part of Expansion of Filters)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4H	Filters	Evaluate seismic restraints for BW tanks and upgrade as required.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,972,000	\$ -	\$ -	\$1,972,000	\$ -
4I	Filters	Rehab East filters of expand West filters	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$3,000,000	\$4,800,000	\$ -	\$ -	\$ -	\$7,800,000	\$ -
4J	Filters	Inspect BW storage tanks and assume recoat.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$508,600	\$ -	\$ -	\$508,600	\$ -
4K	Filters	Provide "concrete equipment pads/curbs" for east filter pipe penetrations through floors.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$10,400	\$ -	\$ -	\$ -	\$10,400	\$ -
4L	Filters	Provide alternative BW supply source to allow for east filters to be off-line (or operate at reduced flows). New BW supply pumps at west filters "B"	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$780,000	\$ -	\$ -	\$780,000	\$ -
4M	Filters	Rehab backwash system valves.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$39,000	\$ -	\$ -	\$39,000	\$ -
4N	Filters	Rehab East filters 1-10	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0	\$ -
4O	Filters	Repair PVC lining at west filter rapid mix. "A"	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$65,000	\$ -	\$ -	\$65,000	\$ -
4P	Filters	Replace East Filter feed meters ("B")	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$260,000	\$ -	\$ -	\$260,000	\$ -
4Q	Filters	Replace WBW valves in filters 9 and 10 ("A")	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$78,000	\$ -	\$ -	\$78,000	\$ -
4R	Filters	Repurpose CCB1 for BW supply as BW tank back-up. Decommission pump station. (Study)	\$ -	\$ -	\$ -	\$ -	\$ -	\$150,000	\$150,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Filters	SUBTOTAL	\$ -	\$ -	\$ -	\$200,000	\$400,000	\$800,000	\$1,400,000	\$3,000,000	\$4,810,400	\$3,702,600	\$ -	\$ -	\$11,513,000	\$ -
5A	General	Integrated Master Plan	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5B	General	Integrated Master Plan I/I study	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5C	General	Phase 2 Expansion (two stages)	\$ -	\$ -	\$ -	\$ -	\$800,000	\$4,000,000	\$4,800,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$19,500,000
	General	SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$800,000	\$4,000,000	\$4,800,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$19,500,000
6A	ATT (Plant 2) Act. Sludge	PS 10 Pump, valve, and VFD replacement	\$ -	\$ -	\$ -	\$450,000	\$ -	\$ -	\$450,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6B	ATT (Plant 2) Act. Sludge	PS 15 Pump, valve, and VFD replacement	\$ -	\$ -	\$ -	\$ -	\$120,000	\$ -	\$120,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6C	ATT (Plant 2) Act. Sludge	PS 16 Pump, valve, and VFD replacement	\$ -	\$ -	\$ -	\$ -	\$300,000	\$ -	\$300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Project Number	Project Type	Project Description	Prior Fiscal Years (Year -1)	Year 1 (14/15)	Year 2 (15/16)	Year 3 (16/17)	Year 4 (17/18)	Year 5 (18/19)	Total (Yrs 1-5)	Year 6 (19/20)	Year 7 (20/21)	Year 8 (21/22)	Year 9 (22/23)	Year 10 (23/24)	Year 6 (6-10)	Year 11 (11-20)
6D	ATT (Plant 2) Act. Sludge	PS 16 Ventilation	\$ -	\$ -	\$ -	\$ -	\$50,000	\$ -	\$50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6E	ATT (Plant 2) Act. Sludge	PS 4 Pump, valve, and VFD replacement	\$ -	\$ -	\$ -	\$ -	\$150,000	\$ -	\$150,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6F	ATT (Plant 2) Act. Sludge	Replace Anoxic Mixers	\$ -	\$ -	\$ -	\$ -	\$ -	\$250,000	\$250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6G	ATT (Plant 2) Act. Sludge	Replace baffles and diffusers (need new cost)	\$ -	\$ -	\$ -	\$50,000	\$ -	\$ -	\$50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6H	ATT (Plant 2) Act. Sludge	Replace instrumentation > 10 yr old	\$ -	\$ -	\$ -	\$ -	\$ -	\$100,000	\$100,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6I	ATT (Plant 2) Act. Sludge	Replace Internal Recycle Pumps	\$ -	\$ -	\$ -	\$ -	\$ -	\$500,000	\$500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6J	ATT (Plant 2) Act. Sludge	Existing Lighting Upgrade	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$40,000	\$ -	\$40,000	\$ -
	ATT (Plant 2) Act. Sludge	SUBTOTAL	\$ -	\$ -	\$ -	\$500,000	\$620,000	\$850,000	\$1,970,000	\$ -	\$ -	\$ -	\$40,000	\$ -	\$40,000	\$ -
7A	Plant Support Facilities and Systems	Architectural and protective coatings plant wide on five-year cycle (run through O&M Budget)	\$ -	\$ -	\$ -	\$ -	\$ -	\$650,000	\$650,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7B	Plant Support Facilities and Systems	Flow Metering Stations Phase A	\$190,000	\$30,000	\$ -	\$3,000,000	\$ -	\$ -	\$3,220,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7C	Plant Support Facilities and Systems	Flow Metering Stations Phase B	\$ -	\$ -	\$ -	\$ -	\$2,000,000	\$1,000,000	\$3,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7D	Plant Support Facilities and Systems	Levee Wall, Fencing and Lighting	\$ -	\$250,000	\$200,000	\$3,000,000	\$ -	\$ -	\$3,450,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7E	Plant Support Facilities and Systems	Potable Water Back-up	\$ -	\$ -	\$ -	\$300,000	\$ -	\$ -	\$300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7F	Plant Support Facilities and Systems	Recycled Water System Phase 2	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,500,000	\$1,500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7G	Plant Support Facilities and Systems	Replace Perimeter Fencing	\$ -	\$ -	\$ -	\$ -	\$250,000	\$ -	\$250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7H	Plant Support Facilities and Systems	Site Concrete and Drainage	\$ -	\$ -	\$100,000	\$ -	\$ -	\$ -	\$100,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7I	Plant Support Facilities and Systems	Site-Security Lighting Masts	\$ -	\$ -	\$ -	\$ -	\$ -	\$500,000	\$500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7J	Plant Support Facilities and Systems	Site-Security Lighting perimeter Study and Installation.	\$50,000	\$ -	\$ -	\$ -	\$ -	\$500,000	\$550,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7K	Plant Support Facilities and Systems	Stormwater Diversion	\$ -	\$150,000	\$ -	\$ -	\$ -	\$750,000	\$900,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7L	Plant Support Facilities and Systems	Transformer T1 & T2 Replacement and Switchgear	\$160,532	\$ -	\$2,000,000	\$ -	\$ -	\$ -	\$2,160,532	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7M	Plant Support Facilities and Systems	Armor Levee - Improve Existing or Additional	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$6,000,000	\$6,000,000	\$12,000,000	\$ -
7N	Plant Support Facilities and Systems	Admin HVAC Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,950,000	\$ -	\$ -	\$1,950,000	\$ -

Project Number	Project Type	Project Description	Prior Fiscal Years (Year -1)	Year 1 (14/15)	Year 2 (15/16)	Year 3 (16/17)	Year 4 (17/18)	Year 5 (18/19)	Total (Yrs 1-5)	Year 6 (19/20)	Year 7 (20/21)	Year 8 (21/22)	Year 9 (22/23)	Year 10 (23/24)	Year 6 (6-10)	Year 11 (11-20)
	Plant Support Facilities and Systems	SUBTOTAL	\$400,532	\$430,000	\$2,300,000	\$6,300,000	\$2,250,000	\$4,900,000	\$16,580,532	\$ -	\$ -	\$1,950,000	\$6,000,000	\$6,000,000	\$13,950,000	\$ -
8A	Preliminary Treatment	Headworks by-pass channel	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,365,000	\$ -	\$ -	\$ -	\$ -	\$1,365,000	\$ -
8B	Preliminary Treatment	Headworks electrical harness set replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0	\$ -	\$ -	\$ -	\$ -	\$0	\$ -
	Preliminary Treatment	SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,365,000	\$ -	\$ -	\$ -	\$ -	\$1,365,000	\$ -
9A	Plant Landscaping	Various Locations for Landscaping	\$ -	\$ -	\$ -	\$ -	\$ -	\$300,000	\$300,000	\$300,000	\$ -	\$ -	\$ -	\$ -	\$300,000	\$ -
	Plant Landscaping	SUBTOTAL	\$ -	\$ -	\$ -	\$ -	\$ -	\$300,000	\$300,000	\$300,000	\$ -	\$ -	\$ -	\$ -	\$300,000	\$ -
9A	Various	Projects	\$1,756,032	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,756,032	\$5,335,000	\$2,199,600	\$4,347,400	\$3,310,000	\$4,000,000	\$19,192,000	\$80,500,000
	Undefined	SUBTOTAL	\$1,756,032	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,756,032	\$5,335,000	\$2,199,600	\$4,347,400	\$3,310,000	\$4,000,000	\$19,192,000	\$80,500,000

**Table 4-4
Line Item Class 5 Cost Estimate**

Project Number	Project Type	Estimate Basis	Unit Price	Quantity	Constr Cost	Engineering	Construction Support	Study/ Eval	Total
		Percent of construction				\$0	\$0	LS	
1A	Biosolids	\$34/sf of Biosolids Structure Floor	\$34	7700	\$261,800	\$39,270	\$39,270	\$25,000	\$400,000
1B	Biosolids	\$480K per unit	\$480,000	2	\$960,000	\$144,000	\$144,000		\$1,250,000
1C	Biosolids	\$550K per unit	\$550,000	2	\$1,100,000	\$165,000	\$165,000		\$1,500,000
1D	Biosolids	Ventilation \$15/sf. Add \$5/sf for fire alarm system. Add \$100 k for conveyor.	\$20	7700	\$254,000	\$38,100	\$38,100	\$50,000	\$400,000
1E	Biosolids	LS from plant staff est x 2	\$100,000	1	\$100,000	\$15,000	\$15,000		\$200,000
1F	Biosolids	8000 gal tank, containment, mech, instrumentation = 50K+100k+100k+50K	\$300,000	1	\$300,000	\$45,000	\$45,000		\$400,000
1G	Biosolids	200 ft of 16 in, \$/in dia	\$20	3200	\$64,000	\$9,600	\$9,600		\$100,000
1H	Biosolids	LS from City staff							
1I	Biosolids	LS							
2A	Cogen	Alt 1 (engines only) from HDR Cogen Report	\$10,550,000	1	\$10,550,000	\$1,582,500	\$1,582,500		\$13,800,000
3B	Disinfection	2 pumps at 100 hp	\$2,500	200	\$500,000	\$75,000	\$75,000		\$650,000
3C	Disinfection	LS Replace existing	\$50,000	1	\$50,000	\$7,500	\$7,500		\$65,000
3D	Disinfection	LS effluent gate \$100K. \$100k for other gates. \$50k for miscellaneous	\$250,000	1	\$250,000	\$37,500	\$37,500		\$325,000
	Disinfection	2000 ft of 2 in, \$/in dia	\$30	4000	\$120,000	\$18,000	\$18,000		\$156,000
4A	Filters	LS - actuator plus elec I/C	\$35,000	1	\$35,000	\$5,250	\$5,250		\$50,000
4B	Filters	LS - actuator plus elec I/C	\$35,000	1	\$35,000	\$5,250	\$5,250		\$50,000
4C	Filters	LS for 300 ft 2 in PVC to sumps	\$60	600	\$36,000	\$5,400	\$5,400		\$50,000
4D	Filters	\$30/sf at TIWRP	\$30	9420	\$282,600	\$42,390	\$42,390		\$400,000
4E	Filters	Price per hub	\$1,000	32	\$32,000	\$4,800	\$4,800		\$50,000
4F	Filters	LS \$/filter	\$18,000	6	\$108,000	\$16,200	\$16,200		\$150,000
4G	Filters	na							
4D	Filters	LS	\$10,000	1	\$10,000	\$1,500	\$1,500		\$13,000
4E	Filters	Demo at \$25/sf	\$25	1000	\$25,000	\$3,750	\$3,750		\$32,500
4F	Filters	Remove equipment. Sand fill basins with concrete on top. LS	\$75,000	1	\$75,000	\$11,250	\$11,250		\$97,500

Project Number	Project Type	Estimate Basis	Unit Price	Quantity	Constr Cost	Engineering	Construction Support	Study/ Eval	Total
4G	Filters	LS \$/filter	\$15,000	10	\$150,000	\$22,500	\$22,500		\$195,000
4H	Filters	Assume 1/2 of tank replacement at \$1/gal (net \$0.5/gal)	\$1	1440000	\$1,440,000	\$216,000	\$216,000	\$100,000	\$1,972,000
4I	Filters	Cost per gpd capacity to add 2 filter cells (3 mgd each) and pump	\$1	6000000	\$6,000,000	\$900,000	\$900,000		\$7,800,000
4J	Filters	Inspect plus recoat tanks inside and out. \$/sf	\$10	37200	\$372,000	\$55,800	\$55,800	\$25,000	\$508,600
4K	Filters	LS per penetration	\$1,000	8	\$8,000	\$1,200	\$1,200		\$10,400
4L	Filters	3 pumps at 100 hp. \$/hp installed with piping, elec, instr	\$2,000	300	\$600,000	\$90,000	\$90,000		\$780,000
4M	Filters	LS	\$15,000	2	\$30,000	\$4,500	\$4,500		\$39,000
4N	Filters	\$750/ft2 from TIWRP; incl. new underdrains. Add \$250 for air scour and instrumentation	\$1,000	5520	\$5,520,000	\$828,000	\$828,000		\$7,176,000
4O	Filters	\$/sq ft	\$100	500	\$50,000	\$7,500	\$7,500		\$65,000
4P	Filters	LS \$/meter	\$20,000	10	\$200,000	\$30,000	\$30,000		\$260,000
4Q	Filters	Per valve \$15,000 x2	\$30,000	2	\$60,000	\$9,000	\$9,000		\$78,000
4R	Filters	Study and evaluation only			\$0	\$0	\$0	\$150,000	\$150,000
5A	General	LS study		0	\$0			\$750,000	\$750,000
5B	General	LS study		0	\$0			\$200,000	\$200,000
5C	General	Blower, membranes, pieces	\$18,690,000	1	\$18,690,000	\$2,803,500	\$2,803,500		\$24,300,000
6A	Plant 2 Act. Sludge	Pump hp, valve dia and number	\$340,000	1	\$340,000	\$51,000	\$51,000		\$450,000
6B	Plant 2 Act. Sludge	Pump hp, valve dia and number	\$92,000	1	\$92,000	\$13,800	\$13,800		\$120,000
6C	Plant 2 Act. Sludge	Pump hp, valve dia and number	\$200,000	1	\$200,000	\$30,000	\$30,000		\$300,000
6D	Plant 2 Act. Sludge	LS	\$35,000	1	\$35,000	\$5,250	\$5,250		\$50,000
6E	Plant 2 Act. Sludge	Pump hp, valve dia and number	\$110,000	1	\$110,000	\$16,500	\$16,500		\$150,000
6F	Plant 2 Act. Sludge	\$2,500/total hp; 60 hp	\$3,200	60	\$192,000	\$28,800	\$28,800		\$250,000
6G	Plant 2 Act. Sludge	FRP baffles, \$/sf	\$60	576	\$34,560	\$5,184	\$5,184		\$50,000
6H	Plant 2 Act. Sludge	10 % Percent of PS rehab above	\$50,000	1	\$50,000	\$7,500	\$7,500		\$100,000
6I	Plant 2 Act. Sludge	\$/hp , 6 @ 20 hp	\$3,000	120	\$360,000	\$54,000	\$54,000		\$500,000
6J	Plant 2 Act. Sludge	Assume replace 50% of existing			\$0	\$0	\$0	\$40,000	\$40,000
7A	Plant Support Facilities and Systems	\$100000/yr (4FTE, 2 months)	\$100,000	5	\$500,000	\$75,000	\$75,000		\$650,000

Project Number	Project Type	Estimate Basis	Unit Price	Quantity	Constr Cost	Engineering	Construction Support	Study/ Eval	Total
7B	Plant Support Facilities and Systems	LS City estimate	\$2,860,000	1	\$2,860,000	\$429,000	\$429,000		\$3,720,000
7C	Plant Support Facilities and Systems	LS City estimate	\$4,000,000	1	\$4,000,000	\$600,000	\$600,000		\$5,200,000
7D	Plant Support Facilities and Systems	LS City estimate	\$2,650,000	1	\$2,650,000	\$397,500	\$397,500		\$3,450,000
7E	Plant Support Facilities and Systems	Estimate based on 500 ft, 2-in lines with BFPs at 5 locations	\$200,000	1	\$200,000	\$30,000	\$30,000		\$300,000
7F	Plant Support Facilities and Systems	\$32/in-ft; assume 12" pipe, 2,000 lf	\$550	2000	\$1,100,000	\$165,000	\$165,000		\$1,500,000
7G	Plant Support Facilities and Systems	Per ft estimate	\$14	13200	\$184,800	\$27,720	\$27,720		\$250,000
7H	Plant Support Facilities and Systems	\$1000/CY; 36 sf/CY; 2000 sf of concrete surface drains	\$1,000	56	\$56,000	\$8,400	\$8,400		\$100,000
7I	Plant Support Facilities and Systems	\$/mast	\$60,000	6	\$360,000	\$54,000	\$54,000		\$500,000
7J	Plant Support Facilities and Systems	\$32/ft perimeter (\$5k/light at 100ft)	\$32	13000	\$416,000	\$62,400	\$62,400		\$550,000
7K	Plant Support Facilities and Systems	2 new catch basins in Acorn and 2300 ft 36 in line to river	\$600,000	1	\$600,000	\$90,000	\$90,000	\$100,000	\$900,000
7L	Plant Support Facilities and Systems	LS from JGC	\$815,589	2	\$1,631,178	\$244,677	\$244,677	\$40,000	\$2,160,532
7M	Plant Support Facilities and Systems	LS City estimate	\$9,000,000	1	\$9,000,000	\$1,350,000	\$1,350,000		\$12,000,000
7N	Plant Support Facilities and Systems	LS City estimate	\$1,500,000	1	\$1,500,000	\$225,000	\$225,000		\$1,950,000
8A	Preliminary Treatment	Bottom up LS	\$1,050,000	1	\$1,050,000	\$157,500	\$157,500		\$1,365,000
8B	Preliminary Treatment	LS per harness	\$1,000	4	\$4,000	\$600	\$600		\$5,200
9A	Plant Landscaping	LS from City staff	\$0	0	\$0	\$0	\$0	\$300,000	\$300,000
9A	Various	Total value equivalent to \$10 million per year	\$0	0	\$0	\$0	\$0	\$80,500,000	\$80,500,000

CAPITAL IMPROVEMENT PROGRAM

This chapter presents the combined Sewer CIP consisting of the Collection System and Riverside Regional Water Quality Control Plant (RWQCP) total capital costs presented in detail in Chapters 4 and 5, with the addition of current and future major projects.

Table 5-1 presents the combined Sewer CIP for the completion of the Phase 1 Rehabilitation project, the collection system and RWQCP capital projects previously identified. An additional project for a desalination system (Desalter) has been included beginning in year 6 (2019/20) that will address the salinity issues that the City will be faced with. Also note that continued capital projects will be required for the collection system and RWQCP for years six through ten and beyond with estimated total capital costs of \$16 million and \$10 million respectively. For the initial five years of this CIP Update, \$122 million of specific and necessary capital projects have been identified. It should be noted that project priorities recommended by staff served to distribute the work for a relatively uniform capital outlay during fiscal years 2015/16 through 2018/19.

Table 5-1 presents the capital cost totals by year in two ways: on the basis of 2013 cost, and as escalated over time at an effective interest rate of 5% per year. These escalated costs form the base capital outlays for the financial plan. The escalated costs, less the Phase 1 Rehabilitation and future Desalter work, are also presented to reflect combined necessary improvements for the collections system and RWQCP facilities.

**Table 5-1
CIP Update Sewer Capital Projects Summary**

Project Type	Basis	Prior Fiscal Years	Year 1 (14/15)	Year 2 (15/16)	Year 3 (16/17)	Year 4 (17/18)	Year 5 (18/19)	Total (Yrs 1-5)	Year 6 (19/20)	Year 7 (20/21)	Year 8 (21/22)	Year 9 (22/23)	Year 10 (23/24)	Total (Yrs 6-10)	Year 11+ (11-20)
Capital Requirements															
Phase 1 Plant Rehabilitation	2013 costs	\$43,915,667	\$61,477,084	\$18,127,607											
Plant Upgrades	2013 costs	\$2,406,564	\$930,000	\$3,550,000	\$13,400,000	\$9,570,000	\$15,250,000	\$45,106,564	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$10,000,000	\$50,000,000	\$100,000,000
Collections	2013 costs	\$6,632,130	\$0	\$23,350,000	\$19,400,000	\$17,520,000	\$12,760,000	\$79,662,130	\$16,000,000	\$16,000,000	\$16,000,000	\$16,000,000	\$16,000,000	\$80,000,000	\$160,000,000
Desalter	2013 costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000,000	\$4,000,000	\$4,000,000	\$20,000,000	\$30,000,000	\$60,000,000	\$40,000,000
Total	2013 costs	\$52,954,361	\$62,407,084	\$45,027,607	\$32,800,000	\$27,090,000	\$28,010,000	\$124,768,694	\$28,000,000	\$30,000,000	\$30,000,000	\$46,000,000	\$56,000,000	\$190,000,000	\$300,000,000
Escalated Capital Requirements															
Phase 1 Plant Rehabilitation	Escalated 5%/yr	\$43,915,667	\$64,550,938	\$19,985,687	\$0	\$0	\$0	\$84,536,625	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plant Upgrades	Escalated 5%/yr	\$2,406,564	\$976,500	\$3,913,875	\$15,512,175	\$11,632,395	\$19,463,294	\$51,498,239	\$13,400,956	\$14,071,004	\$14,774,554	\$15,513,282	\$16,288,946	\$74,048,743	\$207,892,818
Collections	Escalated 5%/yr	\$6,632,130	\$0	\$25,743,375	\$22,457,925	\$21,295,670	\$16,285,353	\$85,782,322	\$21,441,530	\$22,513,607	\$23,639,287	\$24,821,251	\$26,062,314	\$118,477,990	\$332,628,509
Desalter	Escalated 5%/yr	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,680,191	\$5,628,402	\$5,909,822	\$31,026,564	\$48,866,839	\$94,111,818	\$83,157,127
Total	Escalated 5%/yr	\$52,954,361	\$65,527,438	\$49,642,937	\$37,970,100	\$32,928,064	\$35,748,647	\$221,817,186	\$37,522,678	\$42,213,013	\$44,323,663	\$71,361,098	\$91,218,099	\$286,638,551	\$623,678,454
New Collection System and RWQCP Projects Only															
Less Phase 1 Rehab and Desalter	Escalated 5%/yr	\$9,038,694	\$976,500	\$29,657,250	\$37,970,100	\$32,928,064	\$35,748,647	\$137,280,561	\$34,842,487	\$36,584,611	\$38,413,842	\$40,334,534	\$42,351,260	\$192,526,733	\$540,521,327

FINANCIAL PLAN AND RATE DEVELOPMENT STUDY

6.1 INTRODUCTION

6.1.1 Purpose

Over the five-year forecast period from Fiscal Years (FY) 2014/15 through 2018/19, the City of Riverside (City) will continue major improvements to the Regional Water Quality Control Plant (RWQCP) and the collection system. Over the past five years, the City has implemented annual rate increases, which allowed for the funding of Phase I of the RWQCP Rehabilitation Project and other plant and collection systems rehabilitation and replacement (R&R) projects. Phase II of the RWQCP rehabilitation is set to commence in FY 2014/15 along with substantial levels of R&R spending for the RWQCP as well as the collection system. The purpose of this chapter is to present the results of an assessment of the rates charged to the individual users to determine if they are adequate to address current and future operations and maintenance (O&M) and capital costs.

This study includes an assessment of both the City's sewer user rates and capacity fees. The sewer user rates and sewer capacity fees are designed to distribute the cost of the operation and improvement of the RWQCP equitably among all users in accordance with California legal requirements as defined by Proposition 218 and California Government Code §66013, respectively.

6.1.2 Scope of Work

The scope of work for this rate and capacity charge study included the following:

- Develop a capital funding strategy for the proposed FY 2014/15 through 2018/19 capital improvement program.
- Perform a ten-year revenue requirement forecast analysis.
- Develop a five-year rate package.
- Update the City's sewer capacity fees.

This financial study uses the City's FY 2013/14 operating and maintenance budget as the basis for future O&M expenditures. The financial study includes the development of user rates designed to distribute the cost of operation and improvements of the RWQCP and sewer collection system proportionally to all of the users based on wastewater flow and strength characteristics.

The rates charged to customers outside of the City, including the Jurupa, Edgemont, and Rubidoux Community Services Districts (CSD's), as well as the unincorporated area of Highgrove, were also evaluated. These rates are addressed in the service agreements with each specific community.

6.1.3 Forward Looking Statement

The projections and forecasts of this analysis are based on the reasonable expectation of future events. Should cost escalation, operating expenditures, or capital needs vary from projected levels prior to FY 2018/19, the City might require an additional Proposition 218 process to increase rates above currently projected levels. The City might similarly be required to begin a new Proposition 218 process should revenues not materialize as projected.

6.1.4 Key Findings and Recommendations

The key findings and recommendations of the financial study are as follows.

1. Proposed Rate Increases

Annual user rate increases of 8.5 percent will be required in each year of the study period to fund the activities of the City's Sewer Department. The proposed user rates retain the City's current rate structure and represent across-the-board rate increases for each year of the study period.

2. Recommended Minimum Operating Reserve

It is recommended that the City adopt a minimum operating reserve of six months of Operations and Maintenance (O&M) and debt service expenditures. In practice, the City has kept operating reserves above this level; however, no official policy is in place.

3. Recommended Update to Flow and Loading Assumptions

It is recommended that the City conduct a flow and sampling analysis starting two years before the next master plan, in order to update the flow assumptions, Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) loadings concentrations assumptions, return to sewer factors, and the Equivalent Dwelling Unit (EDU) definition for each customer category. These updates would subsequently be used in the next update of both user rates and capacity fees.

4. Proposed Capacity Fees

Capacity fees have been calculated to reflect the updated CIP, flow, and loadings projections. The proposed capacity fee is \$3,933 per EDU. The proposed fee represents an increase of 1.32 percent over the existing fee of \$3,882 per EDU. It is recommended that the capacity fee be adjusted each year by the Engineering News Record Construction Cost Inflation (ENR CCI) factor for Los Angeles or the 20 City Average.

6.1.5 Background

The City is responsible for regional wastewater collection, treatment, and disposal. In 1978, the RWQCP began operation as a regional facility. Subsequent projects added capacity and upgraded the existing primary, secondary, tertiary, and solids handling facilities to provide 40

mgd (annual average basis) of capacity at the RWQCP. In the same time period, the RWQCP has been modified to allow the plant to meet more stringent discharge limits.

In 2009, the City began a large-scale rehabilitation of the RWQCP as a component of the Phase I plant expansion project, which is still under way. The project will expand and improve many plant processes, and increase the overall hydraulic treatment capacity to 46 MGD. The expected completion date of the project is December 2015.

The City provides service to approximately 151,000 Equivalent Dwelling Units (EDUs) from within the City, as well as from Edgemont, Jurupa, and Rubidoux, Community Services Districts. The wastewater treated at the RWQCP was approximately 29 mgd on an annual average basis in FY 2012/13. Additionally, the City will begin treating wastewater from the community of Highgrove, beginning in 2015.

The projected annual average flow at the RWQCP is expected to be 40 mgd in FY 2035/36. This flow projection is described in more detail in Chapter 1: Introduction – Section 2: Population, Flow, and Loading Projections. This amounts to an additional 10 mgd of flow on an annual average basis.

6.2 ASSUMPTIONS AND DATA

6.2.1 Flow and Loadings Assumptions and Growth

Wastewater flows and loadings dictate many collections system and treatment plant operational costs and capital expenditures. Therefore, they are a major driver of financial planning. Customer class specific flow and loadings assumptions are essential to the rate development process as they provide a basis for the allocation of costs to each customer class.

6.2.1.1 Total Projected Flow

As described in Chapter 1, Section 2, Population, Flow, and Loading Projections, the population of the City's service area is projected to grow on an annual average of 0.98% through the five-year study period ending in FY 2018/19. After that time, growth is expected to be between 0.5 percent and 1 percent per year, resulting in a projected population of 388,000 by the year 2035. The average flow rate at the treatment plant is projected to increase to 40.0 million gallons per day by 2035.¹

Since 2008, average daily flow to the RWQCP has dropped by approximately 2 MGD to 29 MGD in FY 2012/13. Several factors led to decreased flows, including increased conservation, the economic downturn, and slower than expected development growth. The flow projection presented in Chapter 1, Section 2, Population, Flow, and Loading Projections reflects these

¹ Chapter 1, Section 2 details the flow and loading projections that have been developed for the CIP Update and Rate Development Study.

changes. As such, projected flows are lower than those projected in the 2008 Integrated Wastewater Master Plan, which reflected the economic growth that the City was experiencing at that time.²

Wastewater flows for the Edgemont, Jurupa, and Rubidoux Community Service Districts are projected to increase at 3.8 percent through the five-year study period¹. This analysis assumes that the CSD's will not purchase additional capacity at the RWQCP and that CSD flows will not exceed currently owned capacity, which totals 7.95 MGD in aggregate.

Table 6-1 presents projected population and flow for The City of Riverside, the CSD's, and Highgrove.

**Table 6-1
Projected Population and Average Daily Flows for RWQCP (mgd)**

Flow Source	Flow (mgd)					
	2012	2015	2020	2025	2030	2035
Population⁽¹⁾	313,673	322,986	339,125	346,825	366,687	387,686
City of Riverside Flows⁽¹⁾	23.5	24.9	26.1	26.7	28.2	29.9
Community Service District/Unincorporated Flows⁽¹⁾						
Jurupa	3.3	3.6	4.0	4.0	4.0	4.0
Rubidoux	2.0	2.3	2.9	3.1	3.1	3.1
Edgemont	0.5	0.5	0.6	0.7	0.9	0.9
Highgrove	0.0	0.1	0.6	1.2	1.7	2.2
Total RWQCP Flows	29.2	31.4	34.3	35.7	37.8	40.0

Notes:

1) A detailed table showing projected flow and loading by customer category is included in Appendix A.

6.2.1.2 Flow per Account

Flows for non-residential accounts are based on charged water consumption multiplied by a return to sewer factor. The return to sewer factor is the average percentage of potable water consumption that enters the sewer system. Monthly charged consumption for each customer class was provided by the City for FY 2011/12 and FY 2012/13. Return to sewer factors are customer class specific and based on analysis performed by the City. **Table 6-2** shows the assumed return to sewer factors for each type of customer.

Flows for residential accounts and flat rate commercial accounts are calculated using the assumed flow per EDU. Single-family residential and flat rate commercial accounts are assigned an EDU factor of 1.0; multi-family residential accounts are assigned an EDU factor of 0.9 to account for the lower water consumption and sewer discharge patterns.

² The 2008 IWWMP evaluated a range of growth projections and incorporated the low-growth scenario as the basis of the engineering and financial analysis.

A mass balance was performed, adjusting flows and loadings to balance the flow and loadings from the City's customer data with the average dry weather influent at the treatment plant headworks. Performing a mass balance helps to achieve proportionality between customer classes in light of changing water usage patterns with conservation and based on best-known information. In particular, this approach accounts for the fact that industrial customers pay for service based on their metered flow and loadings. The FY 2014/15 annual average projected flow and loading for In-City customers is 24.6 MGD of flow, with BOD and TSS concentrations of 326 mg/L and 276 mg/L respectively. Taking into account the mass balance, the FY 2014/15 adjusted daily flow per EDU is 206 gallons per day. This average discharge contrasts with the per EDU flow of 220 gallons per day of wastewater, that is based on the 2001 Revenue Plan Report.

**Table 6-2
Assumed Return to Sewer Factors**

Customer Type	Return to Sewer Factor⁽¹⁾
Department & Retail Stores	76%
Hotels & Motels	78%
Laundromats	90%
Laundries	90%
Markets	90%
Mortuaries	44%
Professional Offices	68%
Repair Shops & Service Stations	90%
Restaurants	81%
Other Commercial	90%
Hospitals	84%
Churches & Halls	44%
Schools "B"	30%
Other Commercial "A"	60%
Other Commercial "B"	30%

Notes:

1) Source: City of Riverside Revenue Plan Report, 2001

6.2.1.3 Loadings Assumptions and Projected Loads

Wastewater strength characteristics (loadings) greatly affect treatment plant operations and costs, as well as capital improvements and rehabilitation projects. Therefore, it is important to take loadings into account in the development of user rates and fees. Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) are the measured wastewater parameters that are used to quantify wastewater strength.

The volume of wastewater discharged to the City's system has decreased since 2005 due to increased conservation measures, including messaging, water rate increases, and broader economic factors. This decrease in the quantity of flow per customer has resulted in higher

wastewater loading concentrations. The loadings projection presented in Chapter 1 assumes that concentrations of BOD and TSS will continue to increase. Projected loadings for each customer category are included for reference in **Appendix A**.

6.2.1.4 Equivalent Dwelling Units

The number of customers or connections to a sewer system is often expressed in EDUs. An EDU is a measurement of the demand on sewer and treatment facilities in terms of flow and strength that is equivalent to that discharged by a single-family home. Both residential and commercial monthly sewer service charges, as well as capacity fees are based on EDUs. As discussed above in Sections 6-2.1.2 and 6.2.1.3 assumed flow per EDU and loading concentrations for each account type have been adjusted in order to balance calculated flow and loads with those measured at the RWQCP. The resulting flow and loading values per EDU are shown in **Table 6-3**.

**Table 6-3
Assumed and Adjusted EDU Flow and Loading**

	Flow (GPD)	BOD (mg/L)	TSS (mg/L)	
Adjusted Value	206	301	284	

The number of existing EDUs is calculated by taking the total existing RWQCP influent flow and loading values and dividing them by the adjusted EDU flow and loading values, which are 206 gallons per day for flow, 301 mg/l for BOD, and 284 mg/l for TSS. A cost weighted average of these values is then used to calculate the number of EDUs. The number of future EDUs is calculated using the same method based on projected flow and loading. **Table 6-4** shows an example of the EDU calculation. **Table 6-5** shows the number of existing and future EDUs calculated for each flow and loading value.

**Table 6-4
Example Calculation - In City EDUs for FY 2014/15**

	Flow	BOD	TSS
Total In-City Flow and Loading	24.6	66,950	56,617
Units	MGD	lb per day	lb per day
÷			
Flow and Loading per EDU	206	0.52	0.49
Units	GPD	lb per day	lb per day
X			
Percentage Allocation	58%	30%	12%
=			
In City EDUs	69,691	38,591	14,029
Total Weighted In-City EDUs	122,311		

**Table 6-5
Existing and Future EDUs**

	Flow	BOD	TSS	Total
Existing Riverside EDUs	69,691	38,591	14,029	122,311
Existing CSD EDUs	17,501	9,691	3,523	30,715
Future Riverside and CSD EDUs	6,754	3,740	1,359	11,853
Total EDUs by FY 2018/19				164,879

6.2.1.5 Recommended Updates to Flow, Loading, and EDU Assumptions

Many of the flow and loading assumptions currently used by the City were developed over 20 years ago. Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) loading concentration assumptions for each customer category were developed in 1990. It is assumed that return to sewer factors were also developed at or near that time. It is recommended that the City conduct a sampling analysis starting two years before the next master plan, in order to update the flow assumptions, BOD and TSS loadings concentrations assumptions, return to sewer factors, and the Equivalent Dwelling Unit (EDU) definition for each customer category. These updates would subsequently be used in the next update of both user rates and capacity fees.

6.2.2 Approach to User Rate Analysis

For the purposes of this study, new FY 2014/15 rates were developed based on cost of service (COS) rate principals. An analysis was performed to determine the feasibility of implementing across-the-board rate increases. The proposed rates reflect annual across-the-board increases. The cost of service process and the analysis comparing each rate implementation strategy is discussed later in this report.

Single-family and multi-family residential, and basic commercial users are billed a flat sewer user rate based on the City of Riverside Resolution No. 18155. The single-family residential (SFR) sewer user rate is based on typical flow and loadings for an average 3-bedroom home. Non-residential users are billed based on monthly water consumption and the customer category specific return to sewer factor. Based on previous sampling, the City maintains a list of average flow and wastewater strength discharges for each user rate category, which is used to develop the user rates. Large industrial or individual users discharging 25,000 gallons or more per day, known as “Special Billing Users,” pay individually calculated user rates, based on measured sewer flows and strengths. These charges are outlined in City of Riverside Resolution No. 18155, Section 1 (b) and Section 2 (b).

The City currently has 39 different residential and commercial customer categories. Some areas of the City have sewer lines that must flow to pumping facilities to pump the wastewater uphill to a gravity feed line. The gravity lines carry the wastewater downhill to the RWQCP. The pumping process requires additional equipment, maintenance, and power. A surcharge is added to the sewer services in these areas.

6.2.3 Capital Improvement Program

The CIP has been developed to meet anticipated regulatory requirements, increased population, additional treatment requirements, energy, other resource-savings considerations, and air quality protection needs. The anticipated projects are listed in the CIP and Overall Implementation Schedule, in Chapter 5. Capital costs discussed in this section are un-escalated and expressed in FY 2013/14 dollars, unless otherwise noted.

The CIP details projects for both the plant and collections system for years 1 through 5 of the planning period. Years 6 through 20 assume that capital projects are capped at \$10 million per year for plant projects and \$16 million per year for collections system projects. All known projects for years 6 through 20 are shown in the CIP with general line items for plant spending and collections system spending included to meet the capped spending levels.

The City anticipates that without intervention, total dissolved solids (TDS) discharge limits will be exceeded. Several methods of TDS mitigation have been proposed to the City involving both water supply mitigation measures, as well as wastewater treatment mitigation measures. City staff has indicated that the most likely approach will be the addition of a reverse osmosis process to the RWQCP. The CIP includes \$100 million for the TDS mitigation project starting in FY 2019/20.

As included in this financial analysis and shown in Chapter 4 **Appendix A** of this report, the CIP total approximately \$795 million between FY 2014/15 and FY 2035/36. Of this total, \$164 million will be undertaken to provide capacity for projected growth, while \$631 million will be undertaken for replacement/rehabilitation and treatment upgrades. The total CIP expenditures over the next five years are projected to total \$195 million; an annual average of \$39 million. Discussion of the capital funding strategy follows in Section 6.3.3.

In addition to the planned CIP, the City is to cash fund some capital expenditures as identified in the FY 2013/14 approved budget. These projects will be rate funded, or funded through the use of reserves. Over the next five years, the total amount of cash funded capital is projected to be \$15.5 million; an annual average of \$3.1 million.

6.2.4 Functional Allocation

Once projected annual expenditures have been determined, it is necessary to allocate these costs to billable constituents. Billable constituents are parameters that can be measured both at the treatment facilities and for each user, and include flow and strength (BOD and TSS). For example, sewer flows are monitored at the treatment plant and can be estimated for an individual user.

The process of assigning O&M costs to billable constituents is developed by first allocating the physical system to the billable constituents on a unit cost basis. For example, the headworks is primarily sized based on hydraulic capacity requirements. Consequently, the cost of operating and maintaining a headworks is proportional to the amount of flow that passes through it and is allocated 100 percent to sewer flow. Using the allocation of the physical system, operating and

maintenance costs are allocated. A similar method is used to allocate capital costs. Costs that cannot be assigned a specific allocation to functional components (un-assignable costs), because they serve a general benefit, such as general administration, are allocated based on the weighted average allocation of assignable costs. The allocation of O&M expenditures by cost category is illustrated in **Table 6-6**. The allocation of CIP expenditures is included for reference in **Appendix B**.

Table 6-6
Operation and Maintenance Cost Allocation to Billable Constituents

Treatment Process	Allocation Percentages (%) ⁽²⁾			
	Pumping	Flow	BOD	TSS
Administration ⁽¹⁾	3%	54%	29%	14%
Collection System Maintenance	13%	87%		
Treatment		44%	39%	17%
Environmental Compliance ⁽¹⁾	3%	54%	29%	14%
Sewer System Plant Maintenance ⁽¹⁾	3%	54%	29%	14%
Electrical and Instrumentation ⁽¹⁾	3%	54%	29%	14%
SCADA and SPL ⁽¹⁾	3%	54%	29%	14%
Warehouse ⁽¹⁾	3%	54%	29%	14%
Laboratory Services ⁽¹⁾	3%	54%	29%	14%
Debt Service	0%	60%	31%	9%
Cogeneration			50%	50%
Capital Project Service ⁽¹⁾	3%	54%	29%	14%
Capital in O&M Budget	4%	72%	16%	7%
Plant Expansion Engineering Support		44%	39%	17%

Notes:

- 1) Percentage based on weighted average for all other allocated costs.
- 2) Cost category allocations shown in this table may not add to 100% due to rounding for presentation purposes.

6.2.5 Operations and Maintenance Expenditures

The revenue requirement analysis uses the City's FY 2013/14 budgets as the basis for forecasting future Operations and Maintenance (O&M) expenditures. O&M expenditures are assumed to increase commensurate with cost inflation and projected cost increases associated with increases in wastewater flows due to growth and higher treatment standards.

Revenues and expenses are projected for future fiscal years using the following annual escalation factors:

- General Cost Inflation: 3 percent.
- Capital Cost Inflation: 5 percent.

- Customer Demand Growth: 0.98 percent.
- Operating Fund Earnings: 1 percent.
- 2009 Bonds Reserve Fund Earnings: 1.75 percent.
- Labor Cost Inflation: 5 percent.
- One-time Expenditure/Revenue: 0 percent.
- Customer Growth + General Inflation: 4 percent.

6.2.5.1 Membrane Bioreactor Process O&M Costs

The ongoing RWQCP Rehabilitation project will convert a portion of the secondary treatment process from activated sludge to a membrane bioreactor (MBR) process. The MBR process is expected to increase O&M costs due primarily to increases in energy usage for scour air and filtrate pumping, and periodic membrane replacement. The MBR process should not require additional staff.

Treatment costs have been projected assuming that the MBR process comes online in FY 2015/16 and that it will treat 50 percent of total plant flow. The process is expected to increase treatment costs by \$126.54 per million gallons (MG) treated. The total annual increase in treatment costs related to the MBR process in FY 2015/16 is projected to be \$725,000.

6.2.5.2 Overall O&M Increases

Since FY 2009/10 Total O&M expenditures have increased at an average rate of 3.8 percent per year. Future total O&M expenditures are projected to increase at an average of 4.1 percent per year for all fiscal years with the exception of FY 2015/16. O&M expenditures will increase 6.4 percent in FY 2015/16 due to the MBR process coming online. **Figure 6-1** illustrates historical and projected O&M expenditures. A detailed table of the O&M cost projection as developed for this study is included as **Appendix C**.

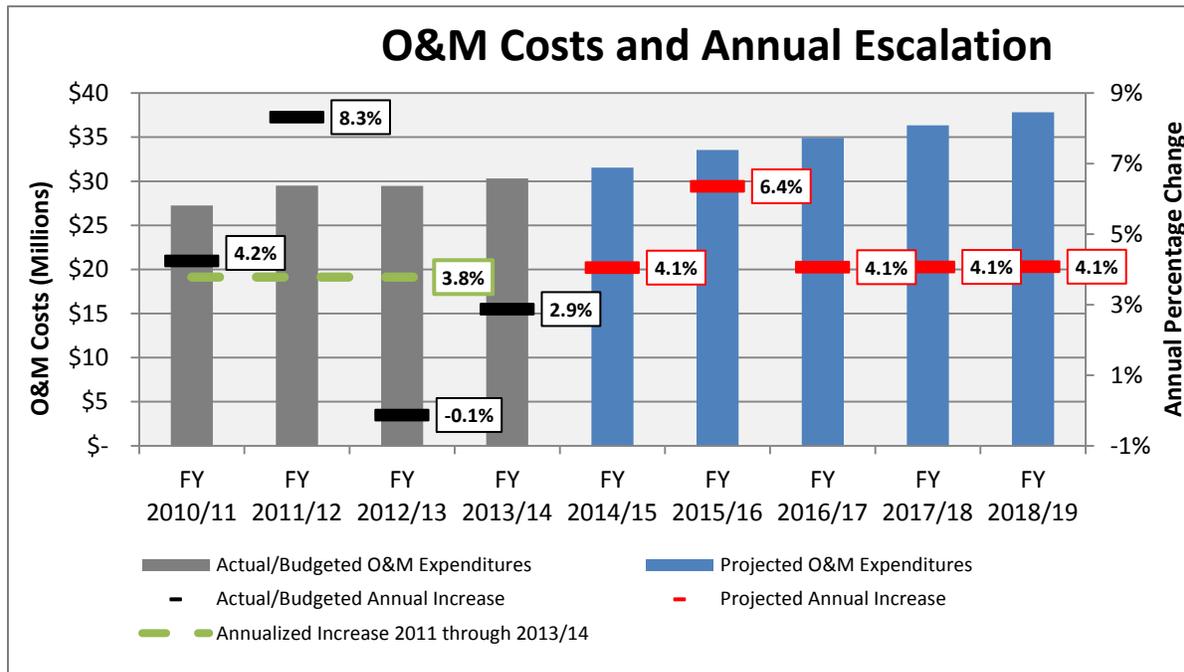
6.2.6 Existing Financial Information

The background financial information included within this study was provided by the City and included existing debt service and future payments, current fund balances, operating fund reserve requirements, and other miscellaneous financial information.

6.2.6.1 Debt Coverage Requirements

The 2009 AB Bonds Official statement outlines two debt coverage factors that must be met or exceeded by the City. The two coverage factors are calculated using the Revenue Only Coverage Test and the Rate Stabilization coverage Test. Failure to meet the coverage requirements outlined in the 2009 AB Bonds Official Statement could result in a downgrade of the City's credit rating and/or legal action against the City.

**Figure 6-1
Historical and Projected Operations and Maintenance Costs**



The required Revenue Only coverage factor is 1.0 x. The coverage factor requires the City to collect sufficient funds through user rates to meet all ongoing operational and maintenance expenses, as well as the annual debt service requirements due during the year.

The required Rate Stabilization Fund coverage factor is 1.25 x. The Rate Stabilization Fund Coverage Test requires the City to set aside money in the Rate Stabilization fund such that the sum of the Rate Stabilization Fund Balance and rate revenues meet all ongoing operational and maintenance expenses, as well as 1.25 times the annual debt service requirements due in a year. The amount of money held in the Rate Stabilization fund is adjusted annually to hold the Rate Stabilization Coverage Factor at 1.25 x.

6.2.6.2 Minimum Operating Reserve

Operating reserves are often expressed as the number of days of operating expenses able to be covered by the funds held in reserve. Operating expenses include all ongoing O&M expenditures associated with normal operation of the sewer collection and treatment system, debt service for all debt obligations, and capital included in the O&M budget. The City has typically kept operating reserves ranging from 180 to 365 days, approximately \$35 million. For

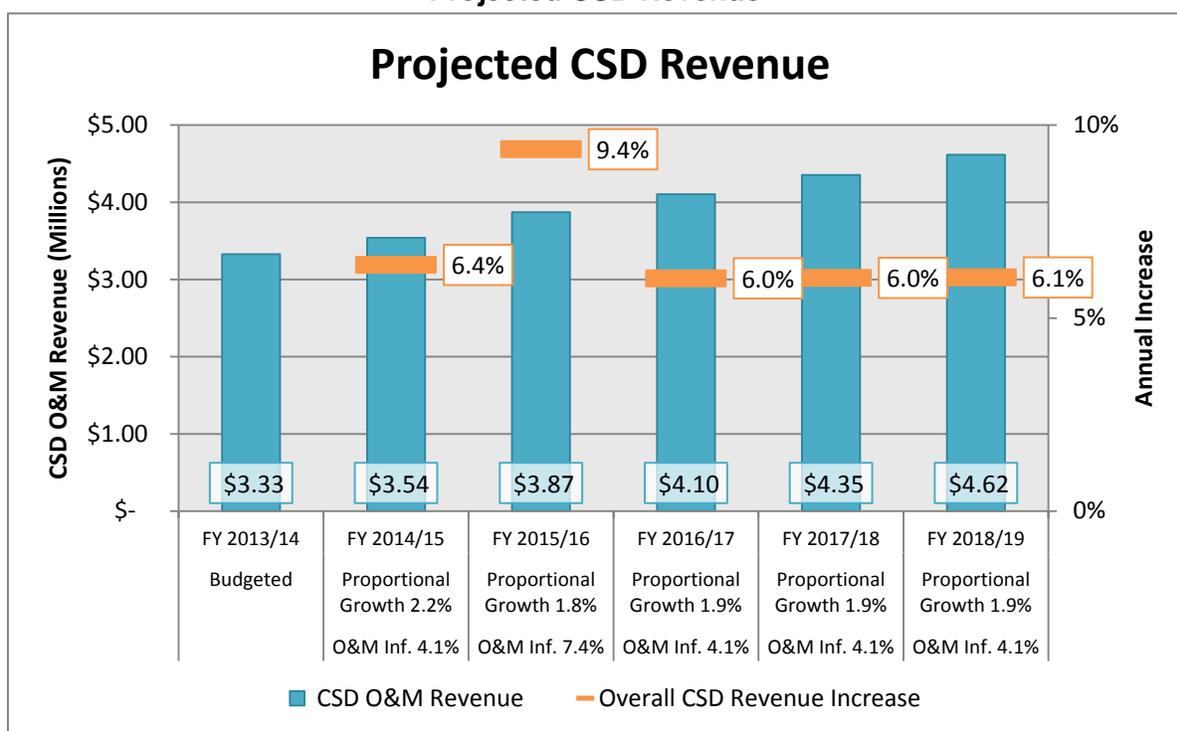
modeling purposes, the minimum operating reserve has been set at 183 days (6 months) of operating and debt service expenditures.³

Currently, the City does not have an officially mandated minimum operating reserve for the Sewer Department. We recommend that the City adopt an official operating reserve policy with the minimum reserve set at 183 days (6 months) of operating expense, including ongoing O&M expenditures and debt service. Doing so will provide for the continuation of the department's responsible management practices and help to secure favorable credit ratings.

6.2.7 Community Service District Payments

Community Service District (CSD) O&M revenues are projected based on the weighted average increase of CSD allocated O&M costs and projected annual increase in proportional flow from the CSD's. Projected revenues and annual revenue increases for the CSD's are presented in Figure 6-2.⁴

Figure 6-2
Projected CSD Revenue⁴



³ Credit rating agencies often evaluate days of cash on hand based on operating expenditures excluding debt service obligations.

⁴ FY 2013/14 CSD revenue is based on the City's FY 2013/14 approved budget. Proportional growth represents the annual change in the share of total RWQCP influent from the CSD's based on the flow projections discussed in Chapter 1.

6.2.8 Outstanding Debt Obligations

The City's outstanding debt totals over \$230 million in remaining principal. Total payments on outstanding debt with interest are projected to be approximately \$399 million. **Table 6-7** outlines the City's outstanding debt obligations.

Table 6-7
Outstanding Debt and Certificates of Participation (\$ Millions)

	Principal Remaining	Projected Interest	Treasury Credit	Total Remaining	Maturity
SRF Loans - Headworks Project	\$2.27	\$0.12	N/A	\$2.4	FY 2018/19
SRF Loans - Cogen Project	2.52	0.19	N/A	2.7	FY 2021/22
2009 A&B Bonds	227.12	231.35	-74.58	383.9	FY 2039/40
Pension Obligation Bonds				9.9	FY 2044/45
Total Remaining				\$398.9	

6.3 REVENUE REQUIREMENT ANALYSIS

6.3.1 Introduction

The adequacy of the existing rate structure can be measured by comparing revenue requirement projections against revenue projections under existing rates. If revenue projections under existing rates do not meet forecasted requirements, rates need to be adjusted.

There are two sufficiency tests utilized to define the necessary annual revenues: the (1) cash flow and (2) debt coverage tests. These sufficiency tests are commonly used to determine the amount of annual revenue that must be generated from an agency's rates.

1. **Cash Flow Test:** A utility must generate annual utility revenues adequate to meet general cash needs.

The cash flow test identifies projected cash requirements in each given year. Cash requirements include operations and maintenance expenses, debt service payments, replacement funding, additions to fund balances, and rate funded capital expenditures. These expenses are compared to total annual projected revenues. Revenues that are available to meet this requirement include user rate revenue, interest earnings, non-operating revenues and miscellaneous revenues. Shortfalls are then used to estimate needed rate increases.

2. **Bond Coverage Test:** Annual rate revenues must satisfy debt coverage obligations.

The bond coverage test measures the ability of a utility to meet both legal and policy-driven revenue obligations. The City is required to collect sufficient funds through user rates to meet all ongoing operational and maintenance expenses, as well as 1.0 times the

annual debt service requirements due in a year. Additionally, the City must maintain the Rate Stabilization Fund at a level such that the sum of the Rate Stabilization Fund balance and funds collected through user rates is equal to all ongoing operational and maintenance expenses, as well as 1.25 times the annual debt service requirements due in a year. Funds may be deposited into the Rate Stabilization Fund as necessary to achieve the coverage requirement.

Revenues must be sufficient to satisfy both tests. If revenues are found to be deficient through one or both of the tests, then the greater deficiency (shortfall) drives the rate increase.

The revenue requirement analysis has two main purposes. It serves as a means of evaluating each cost center's fiscal health and adequacy of current rate levels, and it sets the basis for near-term and long-term rate planning. The analysis is derived of five major components: Operations and Maintenance (O&M), Capital Funding, Annual Debt Service, Policy Requirements & Coverage, and Offsetting Revenues.

Table 6-8 summarizes the results of the revenue requirement analysis. It is referred to throughout Section 6.3.

6.3.2 Operations and Maintenance

The City's FY 2013/14 budget was used as the basis for projection of Operations and Maintenance expenditures. Additional expenditures related to the MBR process are expected beginning in FY 2015/16. Budgeted O&M expenditures for FY 2013/14 are approximately \$30.5 million. Annual O&M expenditures are expected to increase to \$37.8 million by the end of the study period in FY 2018/19. Projected O&M expenditures are shown in Line 5 of Table 6-8.

6.3.3 Capital Funding

The developed CIP is projected to total \$222 million (escalated) in future RWQCP treatment and collection system capital improvements over the five-year study period. An additional \$17.8 (escalated) million is projected in the O&M capital expenditures. Finally, \$53 million in capital expenditures from FY 2013/14 will be reimbursed with the Phase II Bond. The City expects to fund these improvements predominantly through the use of revenue bonds, with lower levels of funding from sewer revenues and reserve funds.

6.3.3.1 Cash Funded Capital

Capital expenditures that have been projected as part of the O&M budget (the Sewer Projects category) will be funded with cash, directly from user rates or from reserves. Over the study period, \$17.8 million (escalated) in capital expenditures will be cash funded.

Annual levels of cash spending for plant and collections system projects are escalated each year by a 5 percent capital cost inflation factor. Plant and collections system expenditures increase from \$3.0 million in FY 2014/15 to \$3.7 million in FY 2018/19. Additional cash funded

capital expenditures of \$1.2 million are included in FY 2017/18 for the Integrated Master Plan and I&I Study. Annual cash funded capital expenditures are shown in Line 8 of Table 6-8.

6.3.3.2 Debt Funded Capital

Based on the analysis of the City's finances, the City will need to rely on the issuance of new debt to fund the majority of its capital expenditures. Projected debt issuances have been provided by Wells Fargo and have been sized such that all projects in the developed CIP are debt funded. Three debt issuances will be required to fund CIP projects in the next five years. The Phase II bonds will be issued in 2014, the Phase III bonds will be split into two issuances in 2016 and 2018.

The Phase II bonds have been sized to provide \$140 million in proceeds in May 2014. The primary use of the Phase II Bonds will be to pay for the remainder of the ongoing plant Rehabilitation project, which is estimated to be \$128.5 million, \$44 million of which is expected to be used to refund FY 2013/14 expenditures. The remaining proceeds will be used to reimburse some FY 2013/14 capital projects (\$9 million), and to fund the CIP for FY 2014/15 (\$1 million). A small amount of proceeds will be available to fund a portion of CIP expenses in FY 2015/16 (\$1.5 million).

Projected debt service for the Phase II Bonds is based on Scenario D of Wells Fargo's analysis (**Appendix D**). Scenario D assumes an amortization period of 25 years and 36 months of capitalized interest for the Phase II bonds.

The Phase III bonds have been split into two issuances, each sized to provide \$68 million. The first issuance is assumed to take place in May 2016, the second in May 2018. The Phase III Bonds will be to pay for CIP expenditures for FY 2015/16 through FY 2018/19.

Projected debt service for the Phase III Bonds is based on Scenario D of Wells Fargo's analysis (**Appendix D**). Scenario D assumes an amortization period of 30 years and 36 months of capitalized interest for the Phase III bonds.

Table 6-8
Revenue Requirements Summary (All monetary values are presented in millions of dollars)

Line Item		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
1	Proposed Rate Increase	7.50%	8.50%	8.50%	8.50%	8.50%	8.50%
2	Rate Revenue After Rate Increase	\$42.03	\$46.05	\$50.45	\$55.28	\$60.56	\$66.36
3	Offsetting Revenues	<u>5.98</u>	<u>5.98</u>	<u>6.42</u>	<u>6.8</u>	<u>7.24</u>	<u>7.63</u>
4	Total Revenues After Rate Increase	\$48.01	\$52.03	\$56.88	\$62.08	\$67.80	\$73.98
5	Less O&M Expenditures	\$30.45	\$31.68	\$33.69	\$35.06	\$36.48	\$37.97
6	Less Debt Service	<u>18.52</u>	<u>18.88</u>	<u>18.88</u>	<u>18.89</u>	<u>28.36</u>	<u>30.28</u>
7	Revenue Available for Cash Funded Sewer Projects	(\$0.96)	\$1.47	\$4.31	\$8.13	\$2.96	\$5.73
8	Less Cash Funded Sewer Projects	<u>\$0.00</u>	<u>\$3.02</u>	<u>\$3.17</u>	<u>\$3.33</u>	<u>\$4.65</u>	<u>\$3.67</u>
9	Available for Capital or (Use of Reserves)	(\$0.96)	(\$1.55)	\$1.14	\$4.81	(\$1.69)	\$2.07
10	Coverage w/o Rate Stabilization Fund	0.95 x	1.08 x	1.23 x	1.43 x	1.10 x	1.19 x
11	Coverage with Rate Stabilization Fund	1.25 x	1.25 x	1.25 x	1.43 x	1.25 x	1.25 x
12	Operating Fund Balance	\$31.96	\$32.75	\$36.73	\$41.94	\$36.12	\$40.48
13	Rate Stabilization Fund Balance	<u>5.59</u>	<u>3.25</u>	<u>0.41</u>	<u>0</u>	<u>4.13</u>	<u>1.84</u>
14	Combined Operating Reserve	\$37.54	\$36.00	\$37.14	\$41.94	\$40.25	\$42.32
15	Days in Reserve (O&M and Debt Service)	280 Days	245 Days	243 Days	267 Days	211 Days	215 Days
16	Days of O&M Expenses	450 Days	379 Days	368 Days	399 Days	357 Days	371 Days

6.3.4 Annual Debt Service

Annual debt service for the City's outstanding debt obligations is approximately \$19 million. Debt service payments for the Phase II bonds are expected to begin in FY 2017/18 and will increase annual payments to \$28.5 million in that year, and to \$30.4 million in FY 2018/19. After that time, debt service will decrease annually until FY 2021/22 as the SRF loans reach maturity, and debt service on the 2009 bonds decreases. Annual debt service payments are expected to increase beginning in FY 2022/23 as much of the CIP for years beyond the study period will require additional debt issuances. Annual debt service is shown in Line 6 of Table 6-8.

6.3.5 Policy Requirements

6.3.5.1 Debt Coverage

As discussed in Section 0, the City must meet the revenue only debt coverage requirement of 1.0 x and the Rate Stabilization Fund coverage requirement of 1.25 x. The analysis assumes that all new debt issuances are on par with the City's existing debt obligations, and are therefore subject to the same coverage requirements. The Rate Stabilization Fund balance is adjusted annually to meet the coverage requirement. Over the study period, the balance ranges from \$0 to \$4.1 million. Coverage factors and the Rate Stabilization Fund balance are shown in lines 10, 11, and 13 of Table 6-8, respectively.

6.3.5.2 Operating Reserves

As discussed in Section 6.2.6.2, the minimum operating reserve has been set at 183 days (6 months). The financial forecast projects a net increase in the operating reserve of \$4.8 million over the study period from \$37.5 million in FY 2013/14 to \$42.3 million in FY 2018/19. Reserve funds will be used to pay for cash funded capital projects. The projected operating reserve balance is shown in line 14 of Table 6-8.

6.3.6 Offsetting Revenues

Revenues from sources other than user rates are used to offset the amount of funds that must be contributed from user rates. For FY 2014/15 (the first year of the study period) the sum of offsetting revenues is approximately \$6 million. By FY 2018/19 offsetting revenues are projected to reach \$7.6 million. The sources of offsetting revenues are described below.

1. **CSD Operations and Maintenance Revenues**

CSD O&M payments are the City's largest source of offsetting revenues. Based on the assumptions discussed in Section 7, CSD revenues are expected to increase from \$3.5 million in FY 2014/15 to \$4.9 million in FY 2018/19.

2. **Capacity Fees**

Capacity Fee revenues include charges from new In-City customers. Capacity Fee revenues are projected to increase from \$1.0 million in FY 2014/15 to \$1.2 million in FY

2018/19. This revenue projection is designed to be conservative and assumes an annual new capacity growth rate of approximately 0.2%.

3. Use of Money and Property

Revenues in the Use of Money and Property category are the interest earnings on the reserve funds held by the City. At the direction of City staff, this analysis assumes fund earnings of 1 percent on the operating reserve and 1.75 percent on the 2009 AB bonds debt service reserve fund. Total revenues from use of money and property are projected to be approximately \$0.7 million per year.

The City also counts earned interest on unused bond proceeds as Use of Money and Property Revenues. Wells Fargo has provided projected levels of interest earnings on bond proceeds based on the capital funding strategy. However, this analysis does not account for those earnings in the annual revenue and bond coverage forecast due to the unpredictability of actual CIP timing and near-term expenditure rates. Relying on these revenues to meet bond coverage requirements could place the City at risk of not meeting its legal obligations if the CIP expenditure rate varies from the preliminary projections.

4. Other Revenues

The City also earns small amounts of revenue through a variety of other fees and charges. Other revenues are projected to increase from \$640 thousand in FY 2014/15 to \$770 thousand in FY 2018/19.

6.3.7 Revenue Requirement Results

The results of the revenue requirements are summarized in Table 6-8. Annual rate increases are shown on a percentage basis. A table showing the results of the revenue requirement analysis in greater detail is included in **Appendix E**.

6.3.7.1 Rate Increases and Key Drivers

Based on the current financial projection, annual rate revenue increases of 8.5 percent are required in each year of the study period in order to meet financial requirements. The key driver of required rate increases is the onset of debt service payments for the Phase II bonds, which begin in FY 2017/18. At that time, total annual debt service will increase approximately \$9.5 million to \$28.4 million. The proposed annual rate increases provide the ramp up in revenue necessary to meet cash flow and revenue only coverage requirements in FY 2017/18.

6.3.7.2 Long-term Rate Outlook

Due to continued CIP spending and the onset of Phase III bonds debt service, annual rate increases above inflationary levels will likely be required in the years following the study period. Cash flow and revenue only coverage requirements will continue to be the main drivers of these rate increases. Based on current assumptions, it is likely that rate increases for FY 2019/20 through FY 2023/24 will need to be within the range of 5.0 to 7.5 percent.

6.3.7.3 CSD Litigation

The City has sued the CSDs over the issue of capital replacement costs. While the City is confident that the litigation will be resolved favorably to the City, to provide the most conservative fiscal analysis, this rate study assumes no future capital contribution from the CSDs. Following resolution of the litigation, capital contributions from the CSDs will allow the City to offset rate increases to In-City customers, or cash fund a portion of the treatment plant CIP projects, slightly lowering the Phase III bonds issuances.

6.4 COST OF SERVICE ANALYSIS

6.4.1 Introduction

The purpose of a cost-of-service (COS) analysis is to provide a rational basis for distributing the full costs of wastewater service to each customer in proportion to the demands they place on the system. The COS analysis yields an appropriate method for allocating costs, which could be continued into the future until substantial changes in cost drivers or customer flow or loading patterns occur.

The City's existing rate structure was developed in 2008 using the cost of service methods and principals discussed in this report. This study revisits the cost of service calculation based on the current conditions affecting the operations of the sewer department. While the City made some changes to the 2008 recommendations, the results of the updated calculations and rates are generally consistent with the 2008 recommendations and findings.

Using a COS analysis, user rates are developed to allocate operations and maintenance, debt service, and rehabilitation and replacement costs to system users. Allocating costs begins by developing unit costs for each billable constituent: pumping, flow, BOD, and TSS. Unit costs are then applied to the flow and loading of each customer category in order to allocate the costs to each customer. The City's current rate structure was developed using a COS analysis. The overall procedure used to develop the user rates is as follows:

- **Revenue Needs:**
Define the annual revenue that must be recovered from user rates and permit users.
- **Functional Allocation:**
Determine the percentage allocation of O&M and capital costs to the billable constituents: pumping, flow, BOD, and TSS.
- **Unit Costs:**
Develop unit costs for each billable constituent by dividing the total cost allocated to that constituent by the total wastewater flow or loadings of that constituent.
- **Customer Category Rates:**

Assign costs to customer categories based on usage, then develop rates for each customer category.

Community Services Districts. These revenues are assumed to reduce the amount of revenue that the City is required to collect through inside City user rates.

Residential and Commercial Customers. The user rates for residential and commercial categories are based on each category's respective flow and loading strength. The estimated flow and loading levels are based on the City's sampling program.

Industrial Customers. The City charges industrial user rates to customers discharging high-strength or high-volume wastes into the sewer system. Customers subject to industrial sewer user rates are billed directly by the City. The fee charged to each customer is based on the customer's flow, and the concentration of BOD, and TSS.

6.4.2 Revenue Needs

The revenue needs are defined as the amount of revenues that must be recovered through user rates and industrial user rates in order to cover annual expenditures less any offsetting revenues.

Expenditures and offsetting revenues for FY 2014/15 are shown in **Table 6-9**. In FY 2014/15, \$46.05 million must be recovered through sewer service charges to cover the City's annual expenditures.

Table 6-9
Expenditures and Off-Setting Revenues

Expenditure or Revenue Category	FY 2014/15
<i>Ongoing Operating Expenses</i>	
Operating Expenses	\$ 31,678,539
<i>Other Operating Expenses</i>	
Debt Service	\$ 18,876,186
Rate Funded Capital Improvements	3,018,750
Additions to/use of reserves	(1,546,167)
Less Offsetting Revenues	
Over/Under Collection of Rates	\$ -
Other	(666,366)
Capacity Fees	(1,041,984)
CSD O&M Revenue	(3,539,632)
Use of Money and Property	(730,434)
Total Revenue Needs	\$ 46,048,892

6.4.3 Functional Allocation

The functional allocation assigns the annual revenue requirement for a select base year by major function. Wastewater unit cost rates are developed based on the total system costs to be collected through user rates, and their allocation to Pumping, Flow, BOD, and TSS. A unit cost is developed for each component and customers are charged based on their specific characteristics.

The Wastewater Utility's budget was analyzed line-item by line-item and expenditures were distributed between the following billable constituents:

Pumping: costs are those operating costs incurred by the wastewater system that are incurred based on the volumetric quantity of wastewater that must be pumped. These costs include the energy, personnel, materials, and equipment costs associated with the operation and maintenance of the City's pump stations and force mains.

Flow: costs are those operating costs incurred by the wastewater system that are incurred based on the volumetric quantity of wastewater that is collected and treated.

BOD₅: costs represent those operating costs incurred based on the Five Day Biochemical Oxygen Demand of influent wastewater. The BOD₅ is used as a measure of the amount of microbial life and other organic matter that must be removed from the wastewater prior to disposal. Unit costs for BOD₅ are developed on a per pound basis.

TSS: costs represent those operating costs incurred based on the Total Suspended Solids of influent wastewater. The TSS of influent wastewater is used as a measure of the amount of solid particulate matter that must be removed from the wastewater prior to disposal. Unit costs for TSS are developed on a per pound basis.

Table 6-10 presents a summary of the allocation percentage basis:

Table 6-10
Functional Allocation Summary

Cost Category	Pumping	Flow	BOD	TSS
Treatment Plant Costs	0%	44%	39%	17%
Collection System Costs	14%	86%	0%	0%
Cogen Costs	0%	0%	50%	50%
Cash Funded Capital	4%	72%	16%	7%
Weighted Average of Assignable O&M Costs	3%	54%	29%	14%
Debt Service (Fixed Asset Basis)	0%	60%	31%	9%

Notes:

- 1) Cost category allocations shown in this table may not add to 100% due to rounding for presentation purposes

Table 6-11 illustrates how expenditures and offsetting revenues are allocated to the billable constituents of pumping, flow, BOD, and TSS based on the allocation percentage listed above.

**Table 6-11
Functional Allocation of Costs**

Expenditure or Revenue Category	Pumping	Flow	BOD	TSS
<i>Ongoing Operating Expenses</i>				
Operating Expenses	3%	54%	29%	14%
<i>Other Operating Expenses</i>				
Debt Service	0%	60%	31%	9%
Rate Funded Capital Improvements	4%	72%	16%	7%
Additions to/use of Reserves for Capital	4%	72%	16%	7%
Less Offsetting Revenues				
Over/Under Collection of Rates	2%	56%	30%	12%
Other	2%	56%	30%	12%
Connection Fees	2%	56%	30%	12%
CSD O&M Revenue	2%	56%	30%	12%
Use of Money and Property	2%	56%	30%	12%

Using the functional percentages from Table 6-11, the revenue needs (Line 2 of Table 6-8) are allocated to each billable constituent. The overall revenue allocation and allocated revenue needs for FY 2014/15 are shown in **Table 6-12**. The overall allocation of revenue needs calculated for this study closely matches the overall allocation that was used to develop the City's current rate structure in 2009, indicating that structural shifts in the costs of the sewer system have not occurred.

Based on the proximity of the 2014 functional allocation percentages to those used to develop the current rate structure, indication from City staff that no significant cost shifts are expected, and the best available flow and loading data, it is reasonable to continue using the current cost of service rate structure. Unit costs for each of the billable constituents will remain consistent.

**Table 6-12
Allocated Revenue Needs**

	Pumping	Flow	BOD	TSS
Allocation Percentage	2%	56%	30%	12%
Allocated Costs	\$979,127	\$25,823,946	\$13,686,636	\$5,559,182
2008 Allocation Percentage (For Reference)	3%	52%	30%	15%

6.4.4 Customer Category User Rates

Single-family and multi-family residential, and basic commercial users are billed a flat monthly user rate. Flow and loading for each account is based on the adjusted EDU definition presented in Table 6-3. Single-family accounts and Basic Commercial accounts are assigned an EDU factor of 1.0. Multi-family accounts are assigned an EDU factor of 0.9

Non-residential users are billed a user rate per hundred cubic feet of water consumption each month. Each customer category is assigned a unique volumetric rate designed to account for category specific loading and return to sewer assumptions.

The City's industrial users, also known as special billing customers, are charged individually based on the measured quantity of each of the billable constituents. The calculation of the total charge is based on the user's flows and loads. The City bills its industrial customers based on its Chemical Oxygen Demand (COD), rather Biochemical Oxygen Demand (BOD). The amount of COD is assumed to be equal to two times the amount of BOD.

Table 6-13 lists the customer categories that are charged a flat monthly user rate and **Table 6-14** lists the customer categories that are charged a rate per unit of CCF:

**Table 6-13
 Customer Categories with a Flat Monthly User Rate**

Residential Sewer Rates
Residence on Septic System
Basic Multi-Family Dwelling Unit
Basic Single Family Dwelling Unit
Basic Single Family Dwelling - Pumping
Basic Multi-Family Dwelling Units - Pumping
Commercial Sewer Rates
Basic Commercial
Basic Commercial - Pumping

**Table 6-14
 Customer Categories with a Rate per Unit CCF Charge**

Commercial Rate Structure - Non-Pumping (per CCF)
Department & Retail Stores
Hotels & Motels
Laundromats
Laundries
Markets
Mortuaries
Professional Offices
Repair Shops & Service Stations
Restaurants
Other Commercial
Hospitals
Churches & Halls
Commercial Rate Structure - Non-Pumping (per CCF)
Schools "B"
Other Commercial "A"
Other Commercial "B"
Commercial Rate Structure - Pumping (per CCF)
Department & Retail Stores
Hotels & Motels
Laundromats
Laundries
Markets
Mortuaries
Professional Offices
Repair Shops & Service Stations
Restaurants
Other Commercial
Hospitals
Churches & Halls
Schools "B"
Other Commercial "A"
Other Commercial "B"

6.4.5 Cost of Service Adjustment

Based on the updated functional allocation presented in Section 6.4.3, if implemented in a single year, the calculated cost of service adjustment could result in some rate spikes for certain customer classes. To prevent these rate spikes, the City could phase-in the new rates over the five-year study period. Using the phase-in approach, rate increases for each customer category would vary between 8 percent and 12 percent for each year of the study period.

6.4.6 Maintaining the Existing Rate Structure

An alternative would be to maintain the existing cost of service rate structure by implementing across-the-board rate increases of 8.5%. Because the City's costs have not changed significantly since 2008; the revenues collected under the existing rate structure are in alignment with the updated functional allocation developed for this study; and, because the City allows individual customers to appeal their rates based on individual sampling programs, the City ostensibly may elect to implement this across-the-board increase to all wastewater charges. The across-the-board increase is in rough alignment with the cost of service adjustment presented in the previous paragraph. All customer categories would see equal rate increases for each year of the study period. City staff indicated that if possible, this is the preferred approach. It is highly recommended that the approach be reviewed by the City's Legal Counsel.

6.4.6.1 Comparison of Implementation Strategies

The rate calculations are presented in **Appendix F**. Rates maintaining the existing cost of service rate structure with across-the-board increases were compared to the calculated cost of service rates to determine the feasibility of across-the-board rate increases. The comparison analyzed the total revenue collected under each strategy, the revenue collected by each customer category under each strategy, and additional considerations. The results of the comparison suggest that maintaining the existing rate structure and applying across-the-board rate increases is feasible.

6.4.6.1.1. Additional Considerations

The cost of service analysis performed as part of this study is highly dependent upon the City's flow and loading assumptions, which were originally developed through a sampling process that was last updated in 1990. Since that time, the City has experienced conservation and reductions in the per capita wastewater discharges, which could impact the cost of service allocation if customer class discharges have decreased at disproportional rates.

We have adjusted flow and loadings to match calculated flow and loading to measured levels. However, while best judgment and rate setting principles have been used to perform a mass balance analysis linking the customer usage data with influent flows and loads at the treatment plant, absent updated sampling information, there is no method for discerning whether there have been proportional shifts in loading among customer classes, or if the return to sewer factors need to be adjusted. This is a consistent challenge facing wastewater agencies

throughout California. As a result, and considering the recent and sharp increase in conservation experienced over the past five years, several agencies have recently begun a multi-year flow and strength sampling study in order to validate or update the wastewater loading assumptions. Due to the age of the current flow and loading assumptions and because costs will change with the completion of the wastewater treatment plant upgrades and proposed sewer trunk and collection system work within the next decade, Carollo strongly recommends that the City complete a flow and sampling study to update the customer discharge assumptions prior to the next 5 year rate cycle, which will begin in FY 2019/20.

6.4.7 Proposed User Rates

It is recommended that rate increases be implemented as 8.5 percent across-the-board increases for each year of the study period. **Table 6-15** presents the proposed user rates for each year of the study period. A cost of service adjustment should be completed in the next rate cycle when updated flow and loadings assumptions are available.

6.4.7.1 Rate Comparison

A survey of sewer rates was conducted to compare the City's existing and proposed rates to those of surrounding agencies. Although not all wastewater systems are alike, such comparisons are common. Care should be taken in drawing conclusions from such comparisons as all systems face unique challenges and have developed their rates accordingly. **Figure 6-3**, **Figure 6-4**, and **Figure 6-5** compare the City's existing and proposed rates for single-family, low strength commercial (Professional Offices), and high strength commercial customers (Restaurants).

**Table 6-15
Proposed User Rates - Across-the-Board Rate Increases**

	Proposed Rate Increase		8.50%	8.50%	8.50%	8.50%	8.50%
Rate Code	Description	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
S800	Residence on Septic System	N/A	N/A	N/A	N/A	N/A	N/A
S474	Basic Multi-Family Dwelling Unit	\$25.77	\$27.97	\$30.35	\$32.93	\$35.73	\$38.77
S475	Basic Single Family Dwelling Unit	\$28.55	\$30.98	\$33.62	\$36.48	\$39.59	\$42.96
S590	Basic Single Family Dwelling - Pumping	\$32.97	\$35.78	\$38.83	\$42.14	\$45.73	\$49.62
S591	Basic Multi-Family Dwelling Units - Pumping	\$29.76	\$32.29	\$35.04	\$38.02	\$41.26	\$44.77
S473	Basic Commercial (Flat Rate)	\$28.55	\$30.98	\$33.62	\$36.48	\$39.59	\$42.96
S594	Basic Commercial - Pumping (Flat Rate)	\$32.97	\$35.78	\$38.83	\$42.14	\$45.73	\$49.62
S500	Department & Retail Stores	\$2.05	\$2.23	\$2.42	\$2.63	\$2.86	\$3.11
S501	Hotels & Motels	\$2.50	\$2.72	\$2.96	\$3.22	\$3.50	\$3.80
S502	Laundromats	\$2.43	\$2.64	\$2.87	\$3.12	\$3.39	\$3.68
S503	Laundries	\$3.99	\$4.33	\$4.70	\$5.10	\$5.54	\$6.02
S504	Markets	\$5.37	\$5.83	\$6.33	\$6.87	\$7.46	\$8.10
S505	Mortuaries	\$2.89	\$3.14	\$3.41	\$3.70	\$4.02	\$4.37
S506	Professional Offices	\$1.69	\$1.84	\$2.00	\$2.17	\$2.36	\$2.57
S507	Repair Shops & Service Stations	\$2.94	\$3.19	\$3.47	\$3.77	\$4.10	\$4.45
S508	Restaurants	\$5.50	\$5.97	\$6.48	\$7.04	\$7.64	\$8.29
S509	Other Commercial	\$2.42	\$2.63	\$2.86	\$3.11	\$3.38	\$3.67
S510	Hospitals	\$2.61	\$2.84	\$3.09	\$3.36	\$3.65	\$3.97
S511	Churches & Halls	\$1.32	\$1.44	\$1.57	\$1.71	\$1.86	\$2.02
S514	Schools "B"	\$0.73	\$0.80	\$0.87	\$0.95	\$1.04	\$1.13
S515	Other Commercial "A"	\$1.62	\$1.76	\$1.91	\$2.08	\$2.26	\$2.46
S516	Other Commercial "B"	\$0.81	\$0.88	\$0.96	\$1.05	\$1.14	\$1.24
S525	Department & Retail Stores - Pumping	\$2.43	\$2.64	\$2.87	\$3.12	\$3.39	\$3.68
S526	Hotels & Motels - Pumping	\$2.88	\$3.13	\$3.40	\$3.69	\$4.01	\$4.36
S527	Laundromats - Pumping	\$2.87	\$3.12	\$3.39	\$3.68	\$4.00	\$4.34
S528	Laundries - Pumping	\$4.43	\$4.81	\$5.22	\$5.67	\$6.16	\$6.69
S529	Markets - Pumping	\$5.82	\$6.32	\$6.86	\$7.45	\$8.09	\$8.78
S530	Mortuaries - Pumping	\$3.11	\$3.38	\$3.67	\$3.99	\$4.33	\$4.70
S531	Professional Offices - Pumping	\$2.03	\$2.21	\$2.40	\$2.61	\$2.84	\$3.09
S532	Repair Shops & Service Stations - Pumping	\$3.39	\$3.68	\$4.00	\$4.34	\$4.71	\$5.12
S533	Restaurants - Pumping	\$5.91	\$6.42	\$6.97	\$7.57	\$8.22	\$8.92
S534	Other Commercial - Pumping	\$2.86	\$3.11	\$3.38	\$3.67	\$3.99	\$4.33
S535	Hospitals - Pumping	\$3.03	\$3.29	\$3.57	\$3.88	\$4.21	\$4.57
S536	Churches & Halls - Pumping	\$1.54	\$1.68	\$1.83	\$1.99	\$2.16	\$2.35
S539	Schools "B" - Pumping	\$0.88	\$0.96	\$1.05	\$1.14	\$1.24	\$1.35

	Proposed Rate Increase		8.50%	8.50%	8.50%	8.50%	8.50%
S540	Other Commercial "A" - Pumping	\$1.92	\$2.09	\$2.27	\$2.47	\$2.68	\$2.91
S541	Other Commercial "B" - Pumping	\$0.97	\$1.06	\$1.16	\$1.26	\$1.37	\$1.49
SPE C	Industrial Users - Non Pumping						
	Flow (per ccf)	\$1.76	\$1.91	\$2.07	\$2.25	\$2.44	\$2.65
	COD (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	TSS (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	Industrial Users - Pumping						
	Flow (per ccf)	\$2.34	\$2.54	\$2.76	\$2.99	\$3.24	\$3.52
	COD (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	TSS (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48

Figure 6-3
Single Family (1 EDU) - Monthly Bill Comparison

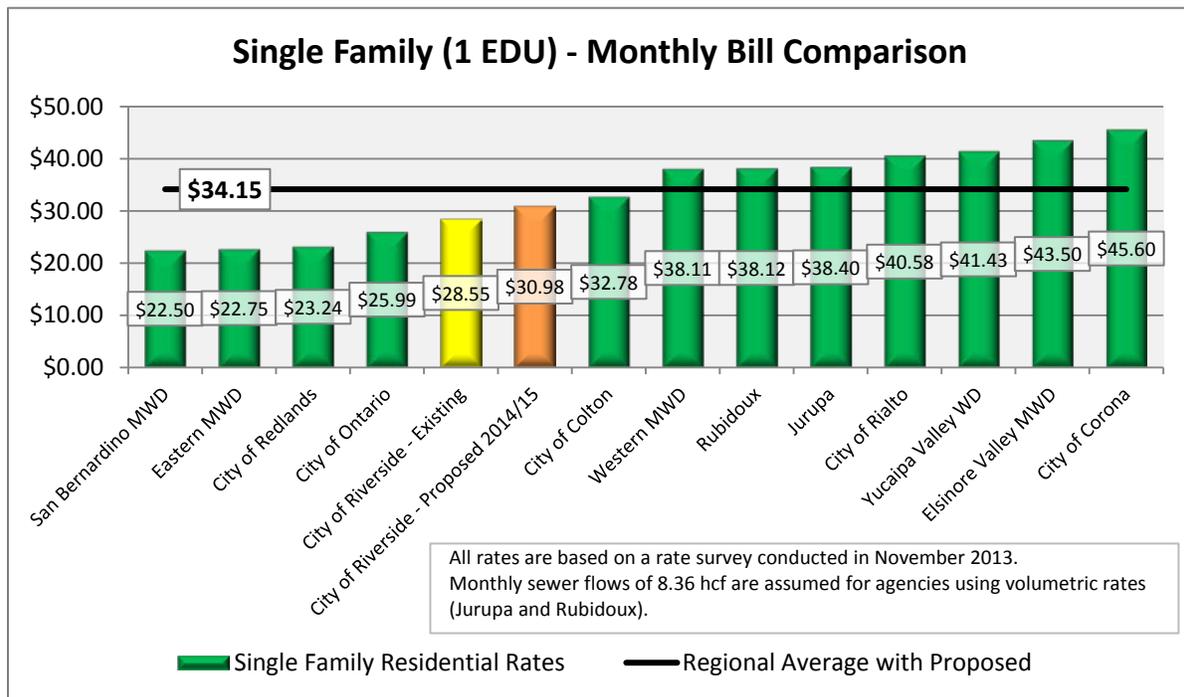


Figure 6-4
Professional Offices (Low Strength Commercial) - Monthly Bill Comparison

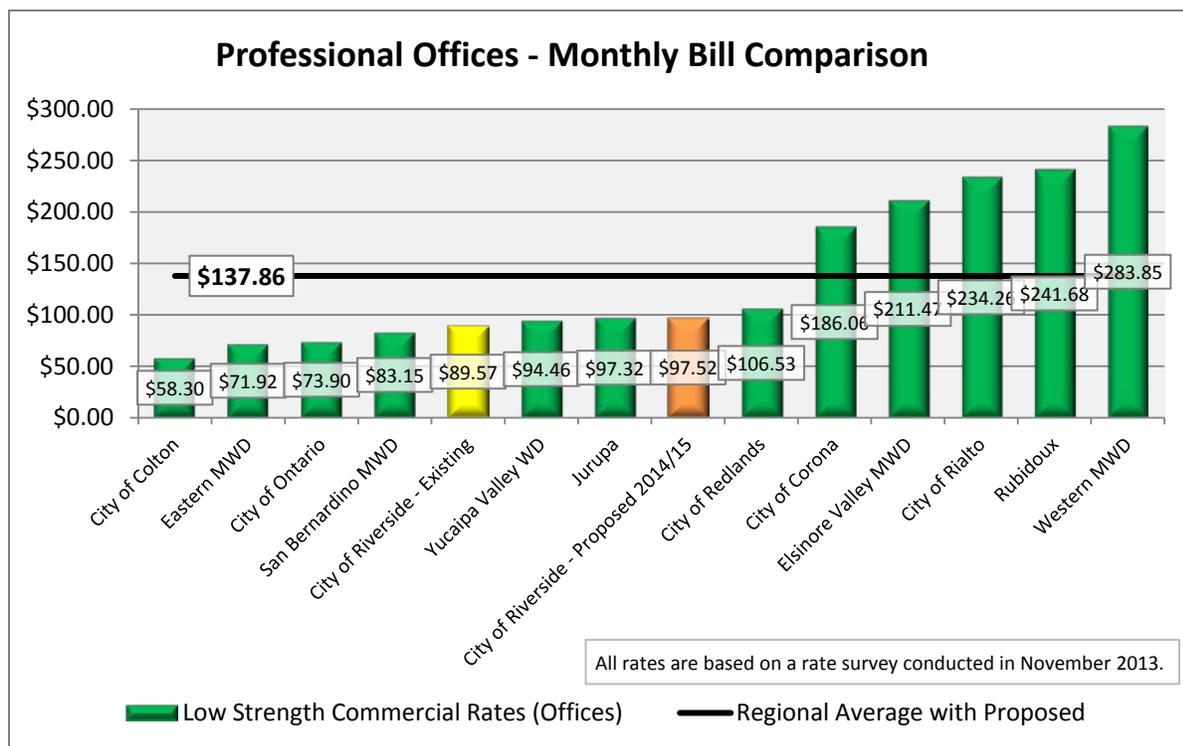
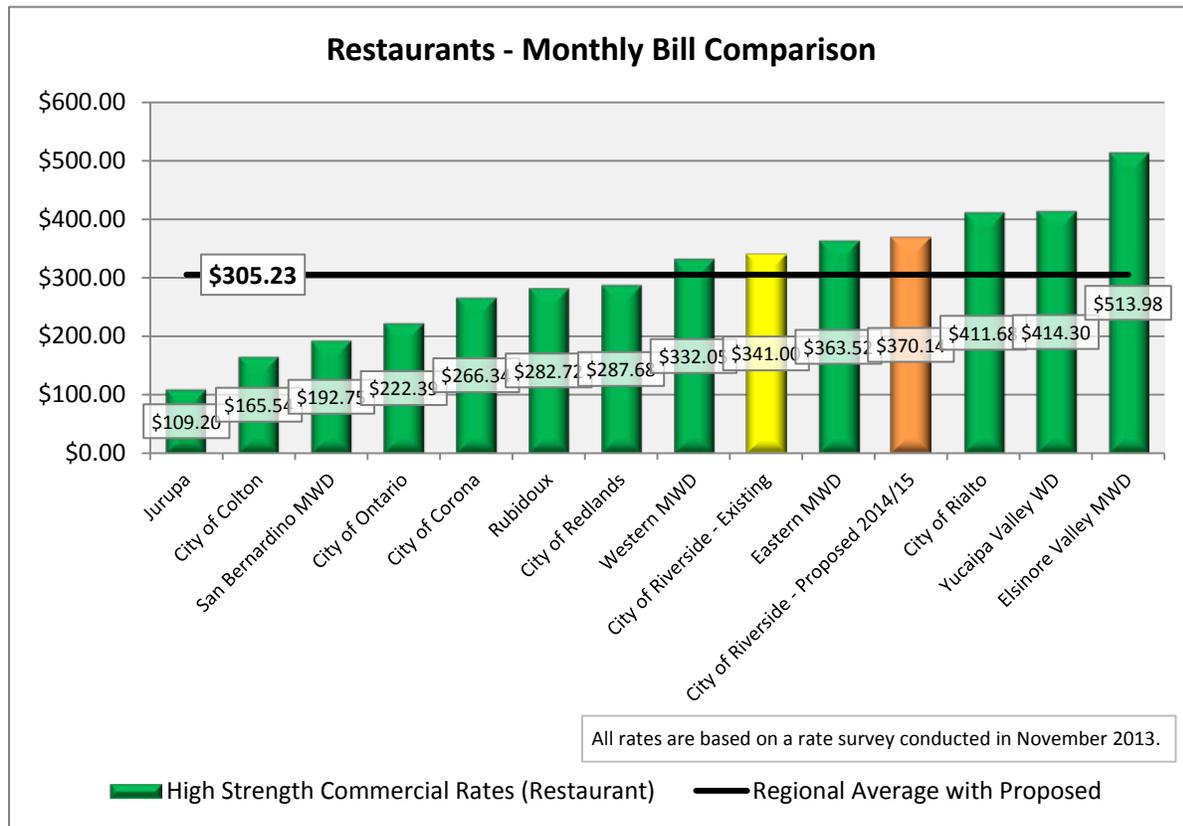


Figure 6-5
Restaurants (High Strength Commercial) - Monthly Bill Comparison



6.5 CAPACITY FEES ANALYSIS

6.5.1 Introduction

Capacity Fees are one-time fees paid at the time property is developed and connected to the Sewer System, or if there is a change in the use of the property. The fees are levied to pay a portion of the City's capital costs and for access to capacity in the Sewer System. Currently, the City has Capacity Fees of \$3,882 per EDU. Residential users pay the capacity fee based on the number of EDU's associated with each new connection. Single-family residential users are charged for one EDU; multifamily residential connections are assigned an EDU factor of 0.9 EDUs per unit. Commercial users are charged a capacity fee per 1,000 square feet of floor space. Each commercial category has a unique capacity fee to account for the specific demand placed on the system by each type of customer. Industrial users pay capacity fees based on the predicted flow and loadings associated with each new connection. Under the current industrial user ordinance, supplemental capacity fees can be imposed on industrial users who place larger than average demands on the Sewer System. Capacity Fees are reviewed annually to reflect the changes in the value of the Sewer System to which a new customer is connecting.

Capacity fees are designed to recover capital costs of providing capacity for new users. They may fund future capacity expansion projects. The underlying premise is to charge each new user the estimated reasonable cost of providing capital facilities necessary to provide sewer service (i.e., require growth to pay for growth). Absent such charges, existing customers would be required to bear the burden of all capital costs, including capacity-related costs, through user rates. Consequently, new customers would receive the benefit of sewer availability, without themselves paying for that capacity.

Similar to the City's sewer user rates, the capacity fee is equal to the capital costs required to support the sewer flows and loadings estimated for an average 3-bedroom single-family residence, or per EDU.

6.5.2 Methodology

The capacity fees, as calculated for this study, evaluate future expansion related capital expenditures only. These costs will be incurred to provide available capacity for new system users. As expressed in the formula below, the capacity fee is calculated by dividing the future expansion CIP costs by the total number of future connections expressed in EDUs.

$$\text{Capacity Fee per EDU} = \frac{\text{Expansion Capital Costs}}{\text{Additional Future EDUs}}$$

6.5.2.1 Approach and Assumptions

The following assumptions were used in calculating the capacity fee:

- Future Facilities:
The cost of future expansion facilities is projected to total \$164.5 million through FY 2035/36. Collection system improvements are assumed to be the responsibility of the inside City users only, excluding any CSD contributions. The CIP used within this analysis represents the City's projected expenditures at this point in time.
- Flow and Load Basis:
The study projects that concentrations of BOD and TSS will continue to increase until FY 2033/34. As such, EDUs for capacity fee calculations use the ultimate BOD and TSS concentration levels. One EDU is assumed to contribute 220 gpd of flow, with a BOD concentration of 378 mg/L and a TSS concentration of 358 mg/L.
- Additional Future EDUs:
The RWQCP is projected to produce an additional capacity of 12 mgd with the City's CIP. This extra capacity will be able to serve 56,587 new EDUs by FY 2035/36. Collections systems improvements will add capacity to serve 23,742 new EDUs by FY 2035/36.

6.5.2.2 Capacity Fee per EDU

Table 6-16 presents the expansion costs divided by the projected number of new EDUs to obtain the capacity fee per EDU.

**Table 6-16
Calculation of Capacity Fee per EDU**

	Total Treatment Costs	Total Collection Costs
Expansion Cost	\$122,488,217	\$41,993,828
=		
New EDUs	56,587	23,742
Component Connection Fee per EDU	\$2,165	\$1,769
Total Connection Fee per EDU	\$3,933	

The total capacity fee charge to inside City new development will total \$3,933 per EDU - \$2,165 for treatment and \$1,769 for collections. The proposed capacity fee represents an increase of 1.32 percent over the existing fee of \$3,882 per EDU.

6.5.2.3 Commercial Capacity Fee Calculation

Commercial capacity fees are assessed based on the type and square footage of each new connection or change in use. Each customer category is assigned an EDUs per 1,000 square feet factor in order develop the category unique capacity charge. The proposed capacity fees retain the existing fee structure and EDU factors. Charges per 1,000 square feet for each customer category have been updated to reflect the proposed charge per EDU.

6.5.2.4 Industrial Capacity Fee Calculation

Capacity fees for industrial users are calculated based on each users anticipated flow, COD, and TSS using the equation shown below. Maximum flow and loadings for the capacity fee calculation are 33.5 ccf per day, 150 lbs COD, and 150 lbs TSS. Industrial capacity fees are calculated using the equation shown below.

$$Capacity\ Fee = \left(\frac{0.55 \times F}{0.29424} + \frac{0.37 \times COD}{0.8350} + \frac{0.08 \times TSS}{0.4751} \right) \times \$/EDU$$

Where:

F = Anticipated flow from the development in ccf per day. (maximum of 33.5 ccf per day)

COD = Anticipated Chemical Oxygen Demand from the development in pounds per day. (maximum of 150 lbs per day)

TSS = Anticipated total Suspended Solids from the development in pounds per day. (maximum of 150 lbs per day)

BOD/COD = 0.5

\$/EDU = \$3,933 for FY 2014/15, adjusted annually by ENR CCI thereafter

ENR CCI = Engineering News Record Construction Cost Index (Los Angeles or 20 City Average)

If a user’s flow and loading exceeds the maximum allowance, the user must pay a monthly supplemental capacity charge based on flow and loadings in excess of the maximum allowance. This charge is to recover the costs to provide the increased collection and treatment facilities needed to carry and treat the additional flow and constituents greater than the maximum used to calculate the Capacity Charge paid at the time of receiving a building permit. Supplemental capacity fees have also been escalated by 1.32 percent to reflect the updated capacity charge. **Table 6-17** presents the supplemental capacity fees for flow, COD and TSS.

**Table 6-17
Supplemental Capacity Fees for Industrial Users**

	Flow	COD	TSS
	(For each 1 CCF/day in excess of 33.5 CCF/day)	(For each 1 lb./day in excess of 150 lbs./day)	(For each 1 lb./day in excess of 150 lbs./day)
Existing Charge	\$1.29	\$0.31	\$0.12
Proposed Charge - FY 2014/15	\$1.31	\$0.31	\$0.12
After FY 2014/15	+ ENR CCI	+ ENR CCI	+ ENR CCI

6.5.3 Proposed Capacity Fees

The proposed capacity fees maintain the incremental cost approach and the City’s existing fee structure. The fees have been updated to reflect the updated CIP and long-term flow and loading growth projections. The proposed capacity fee for FY 2014/15 is \$3,933 per EDU, representing an increase of 1.32 percent over the existing fee of \$3,882 per EDU. The recommended capacity fees for each customer category are presented in **Table 6-18**.

It is recommended that the capacity fee be adjusted annually by the Engineering News Record Construction Cost Index (ENR CCI) for Los Angeles or the 20 City Average. The ENR CCI is based on construction costs and is used as an industry standard for the escalation of capital construction costs. Escalating the capacity fee by the ENR CCI each year accounts for increases in the cost of implementing the CIP. This analysis assumes that the capacity fees will be escalated each year to reflect the current cost of capital projects.

The capacity fees should be reevaluated as part of the next master plan. It is recommended that the City update the EDUs per unit factors for commercial capacity fees as new flow and loading assumptions will be available at that time. Given the level of investment in the system, it may be beneficial to evaluate the use of a hybrid capacity fee (a capacity fee that includes both an incremental and a buy-in portion) at that time.

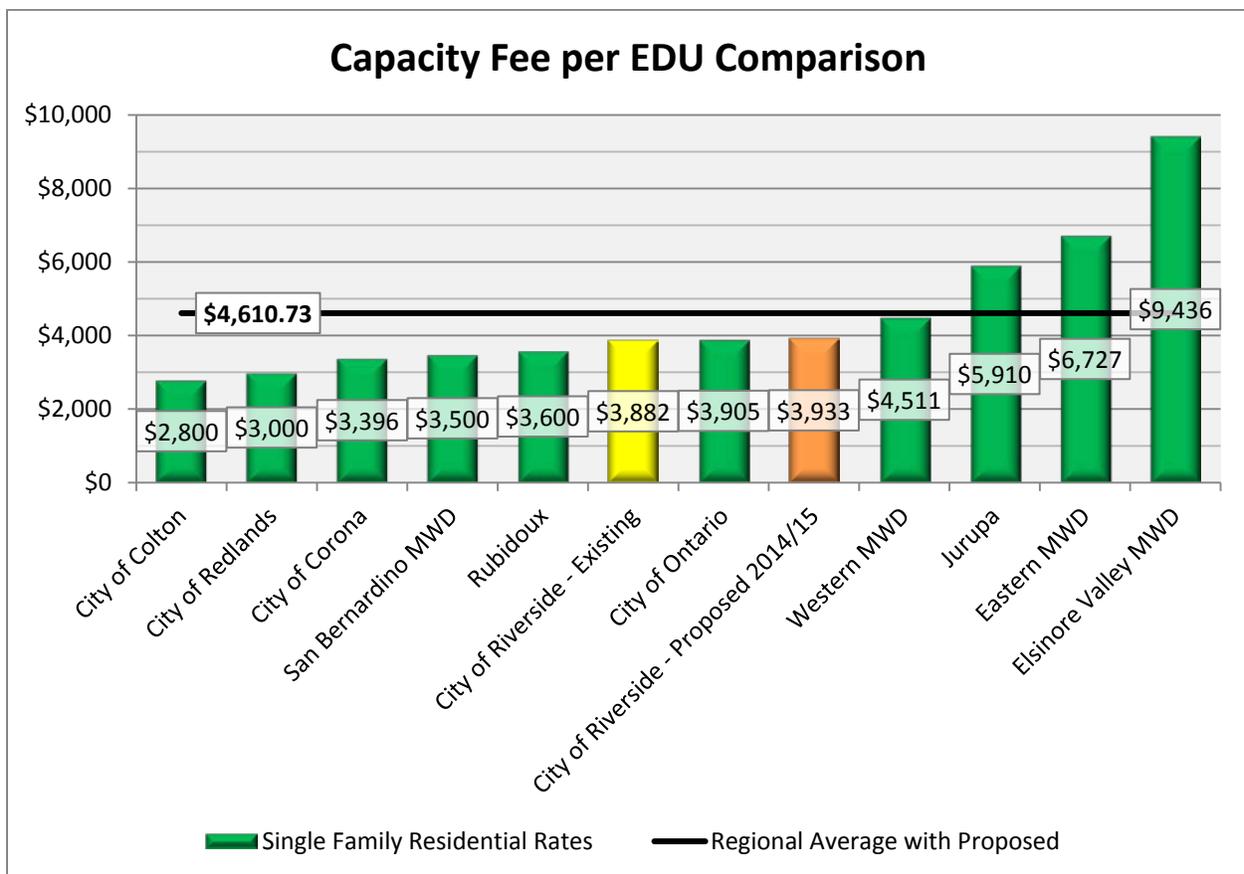
Table 6-18
Flat Rate Customer Categories Loading Assumptions

	Existing	Proposed FY 2014/15	Increase per EDU FY 2014/15					
Capacity Fee per EDU	\$3,882	\$3,933	\$51	1.32%				
Residential Capacity Fees								
Rate Class	Description		Existing Fee per Unit	Fee Effective July 1, 2014	Fee Effective July 1, 2015	Fee Effective July 1, 2016	Fee Effective July 1, 2017	Fee Effective July 1, 2018
S474	Basic Multi-Family Dwelling Unit		\$3,505	\$3,551	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S475	Basic Single Family Dwelling Unit		\$3,882	\$3,933	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S590	Basic Single Family Dwelling - Pumping		\$3,882	\$3,933	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S591	Basic Multi-Family Dwelling Units - Pumping		\$3,505	\$3,551	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
Commercial Capacity Fees								
Rate Class	Description	Units	Existing Fee per Unit	Fee Effective July 1, 2014	Fee Effective July 1, 2015	Fee Effective July 1, 2016	Fee Effective July 1, 2017	Fee Effective July 1, 2018
S473 & S594	Basic Commercial	Unit	\$3,758	\$3,808	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S500 & S525	Department & Retail Stores	1,000 S.F.	\$226	\$229	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S501 & S526	Hotels & Motels (per unit)	Units	\$1,422	\$1,441	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S502 & S527	Laundromats	1,000 S.F.	\$9,678	\$9,806	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S503 & S528	Laundries	1,000 S.F.	\$8,832	\$8,949	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S504 & S529	Markets	1,000 S.F.	\$2,180	\$2,209	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S505 & S530	Mortuaries	1,000 S.F.	\$5,951	\$6,030	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S506 & S531	Professional Offices	1,000 S.F.	\$376	\$381	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S507 & S532	Repair Shops & Service Stations	1,000 S.F.	\$4,260	\$4,316	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S508 & S533	Restaurants	1,000 S.F.	\$9,395	\$9,519	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S509 & S534	Other Commercial	1,000 S.F.	\$626	\$634	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S510 & S535	Hospitals	1,000 S.F.	\$1,549	\$1,569	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S511 & S536	Churches & Halls	1,000 S.F.	\$1,579	\$1,600	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S514 & S539	Schools "B"	1,000 S.F.	\$516	\$523	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S515 & S540	Other Commercial "A"	1,000 S.F.	\$1,629	\$1,651	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
S516 & S541	Other Commercial "B"	1,000 S.F.	\$389	\$394	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
	Warehouse	1,000 S.F.	\$108	\$109	+ ENR CCI	+ ENR CCI	+ ENR CCI	+ ENR CCI
Proposed FY 2014/15 capacity fees for all customer categories represent increase 1.32%.								
ENR CCI - Engineering News Record Construction Cost Index for Los Angeles or 20 City Average								

6.5.4 Capacity Fee Comparison

A capacity fee survey was completed to compare the City’s existing and proposed capacity fee to those of surrounding agencies. Based on the available data, the proposed capacity fee compares favorably to those of neighboring agencies. **Figure 6-6** shows the comparison of capacity fees. Similarly to the comparison of user rates, care should be taken in drawing conclusions from the comparison as each agency has a unique system, and has developed capacity fees accordingly.

Figure 6-6
Comparison of the City’s existing and proposed capacity fee per EDU to those of surrounding agencies.



Appendix A

CUSTOMER FLOW AND LOADINGS FORECAST

Riverside Wastewater Utility
Financial and Rate Model - 2014 Rate Study
Carollo Engineers
Projected Flow and Loadings

FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

Projected Flow and Loadings		FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36
Annual Population Increase,		0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.45%	0.45%	0.45%	0.45%	0.45%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%
Riverside Interpolated Population		313,673	316,747	319,851	322,986	326,151	329,347	332,575	335,834	339,125	340,651	342,184	343,724	345,271	346,825	350,709	354,637	358,609	362,625	366,687	370,794	374,946	379,146	383,392	387,686
Riverside per capita, gpd		75	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77	77
Riverside Flow (MGD)		23.5	24.4	24.6	24.9	25.1	25.4	25.6	25.9	26.1	26.2	26.3	26.5	26.6	26.7	27.0	27.3	27.6	27.9	28.2	28.6	28.9	29.2	29.5	29.9
Jurupa Flow (mgd)		3.28	3.38	3.49	3.59	3.71	3.82	3.94	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Rubidoux Flow (mgd)		1.97	2.07	2.17	2.28	2.39	2.51	2.64	2.77	2.91	3.05	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06
Edgemont Flow (mgd)		0.50	0.51	0.53	0.55	0.56	0.58	0.60	0.62	0.63	0.65	0.67	0.69	0.72	0.74	0.76	0.78	0.81	0.83	0.86	0.88	0.89	0.89	0.89	0.89
Highgrove Flow (mgd)			0.00	0.00	0.10	0.21	0.31	0.42	0.52	0.63	0.73	0.84	0.94	1.05	1.15	1.26	1.36	1.47	1.57	1.68	1.78	1.89	1.99	2.10	2.20
Subtotal CSD's		5.7	6.0	6.2	6.5	6.9	7.2	7.6	7.9	8.2	8.4	8.6	8.7	8.8	8.9	9.1	9.2	9.3	9.5	9.6	9.7	9.8	9.9	10.0	10.1
Combined CSD and Unincorporated Flow Growth			3.7%	3.8%	5.5%	5.3%	5.2%	5.1%	4.2%	3.3%	3.3%	1.5%	1.5%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%	1.1%	1.1%	1.1%	1.0%
Combined CSD Growth Excluding Highgrove				3.8%	3.8%	3.8%	3.8%	3.8%	3.0%	2.1%	2.2%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.1%	0.0%	0.0%	0.0%
CSD's Percent of Total Flow		19.7%	19.6%	20.1%	20.4%	20.8%	21.2%	21.6%	21.9%	22.0%	22.2%	22.1%	22.0%	21.9%	21.9%	21.7%	21.5%	21.3%	21.1%	20.9%	20.7%	20.5%	20.3%	20.1%	19.9%
Change in Proportional Flow			-0.1%	2.2%	1.8%	1.9%	1.9%	1.9%	1.2%	0.6%	1.0%	-0.4%	-0.4%	-0.4%	-0.4%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%	-0.8%	-1.0%	-1.1%	-1.1%	-1.1%
Total Flow (MGD)		29.2	30.4	30.8	31.4	32.0	32.6	33.2	33.8	34.3	34.7	34.9	35.2	35.4	35.7	36.1	36.5	36.9	37.4	37.8	38.3	38.7	39.1	39.6	40.0
			3.85%	1.52%	1.88%	1.88%	1.88%	1.89%	1.71%	1.53%	1.13%	0.71%	0.70%	0.70%	0.70%	1.20%	1.19%	1.19%	1.19%	1.18%	1.18%	1.13%	1.11%	1.10%	1.10%
BOD, mg/L		311	319	326	333	340	347	353	360	366	371	377	382	386	390	394	398	401	404	406	408	409	410	410	410
BOD Conc. Change			2.43%	2.32%	2.21%	2.10%	1.99%	1.88%	1.77%	1.66%	1.55%	1.44%	1.33%	1.22%	1.10%	0.99%	0.88%	0.77%	0.66%	0.55%	0.44%	0.33%	0.22%	0.11%	0.00%
TSS, mg/L		263	269	276	282	288	293	299	304	309	314	318	323	327	330	334	336	339	341	343	345	346	347	347	347
TSS Conc. Change			2.43%	2.32%	2.21%	2.10%	1.99%	1.88%	1.77%	1.66%	1.55%	1.44%	1.33%	1.22%	1.10%	0.99%	0.88%	0.77%	0.66%	0.55%	0.44%	0.33%	0.22%	0.11%	0.00%
BOD Loading, lb/d		75,804	80,635	83,763	87,222	90,727	94,274	97,857	101,288	104,538	107,352	109,665	111,895	114,044	116,105	118,662	121,139	123,528	125,823	128,017	130,103	132,004	133,759	135,385	136,875
TSS Loading, lb/d		64,105	68,189	70,835	73,760	76,724	79,723	82,753	85,655	88,403	90,784	92,739	94,625	96,442	98,185	100,347	102,442	104,463	106,404	108,259	110,022	111,631	113,115	114,489	115,749

Notes and Explanations

In-City Flow and Growth

In-City flow and growth has been projected as discussed in Chapter 1 of the CIP Update and Rate Development Study.

CSD Flow and Growth

Flows from the CSD's are capped at currently own levels of capacity.

Loadings

Loadings concentrations are expected to continue to increase for all customer classes. For the purposes of the rate study, it is assumed that CSD loadings concentrations are equal to the overall concentration plant influent at the headworks.

Flow and Loadings by Customer Category

Flow and loadings for each customer category have been projected based on the overall flow and loading projected for each year and the results of the 2013 mass balance. This projection assumed that flow and loadings from proportionally among all customer categories.

Riverside Wastewater Utility
Financial and Rate Model - 2014 Rate Study
Carollo Engineers
Projected Flow and Loadings

2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036
 FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

CSD and Highgrove Information - Calculated

	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36
BOD lb/day																								
Jurupa	8,505	8,982	9,475	9,985	10,510	11,052	11,608	11,998	12,197	12,386	12,564	12,730	12,885	13,027	13,157	13,273	13,375	13,464	13,538	13,598	13,643	13,673	13,689	13,689
Rubidoux	5,103	5,489	5,897	6,328	6,784	7,265	7,771	8,304	8,864	9,451	9,959	10,488	10,981	11,499	12,008	12,517	13,025	13,532	14,039	14,546	15,053	15,560	16,067	16,574
Edgemont	1,295	1,367	1,441	1,518	1,597	1,678	1,762	1,848	1,936	2,026	2,117	2,211	2,306	2,402	2,500	2,599	2,699	2,800	2,901	3,003	3,036	3,042	3,046	3,046
Highgrove	-	-	-	291	594	909	1,235	1,571	1,917	2,271	2,632	3,001	3,375	3,753	4,135	4,519	4,904	5,289	5,673	6,054	6,432	6,804	7,170	7,529
Total CSD BOD Loading	14,903	15,837	16,813	18,122	19,486	20,904	22,377	23,721	24,913	26,133	26,909	27,664	28,406	29,132	29,840	30,528	31,195	31,837	32,453	33,042	33,531	33,963	34,359	34,718
TSS lb/day																								
Jurupa	7,193	7,596	8,013	8,444	8,888	9,346	9,817	10,146	10,315	10,474	10,624	10,765	10,896	11,016	11,126	11,224	11,311	11,386	11,449	11,499	11,538	11,563	11,576	11,576
Rubidoux	4,316	4,641	4,987	5,352	5,737	6,144	6,572	7,023	7,496	7,992	8,114	8,222	8,322	8,414	8,497	8,573	8,639	8,696	8,744	8,783	8,812	8,831	8,841	8,841
Edgemont	1,095	1,156	1,219	1,283	1,350	1,419	1,490	1,563	1,637	1,713	1,790	1,870	1,950	2,032	2,114	2,198	2,283	2,368	2,454	2,540	2,567	2,573	2,576	2,576
Highgrove	-	-	-	246	503	769	1,045	1,329	1,621	1,920	2,226	2,538	2,854	3,174	3,497	3,822	4,147	4,473	4,798	5,120	5,439	5,754	6,064	6,367
Total CSD TSS Loading	12,603	13,393	14,218	15,325	16,478	17,678	18,923	20,060	21,068	22,100	22,755	23,394	24,022	24,636	25,235	25,817	26,380	26,923	27,444	27,942	28,356	28,721	29,056	29,359

CSD's and Highgrove Growth

Jurupa Growth		3%	3%	3%	3%	3%	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Rubidoux Growth		5%	5%	5%	5%	5%	5%	5%	5%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Edgemont Growth		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	1%	0%	0%	0%
Highgrove Growth					100%	50%	33%	25%	20%	17%	14%	13%	11%	10%	9%	8%	8%	7%	7%	6%	6%	6%	5%	5%

CSD's Percent of Total Flow

Jurupa	11.2%	11.1%	11.3%	11.4%	11.6%	11.7%	11.9%	11.8%	11.7%	11.5%	11.5%	11.4%	11.3%	11.2%	11.1%	11.0%	10.8%	10.7%	10.6%	10.5%	10.3%	10.2%	10.1%	10.0%
Rubidoux	6.7%	6.8%	7.0%	7.3%	7.5%	7.7%	7.9%	8.2%	8.5%	8.8%	8.7%	8.7%	8.6%	8.6%	8.5%	8.4%	8.3%	8.2%	8.1%	8.0%	7.9%	7.8%	7.7%	7.6%
Edgemont	1.7%	1.7%	1.7%	1.7%	1.8%	1.8%	1.8%	1.8%	1.9%	1.9%	1.9%	2.0%	2.0%	2.1%	2.1%	2.1%	2.2%	2.2%	2.3%	2.3%	2.3%	2.3%	2.2%	2.2%
Highgrove	0.0%	0.0%	0.0%	0.3%	0.7%	1.0%	1.3%	1.6%	1.8%	2.1%	2.4%	2.7%	3.0%	3.2%	3.5%	3.7%	4.0%	4.2%	4.4%	4.7%	4.9%	5.1%	5.3%	5.5%

Change in Proportional Flow

Jurupa		-0.7%	1.6%	1.2%	1.2%	1.2%	1.2%	-0.1%	-1.5%	-1.1%	-0.7%	-0.7%	-0.7%	-0.7%	-1.2%	-1.2%	-1.2%	-1.2%	-1.2%	-1.2%	-1.1%	-1.1%	-1.1%	-1.1%
Rubidoux		1.1%	3.4%	3.1%	3.1%	3.1%	3.1%	3.2%	3.4%	3.8%	-0.6%	-0.7%	-0.7%	-0.7%	-1.2%	-1.2%	-1.2%	-1.2%	-1.2%	-1.2%	-1.1%	-1.1%	-1.1%	-1.1%
Edgemont		-0.8%	1.5%	1.1%	1.1%	1.1%	1.1%	1.3%	1.5%	1.9%	2.3%	2.3%	2.3%	2.3%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	-0.4%	-1.1%	-1.1%	-1.1%
Highgrove					96.3%	47.2%	30.9%	22.9%	18.2%	15.4%	13.5%	11.7%	10.3%	9.2%	7.8%	7.1%	6.4%	5.9%	5.4%	5.0%	4.7%	4.4%	4.1%	3.9%

Flow and Loadings For Riverside Customers - Calculated

	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36
Riverside Flow (MGD)	23.5	24.4	24.6	24.9	25.1	25.4	25.6	25.9	26.1	26.2	26.3	26.5	26.6	26.7	27.0	27.3	27.6	27.9	28.2	28.6	28.9	29.2	29.5	29.9
Growth		3.87%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.45%	0.45%	0.45%	0.45%	0.45%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%
Riverside BOD Loading, lb/d	60,901	64,797	66,950	69,100	71,241	73,370	75,480	77,567	79,624	81,220	82,757	84,231	85,638	86,973	88,822	90,610	92,333	93,986	95,564	97,061	98,473	99,796	101,025	102,157
Growth		6.40%	3.32%	3.21%	3.10%	2.99%	2.88%	2.76%	2.65%	2.00%	1.89%	1.78%	1.67%	1.56%	2.13%	2.01%	1.90%	1.79%	1.68%	1.57%	1.46%	1.34%	1.23%	1.12%
Riverside TSS Loading, lb/d	51,502	54,796	56,617	58,435	60,246	62,046	63,830	65,595	67,335	68,684	69,984	71,231	72,420	73,550	75,113	76,625	78,083	79,480	80,814	82,081	83,275	84,394	85,433	86,390
Growth		6.40%	3.32%	3.21%	3.10%	2.99%	2.88%	2.76%	2.65%	2.00%	1.89%	1.78%	1.67%	1.56%	2.13%	2.01%	1.90%	1.79%	1.68%	1.57%	1.46%	1.34%	1.23%	1.12%

Assumes that overall concentrations from Riverside and CSD's are equal.

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2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036
 FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

Flow and Loading Defined EDU's - Calculated		FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36	
SFR Loadings																										
Flow	GPD per EDU	200	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	
BOD	mg/l	287	294	301	307	314	320	326	332	337	342	347	352	356	360	364	367	370	372	374	376	377	378	378	378	
TSS	mg/l	271	278	284	290	296	302	308	313	319	323	328	332	337	340	344	347	349	352	354	355	356	357	358	358	
Flow		200	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	206	
BOD		0.48	0.50	0.52	0.53	0.54	0.55	0.56	0.57	0.58	0.59	0.60	0.60	0.61	0.62	0.62	0.63	0.63	0.64	0.64	0.64	0.65	0.65	0.65	0.65	
TSS		0.45	0.48	0.49	0.50	0.51	0.52	0.53	0.54	0.55	0.55	0.56	0.57	0.58	0.58	0.59	0.59	0.60	0.60	0.61	0.61	0.61	0.61	0.61	0.61	
Functional Allocation Split		EDU Fraction																								
Total EDUs																										
Flow	58%	85,070	85,883	87,193	88,830	90,501	92,206	93,946	95,552	97,010	98,105	98,800	99,490	100,183	100,880	102,087	103,305	104,534	105,775	107,028	108,294	109,514	110,725	111,947	113,179	
BOD	30%	47,106	47,557	48,282	49,189	50,114	51,058	52,022	52,911	53,718	54,325	54,709	55,091	55,475	55,861	56,529	57,204	57,884	58,572	59,266	59,966	60,642	61,313	61,989	62,671	
TSS	12%	17,124	17,288	17,552	17,881	18,218	18,561	18,911	19,234	19,528	19,748	19,888	20,027	20,167	20,307	20,550	20,795	21,043	21,292	21,545	21,799	22,045	22,289	22,535	22,783	
Total EDU's		149,301	150,728	153,026	155,901	158,833	161,825	164,879	167,697	170,256	172,178	173,397	174,609	175,826	177,048	179,166	181,303	183,461	185,640	187,839	190,059	192,201	194,327	196,471	198,633	
EDU Growth		0.96%	1.52%	1.88%	1.88%	1.88%	1.89%	1.71%	1.53%	1.13%	0.71%	0.70%	0.70%	0.70%	1.20%	1.19%	1.19%	1.19%	1.18%	1.18%	1.13%	1.11%	1.10%	1.10%		
CSD EDUs																										
Flow	58%	16,725	16,868	17,501	18,456	19,437	20,446	21,483	22,378	23,119	23,882	24,243	24,597	24,954	25,312	25,672	26,034	26,398	26,764	27,132	27,503	27,818	28,114	28,411	28,707	
BOD	30%	9,261	9,340	9,691	10,220	10,763	11,322	11,896	12,392	12,802	13,224	13,424	13,620	13,818	14,016	14,216	14,416	14,618	14,820	15,024	15,229	15,404	15,568	15,732	15,896	
TSS	12%	3,367	3,396	3,523	3,715	3,913	4,116	4,324	4,505	4,654	4,807	4,880	4,951	5,023	5,095	5,168	5,241	5,314	5,388	5,462	5,536	5,600	5,659	5,719	5,779	
Total In City EDI		29,353	29,604	30,715	32,391	34,113	35,883	37,703	39,274	40,575	41,914	42,547	43,169	43,794	44,423	45,055	45,691	46,330	46,972	47,618	48,268	48,821	49,342	49,862	50,382	
Riverside (In City) EDUs																										
Flow	58%	68,345	69,015	69,691	70,374	71,064	71,760	72,464	73,174	73,891	74,223	74,557	74,893	75,230	75,568	76,415	77,271	78,136	79,011	79,896	80,791	81,696	82,611	83,536	84,472	
BOD	30%	37,845	38,216	38,591	38,969	39,351	39,736	40,126	40,519	40,916	41,100	41,285	41,471	41,658	41,845	42,314	42,788	43,267	43,751	44,241	44,737	45,238	45,745	46,257	46,775	
TSS	12%	13,758	13,893	14,029	14,166	14,305	14,445	14,587	14,730	14,874	14,941	15,008	15,076	15,144	15,212	15,382	15,554	15,729	15,905	16,083	16,263	16,445	16,629	16,816	17,004	
Total In City EDI		119,948	121,124	122,311	123,509	124,720	125,942	127,176	128,423	129,681	130,265	130,851	131,440	132,031	132,625	134,111	135,613	137,132	138,667	140,221	141,791	143,379	144,985	146,609	148,251	
CIP Allocation Split		EDU Fraction																								
Flow	55%	80,443	81,212	82,451	83,999	85,579	87,191	88,837	90,355	91,734	92,770	93,427	94,079	94,735	95,394	96,535	97,686	98,849	100,023	101,208	102,404	103,558	104,703	105,859	107,024	
BOD	45%	70,532	71,206	72,292	73,650	75,035	76,449	77,891	79,223	80,432	81,340	81,916	82,488	83,063	83,640	84,641	85,650	86,670	87,699	88,738	89,787	90,799	91,803	92,816	93,837	
TSS	0%	649	655	665	678	690	703	717	729	740	748	754	759	764	769	779	788	797	807	816	826	835	845	854	863	
Total EDU's		151,624	153,073	155,408	158,327	161,305	164,343	167,445	170,307	172,906	174,858	176,096	177,326	178,562	179,804	181,954	184,125	186,316	188,528	190,762	193,017	195,192	197,351	199,528	201,724	
EDU Growth		0.96%	1.52%	1.88%	1.88%	1.88%	1.89%	1.71%	1.53%	1.13%	0.71%	0.70%	0.70%	0.70%	1.20%	1.19%	1.19%	1.19%	1.18%	1.18%	1.13%	1.11%	1.10%	1.10%		

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 FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

Projected Accounts and EDU's By Customer Class																									
Accounts per Customer Class																									
Class	Description	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36
RESIDENTIAL:	S800 Residence on Septic System	171	173	174	176	178	180	181	183	185	186	187	187	188	189	191	193	195	198	200	202	204	207	209	211
	S474 Basic Multi-Family Dwelling Unit	20273	20471	20672	20874	21079	21286	21494	21705	21918	22016	22115	22215	22315	22415	22666	22920	23177	23436	23699	23964	24233	24504	24779	25056
	S475 Basic Single Family Dwelling Unit	43778	44207	44641	45078	45520	45966	46416	46871	47331	47544	47758	47973	48188	48405	48947	49496	50050	50611	51177	51751	52330	52916	53509	54108
	S590 Basic Single Family Dwelling - Pumping	17096	17263	17432	17603	17776	17950	18126	18304	18483	18566	18650	18734	18818	18903	19114	19328	19545	19764	19985	20209	20435	20664	20896	21130
	S591 Basic Multi-Family Dwelling Units - Pumping	5915	5973	6031	6091	6150	6210	6271	6333	6395	6424	6453	6482	6511	6540	6613	6687	6762	6838	6915	6992	7070	7150	7230	7311
S801 Association HSE Sewer	20	20	20	21	21	21	21	21	22	22	22	22	22	22	22	23	23	23	23	24	24	24	24	25	
COMI:	S473 Basic Commercial (Flat Rate)	77	78	79	79	80	81	82	83	83	84	84	84	85	85	86	87	88	89	90	91	92	93	94	95
	S594 Basic Commercial - Pumping (Flat Rate)	12	12	12	12	12	13	13	13	13	13	13	13	13	13	14	14	14	14	14	14	15	15	15	
COMMERCIAL NON-PUMPING:	S500 Department & Retail Stores	268	271	274	276	279	282	284	287	290	291	293	294	295	297	300	303	307	310	314	317	321	324	328	332
	S501 Hotels & Motels	25	25	26	26	26	27	27	27	27	27	28	28	28	28	28	29	29	29	30	30	30	31	31	31
	S502 Laundromats	20	20	20	21	21	21	21	21	22	22	22	22	22	22	22	23	23	23	23	24	24	24	24	25
	S503 Laundries	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	S504 Markets	61	62	62	63	64	64	65	65	66	66	67	67	67	68	68	69	70	71	71	72	73	74	75	75
	S505 Mortuaries	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
	S506 Professional Offices	226	228	230	232	235	237	239	242	244	245	246	247	248	249	252	255	258	261	264	267	270	273	276	279
	S507 Repair Shops & Service Stations	139	140	141	143	144	146	147	148	150	151	151	152	153	153	155	157	158	160	162	164	166	168	169	171
	S508 Restaurants	199	201	203	205	207	209	211	213	215	216	217	218	219	220	222	225	228	230	233	235	238	241	243	246
	S509 Other Commercial	1566	1582	1597	1613	1628	1644	1661	1677	1693	1701	1709	1716	1724	1732	1751	1771	1791	1811	1831	1851	1872	1893	1914	1936
	S510 Hospitals	31	31	32	32	32	33	33	33	34	34	34	34	34	34	35	35	36	36	36	37	37	38	38	38
	S511 Churches & Halls	127	128	129	131	132	133	134	136	137	138	138	139	140	140	142	143	145	147	148	150	152	153	155	157
	S514 Schools "B"	92	93	94	95	96	97	98	99	100	100	100	101	101	102	103	104	105	106	108	109	110	111	113	114
S515 Other Commercial "A"	46	46	47	47	48	48	49	49	49	50	50	50	50	51	51	52	52	53	53	54	55	55	56	57	
S516 Other Commercial "B"	197	199	201	203	205	207	209	211	213	214	215	216	217	218	221	223	226	228	231	233	236	238	241	244	
COMMERCIAL PUMPING:	S525 Department & Retail Stores	73	74	75	75	76	77	78	78	79	80	80	80	81	81	82	83	84	85	86	87	88	89	90	91
	S526 Hotels & Motels	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	
	S527 Laundromats	7	7	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9
	S528 Laundries	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	S529 Markets	15	15	15	15	16	16	16	16	16	16	16	16	16	16	17	17	17	17	17	18	18	18	18	18
	S530 Mortuaries	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	S531 Professional Offices	21	21	21	22	22	22	22	22	23	23	23	23	23	23	23	24	24	24	25	25	25	26	26	26
	S532 Repair Shops & Service Stations	25	25	26	26	26	27	27	27	27	27	28	28	28	28	28	29	29	29	30	30	30	31	31	31
	S533 Restaurants	71	71	72	73	74	74	75	76	76	77	77	78	78	78	79	80	81	82	83	84	85	86	86	87
	S534 Other Commercial	225	228	230	232	234	237	239	241	244	245	246	247	248	249	252	255	258	260	263	266	269	272	275	279
	S535 Hospitals	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	S536 Churches & Halls	19	19	20	20	20	20	20	20	21	21	21	21	21	21	21	21	22	22	22	22	23	23	23	23
	S539 Schools "B"	29	30	30	30	31	31	31	31	32	32	32	32	32	32	33	33	34	34	34	35	35	35	36	36
S540 Other Commercial "A"	10	10	10	10	10	10	10	10	10	10	10	11	11	11	11	11	11	11	11	11	11	12	12	12	
S541 Other Commercial "B"	36	36	37	37	37	38	38	38	38	39	39	39	39	39	40	40	40	41	41	42	42	43	44	44	
SPEC	Special Industrial Users	14	14	14	14	15	15	15	15	15	15	15	15	15	15	16	16	16	16	16	17	17	17	17	
Total Flow		90905	91796	92695	93604	94521	95447	96383	97327	98281	98723	99168	99614	100062	100512	101638	102777	103928	105092	106269	107459	108662	109879	111110	112355

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 FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

Projected Flow and Loadings By Customer Class																												
Flow (MGD) per Customer Class																												
Class	Description	2012/13	Percent	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36	
RESIDENTIAL:	S800	Residence on Septic System	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	S474	Basic Multi-Family Dwelling Unit	3.65	15.54%	3.65	3.79	3.83	3.86	3.90	3.94	3.98	4.02	4.06	4.08	4.09	4.11	4.13	4.15	4.20	4.24	4.29	4.34	4.39	4.44	4.49	4.54	4.59	4.64
	S475	Basic Single Family Dwelling Unit	8.75	37.28%	8.75	9.09	9.18	9.27	9.36	9.46	9.55	9.64	9.74	9.78	9.82	9.87	9.91	9.96	10.07	10.18	10.30	10.41	10.53	10.64	10.76	10.88	11.01	11.13
	S590	Basic Single Family Dwelling - Pumping	3.42	14.56%	3.42	3.55	3.59	3.62	3.66	3.69	3.73	3.76	3.80	3.82	3.84	3.85	3.87	3.89	3.93	3.98	4.02	4.07	4.11	4.16	4.20	4.25	4.30	4.35
	S591	Basic Multi-Family Dwelling Units - Pumping	1.06	4.53%	1.06	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.19	1.20	1.21	1.21	1.22	1.24	1.25	1.27	1.28	1.29	1.31	1.32	1.34	1.35
	S801	Association HSE Sewer	0.05	0.21%	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
COM:	S473	Basic Commercial (Flat Rate)	0.02	0.07%	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	S594	Basic Commercial - Pumping (Flat Rate)	0.00	0.01%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
COMMERCIAL NON-PUMPING:	S500	Department & Retail Stores	0.16	0.68%	0.16	0.17	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.20	
	S501	Hotels & Motels	0.30	1.27%	0.30	0.31	0.31	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.33	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.36	0.36	0.37	0.37	0.38	
	S502	Laundromats	0.06	0.24%	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
	S503	Laundries	0.01	0.04%	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
	S504	Markets	0.09	0.39%	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	
	S505	Mortuaries	0.01	0.03%	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
	S506	Professional Offices	0.20	0.87%	0.20	0.21	0.21	0.22	0.22	0.22	0.22	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.26	
	S507	Repair Shops & Service Stations	0.11	0.46%	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14	
	S508	Restaurants	0.24	1.02%	0.24	0.25	0.25	0.25	0.26	0.26	0.26	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.28	0.28	0.28	0.29	0.29	0.29	0.30	0.30	
	S509	Other Commercial	2.06	8.77%	2.06	2.14	2.16	2.18	2.20	2.23	2.25	2.27	2.29	2.30	2.31	2.32	2.33	2.34	2.37	2.40	2.42	2.45	2.48	2.51	2.53	2.56	2.59	
	S510	Hospitals	0.33	1.41%	0.33	0.34	0.35	0.35	0.36	0.36	0.36	0.37	0.37	0.37	0.37	0.37	0.37	0.38	0.38	0.38	0.39	0.39	0.40	0.40	0.41	0.41	0.42	
	S511	Churches & Halls	0.12	0.50%	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15	
	S514	Schools "B"	0.63	2.68%	0.63	0.65	0.66	0.67	0.67	0.68	0.69	0.69	0.70	0.70	0.71	0.71	0.71	0.72	0.72	0.73	0.74	0.75	0.76	0.77	0.77	0.78	0.79	
	S515	Other Commercial "A"	0.12	0.52%	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	
S516	Other Commercial "B"	0.26	1.10%	0.26	0.27	0.27	0.27	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.31	0.31	0.32	0.32	0.33	0.33		
COMMERCIAL PUMPING:	S525	Department & Retail Stores	0.08	0.36%	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.11	
	S526	Hotels & Motels	0.02	0.09%	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	
	S527	Laundromats	0.03	0.15%	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
	S528	Laundries	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	S529	Markets	0.04	0.16%	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	
	S530	Mortuaries	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	S531	Professional Offices	0.10	0.44%	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	
	S532	Repair Shops & Service Stations	0.02	0.07%	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	S533	Restaurants	0.14	0.58%	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	
	S534	Other Commercial	0.29	1.24%	0.29	0.30	0.31	0.31	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.33	0.33	0.34	0.34	0.34	0.35	0.35	0.35	0.36	0.36	0.37	0.37	
	S535	Hospitals	0.01	0.06%	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	S536	Churches & Halls	0.02	0.08%	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
	S539	Schools "B"	0.06	0.26%	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08		
	S540	Other Commercial "A"	0.02	0.09%	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	
S541	Other Commercial "B"	0.06	0.24%	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07		
SPEC	Special Industrial Users	0.95	4.03%	0.95	0.98	0.99	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.06	1.07	1.07	1.07	1.09	1.10	1.11	1.12	1.14	1.15	1.16	1.18	1.19		
Total Flow		23.48	100%	23.48	24.39	24.63	24.87	25.11	25.36	25.61	25.86	26.11	26.23	26.35	26.47	26.59	26.71	27.00	27.31	27.61	27.92	28.23	28.55	28.87	29.19	29.52		

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 FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

BOD Loading (lbs per day) per Customer Class		Annual Lbs	Percent	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36		
Class	Description	2012/13	Daily																										
RESIDENTIAL:	S800 Residence on Septic System	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	S474 Basic Multi-Family Dwelling Unit	3,185,186	16%	8,727	9,285	9,593	9,901	10,208	10,513	10,816	11,115	11,409	11,638	11,858	12,069	12,271	12,462	12,727	12,984	13,231	13,467	13,693	13,908	14,110	14,300	14,476	14,638		
	S475 Basic Single Family Dwelling Unit	7,642,638	38%	20,939	22,278	23,018	23,758	24,494	25,226	25,951	26,669	27,376	27,925	28,453	28,960	29,444	29,903	30,538	31,153	31,746	32,314	32,856	33,371	33,857	34,312	34,734	35,123		
	S590 Basic Single Family Dwelling - Pumping	2,984,499	15%	8,177	8,700	8,989	9,277	9,565	9,851	10,134	10,414	10,691	10,905	11,111	11,309	11,498	11,677	11,925	12,166	12,397	12,619	12,831	13,032	13,221	13,399	13,564	13,716		
	S591 Basic Multi-Family Dwelling Units - Pumping	929,339	5%	2,546	2,709	2,799	2,889	2,978	3,067	3,156	3,243	3,329	3,396	3,460	3,521	3,580	3,636	3,713	3,788	3,860	3,929	3,995	4,058	4,117	4,172	4,224	4,271		
	S801 Association HSE Sewer	43,619	0%	120	127	131	136	140	144	148	152	156	159	162	165	168	171	174	178	181	184	188	190	193	196	198	200		
COMM:	S473 Basic Commercial (Flat Rate)	13,457	0%	37	39	41	42	43	44	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62			
	S594 Basic Commercial - Pumping (Flat Rate)	2,095	0%	6	6	6	7	7	7	7	7	8	8	8	8	8	8	8	9	9	9	9	9	9	9	10	10		
COMMERCIAL NON-PUMPING:	S500 Department & Retail Stores	99,205	0%	272	289	299	308	318	327	337	346	355	362	369	376	382	388	396	404	412	419	426	433	439	445	451	456		
	S501 Hotels & Motels	309,020	2%	847	901	931	961	990	1,020	1,049	1,078	1,107	1,129	1,150	1,171	1,191	1,209	1,235	1,260	1,284	1,307	1,329	1,349	1,369	1,387	1,404	1,420		
	S502 Laundromats	34,803	0%	95	101	105	108	112	115	118	121	125	127	130	132	134	136	139	142	145	147	150	152	154	156	158	160		
	S503 Laundries	17,873	0%	49	52	54	56	57	59	61	62	64	65	67	68	69	70	71	73	74	76	77	78	79	80	81	82		
	S504 Markets	301,692	1%	827	879	909	938	967	996	1,024	1,053	1,081	1,102	1,123	1,143	1,162	1,180	1,205	1,230	1,253	1,276	1,297	1,317	1,336	1,354	1,371	1,386		
	S505 Mortuaries	19,597	0%	54	57	59	61	63	65	67	68	70	72	73	74	75	77	78	80	81	83	84	86	87	88	89	90		
	S506 Professional Offices	109,972	1%	301	321	331	342	352	363	373	384	394	402	409	417	424	430	439	448	457	465	473	480	487	494	500	505		
	S507 Repair Shops & Service Stations	90,254	0%	247	263	272	281	289	298	306	315	323	330	336	342	348	353	361	368	375	382	388	394	400	405	410	415		
	S508 Restaurants	993,133	5%	2,721	2,895	2,991	3,087	3,183	3,278	3,372	3,465	3,557	3,629	3,697	3,763	3,826	3,886	3,968	4,048	4,125	4,199	4,270	4,336	4,400	4,459	4,514	4,564		
	S509 Other Commercial	1,284,803	6%	3,520	3,745	3,870	3,994	4,118	4,241	4,363	4,483	4,602	4,694	4,783	4,868	4,950	5,027	5,134	5,237	5,337	5,432	5,523	5,610	5,692	5,768	5,839	5,905		
	S510 Hospitals	309,233	2%	847	901	931	961	991	1,021	1,050	1,079	1,108	1,130	1,151	1,172	1,191	1,210	1,236	1,261	1,284	1,307	1,329	1,350	1,370	1,388	1,405	1,421		
	S511 Churches & Halls	96,933	0%	266	283	292	301	311	320	329	338	347	354	361	367	373	379	387	395	403	410	417	423	429	435	441	445		
	S514 Schools "B"	301,285	1%	825	878	907	937	966	994	1,023	1,051	1,079	1,101	1,122	1,142	1,161	1,179	1,204	1,228	1,251	1,274	1,295	1,316	1,335	1,353	1,369	1,385		
	S515 Other Commercial "A"	75,903	0%	208	221	229	236	243	251	258	265	272	277	283	288	292	297	303	309	315	321	326	331	336	341	345	349		
	S516 Other Commercial "B"	161,408	1%	442	471	486	502	517	533	548	563	578	590	601	612	622	632	645	658	670	682	694	705	715	725	734	742		
	COMMERCIAL PUMPING:	S525 Department & Retail Stores	52,491	0%	144	153	158	163	168	173	178	183	188	192	195	199	202	205	210	214	218	222	226	229	233	236	239	241	
S526 Hotels & Motels		20,863	0%	57	61	63	65	67	69	71	73	75	76	78	79	80	82	83	85	87	88	90	91	92	94	95	96		
S527 Laundromats		21,605	0%	59	63	65	67	69	71	73	75	77	79	80	82	83	85	86	88	90	91	93	94	96	97	98	99		
S528 Laundries		114	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1		
S529 Markets		123,921	1%	340	361	373	385	397	409	421	432	444	453	461	470	477	485	495	505	515	524	533	541	549	556	563	570		
S530 Mortuaries		1,029	0%	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5		
S531 Professional Offices		56,137	0%	154	164	169	175	180	185	191	196	201	205	209	213	216	220	224	229	233	237	241	245	249	252	255	258		
S532 Repair Shops & Service Stations		14,331	0%	39	42	43	45	46	47	49	50	51	52	53	54	55	56	57	58	60	61	62	63	64	65	66	66		
S533 Restaurants		570,103	3%	1,562	1,662	1,717	1,772	1,827	1,882	1,936	1,989	2,042	2,083	2,122	2,160	2,196	2,231	2,278	2,324	2,368	2,410	2,451	2,489	2,526	2,559	2,591	2,620		
S534 Other Commercial		181,732	1%	498	530	547	565	582	600	617	634	651	664	677	689	700	711	726	741	755	768	781	794	805	816	826	835		
S535 Hospitals		12,347	0%	34	36	37	38	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	55	55	56	57		
S536 Churches & Halls		14,679	0%	40	43	44	46	47	48	50	51	53	54	55	56	57	59	60	61	62	63	64	65	66	66	67	67		
S539 Schools "B"		29,005	0%	79	85	87	90	93	96	98	101	104	106	108	110	112	113	116	118	120	123	125	127	128	130	132	133		
S540 Other Commercial "A"		12,608	0%	35	37	38	39	40	42	43	44	45	46	47	48	49	49	50	51	52	53	54	55	56	57	57	58		
S541 Other Commercial "B"	34,884	0%	96	102	105	108	112	115	118	122	125	127	130	132	134	136	139	142	145	147	150	152	155	157	159	160			
SPEC	Special Industrial Users	2,077,075		5,691	6,055	6,256	6,457	6,657	6,856	7,053	7,248	7,440	7,589	7,733	7,871	8,002	8,127	8,300	8,467	8,628	8,782	8,930	9,069	9,201	9,325	9,440	9,546		
Total BOD Loading		22,228,871		60,901	64,797	66,950	69,100	71,241	73,370	75,480	77,567	79,624	81,220	82,757	84,231	85,638	86,973	88,822	90,610	92,333	93,986	95,564	97,061	98,473	99,796	101,025	102,157		

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Projected Flow and Loadings

2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036
 FY 2012/13 FY 2013/14 FY 2014/15 FY 2015/16 FY 2016/17 FY 2017/18 FY 2018/19 FY 2019/20 FY 2020/21 FY 2021/22 FY 2022/23 FY 2023/24 FY 2024/25 FY 2025/26 FY 2026/27 FY 2027/28 FY 2028/29 FY 2029/30 FY 2030/31 FY 2031/32 FY 2032/33 FY 2033/34 FY 2034/35 FY 2035/36

TSS Loading (lbs per day) per Customer Class		Annual Lbs	Percent	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36		
Class	Description	2012/13	Daily																										
RESIDENTIAL:	S800	Residence on Septic System	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	S474	Basic Multi-Family Dwelling Unit	16%	3,009,588	8,245	8,773	9,064	9,355	9,645	9,934	10,219	10,502	10,780	10,996	11,204	11,404	11,595	11,775	12,026	12,268	12,501	12,725	12,938	13,141	13,332	13,512	13,678	13,831	
	S475	Basic Single Family Dwelling Unit	38%	7,221,302	19,784	21,050	21,749	22,448	23,144	23,835	24,520	25,198	25,867	26,385	26,884	27,363	27,820	28,254	28,855	29,436	29,996	30,533	31,045	31,531	31,990	32,420	32,819	33,187	
	S590	Basic Single Family Dwelling - Pumping	15%	2,819,964	7,726	8,220	8,493	8,766	9,038	9,308	9,575	9,840	10,101	10,304	10,499	10,686	10,864	11,033	11,268	11,495	11,713	11,923	12,123	12,313	12,492	12,660	12,816	12,960	
	S591	Basic Multi-Family Dwelling Units - Pumping	5%	878,105	2,406	2,560	2,645	2,730	2,814	2,898	2,982	3,064	3,145	3,208	3,269	3,327	3,383	3,436	3,509	3,579	3,647	3,713	3,775	3,834	3,890	3,942	3,991	4,035	
	S801	Association HSE Sewer	0%	41,214	113	120	124	128	132	136	140	144	148	151	153	156	159	161	165	168	171	174	177	180	183	185	187	189	
COMM:	S473	Basic Commercial (Flat Rate)	0%	12,715	35	37	38	40	41	42	43	44	46	47	48	49	50	51	52	53	54	55	56	56	57	58	58		
	S594	Basic Commercial - Pumping (Flat Rate)	0%	1,979	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	8	8	9	9	9	9	9	9		
COMMERCIAL NON-PUMPING:	S500	Department & Retail Stores	0%	91,861	252	268	277	286	294	303	312	321	329	336	342	348	354	359	367	374	382	388	395	401	407	412	417	422	
	S501	Hotels & Motels	1%	233,003	638	679	702	724	747	769	791	813	835	851	867	883	898	912	931	950	968	985	1,002	1,017	1,032	1,046	1,059	1,071	
	S502	Laundromats	0%	33,148	91	97	100	103	106	109	113	116	119	121	123	126	128	130	132	135	138	140	143	145	147	149	151	152	
	S503	Laundries	0%	15,998	44	47	48	50	51	53	54	56	57	58	60	61	62	63	64	65	66	68	69	70	71	72	73	74	
	S504	Markets	1%	185,948	509	542	560	578	596	614	631	649	666	679	692	705	716	728	743	758	772	786	799	812	824	835	845	855	
	S505	Mortuaries	0%	19,370	53	56	58	60	62	64	66	68	69	71	72	73	75	76	77	79	80	82	83	85	86	87	88	89	
	S506	Professional Offices	0%	60,427	166	176	182	188	194	199	205	211	216	221	225	229	233	236	241	246	251	255	260	264	268	271	275	278	
	S507	Repair Shops & Service Stations	1%	146,402	401	427	441	455	469	483	497	511	524	535	545	555	564	573	585	597	608	619	629	639	649	657	665	673	
	S508	Restaurants	3%	567,534	1,555	1,654	1,709	1,764	1,819	1,873	1,927	1,980	2,033	2,074	2,113	2,151	2,186	2,221	2,268	2,313	2,357	2,400	2,440	2,478	2,514	2,548	2,579	2,608	
	S509	Other Commercial	6%	1,189,693	3,259	3,468	3,583	3,698	3,813	3,927	4,040	4,151	4,262	4,347	4,429	4,508	4,583	4,655	4,754	4,849	4,942	5,030	5,115	5,195	5,270	5,341	5,407	5,467	
	S510	Hospitals	1%	272,706	747	795	821	848	874	900	926	952	977	996	1,015	1,033	1,051	1,067	1,090	1,112	1,133	1,153	1,172	1,191	1,208	1,224	1,239	1,253	
	S511	Churches & Halls	0%	91,360	250	266	275	284	293	302	310	319	327	334	340	346	352	357	365	372	379	386	393	399	405	410	415	420	
	S514	Schools "B"	1%	254,722	698	743	767	792	816	841	865	889	912	931	948	965	981	997	1,018	1,038	1,058	1,077	1,095	1,112	1,128	1,144	1,158	1,171	
	S515	Other Commercial "A"	0%	69,280	190	202	209	215	222	229	235	242	248	253	258	263	267	271	277	282	288	293	298	303	307	311	315	318	
S516	Other Commercial "B"	1%	151,594	415	442	457	471	486	500	515	529	543	554	564	574	584	593	606	618	630	641	652	662	672	681	689	697		
COMMERCIAL PUMPING:	S525	Department & Retail Stores	0%	48,606	133	142	146	151	156	160	165	170	174	178	181	184	187	190	194	198	202	206	209	212	215	218	221	223	
	S526	Hotels & Motels	0%	15,731	43	46	47	49	50	52	53	55	56	57	59	60	61	62	63	64	65	67	68	69	70	71	71	72	
	S527	Laundromats	0%	20,578	56	60	62	64	66	68	70	72	74	75	77	78	79	81	82	84	85	87	88	90	91	92	94	95	
	S528	Laundries	0%	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	S529	Markets	0%	76,379	209	223	230	237	245	252	259	267	274	279	284	289	294	299	305	311	317	323	328	334	338	343	347	351	
	S530	Mortuaries	0%	1,017	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	
	S531	Professional Offices	0%	30,846	85	90	93	96	99	102	105	108	110	113	115	117	119	121	123	126	128	130	133	135	137	138	140	142	
	S532	Repair Shops & Service Stations	0%	23,246	64	68	70	72	75	77	79	81	83	85	87	88	90	91	93	95	97	98	100	102	103	104	106	107	
	S533	Restaurants	2%	325,790	893	950	981	1,013	1,044	1,075	1,106	1,137	1,167	1,190	1,213	1,234	1,255	1,275	1,302	1,328	1,353	1,377	1,401	1,423	1,443	1,463	1,481	1,497	
	S534	Other Commercial	1%	168,279	461	491	507	523	539	555	571	587	603	615	626	638	648	658	672	686	699	712	723	735	745	755	765	773	
	S535	Hospitals	0%	10,889	30	32	33	34	35	36	37	38	39	40	41	41	42	43	44	44	45	46	47	48	48	49	49	50	
	S536	Churches & Halls	0%	13,835	38	40	42	43	44	46	47	48	50	51	52	52	53	54	55	56	57	58	59	60	61	62	63	64	
	S539	Schools "B"	0%	24,522	67	71	74	76	79	81	83	86	88	90	91	93	94	96	98	100	102	104	105	107	109	110	111	113	
	S540	Other Commercial "A"	0%	11,508	32	34	35	36	37	38	39	40	41	42	43	44	44	45	46	47	48	49	49	50	51	52	52	53	
S541	Other Commercial "B"	0%	32,763	90	96	99	102	105	108	111	114	117	120	122	124	126	128	131	134	136	139	141	143	145	147	149	151		
SPEC	Special Industrial Users	3%	626,044	1,715	1,825	1,886	1,946	2,006	2,066	2,126	2,185	2,243	2,287	2,331	2,372	2,412	2,449	2,502	2,552	2,600	2,647	2,691	2,734	2,773	2,811	2,845	2,877		
Total TSS Loading		18,798,048	100%	51,502	54,796	56,617	58,435	60,246	62,046	63,830	65,595	67,335	68,684	69,984	71,231	72,420	73,550	75,113	76,625	78,083	79,480	80,814	82,081	83,275	84,394	85,433	86,390		

Projected Accounts, Flows, and Loading Summary for In-City Customers		FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	FY 2033/34	FY 2034/35	FY 2035/36
Accounts		90905	91796	92695	93604	94521	95447	96383	97327	98281	98723	99168	99614	100062	100512	101638	102777	103928	105092	106269	107459				

Customer Loading and Mass Balance

**Year of Flow and Loading Data: FY 2014/15
(Projected)**

This mass balance was performed to adjust flow per EDU and loading concentrations for each customer class to balance calculated flow and loading with projected flow and loading. Flow per EDU is slightly higher than the FY 2012/13 Mass Balance due to flow growth being slightly higher than account growth for the first year of the projection. Concentrations are also higher as they are projected to continually increase through the study period.

Number Of Conn.	EDUs	EDU Ratio	Flow per Unit	User Group	FLOW:			BOD:			TSS:		
					(A1) Projected Flows per Category	(A2) Annual Capacity	(A3) Total Flow In MGD	(B1) BOD User	(B2) Adjust For Actual Plant Loading	(B3) Annual Capacity	(C1) SS Per User	(C2) Adjust For Actual Plant Loading	(C3) Annual Capacity
					(CCF)	(MG)	(MGD)	(MG/L)		(LBS.)	(MG/L)		(LBS.)
				S800	RESIDENTIAL:								
20,672	18,605	0.90	185	S474	Residence on Septic System	-	0.00	0.00	210		0	200	0
44,641	44,641	1.00	206	S475	Basic Multi-Family Dwelling Unit	1,867,408	1396.82	3.83	210	301	3,501,556	200	3,308,517
17,432	17,432	1.00	206	S590	Basic Single Family Dwelling Unit	4,480,719	3351.58	9.18	210	301	8,401,746	200	7,938,561
6,031	5,428	0.90	185	S591	Basic Single Family Dwelling - Pumping	1,749,749	1308.81	3.59	210	301	3,280,935	200	3,100,059
20	255		2,570	S801	Basic Multi-Family Dwelling Units - Pumping	544,852	407.55	1.12	210	301	1,021,647	200	965,324
					ASSOCIATION HSE SEWER	25,573	19.13	0.05	210	301	47,952	200	45,308
88,776					Subtotal - Residential	8,668,301	6,484	17.76			16,253,836		15,357,768
					COMMERCIAL:								
79		1.00	206	S473	Basic Commercial (Flat Rate)	7,889	5.90	0.02	210	301	14,793	200	13,978
12		1.00	206	S594	Basic Commercial - Pumping (Flat Rate)	1,228	0.92	0.00	210	301	2,303	200	2,176
					COMMERCIAL NON-PUMPING:								
274	713	2.61	610	S500	Department & Retail Stores	81,426	60.91	0.17	150	215	109,059	140	100,985
26	1,593	61.87	12,113	S501	Hotels & Motels	152,185	113.83	0.31	250	358	339,714	190	256,147
20	251	12.35	2,883	S502	Laundromats	28,566	21.37	0.06	150	215	38,260	144	36,440
2	71	29.98	4,212	S503	Laundries	4,890	3.66	0.01	450	644	19,648	406	17,587
62	932	14.96	1,528	S504	Markets	46,430	34.73	0.10	800	1145	331,658	497	204,418
5	66	12.94	1,212	S505	Mortuaries	3,016	2.26	0.01	800	1145	21,544	797	1132
230	840	3.65	928	S506	Professional Offices	104,151	77.90	0.21	130	186	120,895	72	66,429
141	588	4.16	806	S507	Repair Shops & Service Stations	55,560	41.56	0.11	200	286	99,219	327	464
203	2,857	14.08	1,235	S508	Restaurants	122,273	91.46	0.25	1000	1431	1,091,777	576	818
1,597	9,234	5.78	1,353	S509	Other Commercial	1,054,555	788.81	2.16	150	215	1,412,417	140	1,307,860
32	1,722	54.32	10,940	S510	Hospitals	169,210	126.57	0.35	225	322	339,947	200	299,793
129	582	4.51	946	S511	Churches & Halls	59,671	44.63	0.12	200	286	106,561	190	100,435
94	2,584	27.52	7,040	S514	Schools "B"	322,554	241.27	0.66	115	165	331,210	98	139
47	545	11.68	2,737	S515	Other Commercial "A"	62,301	46.60	0.13	150	215	83,442	138	196
201	1,162	5.78	1,350	S516	Other Commercial "B"	132,482	99.10	0.27	150	215	177,440	142	202
					COMMERCIAL PUMPING:								
75	377	5.05	1,182	S525	Department & Retail Stores	43,084	32.23	0.09	150	215	57,705	140	199
6	108	17.58	3,441	S526	Hotels & Motels	10,274	7.69	0.02	250	358	22,935	190	0
7	156	22.08	5,153	S527	Laundromats	17,733	13.26	0.04	150	215	23,751	144	0
1	0	0.45	63	S528	Laundries	31	0.02	0.00006	450	644	125	406	0
15	383	25.16	2,569	S529	Markets	19,071	14.27	0.04	800	1145	136,229	497	0
1	3	3.40	318	S530	Mortuaries	158	0.12	0.00	800	1145	1,131	797	0
21	429	20.02	5,088	S531	Professional Offices	53,166	39.77	0.11	130	186	61,713	72	0
26	93	3.63	702	S532	Repair Shops & Service Stations	8,822	6.60	0.02	200	286	15,754	327	0
72	1,640	22.73	1,994	S533	Restaurants	70,190	52.50	0.14	1000	1431	626,728	576	0
230	1,306	5.68	1,330	S534	Other Commercial	149,164	111.57	0.31	150	215	199,782	140	0
6	69	11.24	2,263	S535	Hospitals	6,756	5.05	0.01	225	322	13,573	200	0
19	88	4.55	956	S536	Churches & Halls	9,036	6.76	0.02	200	286	16,137	190	0
30	249	8.32	2,128	S539	Schools "B"	31,052	23.23	0.06	115	165	31,886	98	0
10	90	9.26	2,170	S540	Other Commercial "A"	10,348	7.74	0.02	150	215	13,860	138	0
36	251	6.89	1,610	S541	Other Commercial "B"	28,632	21.42	0.06	150	215	38,348	142	0
3,710	28,981				Subtotal - Commercial	2,865,908	2,144	5.87			5,899,546		4,619,178
14		0.00		SPEC	Special Industrial Users		362	0.99	757		2,283,381	228	688,226
92,501	28,981				Subtotal - Riverside Users	11,534,209	8,989	24.6			24,436,763		20,665,172
					Overall loading				326			276	

- Notes/Explanation**
- (A1) This column shows the projected sewer flow for each customer category based on the overall flow and growth pojections determined by MWH and the customer data provided by the City.
 - (A2) This column shows the total annual flow from each customer category in millions of gallons.
 - (A3) This column shows the flows in column A1 in million gallons per day (MGD), flows for industrial customers are based on flow metering data provided by the City
 - (B1) Assumed BOD concentrations for each customer category based on 2001 Revenue Plan Report Appendix C.
 - (B2) Adjusted BOD concentrations for each customer category based on mass balance with measured BOD concentrations.
 - (B3) This column shows the projected total annual BOD loading from each customer category in pounds.
 - (C1) Assumed TSS concentrations for each customer category based on 2001 Revenue Plan Report Appendix C.
 - (C2) Adjusted TSS concentrations for each customer category based on mass balance with projected BOD concentrations.
 - (C2) This column shows the projected total annual TSS loading from each customer category in pounds.

Projected Total In-City Flow and Loadings	24.6	326	24,436,763	276	20,665,172
Difference	0	0	0	0	0

Appendix B

FUNCTIONAL ALLOCATION OF CIP

Appendix C

PROJECTED O&M EXPENDITURES

Operations and Maintenance Budget Projection

Projected O&M Expenditures	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	
O&M Escalators																					
General Inflation	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Labor Inflation	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Growth	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.98%	0.45%	0.45%	0.45%	0.45%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%	1.12%
GI + Growth	3.98%	3.98%	3.98%	3.98%	3.98%	3.98%	3.98%	3.98%	3.45%	3.45%	3.45%	3.45%	3.45%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
Benefits and W Comp	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Chemicals	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
CSD O&M Escalation		4.10%	7.39%	4.11%	4.11%	4.12%	4.12%	4.13%	3.95%	3.96%	3.97%	3.98%	3.98%	4.22%	4.22%	4.23%	4.23%	4.24%	4.25%	4.25%	4.25%
One Time Expense	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-100.00%
Capital Inflation	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
no escalator																					

Operations and Maintenance Summary	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	
Expenditures																					
PW - Sewer Sys-Admin	\$ 5,213,254	\$ 5,406,451	\$ 5,607,284	\$ 5,816,073	\$ 6,033,155	\$ 6,258,879	\$ 6,493,612	\$ 6,737,735	\$ 6,991,647	\$ 7,255,766	\$ 7,530,526	\$ 7,816,384	\$ 8,113,815	\$ 8,423,315	\$ 8,745,405	\$ 9,080,627	\$ 9,429,549	\$ 9,792,764	\$ 10,170,891	\$ 10,564,580	
PW - Sewer - Collection Syst Maint	4,785,052	4,970,797	5,164,158	5,365,463	5,575,055	5,793,293	6,020,549	6,257,216	6,499,109	6,750,907	7,013,037	7,285,947	7,570,103	7,872,873	8,188,409	8,517,273	8,860,054	9,217,367	9,589,857	9,978,195	
PW - Sewer Systems - Treatment	11,522,036	12,005,166	13,233,907	13,788,096	14,365,925	14,968,420	15,596,653	16,251,744	16,880,445	17,534,350	18,214,505	18,922,004	19,657,989	20,505,150	21,389,398	22,312,379	23,275,816	24,281,505	25,331,326	26,427,245	
PW - Sewer - Environmental Compliance	1,477,513	1,541,154	1,607,669	1,677,195	1,749,870	1,825,844	1,905,271	1,988,314	2,075,142	2,165,934	2,260,876	2,360,165	2,464,005	2,572,613	2,686,213	2,805,043	2,929,349	3,059,393	3,195,445	3,337,793	
PW - Sewer Systems Plant Maintenance	2,633,794	2,743,817	2,858,690	2,978,638	3,103,893	3,234,701	3,371,318	3,514,012	3,663,065	3,818,771	3,981,439	4,151,392	4,328,969	4,514,525	4,708,432	4,911,081	5,122,878	5,344,252	5,575,652	5,817,548	
PW - Sewer - Electrical and Instrumentation	1,471,713	1,536,502	1,604,267	1,675,149	1,749,294	1,826,859	1,908,004	1,992,901	2,081,728	2,174,672	2,271,928	2,373,703	2,480,212	2,591,681	2,708,348	2,830,460	2,958,278	3,092,077	3,232,142	3,378,774	
PW - Sewer SCADA and SPL	502,106	524,704	548,357	573,115	599,031	626,161	654,563	684,298	715,429	748,025	782,155	817,893	855,317	894,509	935,552	978,538	1,023,559	1,070,714	1,120,105	1,171,843	
PW - Sewer - Warehouse	198,870	207,388	216,289	225,591	235,312	245,473	256,094	267,196	278,802	290,936	303,623	316,888	330,759	345,264	360,434	376,299	392,892	410,249	428,405	447,398	
PW - Sewer - Laboratory Services	959,446	1,000,371	1,043,131	1,087,811	1,134,501	1,183,294	1,234,289	1,287,589	1,343,301	1,401,539	1,462,421	1,526,071	1,592,619	1,662,202	1,734,963	1,811,052	1,890,625	1,973,848	2,060,892	2,151,939	
PW - Sewer Systems Debt Service	18,642,411	19,006,252	19,013,154	19,028,299	28,501,821	30,428,533	29,949,636	26,137,449	26,133,315	25,801,054	34,776,388	34,772,913	38,210,955	56,284,697	56,280,518	63,189,385	64,135,706	66,941,577	71,031,190	76,011,131	
PW - Sewer System - Sewer Projects		3,018,750	3,169,688	3,328,172	4,649,311	3,669,309	3,852,775	4,045,414	4,247,684	4,460,069	4,683,072	4,917,226	5,163,087	5,421,241	5,692,303	5,976,919	6,275,764	6,589,553	6,919,030	7,264,982	
PW - Sewer System - CoGen	1,049,716	1,085,170	1,121,885	1,159,910	1,199,294	1,240,089	1,282,349	1,326,129	1,371,488	1,418,487	1,467,188	1,517,658	1,569,964	1,624,179	1,680,376	1,738,632	1,799,028	1,861,648	1,926,579	1,993,912	
PW - Sewer Capital Project Serv	298,279	309,936	322,078	334,727	347,905	361,634	375,940	390,848	406,385	422,579	439,458	457,054	475,399	494,525	514,469	535,266	556,955	579,577	603,172	627,786	
PW - Sewer - Plant Expansion Engineering Support	208,328	217,016	226,087	235,558	245,447	255,774	266,559	277,824	289,589	301,879	314,718	328,132	342,146	356,789	372,091	388,081	404,793	422,259	440,515	459,599	
Total Operations and Maintenance Expenditures	48,962,518	53,573,474	55,736,644	57,273,795	69,489,816	71,918,265	73,167,614	71,158,668	72,977,131	74,544,965	85,501,334	87,563,429	93,155,340	113,563,565	115,996,911	125,451,034	129,055,247	134,636,781	141,625,203	149,632,724	

Operations and Maintenance Summary	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	
Expenditure Category																				
PW - Sewer Sys-Admin	68%	3.71%	3.71%	3.72%	3.73%	3.74%	3.75%	3.76%	3.77%	3.78%	3.79%	3.80%	3.81%	3.81%	3.82%	3.83%	3.84%	3.85%	3.86%	3.87%
PW - Sewer - Collection Syst Maint	0%	3.88%	3.89%	3.90%	3.91%	3.91%	3.92%	3.93%	3.87%	3.87%	3.88%	3.89%	3.90%	4.00%	4.01%	4.02%	4.03%	4.04%	4.04%	4.05%
PW - Sewer Systems - Treatment	100%	4.19%	10.24%	4.19%	4.19%	4.19%	4.20%	4.20%	3.87%	3.87%	3.88%	3.89%	4.31%	4.31%	4.32%	4.32%	4.32%	4.32%	4.32%	4.33%
PW - Sewer - Environmental Compliance	2%	4.31%	4.32%	4.32%	4.33%	4.34%	4.35%	4.36%	4.37%	4.38%	4.38%	4.39%	4.40%	4.41%	4.42%	4.42%	4.43%	4.44%	4.45%	4.45%
PW - Sewer Systems Plant Maintenance	97%	4.18%	4.19%	4.20%	4.21%	4.21%	4.22%	4.23%	4.24%	4.25%	4.26%	4.27%	4.28%	4.29%	4.30%	4.31%	4.32%	4.33%	4.33%	4.34%
PW - Sewer - Electrical and Instrumentation	97%	4.40%	4.41%	4.42%	4.43%	4.43%	4.44%	4.45%	4.46%	4.46%	4.47%	4.48%	4.49%	4.49%	4.50%	4.51%	4.52%	4.52%	4.53%	4.54%
PW - Sewer SCADA and SPL	97%	4.50%	4.51%	4.51%	4.52%	4.53%	4.54%	4.54%	4.55%	4.56%	4.56%	4.57%	4.58%	4.58%	4.59%	4.60%	4.61%	4.61%	4.61%	4.62%
PW - Sewer - Warehouse	97%	4.28%	4.29%	4.30%	4.31%	4.32%	4.33%	4.34%	4.34%	4.35%	4.36%	4.37%	4.38%	4.39%	4.40%	4.41%	4.42%	4.42%	4.43%	4.43%
PW - Sewer - Laboratory Services	94%	4.27%	4.27%	4.28%	4.29%	4.30%	4.31%	4.32%	4.33%	4.34%	4.34%	4.35%	4.36%	4.37%	4.38%	4.39%	4.40%	4.40%	4.41%	4.42%
PW - Sewer Systems Debt Service	0%	1.95%	0.04%	0.08%	49.79%	6.76%	-1.57%	-12.73%	-0.02%	-1.27%	34.79%	-0.01%	9.89%	47.30%	-0.01%	12.28%	1.50%	4.37%	6.11%	7.01%
PW - Sewer System - Sewer Projects	0%	0.00%	5.00%	5.00%	39.70%	-21.08%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
PW - Sewer System - CoGen	100%	3.38%	3.38%	3.39%	3.40%	3.40%	3.41%	3.41%	3.42%	3.43%	3.43%	3.44%	3.45%	3.45%	3.46%	3.47%	3.47%	3.48%	3.49%	3.49%
PW - Sewer Capital Project Serv	0%	3.91%	3.92%	3.93%	3.94%	3.95%	3.96%	3.97%	3.98%	3.98%	3.99%	4.00%	4.01%	4.02%	4.03%	4.04%	4.05%	4.06%	4.07%	4.08%
PW - Sewer - Plant Expansion Engineering Support	25%	4.17%	4.18%	4.19%	4.20%	4.21%	4.22%	4.23%	4.23%	4.24%	4.25%	4.26%	4.27%	4.28%	4.29%	4.30%	4.31%	4.31%	4.32%	4.33%
CSD O&M Revenue Escalator		4.10%	7.39%	4.11%	4.11%	4.12%	4.12%	4.13%	3.95%	3.96%	3.97%	3.98%	3.98%	4.22%	4.22%	4.23%	4.23%	4.24%	4.25%	4.25%

Riverside Wastewater Utility
 Financial and Rate Model - 2014 Rate Study
 Carollo Engineers

Operations and Maintenance Budget Projection

Projected O&M Expenditures	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	
Operations and Maintenance Expenditures																					
PW - Sewer Sys-Admin																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	1,261,822	1,324,913	1,391,159	1,460,717	1,533,753	1,610,440	1,690,962	1,775,510	1,864,286	1,957,500	2,055,375	2,158,144	2,266,051	2,379,354	2,498,321	2,623,237	2,754,399	2,892,119	3,036,725	3,188,561
411105 Salaries - Non-Productive	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411320 Temporary Foreman Pay	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	6,919	7,265	7,628	8,010	8,410	8,831	9,272	9,736	10,223	10,734	11,270	11,834	12,426	13,047	13,699	14,384	15,103	15,858	16,651	17,484
412210 Workers Compensation Ins	Labor Inflation	23,848	25,040	26,292	27,607	28,987	30,437	31,959	33,557	35,234	36,996	38,846	40,788	42,828	44,969	47,217	49,578	52,057	54,660	57,393	60,263
412220 Health Insurance	Labor Inflation	158,480	166,404	174,724	183,460	192,633	202,265	212,378	222,997	234,147	245,854	258,147	271,055	284,607	298,838	313,780	329,469	345,942	363,239	381,401	400,471
412222 Dental Insurance	Labor Inflation	7,934	8,331	8,747	9,185	9,644	10,126	10,632	11,164	11,722	12,308	12,924	13,570	14,248	14,961	15,709	16,494	17,319	18,185	19,094	20,049
412230 Life Insurance	Labor Inflation	6,711	7,047	7,399	7,769	8,157	8,565	8,993	9,443	9,915	10,411	10,932	11,478	12,052	12,655	13,287	13,952	14,649	15,382	16,151	16,958
412240 Unemployment Insurance	Labor Inflation	1,767	1,855	1,948	2,046	2,148	2,255	2,368	2,486	2,611	2,741	2,878	3,022	3,173	3,332	3,499	3,673	3,857	4,050	4,252	4,465
412250 Disability Insurance	Labor Inflation	544	571	600	630	661	694	729	765	804	844	886	930	977	1,026	1,077	1,131	1,187	1,247	1,309	1,375
412310 PERS Retirement	Labor Inflation	352,905	370,550	389,078	408,532	428,958	450,406	472,926	496,573	521,401	547,471	574,845	603,587	633,767	665,455	698,728	733,664	770,347	808,865	849,308	891,773
412320 Medicare OASDI	Labor Inflation	18,296	19,211	20,171	21,180	22,239	23,351	24,518	25,744	27,032	28,383	29,802	31,292	32,857	34,500	36,225	38,038	39,938	41,935	44,032	46,233
413120 Overtime At 1.5 Rate	Labor Inflation	735	772	810	851	893	938	985	1,034	1,086	1,140	1,197	1,257	1,320	1,386	1,455	1,528	1,604	1,685	1,769	1,857
413230 Holiday O/T-Strt/Subj To Retir	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non-Personnel																					
421000 Professional Services	General Inflation	35,000	36,050	37,132	38,245	39,393	40,575	41,792	43,046	44,337	45,667	47,037	48,448	49,902	51,399	52,941	54,529	56,165	57,850	59,585	61,373
421000 Professional Services	General Inflation	10,000	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	13,048	13,439	13,842	14,258	14,685	15,126	15,580	16,047	16,528	17,024	17,535
421043 Prof Svcs Regulatory Comp	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
421043 Prof Svcs Regulatory Comp	General Inflation	245,539	252,905	260,492	268,307	276,356	284,647	293,186	301,982	311,041	320,373	329,984	339,883	350,080	360,582	371,400	382,542	394,018	405,839	418,014	430,554
421043 Prof Svcs Regulatory Comp	General Inflation	7,630	7,859	8,095	8,338	8,588	8,845	9,111	9,384	9,665	9,955	10,254	10,562	10,879	11,205	11,541	11,887	12,244	12,611	12,990	13,379
421100 Outside Legal Services	General Inflation	350,000	360,500	371,315	382,454	393,928	405,746	417,918	430,456	443,370	456,671	470,371	484,482	499,016	513,987	529,406	545,289	561,647	578,497	595,852	613,727
422100 Telephone	General Inflation	4,500	4,635	4,774	4,917	5,065	5,217	5,373	5,534	5,700	5,871	6,048	6,229	6,416	6,608	6,807	7,011	7,221	7,438	7,661	7,891
422120 Telephone - Cellular	General Inflation	6,500	6,695	6,896	7,103	7,316	7,535	7,761	7,994	8,234	8,481	8,735	8,998	9,267	9,545	9,832	10,127	10,431	10,744	11,066	11,398
422120 Telephone - Cellular	General Inflation	4,338	4,468	4,602	4,740	4,882	5,029	5,180	5,335	5,495	5,660	5,830	6,005	6,185	6,370	6,562	6,758	6,961	7,170	7,385	7,607
423400 Motor Pool Equipment Rental	General Inflation	24,000	24,720	25,462	26,225	27,012	27,823	28,657	29,517	30,402	31,315	32,254	33,228	34,218	35,245	36,302	37,391	38,513	39,668	40,858	42,084
424120 Constr & Maint Materials	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
424130 Maint/Repair of Bldgs & Improv	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
424220 All Other Equip Maint/Repair	General Inflation	15,500	15,965	16,444	16,937	17,445	17,969	18,508	19,063	19,635	20,224	20,831	21,456	22,099	22,762	23,445	24,148	24,873	25,619	26,388	27,179
424230 Central Garage Charges	General Inflation	3,500	3,605	3,713	3,825	3,939	4,057	4,179	4,305	4,434	4,567	4,704	4,845	4,990	5,140	5,294	5,453	5,616	5,785	5,959	6,137
425200 Periodicals & Dues	General Inflation	21,540	22,186	22,852	23,537	24,243	24,971	25,720	26,491	27,286	28,105	28,948	29,816	30,711	31,632	32,581	33,559	34,565	35,602	36,670	37,771
425200 Periodicals & Dues	General Inflation	39,312	40,491	41,706	42,957	44,246	45,573	46,941	48,349	49,799	51,293	52,832	54,417	56,050	57,731	59,463	61,247	63,084	64,977	66,926	68,934
425200 Periodicals & Dues	General Inflation	12,616	12,994	13,384	13,786	14,199	14,625	15,064	15,516	15,982	16,461	16,955	17,465	17,987	18,527	19,083	19,655	20,245	20,852	21,478	22,122
425200 Periodicals & Dues	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
425400 General Office Expense	General Inflation	20,000	20,600	21,218	21,855	22,510	23,185	23,881	24,597	25,335	26,095	26,878	27,685	28,515	29,371	30,252	31,159	32,094	33,057	34,049	35,070
425400 General Office Expense	General Inflation	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957	2,016	2,076	2,139	2,203	2,269	2,337	2,407	2,479	2,554	2,630
425400 General Office Expense	General Inflation	100	103	106	109	113	116	119	123	127	130	134	138	143	147	151	156	160	165	170	175
425400 General Office Expense	General Inflation	500	515	530	546	563	580	597	615	633	652	672	692	713	734	756	779	802	826	851	877
425500 Postage	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
425500 Postage	General Inflation	150	155	159	164	169	174	179	184	190	196	202	208	214	220	227	234	241	248	255	263
425600 Central Printing Charges	General Inflation	200	206	212	219	225	232	239	246	253	261	269	277	285	294	303	312	321	331	340	351
425600 Central Printing Charges	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425600 Central Printing Charges	General Inflation	600	618	637	656	675	696	716	738	760	783	806	831	855	881	908	935	963	992	1,021	1,052
425610 Outside Printing Expense	General Inflation	300	309	318	328	338	348	358	369	380	391	403	415	428	441	454	467	481	496	511	526
425800 Computer Equip Purc Undr \$5000	General Inflation	5,600	5,768	5,941	6,119	6,303	6,492	6,687	6,887	7,092	7,302	7,522	7,752	7,994	8,248	8,511	8,785	9,069	9,364	9,669	9,984
426100 Janitorial Supplies	General Inflation	25	26	27	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	43	44
426200 Clothing/Linen/Safety Supplies	General Inflation	-	-	-	-	-</															

Operations and Maintenance Budget Projection

Projected O&M Expenditures	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33	
PW - Sewer - Collection Syst Maint																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	1,071,308	1,124,873	1,181,117	1,240,173	1,302,182	1,367,291	1,435,655	1,507,438	1,582,810	1,661,950	1,745,048	1,832,300	1,923,915	2,020,111	2,121,117	2,227,172	2,338,531	2,455,458	2,578,230	2,707,142
411105 Salaries - Non-Productive	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411250 Industrial Accident	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411310 Night Shift Premium	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	5,983	6,282	6,596	6,926	7,272	7,636	8,018	8,419	8,840	9,282	9,746	10,233	10,745	11,282	11,846	12,438	13,060	13,713	14,399	15,119
412210 Workers Compensation Ins	Labor Inflation	20,248	21,260	22,323	23,440	24,612	25,842	27,134	28,491	29,916	31,411	32,982	34,631	36,362	38,181	40,090	42,094	44,199	46,409	48,729	51,166
412220 Health Insurance	Labor Inflation	179,370	188,339	197,755	207,643	218,025	228,927	240,373	252,392	265,011	278,262	292,175	306,784	322,123	338,229	355,140	372,897	391,542	411,119	431,675	453,259
412222 Dental Insurance	Labor Inflation	9,056	9,509	9,984	10,483	11,008	11,558	12,136	12,743	13,380	14,049	14,751	15,489	16,263	17,076	17,930	18,827	19,768	20,757	21,794	22,884
412230 Life Insurance	Labor Inflation	2,373	2,492	2,616	2,747	2,884	3,029	3,180	3,339	3,506	3,683	3,865	4,059	4,262	4,475	4,698	4,933	5,180	5,439	5,711	5,996
412240 Unemployment Insurance	Labor Inflation	1,500	1,575	1,654	1,736	1,823	1,914	2,010	2,111	2,216	2,327	2,443	2,566	2,694	2,828	2,970	3,118	3,274	3,438	3,610	3,790
412250 Disability Insurance	Labor Inflation	1,904	1,999	2,099	2,204	2,314	2,430	2,552	2,679	2,813	2,954	3,101	3,256	3,419	3,590	3,770	3,958	4,156	4,364	4,582	4,811
412310 PERS Retirement	Labor Inflation	281,411	295,482	310,256	325,768	342,057	359,160	377,118	395,974	415,772	436,561	458,389	481,308	505,374	530,642	557,175	585,033	614,285	644,999	677,249	711,112
412320 Medicare OASDI	Labor Inflation	13,787	14,476	15,200	15,960	16,758	17,596	18,476	19,400	20,370	21,388	22,458	23,580	24,759	25,997	27,297	28,662	30,095	31,600	33,180	34,839
413110 Overtime At Straight Rate	Labor Inflation	23,100	24,255	25,468	26,741	28,078	29,482	30,956	32,504	34,129	35,836	37,627	39,509	41,484	43,558	45,736	48,023	50,424	52,946	55,593	58,373
413120 Overtime At 1.5 Rate	Labor Inflation	66,465	69,788	73,278	76,942	80,789	84,828	89,069	93,523	98,199	103,109	108,264	113,678	119,362	125,330	131,596	138,176	145,085	152,339	159,956	167,954
413130 Overtime At Double Time Rate	Labor Inflation	8,505	8,930	9,377	9,846	10,338	10,855	11,398	11,967	12,566	13,194	13,854	14,546	15,274	16,037	16,839	17,681	18,565	19,494	20,468	21,492
Non-Personnel																					
421000 Professional Services	General Inflation	207,750	213,983	220,402	227,014	233,824	240,839	248,064	255,506	263,171	271,067	279,199	287,575	296,202	305,088	314,241	323,668	333,378	343,379	353,680	364,291
421001 Prof Services/Internal	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
422100 Telephone	General Inflation	1,620	1,669	1,719	1,770	1,823	1,878	1,934	1,992	2,052	2,114	2,177	2,242	2,310	2,379	2,450	2,524	2,600	2,678	2,758	2,841
422120 Telephone - Cellular	General Inflation	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	10,438	10,751	11,074	11,406	11,748	12,101	12,464	12,838	13,223	13,619	14,028
422200 Electric	GI + Growth	185,000	192,363	200,019	207,980	216,257	224,864	233,814	243,120	251,507	260,184	269,161	278,447	288,053	299,921	312,278	325,144	338,540	352,487	367,010	382,131
422300 Gas	GI + Growth	220	229	238	247	257	267	278	289	299	309	320	331	343	357	371	387	403	419	436	454
422500 Water	GI + Growth	17,300	17,989	18,704	19,449	20,223	21,028	21,865	22,735	23,519	24,331	25,170	26,039	26,937	27,864	28,820	29,807	30,824	31,871	32,949	34,058
422600 Other Utilities	GI + Growth	5,850	6,083	6,325	6,577	6,838	7,111	7,394	7,688	7,993	8,311	8,645	8,995	9,361	9,744	10,144	10,561	11,000	11,461	11,944	12,449
422700 Refuse/Disposal Fees	GI + Growth	2,000	2,080	2,162	2,248	2,338	2,431	2,528	2,628	2,719	2,813	2,910	3,010	3,114	3,222	3,376	3,515	3,660	3,811	3,968	4,131
423100 Equipment Rental	GI + Growth	4,000	4,159	4,325	4,497	4,676	4,862	5,055	5,257	5,438	5,626	5,820	6,020	6,228	6,485	6,752	7,030	7,320	7,621	7,935	8,262
423400 Motor Pool Equipment Rental	GI + Growth	105,000	109,179	113,524	118,043	122,741	127,626	132,705	137,987	142,747	147,672	152,767	158,037	163,490	170,226	177,239	184,541	192,144	200,060	208,303	216,885
424120 Constr & Maint Materials	GI + Growth	13,100	13,621	14,164	14,727	15,313	15,923	16,557	17,216	17,809	18,424	19,059	19,717	20,397	21,100	21,828	22,582	23,362	24,168	24,999	25,856
424130 Maint/Repair of Bldgs & Improv	GI + Growth	1,500	1,560	1,622	1,686	1,753	1,823	1,896	1,971	2,039	2,110	2,182	2,258	2,336	2,432	2,532	2,636	2,745	2,858	2,976	3,098
424220 All Other Equip Maint/Repair	GI + Growth	52,500	54,590	56,762	59,021	61,370	63,813	66,353	68,993	71,734	73,836	76,383	79,019	81,745	85,113	88,619	92,271	96,072	100,030	104,151	108,443
424230 Central Garage Charges	GI + Growth	140,000	145,572	151,366	157,390	163,654	170,168	176,940	183,983	190,330	196,896	203,717	210,717	217,986	226,967	236,318	246,055	256,192	266,747	277,737	289,180
424240 Central Communications Chg	GI + Growth	2,000	2,080	2,162	2,248	2,338	2,431	2,528	2,628	2,719	2,813	2,910	3,010	3,114	3,222	3,376	3,515	3,660	3,811	3,968	4,131
425200 Periodicals & Dues	GI + Growth	3,414	3,550	3,691	3,838	3,991	4,150	4,315	4,487	4,641	4,801	4,967	5,138	5,316	5,535	5,763	6,000	6,247	6,505	6,773	7,052
425300 Photo & Recording Supplies	GI + Growth	1,000	1,040	1,081	1,124	1,169	1,215	1,264	1,314	1,359	1,406	1,455	1,505	1,557	1,621	1,688	1,758	1,830	1,905	1,984	2,066
425400 General Office Expense	GI + Growth	3,000	3,119	3,244	3,373	3,507	3,646	3,792	3,942	4,078	4,219	4,365	4,515	4,671	4,864	5,064	5,273	5,490	5,716	5,952	6,197
425500 Postage	GI + Growth	50	52	54	56	58	61	63	66	68	70	73	75	78	81	84	88	91	95	99	103
425600 Central Printing Charges	GI + Growth	1,500	1,560	1,622	1,686	1,753	1,823	1,896	1,971	2,039	2,110	2,182	2,258	2,336	2,432	2,532	2,636	2,745	2,858	2,976	3,098
425700 Software Purchase/Licensing	GI + Growth	3,000	3,119	3,244	3,373	3,507	3,646	3,792	3,942	4,078	4,219	4,365	4,515	4,671	4,864	5,064	5,273	5,490	5,716	5,952	6,197
425800 Computer Equip Purc Undr \$5000	GI + Growth	12,000	12,478	12,974	13,491	14,028	14,586	15,166	15,770	16,314	16,877	17,459	18,061	18,685	19,454	20,256	21,090	21,959	22,864	23,806	24,787
426100 Janitorial Supplies	GI + Growth	100	104	108	112	117	122	126	131	136	141	145	151	156	162	169	176	183	191	198	207
426200 Clothing/Linen/Safety Supplies	GI + Growth	19,480	20,255	21,061	21,900	22,771	23,678	24,620	25,600	26,613	27,659	28,742	29,862	30,331	31,581	32,882	34,237	35,647	37,116	38,645	40,237
426300 Motor Fuels & Lubricants	GI + Growth	39,000	40,552	42,166	43,844	45,589	47,404	49,291	51,252	53,020	54,850	56,742	58,700	60,725	62,827	65,832	68,544	71,368	74,308	77,370	80,557
426600 Chemical Supplies	Chemicals	101,500	106,575	111,904	117,499	123,374	129,543	136,020	142,821	149,962	157,460	165,333	173,599	182,279	191,393	200,963	211,011	221,562	232,640	244,272	256,485
426700 Maintenance Tools/Supplies	GI + Growth	48,500	50,430	52,437	54,524	56,695	58,951	61,297	63,737	65,936	68										

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
411420 Sick Leave Payoff	Labor Inflation	41,573	43,652	45,834	48,126	50,532	53,059	55,712	58,497	61,422	64,493	67,718	71,104	74,659	78,392	82,312	86,427	90,749	95,286	100,050	105,053
411430 Compensatory Time Payoff	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	11,489	12,063	12,667	13,300	13,965	14,663	15,396	16,166	16,974	17,823	18,714	19,650	20,633	21,664	22,747	23,885	25,079	26,333	27,650	29,032
412210 Workers Compensation Ins	Labor Inflation	40,004	42,004	44,104	46,310	48,625	51,056	53,609	56,290	59,104	62,059	65,162	68,420	71,841	75,434	79,205	83,165	87,324	91,690	96,274	101,088
412220 Health Insurance	Labor Inflation	247,807	260,197	273,207	286,868	301,211	316,272	332,085	348,689	366,124	384,430	403,651	423,834	445,026	467,277	490,641	515,173	540,932	567,978	596,377	626,196
412222 Dental Insurance	Labor Inflation	13,030	13,682	14,366	15,084	15,838	16,630	17,461	18,335	19,251	20,214	21,224	22,286	23,400	24,570	25,799	27,088	28,443	29,865	31,358	32,926
412230 Life Insurance	Labor Inflation	6,184	6,493	6,818	7,159	7,517	7,893	8,287	8,702	9,137	9,593	10,073	10,577	11,106	11,661	12,244	12,856	13,499	14,174	14,883	15,627
412240 Unemployment Insurance	Labor Inflation	2,963	3,111	3,267	3,430	3,602	3,782	3,971	4,169	4,378	4,597	4,826	5,068	5,321	5,587	5,867	6,160	6,468	6,791	7,131	7,487
412250 Disability Insurance	Labor Inflation	2,720	2,856	2,999	3,149	3,306	3,471	3,645	3,827	4,019	4,220	4,431	4,652	4,885	5,129	5,385	5,655	5,937	6,234	6,546	6,873
412310 PERS Retirement	Labor Inflation	582,610	611,741	642,328	674,444	708,166	743,574	780,753	819,791	860,780	903,819	949,010	996,461	1,046,284	1,098,598	1,153,528	1,211,204	1,271,765	1,335,353	1,402,120	1,472,226
412320 Medicare OASDI	Labor Inflation	28,544	29,971	31,470	33,043	34,695	36,430	38,252	40,164	42,172	44,281	46,495	48,820	51,261	53,824	56,515	59,341	62,308	65,423	68,695	72,129
413110 Overtime At Straight Rate	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
413120 Overtime At 1.5 Rate	Labor Inflation	125,000	131,250	137,813	144,703	151,938	159,535	167,512	175,888	184,682	193,916	203,612	213,792	224,482	235,706	247,491	259,866	272,859	286,502	300,827	315,869
413130 Overtime At Double Time Rate	Labor Inflation	40,000	42,000	44,100	46,305	48,620	51,051	53,604	56,284	59,098	62,053	65,156	68,414	71,834	75,426	79,197	83,157	87,315	91,681	96,265	101,078
413210 Holiday O/T-Straight/Non-Sched	Labor Inflation	25,000	26,250	27,563	28,941	30,388	31,907	33,502	35,178	36,936	38,783	40,722	42,758	44,896	47,141	49,498	51,973	54,572	57,300	60,165	63,174
413230 Holiday O/T-Strt/Subj To Retir	Labor Inflation	35,000	36,750	38,588	40,517	42,543	44,670	46,903	49,249	51,711	54,298	57,011	59,862	62,855	65,998	69,298	72,762	76,401	80,221	84,232	88,443
413240 O/T 1.5 Rate Sub To Retirement	Labor Inflation	1,500	1,575	1,654	1,736	1,823	1,914	2,010	2,111	2,216	2,327	2,443	2,566	2,694	2,828	2,970	3,118	3,274	3,438	3,610	3,790
Non-Personnel																					
421000 Professional Services	General Inflation	26,193	26,979	27,788	28,622	29,480	30,365	31,276	32,214	33,181	34,176	35,201	36,257	37,345	38,465	39,619	40,808	42,032	43,293	44,592	45,930
421043 Prof Svcs Regulatory Comp	General Inflation	244,641	251,980	259,540	267,326	275,346	283,606	292,114	300,878	309,904	319,201	328,777	338,640	348,800	359,264	370,041	381,143	392,577	404,354	416,485	428,979
422100 Telephone	General Inflation	2,100	2,163	2,228	2,295	2,364	2,434	2,508	2,583	2,660	2,740	2,822	2,907	2,994	3,084	3,176	3,272	3,370	3,471	3,575	3,682
422120 Telephone - Cellular	General Inflation	5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
422200 Electric	GI + Growth	1,850,000	1,923,630	2,000,190	2,079,798	2,162,574	2,248,644	2,338,141	2,431,199	2,515,075	2,601,845	2,691,609	2,784,469	2,880,533	2,999,211	3,122,779	3,251,437	3,385,396	3,524,875	3,670,100	3,821,308
422300 Gas	GI + Growth	1,000	1,040	1,081	1,124	1,169	1,215	1,264	1,314	1,359	1,406	1,455	1,505	1,557	1,621	1,688	1,758	1,830	1,905	1,984	2,066
422500 Water	GI + Growth	135,000	140,373	145,960	151,769	157,809	164,090	170,621	177,412	183,532	189,864	196,415	203,191	210,201	218,861	227,878	237,267	247,042	257,221	267,818	278,852
422600 Other Utilities	GI + Growth	62,000	64,668	67,033	69,701	72,475	75,360	78,359	81,478	84,789	88,299	92,005	95,917	100,037	104,375	108,942	113,747	118,791	123,984	129,326	134,826
422700 Refuse/Disposal Fees	GI + Growth	1,896,000	1,971,461	2,049,925	2,131,512	2,216,346	2,304,557	2,396,278	2,491,650	2,577,612	2,666,539	2,758,535	2,853,705	2,952,157	3,073,786	3,200,426	3,332,284	3,469,574	3,612,520	3,761,356	3,916,324
423100 Equipment Rental	GI + Growth	107,675	111,960	116,416	121,050	125,868	130,877	136,086	141,502	146,384	151,434	156,659	162,064	167,655	173,432	179,405	185,574	191,948	198,626	205,610	212,900
423400 Motor Pool Equipment Rental	GI + Growth	45,000	46,791	48,653	50,590	52,603	54,697	56,874	59,137	61,477	63,888	65,472	67,730	70,067	72,954	75,959	79,089	82,347	85,740	89,273	92,951
424200 Maintenance & Repair - General	GI + Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
424220 All Other Equip Maint/Repair	GI + Growth	22,260	23,146	24,067	25,025	26,021	27,057	28,134	29,253	30,416	31,627	32,878	34,170	35,604	36,088	37,575	39,123	40,735	42,413	44,160	45,980
424230 Central Garage Charges	GI + Growth	14,500	15,077	15,677	16,301	16,950	17,625	18,326	19,053	19,817	20,619	21,460	22,342	23,265	24,230	25,237	26,287	27,381	28,520	29,704	30,934
424240 Central Communications Chg	GI + Growth	2,000	2,080	2,162	2,248	2,338	2,431	2,528	2,628	2,719	2,813	2,910	3,010	3,114	3,222	3,334	3,450	3,570	3,694	3,822	3,954
425200 Periodicals & Dues	GI + Growth	5,700	5,927	6,163	6,408	6,663	6,928	7,204	7,491	7,799	8,128	8,478	8,849	9,241	9,654	10,089	10,545	11,022	11,520	12,040	12,582
425300 Photo & Recording Supplies	GI + Growth	500	520	541	562	584	608	632	657	680	703	727	753	779	811	844	879	915	953	992	1,033
425400 General Office Expense	GI + Growth	8,600	8,942	9,298	9,668	10,053	10,453	10,869	11,302	11,692	12,095	12,512	12,944	13,391	13,942	14,517	15,115	15,738	16,386	17,061	17,764
425500 Postage	GI + Growth	100	104	108	112	117	122	126	131	136	141	145	151	156	162	169	176	183	191	198	207
425600 Central Printing Charges	GI + Growth	225	234	243	253	263	273	284	296	306	316	327	339	350	365	380	395	412	429	446	465
425610 Outside Printing Expense	GI + Growth	150	156	162	169	175	182	190	197	204	211	218	226	234	243	253	264	274	286	298	310
425800 Computer Equip Purc Undr \$5000	GI + Growth	4,200	4,367	4,541	4,722	4,910	5,105	5,308	5,519	5,710	5,907	6,111	6,321	6,540	6,809	7,090	7,382	7,686	8,002	8,332	8,675
426100 Janitorial Supplies	GI + Growth	250	260	270	281	292	304	316	329	340	352	364	376	389	405	422	439	457	476	496	516
426200 Clothing/Linen/Safety Supplies	GI + Growth	26,420	27,472	28,565	29,702	30,884	32,113	33,391	34,720	35,918	37,157	38,439	39,765	41,137	42,832	44,957	46,434	48,347	50,339	52,413	54,572
426300 Motor Fuels & Lubricants	GI + Growth	10,250	10,658	11,082	11,523	11,982	12,459	12,955	13,470	13,935	14,416	14,913	15,427	15,960	16,617	17,302	18,015	18,757	19,530	20,334	21,172
426600 Chemical Supplies	GI + Growth	2,940,000	3,057,012	3,178,681	3,305,193	3,436,739	3,573,521	3,715,748	3,863,634	3,996,930	4,134,824	4,277,475	4,425,048	4,577,712	4,766,314	4,962,686	5,167,149	5,380,035	5,601,693	5,832,483	6,072,781
426700 Maintenance Tools/Supplies	GI + Growth	10,000	10,398	10,812	11,242	11,690	12,155	12,639	13,142	13,595	14,064	14,549	15,051	15,570	16,212	16,880	17,575	18,299	19,053	19,838	20,656
426710 Work Boot Reimbursement	General Inflation	3,600	3,708	3,819	3,934	4,052	4,173	4,299	4,428	4,560	4,697	4,838	4,983	5,133	5,287	5,445	5,609	5,779	5,950	6,129	6,313
426800 Special Department Supplies	General Inflation	14,200	14,626	15,0																	

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
Non-Personnel																					
421000 Professional Services	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
421043 Prof Svcs Regulatory Comp	General Inflation	29,000	29,870	30,766	31,689	32,640	33,619	34,628	35,666	36,736	37,838	38,974	40,143	41,347	42,587	43,865	45,181	46,536	47,933	49,371	50,852
422100 Telephone	General Inflation	300	309	318	328	338	348	358	369	380	391	403	415	428	441	454	467	481	496	511	526
422120 Telephone - Cellular	General Inflation	3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	3,914	4,032	4,153	4,277	4,406	4,538	4,674	4,814	4,959	5,107	5,261
423100 Equipment Rental	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
423400 Motor Pool Equipment Rental	General Inflation	55,000	56,550	58,350	60,100	61,903	63,760	65,673	67,643	69,672	71,763	73,915	76,133	78,417	80,769	83,192	85,688	88,259	90,907	93,634	96,443
424220 All Other Equip Maint/Repair	General Inflation	4,000	4,120	4,244	4,371	4,502	4,637	4,776	4,919	5,067	5,219	5,376	5,537	5,703	5,874	6,050	6,232	6,419	6,611	6,810	7,014
424230 Central Garage Charges	General Inflation	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957	2,016	2,076	2,139	2,203	2,269	2,337	2,407	2,479	2,554	2,630
424240 Central Communications Chg	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
425200 Periodicals & Dues	General Inflation	4,500	4,635	4,774	4,917	5,065	5,217	5,373	5,534	5,700	5,871	6,048	6,229	6,416	6,608	6,807	7,011	7,221	7,438	7,661	7,891
425300 Photo & Recording Supplies	General Inflation	350	361	371	382	394	406	418	430	443	457	470	484	499	514	529	545	562	578	596	614
425400 General Office Expense	General Inflation	5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
425500 Postage	General Inflation	500	515	530	546	563	580	597	615	633	652	672	692	713	734	756	779	802	826	851	877
425600 Central Printing Charges	General Inflation	3,500	3,605	3,713	3,825	3,939	4,057	4,179	4,305	4,434	4,567	4,704	4,845	4,990	5,140	5,294	5,453	5,616	5,785	5,959	6,137
425610 Outside Printing Expense	General Inflation	189	195	201	207	213	219	226	232	239	247	254	262	269	278	286	294	303	312	322	331
425700 Software Purchase/Licensing	General Inflation	33,650	34,660	35,699	36,770	37,873	39,010	40,180	41,385	42,627	43,906	45,223	46,579	47,977	49,416	50,899	52,426	53,998	55,618	57,287	59,005
425800 Computer Equip Purc Undr \$5000	General Inflation	4,200	4,326	4,456	4,589	4,727	4,869	5,015	5,165	5,320	5,480	5,644	5,814	5,988	6,168	6,353	6,543	6,740	6,942	7,150	7,365
426200 Clothing/Line/Safety Supplies	General Inflation	3,820	3,935	4,053	4,174	4,299	4,428	4,561	4,698	4,839	4,984	5,134	5,288	5,446	5,610	5,778	5,951	6,130	6,314	6,503	6,698
426300 Motor Fuels & Lubricants	General Inflation	1,300	1,339	1,379	1,421	1,463	1,507	1,552	1,599	1,647	1,696	1,747	1,800	1,853	1,909	1,966	2,025	2,086	2,149	2,213	2,280
426700 Maintenance Tools/Supplies	General Inflation	4,400	4,532	4,668	4,808	4,952	5,101	5,254	5,411	5,574	5,741	5,913	6,091	6,273	6,462	6,655	6,855	7,061	7,273	7,491	7,715
426710 Work Boot Reimbursement	General Inflation	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957	2,016	2,076	2,139	2,203	2,269	2,337	2,407	2,479	2,554	2,630
426800 Special Department Supplies	General Inflation	11,000	11,330	11,670	12,020	12,381	12,752	13,135	13,529	13,934	14,353	14,783	15,227	15,683	16,154	16,638	17,138	17,652	18,181	18,727	19,289
427100 Travel & Meeting Expense	General Inflation	750	773	796	820	844	869	896	922	950	979	1,008	1,038	1,069	1,101	1,134	1,168	1,204	1,240	1,277	1,315
427200 Training	General Inflation	6,364	6,555	6,752	6,954	7,163	7,378	7,599	7,827	8,062	8,304	8,553	8,809	9,074	9,346	9,626	9,915	10,212	10,519	10,834	11,159
428400 Liability Insurance	General Inflation	31,430	32,373	33,344	34,344	35,375	36,436	37,529	38,655	39,815	41,009	42,239	43,506	44,812	46,156	47,541	48,967	50,436	51,949	53,507	55,113
Grants and Capital Projects																					
448000 Employee Meal Allowance	General Inflation	50	52	53	55	56	58	60	61	63	65	67	69	71	73	76	78	80	83	85	88
Special Programs																					
450368 SPB Program - Comm/Indust	General Inflation	167,400	172,422	177,595	182,922	188,410	194,062	199,884	205,881	212,057	218,419	224,972	231,721	238,672	245,833	253,208	260,804	268,628	276,687	284,987	293,537
450369 SPB Program - Residential	General Inflation	53,600	55,208	56,864	58,570	60,327	62,137	64,001	65,921	67,899	69,936	72,034	74,195	76,421	78,713	81,075	83,507	86,012	88,593	91,250	93,988
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	81,445	83,888	86,405	88,997	91,667	94,417	97,250	100,167	103,172	106,267	109,455	112,739	116,121	119,605	123,193	126,889	130,695	134,616	138,655	142,814
Total PW - Sewer - Environmental Compliance		1,477,513	1,541,154	1,607,669	1,677,195	1,749,870	1,825,844	1,905,271	1,988,314	2,075,142	2,165,934	2,260,876	2,360,165	2,464,005	2,572,613	2,686,213	2,805,043	2,929,349	3,059,393	3,195,445	3,337,793
PW - Sewer Systems Plant Maintenance																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	991,897	1,041,492	1,093,566	1,148,245	1,205,657	1,265,940	1,329,237	1,395,699	1,465,484	1,538,758	1,615,696	1,696,480	1,781,305	1,870,370	1,963,888	2,062,083	2,165,187	2,273,446	2,387,118	2,506,474
411105 Salaries - Non-Productive	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411260 Bereavement Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	5,666	5,949	6,247	6,559	6,887	7,231	7,593	7,973	8,371	8,790	9,229	9,691	10,175	10,684	11,218	11,779	12,368	12,987	13,636	14,318
411210 Workers Compensation Ins	Labor Inflation	18,747	19,684	20,669	21,702	22,787	23,926	25,123	26,379	27,698	29,083	30,537	32,064	33,667	35,350	37,118	38,974	40,922	42,968	45,117	47,373
412220 Health Insurance	Labor Inflation	180,247	189,259	198,722	208,658	219,091	230,046	241,548	253,626	266,307	279,622	293,603	308,284	323,698	339,883	356,877	374,721	393,457	413,129	433,786	455,475
412222 Dental Insurance	Labor Inflation	8,508	8,933	9,380	9,849	10,342	10,859	11,402	11,972	12,570	13,199	13,859	14,552	15,279	16,043	16,845	17,688	18,572	19,500	20,476	21,499
412230 Life Insurance	Labor Inflation	1,789	1,878	1,972	2,071	2,175	2,283	2,397	2,517	2,643	2,775	2,914	3,060	3,213	3,373	3,542	3,719	3,905	4,100	4,305	4,521
412240 Unemployment Insurance	Labor Inflation	1,389	1,458	1,531	1,608	1,688	1,773	1,861	1,954	2,052	2,155	2,263	2,376	2,494	2,619	2,750	2,888	3,032	3,184	3,343	3,510
412250 Disability Insurance	Labor Inflation	2,176	2,285	2,399	2,519	2,645	2,777	2,916	3,062	3,215	3,376	3,544	3,722	3,908	4,103	4,308	4,524	4,750	4,987	5,237	5,499
412310 PERS Retirement	Labor Inflation	278,106	292,011	306,612	321,942	338,040	354,942	372,689	391,323	410,889	431,434	453,005	475,656	499,438	524,410	550,631	578,162	607,071	637,424	669,295	702,760
412320 Medicare OASDI	Labor Inflation	13,409	14,079	14,783	15,523	16,299	17,114	17,969	18,868	19,811	20,802	21,842	22,934	24,078	25,285	26,549	27,876	29,270	30,734	32,270	33,884
413110 Overtime At Straight Rate	Labor Inflation	20,000	21,000	22,050	23,153	24,310	25,526	26,802	28,142	29,549	31,027	32,578	34,207	35,917	37,713	39,599	41,579	43,657	45,840	48,132	50,539
413120 Overtime At 1.5 Rate	Labor Inflation	21,000	22,050	23,153	24,310	25,526	26,80														

Riverside Wastewater Utility
 Financial and Rate Model - 2014 Rate Study
 Carollo Engineers

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
448000 Employee Meal Allowance	General Inflation	50	52	53	55	56	58	60	61	63	65	67	69	71	73	76	78	80	83	85	88
Capital Purchases																					
462050 Building and Improvements	General Inflation	18,000	18,540	19,096	19,669	20,259	20,867	21,493	22,138	22,802	23,486	24,190	24,916	25,664	26,434	27,227	28,043	28,885	29,751	30,644	31,563
462100 Automotive Equipment	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
462200 Machine and Equipment	General Inflation	15,000	15,450	15,914	16,391	16,883	17,389	17,911	18,448	19,002	19,572	20,159	20,764	21,386	22,028	22,689	23,370	24,071	24,793	25,536	26,303
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	118,922	122,490	126,164	129,949	133,848	137,863	141,999	146,259	150,647	155,166	159,821	164,616	169,554	174,641	179,880	185,277	190,835	196,560	202,457	208,530
882510 Utilization Chgs from 510 Fund	General Inflation	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566	1,613	1,661	1,711	1,762	1,815	1,870	1,926	1,983	2,043	2,104
882540 Utilization Chgs from 540 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
884550 Interfund Services from 550 Fd	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Charges to Others																					
894550 Interfund Services to 550 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PW - Sewer Systems Plant Maintenance		2,633,794	2,743,817	2,858,690	2,978,638	3,103,893	3,234,701	3,371,318	3,514,012	3,663,065	3,818,771	3,981,439	4,151,392	4,328,969	4,514,525	4,708,432	4,911,081	5,122,878	5,344,252	5,575,652	5,817,548
PW - Sewer - Electrical and Instrumentation																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	662,246	695,358	730,126	766,633	804,964	845,212	887,473	931,847	978,439	1,027,361	1,078,729	1,132,665	1,189,299	1,248,764	1,311,202	1,376,762	1,445,600	1,517,880	1,593,774	1,673,463
411105 Salaries - Non-Productive	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	3,715	3,901	4,096	4,301	4,516	4,741	4,978	5,227	5,489	5,763	6,051	6,354	6,672	7,005	7,355	7,723	8,109	8,515	8,941	9,388
412210 Workers Compensation Ins	Labor Inflation	12,516	13,142	13,799	14,489	15,213	15,974	16,773	17,611	18,492	19,416	20,387	21,407	22,477	23,601	24,781	26,020	27,321	28,687	30,121	31,627
412220 Health Insurance	Labor Inflation	104,424	109,645	115,127	120,884	126,928	133,274	139,938	146,935	154,282	161,996	170,096	178,600	187,531	196,907	206,752	217,090	227,944	239,342	251,309	263,874
412222 Dental Insurance	Labor Inflation	5,234	5,496	5,770	6,059	6,362	6,680	7,014	7,365	7,733	8,120	8,526	8,952	9,400	9,869	10,363	10,881	11,425	11,996	12,596	13,226
412230 Life Insurance	Labor Inflation	1,182	1,241	1,303	1,368	1,437	1,509	1,584	1,663	1,746	1,834	1,925	2,022	2,123	2,229	2,340	2,457	2,580	2,709	2,845	2,987
412240 Unemployment Insurance	Labor Inflation	927	973	1,022	1,073	1,127	1,183	1,242	1,304	1,370	1,438	1,510	1,585	1,665	1,748	1,835	1,927	2,024	2,125	2,231	2,342
412250 Disability Insurance	Labor Inflation	1,088	1,142	1,200	1,259	1,322	1,389	1,458	1,531	1,607	1,688	1,772	1,861	1,954	2,052	2,154	2,262	2,375	2,494	2,618	2,749
412310 PERS Retirement	Labor Inflation	182,264	191,377	200,946	210,993	221,543	232,620	244,251	256,464	269,287	282,751	296,889	311,733	327,320	343,686	360,870	378,914	397,859	417,752	438,640	460,572
412320 Medicare OASDI	Labor Inflation	9,603	10,083	10,587	11,117	11,673	12,256	12,869	13,512	14,188	14,897	15,642	16,424	17,246	18,108	19,013	19,964	20,962	22,010	23,111	24,266
413110 Overtime At Straight Rate	Labor Inflation	23,000	24,150	25,358	26,625	27,957	29,354	30,822	32,363	33,981	35,681	37,465	39,338	41,305	43,370	45,538	47,815	50,206	52,716	55,352	58,120
413120 Overtime At 1.5 Rate	Labor Inflation	24,000	25,200	26,460	27,783	29,172	30,631	32,162	33,770	35,459	37,232	39,093	41,048	43,101	45,256	47,518	49,894	52,389	55,008	57,759	60,647
413130 Overtime At Double Time Rate	Labor Inflation	1,700	1,785	1,874	1,968	2,066	2,170	2,278	2,392	2,512	2,637	2,769	2,908	3,053	3,206	3,366	3,534	3,711	3,896	4,091	4,296
Non-Personnel																					
421000 Professional Services	General Inflation	71,056	73,188	75,383	77,645	79,974	82,373	84,845	87,390	90,012	92,712	95,493	98,358	101,309	104,348	107,479	110,703	114,024	117,445	120,968	124,597
423100 Equipment Rental	General Inflation	11,400	11,742	12,094	12,457	12,831	13,216	13,612	14,021	14,441	14,874	15,321	15,780	16,254	16,741	17,244	17,761	18,294	18,842	19,408	19,990
423400 Motor Pool Equipment Rental	General Inflation	14,500	14,935	15,383	15,845	16,320	16,809	17,314	17,833	18,368	18,919	19,487	20,071	20,674	21,294	21,933	22,591	23,268	23,966	24,685	25,426
424130 Maint/Repair of Bldgs & Improv	General Inflation	21,000	21,630	22,279	22,947	23,636	24,345	25,075	25,827	26,602	27,400	28,222	29,069	29,941	30,839	31,764	32,717	33,699	34,710	35,751	36,824
424220 All Other Equip Maint/Repair	General Inflation	202,500	208,575	214,832	221,277	227,916	234,753	241,796	249,049	256,521	264,217	272,143	280,307	288,717	297,378	306,299	315,488	324,953	334,702	344,743	355,085
424230 Central Garage Charges	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
424240 Central Communications Chg	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
425400 General Office Expense	General Inflation	2,250	2,318	2,387	2,459	2,532	2,608	2,687	2,767	2,850	2,936	3,024	3,115	3,208	3,304	3,403	3,505	3,611	3,719	3,830	3,945
425800 Computer Equip Purc Undr \$5000	General Inflation	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957	2,016	2,076	2,139	2,203	2,269	2,337	2,407	2,479	2,554	2,630
426200 Clothing/Linen/Safety Supplies	General Inflation	11,235	11,572	11,919	12,277	12,645	13,024	13,415	13,818	14,232	14,659	15,099	15,552	16,018	16,499	16,994	17,504	18,029	18,570	19,127	19,701
426300 Motor Fuels & Lubricants	General Inflation	50	52	53	55	56	58	60	61	63	65	67	69	71	73	76	78	80	83	85	88
426600 Chemical Supplies	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
426700 Maintenance Tools/Supplies	General Inflation	7,000	7,311	7,631	7,961	8,301	8,661	9,031	9,411	9,801	10,201	10,611	11,031	11,461	11,901	12,351	12,811	13,281	13,761	14,251	14,751
426710 Work Boot Reimbursement	General Inflation	1,050	1,082	1,114	1,147	1,182	1,217	1,254	1,291	1,330	1,370	1,411	1,453	1,497	1,542	1,588	1,636	1,685	1,735	1,788	1,841
426800 Special Department Supplies	General Inflation	3,500	3,605	3,713	3,825	3,939	4,057	4,179	4,305	4,434	4,567	4,704	4,845	4,990	5,140	5,294	5,453	5,616	5,785	5,959	6,137
427200 Training	General Inflation	10,764	11,086	11,419	11,762	12,114	12,476	12,848	13,231	13,624	14,028	14,443	14,869	15,306	15,754	16,214	16,686	17,161	17,648	18,139	18,634
428400 Liability Insurance	General Inflation	32,119	33,083	34,075	35,097	36,150	37,235	38,352	39,502	40,687	41,908	43,165	44,460	45,794	47,168	48,583	50,040	51,542	53,088	54,680	

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
421000 Professional Services	General Inflation	10,200	10,506	10,821	11,146	11,480	11,825	12,179	12,545	12,921	13,309	13,708	14,119	14,543	14,979	15,428	15,891	16,368	16,859	17,365	17,886
423400 Motor Pool Equipment Rental	General Inflation	12,000	12,360	12,731	13,113	13,506	13,911	14,329	14,758	15,201	15,657	16,127	16,611	17,109	17,622	18,151	18,696	19,256	19,834	20,429	21,042
424220 All Other Equip Maint/Repair	General Inflation	20,500	21,115	21,748	22,401	23,073	23,765	24,478	25,212	25,969	26,748	27,550	28,377	29,228	30,105	31,008	31,938	32,896	33,883	34,900	35,947
425400 General Office Expense	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
425500 Postage	General Inflation	50	52	53	55	56	58	60	61	63	65	67	69	71	73	76	78	80	83	85	88
425700 Software Purchase/Licensing	General Inflation	48,605	50,063	51,565	53,112	54,705	56,347	58,037	59,778	61,571	63,419	65,321	67,281	69,299	71,378	73,519	75,725	77,997	80,337	82,747	85,229
425800 Computer Equip Purc Undr \$5000	General Inflation	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957	2,016	2,076	2,139	2,203	2,269	2,337	2,407	2,479	2,554	2,630
426710 Work Boot Reimbursement	General Inflation	300	309	318	328	338	348	358	369	380	391	403	415	428	441	454	467	481	496	511	526
427100 Travel & Meeting Expense	General Inflation	50	52	53	55	56	58	60	61	63	65	67	69	71	73	76	78	80	83	85	88
427200 Training	General Inflation	7,913	8,150	8,395	8,647	8,906	9,173	9,449	9,732	10,024	10,325	10,634	10,953	11,282	11,621	11,969	12,328	12,698	13,079	13,471	13,875
428400 Liability Insurance	General Inflation	11,547	11,893	12,250	12,618	12,996	13,386	13,788	14,201	14,627	15,066	15,518	15,984	16,463	16,957	17,466	17,990	18,530	19,085	19,658	20,248
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	11,689	12,040	12,401	12,773	13,156	13,551	13,957	14,376	14,807	15,251	15,709	16,180	16,666	17,166	17,681	18,211	18,757	19,320	19,900	20,497
Charges to Others																					
894540 Interfund Services to 540 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
894550 Interfund Services to 550 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PW - Sewer SCADA and SPL		502,106	524,704	548,357	573,115	599,031	626,161	654,563	684,298	715,429	748,025	782,155	817,893	855,317	894,509	935,552	978,538	1,023,559	1,070,714	1,120,105	1,171,843
PW - Sewer - Warehouse																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	85,104	89,359	93,827	98,519	103,444	108,617	114,047	119,750	125,737	132,024	138,625	145,557	152,835	160,476	168,500	176,925	185,771	195,060	204,813	215,054
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	482	506	531	558	586	615	646	678	712	748	785	824	866	909	954	1,002	1,052	1,105	1,160	1,218
412210 Workers Compensation Ins	Labor Inflation	1,608	1,688	1,773	1,861	1,955	2,052	2,155	2,263	2,376	2,495	2,619	2,750	2,888	3,032	3,184	3,343	3,510	3,686	3,870	4,063
412220 Health Insurance	Labor Inflation	17,520	18,396	19,316	20,282	21,296	22,360	23,478	24,652	25,885	27,179	28,538	29,965	31,463	33,037	34,688	36,423	38,244	40,156	42,164	44,272
412222 Dental Insurance	Labor Inflation	787	826	868	911	957	1,004	1,055	1,107	1,163	1,221	1,282	1,346	1,413	1,484	1,558	1,636	1,718	1,804	1,894	1,989
412230 Life Insurance	Labor Inflation	52	55	57	60	63	66	70	73	77	81	85	89	93	98	103	108	114	119	125	131
412240 Unemployment Insurance	Labor Inflation	119	125	131	138	145	152	159	167	176	185	194	204	214	224	236	247	260	273	286	301
412250 Disability Insurance	Labor Inflation	272	286	300	315	331	347	365	383	402	422	443	465	488	513	539	565	594	623	655	687
412310 PERS Retirement	Labor Inflation	20,405	21,425	22,497	23,621	24,802	26,043	27,345	28,712	30,147	31,655	33,238	34,899	36,644	38,477	40,401	42,421	44,542	46,769	49,107	51,562
412320 Medicare OASDI	Labor Inflation	1,234	1,296	1,360	1,429	1,500	1,575	1,654	1,736	1,823	1,914	2,010	2,111	2,216	2,327	2,443	2,565	2,694	2,828	2,970	3,118
Non-Personnel																					
421000 Professional Services	General Inflation	500	515	530	546	563	580	597	615	633	652	672	692	713	734	756	779	802	826	851	877
424130 Maint/Repair of Bldgs & Improv	General Inflation	100	103	106	109	113	116	119	123	127	130	134	138	143	147	151	156	160	165	170	175
424220 All Other Equip Maint/Repair	General Inflation	250	258	265	273	281	290	299	307	317	326	336	346	356	367	378	389	401	413	426	438
425400 General Office Expense	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
425500 Postage	General Inflation	100	103	106	109	113	116	119	123	127	130	134	138	143	147	151	156	160	165	170	175
425700 Software Purchase/Licensing	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
425800 Computer Equip Purc Undr \$5000	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
426200 Clothing/Linen/Safety Supplies	General Inflation	200	206	212	219	225	232	239	246	253	261	269	277	285	294	303	312	321	331	340	351
426700 Maintenance Tools/Supplies	General Inflation	100	103	106	109	113	116	119	123	127	130	134	138	143	147	151	156	160	165	170	175
426710 Work Boot Reimbursement	General Inflation	150	155	159	164	169	174	179	184	190	196	202	208	214	220	227	234	241	248	255	263
426800 Special Department Supplies	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
427200 Training	General Inflation	1,500	1,545	1,591	1,639	1,688	1,739	1,791	1,845	1,900	1,957	2,016	2,076	2,139	2,203	2,269	2,337	2,407	2,479	2,554	2,630
428400 Liability Insurance	General Inflation	4,128	4,252	4,379	4,511	4,646	4,785	4,929	5,077	5,229	5,386	5,548	5,714	5,886	6,062	6,244	6,431	6,624	6,823	7,028	7,238
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	60,259	62,067	63,929	65,847	67,822	69,857	71,952	74,111	76,334	78,624	80,983	83,413	85,915	88,492	91,147	93,882	96,698	99,599	102,587	105,665
Total PW - Sewer - Warehouse		198,870	207,388	216,289	225,591	235,312	245,473	256,094	267,196	278,802	290,936	303,623	316,888	330,759	345,264	360,434	376,299	392,892	410,249	428,405	447,398
PW - Sewer - Laboratory Services																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	413,282	433,946	455,643	478,426	502,347	527,464	553,837	581,529	610,606	641,136	673,193	706,852	742,195	779,305	818,270	859,184	902,143	947,250	994,612	1,044,343
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-																		

Riverside Wastewater Utility
 Financial and Rate Model - 2014 Rate Study
 Carollo Engineers

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
426200 Clothing/Linen/Safety Supplies	General Inflation	8,160	8,405	8,657	8,917	9,184	9,460	9,743	10,036	10,337	10,647	10,966	11,295	11,634	11,983	12,343	12,713	13,094	13,487	13,892	14,309
426300 Motor Fuels & Lubricants	General Inflation	50	52	53	55	56	58	60	61	63	65	67	69	71	73	76	78	80	83	85	88
426600 Chemical Supplies	General Inflation	36,000	37,080	38,192	39,338	40,518	41,734	42,986	44,275	45,604	46,972	48,381	49,832	51,327	52,867	54,453	56,087	57,769	59,503	61,288	63,126
426700 Maintenance Tools/Supplies	General Inflation	200	206	212	219	225	232	239	246	253	261	269	277	285	294	303	312	321	331	340	351
426710 Work Boot Reimbursement	General Inflation	750	773	796	820	844	869	896	922	950	979	1,008	1,038	1,069	1,101	1,134	1,168	1,204	1,240	1,277	1,315
426800 Special Department Supplies	General Inflation	51,630	53,179	54,774	56,417	58,110	59,853	61,649	63,498	65,403	67,365	69,386	71,468	73,612	75,820	78,095	80,438	82,851	85,337	87,897	90,534
427100 Travel & Meeting Expense	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
427200 Training	General Inflation	5,500	5,665	5,835	6,010	6,190	6,376	6,567	6,764	6,967	7,176	7,392	7,613	7,842	8,077	8,319	8,569	8,826	9,091	9,363	9,644
428400 Liability Insurance	General Inflation	20,044	20,645	21,265	21,903	22,560	23,236	23,934	24,652	25,391	26,153	26,937	27,746	28,578	29,435	30,318	31,228	32,165	33,130	34,124	35,147
Capital Purchases																					
462200 Machine and Equipment	General Inflation	22,500	23,175	23,870	24,586	25,324	26,084	26,866	27,672	28,502	29,357	30,238	31,145	32,080	33,042	34,033	35,054	36,106	37,189	38,305	39,454
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	52,844	54,429	56,062	57,744	59,476	61,261	63,098	64,991	66,941	68,949	71,018	73,148	75,343	77,603	79,931	82,329	84,799	87,343	89,963	92,662
Total PW - Sewer - Laboratory Services		959,446	1,000,371	1,043,131	1,087,811	1,134,501	1,183,294	1,234,289	1,287,589	1,343,301	1,401,539	1,462,421	1,526,071	1,592,619	1,662,202	1,734,963	1,811,052	1,890,625	1,973,848	2,060,892	2,151,939
PW - Sewer Systems Debt Service																					
Non-Personnel																					
421000 Professional Services	General Inflation	8,000	8,240	8,487	8,742	9,004	9,274	9,552	9,839	10,134	10,438	10,751	11,074	11,406	11,748	12,101	12,464	12,838	13,223	13,619	14,028
Grants and Capital Projects																					
447010 Annual Bond Expense	General Inflation	5,500	5,665	5,835	6,010	6,190	6,376	6,567	6,764	6,967	7,176	7,392	7,613	7,842	8,077	8,319	8,569	8,826	9,091	9,363	9,644
Debt Service																					
481000 Principal	<Calculated>	136,904	731,453	745,268	759,345	773,690	788,308	325,816	332,575	332,575	-	-	-	3,433,800	3,622,659	3,821,906	10,946,427	11,548,480	12,183,647	13,215,077	15,016,631
481020 L/T Debt Prin Other Loan	<Calculated>	7,852,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
482000 Interest	<Calculated>	10,527,228	18,144,732	18,133,917	18,130,965	27,586,003	29,493,833	29,473,037	25,649,567	25,640,774	25,636,288	34,606,680	34,598,113	34,597,111	52,476,592	52,267,604	52,046,219	52,384,585	54,549,211	57,601,132	60,773,069
Treasury Credit	<Calculated>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	112,779	116,162	119,647	123,237	126,934	130,742	134,664	138,704	142,865	147,151	151,566	156,113	160,796	165,620	170,588	175,706	180,977	186,407	191,999	197,759
Total PW - Sewer Systems Debt Service		18,642,411	19,006,252	19,013,154	19,028,299	28,501,821	30,428,533	29,949,636	26,137,449	26,133,315	25,801,054	34,776,388	34,772,913	38,210,955	56,284,697	56,280,518	63,189,385	64,135,706	66,941,577	71,031,190	76,011,131
PW - Sewer System - Sewer Projects																					
Grants and Capital Projects																					
440301 Misc Sewer Construction - City Funds	Capital Inflation	2,000,000	2,100,000	2,205,000	2,315,250	2,431,013	2,552,563	2,680,191	2,814,201	2,954,911	3,102,656	3,257,789	3,420,679	3,591,713	3,771,298	3,959,863	4,157,856	4,365,749	4,584,037	4,813,238	5,053,900
440301 WQCP Equip Replacement - City Funds	Capital Inflation	625,000	656,250	689,063	723,516	759,691	797,676	837,560	879,438	923,410	969,580	1,018,059	1,068,962	1,122,410	1,178,531	1,237,457	1,299,330	1,364,297	1,432,511	1,504,137	1,579,344
440301 Secondary System Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Recycled Water Pumping Station - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Solids Handling Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Wood Rd Pump Station Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Repl MCC Dist Centers M&W - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Master Plan for Facility - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 WQCP Security System Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Misc Lift Stn Equip Replacmnt - City Funds	Capital Inflation	100,000	105,000	110,250	115,763	121,551	127,628	134,010	140,710	147,746	155,133	162,889	171,034	179,586	188,565	197,993	207,893	218,287	229,202	240,662	252,695
440301 Lift Station Automation & Cont - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Septage Sta & Entrance Gates - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Ag Park Cleanup - City Funds	One Time Expense	100,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Total Dissolved Solids Offset - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Rep. Ivy Eastmnt-Ivy/Arroyo - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Teq./Arroyo Trunk Line - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Univ Avenue-Chicago to C.Crest - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 LS Area Swr Force Main PH II - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Flow Meters - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Maintenance Management System - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Palmyrita Capacity Improvement - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 E. La Cadena Capacity Improvem - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Hidden Valley Wetlands Improv - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Pump/Lift Station Upgrades - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Collection System Upgrades - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Santa Ana River Trunk Replacem - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Mission Inn-Swr-Mrkt-BNSF - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Wood Rd Pump Sta Fuel Tank - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 SCADA System Upgrades - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Energy System Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Golden-Rancho del Oro/Magnolia - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Collett-La Sierra/S of Drexel - City Funds	One Time Expense	-																			

Riverside Wastewater Utility
 Financial and Rate Model - 2014 Rate Study
 Carollo Engineers

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
440301 Sewer Main Replacement 9th St - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Pipe Liner Rep Var Locations - City Funds	Capital Inflation	150,000	157,500	165,375	173,644	182,326	191,442	201,014	211,065	221,618	232,699	244,334	256,551	269,378	282,847	296,990	311,839	327,431	343,803	360,993	379,043
440301 Digester 3 Roof Rehabilitation - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Arc Flash Survey - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Sewer Rate Study - City Funds	One Time Expense	1,200,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 CW Manhole Adj & Pipe Replace - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 CW Point Repair & CIPP Liner - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 CSD Capital Contribution Study - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Sewer Imp/Street Rehab 12/13 - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Arlanza Trnk Swr Ln MH Rehab - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Dexter Lift Station Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Emergency Swr Repair 3rd-Lemon - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Swr Rep Ctrl/Riv - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Influent Control Valves - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Alley e/o Mrkt-Unv/Mss Inn Swr - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Pot/Recyc H2O Pipeline Upgrade - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 5th St Sewer-Market to Orange - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440301 Central & Hillside Sewer - City Funds	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440303 Crest & Ontario Pump Upgrade - Signal Mitgn	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
440309 SR91 Util Relo-Adams to Univ - Misc Agy Fun	One Time Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Integrated Master Plan	One Time Expense	-	-	-	-	911,630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Integrated Master Plan I/I Study	One Time Expense	-	-	-	-	243,101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PW - Sewer System - Sewer Projects			3,018,750	3,169,688	3,328,172	4,649,311	3,669,309	3,852,775	4,045,414	4,247,684	4,460,069	4,683,072	4,917,226	5,163,087	5,421,241	5,692,303	5,976,919	6,275,764	6,589,553	6,919,030	7,264,982
PW - Sewer System - CoGen																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	123,252	129,415	135,885	142,680	149,814	157,304	165,169	173,428	182,099	191,204	200,765	210,803	221,343	232,410	244,031	256,232	269,044	282,496	296,621	311,452
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	695	730	766	805	845	887	931	978	1,027	1,078	1,132	1,189	1,248	1,311	1,376	1,445	1,517	1,593	1,673	1,756
412210 Workers Compensation Ins	Labor Inflation	2,329	2,445	2,568	2,696	2,831	2,972	3,121	3,277	3,441	3,613	3,794	3,983	4,183	4,392	4,611	4,842	5,084	5,338	5,605	5,885
412220 Health Insurance	Labor Inflation	20,280	21,294	22,359	23,477	24,650	25,883	27,177	28,536	29,963	31,461	33,034	34,686	36,420	38,241	40,153	42,161	44,269	46,482	48,806	51,247
412222 Dental Insurance	Labor Inflation	914	960	1,008	1,058	1,111	1,167	1,225	1,286	1,350	1,418	1,489	1,563	1,641	1,723	1,810	1,900	1,995	2,095	2,200	2,310
412230 Life Insurance	Labor Inflation	52	55	57	60	63	66	70	73	77	81	85	89	93	98	103	108	114	119	125	131
412240 Unemployment Insurance	Labor Inflation	173	182	191	200	210	221	232	243	256	268	282	296	311	326	343	360	378	397	416	437
412250 Disability Insurance	Labor Inflation	272	286	300	315	331	347	365	383	402	422	443	465	488	513	539	565	594	623	655	687
412310 PERS Retirement	Labor Inflation	35,027	36,778	38,617	40,548	42,576	44,704	46,940	49,287	51,751	54,338	57,055	59,908	62,903	66,049	69,351	72,819	76,460	80,283	84,297	88,511
412320 Medicare OASDI	Labor Inflation	888	932	979	1,028	1,079	1,133	1,190	1,250	1,312	1,378	1,446	1,519	1,595	1,674	1,758	1,846	1,938	2,035	2,137	2,244
413110 Overtime At Straight Rate	Labor Inflation	6,100	6,405	6,725	7,062	7,415	7,785	8,175	8,583	9,012	9,463	9,936	10,433	10,955	11,507	12,078	12,668	13,276	13,911	14,584	15,294
413120 Overtime At 1.5 Rate	Labor Inflation	4,600	4,830	5,072	5,325	5,591	5,871	6,164	6,473	6,796	7,136	7,493	7,868	8,261	8,674	9,108	9,563	10,041	10,543	11,070	11,624
413130 Overtime At Double Time Rate	Labor Inflation	1,530	1,607	1,687	1,771	1,860	1,953	2,050	2,153	2,261	2,374	2,492	2,617	2,748	2,885	3,029	3,181	3,340	3,507	3,682	3,866
413210 Holiday O/T-Straight/Non-Sched	Labor Inflation	1,000	1,050	1,103	1,158	1,216	1,276	1,340	1,407	1,477	1,551	1,629	1,710	1,796	1,886	1,980	2,079	2,183	2,292	2,407	2,527
413230 Holiday O/T-Strt/Subj To Retir	Labor Inflation	1,000	1,050	1,103	1,158	1,216	1,276	1,340	1,407	1,477	1,551	1,629	1,710	1,796	1,886	1,980	2,079	2,183	2,292	2,407	2,527
Non-Personnel																					
421000 Professional Services	General Inflation	249,700	257,191	264,907	272,854	281,040	289,471	298,155	307,100	316,312	325,802	335,576	345,643	356,012	366,693	377,694	389,024	400,695	412,716	425,098	437,850
421043 Prof Svcs Regulatory Comp	General Inflation	46,945	48,353	49,804	51,298	52,833	54,422	56,055	57,736	59,469	61,253	63,090	64,983	66,932	68,940	71,009	73,139	75,333	77,593	79,921	82,318
422100 Telephone	General Inflation	1,260	1,298	1,337	1,377	1,418	1,461	1,505	1,550	1,596	1,644	1,693	1,744	1,796	1,850	1,906	1,963	2,022	2,083	2,145	2,209
422120 Telephone - Cellular	General Inflation	650	670	690	710	732	754	776	799	823	848	874	900	927	955	983	1,013	1,043	1,074	1,107	1,140
422200 Electric	General Inflation	27,000	27,810	28,644	29,504	30,389	31,300	32,239	33,207	34,203	35,229	36,286	37,374	38,496	39,650	40,840	42,065	43,327	44,627	45,966	47,345
422300 Gas	General Inflation	250,000	257,500	265,225	273,182	281,377	289,819	298,513	307,468	316,693	326,193	335,979	346,058	356,440	367,133	378,147	389,492	401,177	413,212	425,608	438,377
422500 Water	General Inflation	975	1,004	1,034	1,065	1,097	1,130	1,164	1,199	1,235	1,272	1,310	1,350	1,390	1,432	1,475	1,519	1,565	1,612	1,660	1,710
422600 Other Utilities	General Inflation	850	876	902	929	957	985	1,015	1,045	1,077	1,109	1,142	1,177	1,212	1,248	1,286	1,324	1,364	1,405	1,447	1,490
422700 Refuse/Disposal Fees	General Inflation	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	2,534	2,610	2,688	2,768	2,852	2,937	3,025	3,116	3,209	3,306	3,405	3,507
423100 Equipment Rental	General Inflation	600	618	637	656	675	696	716	738	760	783	806	831	855	881	908	935	963	992	1,021	1,052
424124 Const. Maint. Materials- Storm	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
424130 Maint/Repair of Bldgs & Improv	General Inflation	5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
424220 All Other Equip Maint/Repair	General Inflation	138,500	142,655</																		

Operations and Maintenance Budget Projection

Projected O&M Expenditures		FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	FY 2030/31	FY 2031/32	FY 2032/33
Personnel																					
411100 Salaries - Regular	Labor Inflation	632,134	663,741	696,928	731,774	768,363	806,781	847,120	889,476	933,950	980,647	1,029,680	1,081,164	1,135,222	1,191,983	1,251,582	1,314,161	1,379,869	1,448,863	1,521,306	1,597,371
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411250 Industrial Accident	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	3,429	3,600	3,780	3,969	4,168	4,376	4,595	4,825	5,066	5,320	5,585	5,865	6,158	6,466	6,789	7,129	7,485	7,859	8,252	8,665
412210 Workers Compensation Ins	Labor Inflation	11,947	12,544	13,172	13,830	14,522	15,248	16,010	16,811	17,651	18,534	19,460	20,433	21,455	22,528	23,654	24,837	26,079	27,383	28,752	30,189
412220 Health Insurance	Labor Inflation	66,864	70,207	73,718	77,403	81,274	85,337	89,604	94,084	98,789	103,728	108,914	114,360	120,078	126,082	132,386	139,005	145,956	153,254	160,916	168,962
412222 Dental Insurance	Labor Inflation	3,240	3,402	3,572	3,751	3,938	4,135	4,342	4,559	4,787	5,026	5,278	5,541	5,819	6,110	6,415	6,736	7,073	7,426	7,797	8,187
412230 Life Insurance	Labor Inflation	1,541	1,618	1,699	1,784	1,873	1,967	2,065	2,168	2,277	2,391	2,510	2,636	2,767	2,906	3,051	3,204	3,364	3,532	3,709	3,894
412240 Unemployment Insurance	Labor Inflation	885	929	976	1,024	1,076	1,130	1,186	1,245	1,308	1,373	1,442	1,514	1,589	1,669	1,752	1,840	1,932	2,028	2,130	2,236
412250 Disability Insurance	Labor Inflation	544	571	600	630	661	694	729	765	804	844	886	930	977	1,026	1,077	1,131	1,187	1,247	1,309	1,375
412310 PERS Retirement	Labor Inflation	179,646	188,628	198,060	207,963	218,361	229,279	240,743	252,780	265,419	278,690	292,624	307,256	322,618	338,749	355,687	373,471	392,145	411,752	432,340	453,956
412320 Medicare OASDI	Labor Inflation	9,166	9,624	10,106	10,611	11,141	11,698	12,283	12,897	13,542	14,219	14,930	15,677	16,461	17,284	18,148	19,055	20,008	21,009	22,059	23,162
413120 Overtime At 1.5 Rate	Labor Inflation	300	315	331	347	365	383	402	422	443	465	489	513	539	566	594	624	655	688	722	758
413130 Overtime At Double Time Rate	Labor Inflation	800	840	882	926	972	1,021	1,072	1,126	1,182	1,241	1,303	1,368	1,437	1,509	1,584	1,663	1,746	1,834	1,925	2,022
Non-Personnel																					
421000 Professional Services	General Inflation	10,000	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	13,048	13,439	13,842	14,258	14,685	15,126	15,580	16,047	16,528	17,024	17,535
422120 Telephone - Cellular	General Inflation	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566	1,613	1,661	1,711	1,762	1,815	1,870	1,926	1,983	2,043	2,104
423400 Motor Pool Equipment Rental	General Inflation	13,500	13,905	14,322	14,752	15,194	15,650	16,120	16,603	17,101	17,614	18,143	18,687	19,248	19,825	20,420	21,033	21,664	22,313	22,983	23,672
424220 All Other Equip Maint/Repair	General Inflation	200	206	212	219	225	232	239	246	253	261	269	277	285	294	303	312	321	331	340	351
425200 Periodicals & Dues	General Inflation	375	386	398	410	422	435	448	461	475	489	504	519	535	551	567	584	602	620	638	658
425400 General Office Expense	General Inflation	3,000	3,090	3,183	3,278	3,377	3,478	3,582	3,690	3,800	3,914	4,032	4,153	4,277	4,406	4,538	4,674	4,814	4,959	5,107	5,261
425500 Postage	General Inflation	200	206	212	219	225	232	239	246	253	261	269	277	285	294	303	312	321	331	340	351
425600 Central Printing Charges	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
425700 Software Purchase/Licensing	General Inflation	1,200	1,236	1,273	1,311	1,351	1,391	1,433	1,476	1,520	1,566	1,613	1,661	1,711	1,762	1,815	1,870	1,926	1,983	2,043	2,104
425800 Computer Equip Purc Undr \$5000	General Inflation	5,000	5,150	5,305	5,464	5,628	5,796	5,970	6,149	6,334	6,524	6,720	6,921	7,129	7,343	7,563	7,790	8,024	8,264	8,512	8,768
426200 Clothing/Linen/Safety Supplies	General Inflation	500	515	530	546	563	580	597	615	633	652	672	692	713	734	756	779	802	826	851	877
426710 Work Boot Reimbursement	General Inflation	450	464	477	492	506	522	537	553	570	587	605	623	642	661	681	701	722	744	766	789
426800 Special Department Supplies	General Inflation	1,000	1,030	1,061	1,093	1,126	1,159	1,194	1,230	1,267	1,305	1,344	1,384	1,426	1,469	1,513	1,558	1,605	1,653	1,702	1,754
427200 Training	General Inflation	263	271	279	287	296	305	314	323	333	343	353	364	375	386	398	410	422	435	448	461
428400 Liability Insurance	General Inflation	30,659	31,579	32,526	33,502	34,507	35,542	36,608	37,707	38,838	40,003	41,203	42,439	43,712	45,024	46,374	47,766	49,199	50,675	52,195	53,761
Charges from Others																					
881100 General Fund Allocation Chgs	General Inflation	1,026,196	1,056,982	1,088,691	1,121,352	1,154,993	1,189,642	1,225,332	1,262,092	1,299,954	1,338,953	1,379,122	1,420,495	1,463,110	1,507,003	1,552,214	1,598,780	1,646,743	1,696,146	1,747,030	1,799,441
884550 Interfund Services from 550 Fd	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Charges to Others																					
894410 Interfund Services to 410 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
894458 Interfund Services to 458 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
894540 Interfund Services to 540 Fund	General Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
894550 Interfund Services to 550 Fund	General Inflation	(1,706,960)	(1,773,670)	(1,843,156)	(1,915,541)	(1,990,952)	(2,069,522)	(2,151,392)	(2,236,707)	(2,325,620)	(2,418,291)	(2,514,887)	(2,615,583)	(2,720,563)	(2,830,018)	(2,944,148)	(3,063,164)	(3,187,285)	(3,316,740)	(3,451,772)	(3,592,630)
Total PW - Sewer Capital Project Serv		298,279	309,936	322,078	334,727	347,905	361,634	375,940	390,848	406,385	422,579	439,458	457,054	475,399	494,525	514,469	535,266	556,955	579,577	603,172	627,786
894550 Interfund Services to 550 Fund	Escalator		3.91%	3.92%	3.93%	3.94%	3.95%	3.96%	3.97%	3.98%	3.98%	3.99%	4.00%	4.01%	4.02%	4.03%	4.04%	4.05%	4.06%	4.07%	4.08%
PW - Sewer - Plant Expansion Engineering Support																					
Personnel																					
411100 Salaries - Regular	Labor Inflation	503,873	529,067	555,520	583,296	612,461	643,084	675,238	709,000	744,450	781,672	820,756	861,794	904,884	950,128	997,634	1,047,516	1,099,892	1,154,886	1,212,630	1,273,262
411105 Salaries - Non-Productive	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411130 Compensatory Time	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411210 Vacation	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411220 Holidays & Special Days Off	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411240 Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411245 Family Illness Sick Leave	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411310 Night Shift Premium	Labor Inflation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411510 Accrued Payroll	Labor Inflation	2,727	2,863	3,007	3,157	3,315	3,480	3,654	3,837	4,029	4,230	4,442	4,664	4,897	5,142	5,399	5,669	5,953	6,250	6,563	6,891
412210 Workers Compensation Ins	Labor Inflation	9,523	9,999	10,499	11,024	11,575	12,154	12,762	13,400	14,070	14,773	15,512	16								

Appendix D

PHASE II AND PHASE III BONDS DEBT SERVICE

City of Riverside
Sewer Revenue Bonds - Phase II

Financial Forecast as of December 4, 2013

Scenario D: 25-Year, 36 Months Capitalized Interest thru 5/1/2017, Change in growth assumptions [A] and [C] at 5% and 3%

Year	FYE	[A]	[B]	[C]	[D]=[A]+[C]	[E]	[F]	[G]	Phase II Bonds	[I]	Phase III Bonds	Phase III Bonds	[L]
		Subtotal User Rate Rev	% Change	Subtotal Other Rev	Rev after Rate Inc	Less O&M Expenditures	% Change	2009 Net Debt Service	2014 Net Debt Service	Debt Service Coverage	2016 Net Debt Service	2018 Net Debt Service	Debt Service Coverage
0	2014	42,029,486	--	4,975,765	47,005,251	30,446,386	--	17,828,524	-	0.93 x	-	-	0.93 x
1	2015	45,624,478	8.6%	5,293,730	50,918,208	32,423,907	6.5%	17,831,324	-	1.04 x	-	-	1.04 x
2	2016	49,526,968	8.6%	5,507,327	55,034,295	33,737,848	4.0%	17,828,324	-	1.19 x	-	-	1.19 x
3	2017	53,763,257	8.6%	5,729,817	59,493,074	35,107,383	4.1%	17,830,449	-	1.37 x	-	-	1.37 x
4	2018	58,361,897	8.6%	5,961,582	64,323,479	36,534,953	4.1%	17,824,794	9,469,038	1.02 x	-	-	1.02 x
5	2019	63,353,882	8.6%	6,203,017	69,556,899	38,023,111	4.1%	17,810,850	11,400,450	1.08 x	-	-	1.08 x
6	2020	66,521,576	5.0%	6,513,168	73,034,744	39,574,524	4.1%	17,800,319	11,400,000	1.15 x	2,894,213	-	1.04 x
7	2021	69,847,655	5.0%	6,838,826	76,686,481	41,191,980	4.1%	13,978,177	11,400,250	1.40 x	5,157,450	-	1.16 x
8	2022	73,340,038	5.0%	7,180,768	80,520,805	42,819,065	3.9%	13,964,600	11,399,750	1.49 x	5,158,350	2,911,200	1.13 x
9	2023	77,007,040	5.0%	7,539,806	84,546,845	44,513,748	4.0%	13,958,497	11,402,875	1.58 x	5,154,750	5,185,000	1.12 x
10	2024	80,857,392	5.0%	7,916,796	88,774,188	46,278,969	4.0%	13,949,161	11,399,125	1.68 x	5,155,875	5,185,700	1.19 x
11	2025	83,283,113	3.0%	8,154,300	91,437,413	47,204,548	2.0%	13,931,236	11,402,875	1.75 x	5,153,250	5,186,750	1.24 x
12	2026	85,781,607	3.0%	8,398,929	94,180,536	48,148,639	2.0%	13,924,013	11,403,375	1.82 x	5,156,625	5,187,375	1.29 x
13	2027	88,355,055	3.0%	8,650,897	97,005,952	49,111,612	2.0%	13,911,666	11,400,125	1.89 x	5,155,750	5,184,250	1.34 x
14	2028	91,005,706	3.0%	8,910,424	99,916,130	50,093,844	2.0%	13,893,723	11,402,375	1.97 x	5,155,500	5,187,125	1.40 x
15	2029	93,735,878	3.0%	9,177,737	102,913,614	51,095,721	2.0%	13,879,473	11,399,375	2.05 x	5,155,625	5,185,750	1.45 x
16	2030	96,547,954	3.0%	9,453,069	106,001,023	52,117,636	2.0%	13,867,971	11,400,375	2.13 x	5,155,875	5,185,000	1.51 x
17	2031	99,444,393	3.0%	9,736,661	109,181,053	53,159,988	2.0%	13,852,358	11,399,500	2.22 x	5,156,000	5,184,625	1.57 x
18	2032	102,427,724	3.0%	10,028,761	112,456,485	54,223,188	2.0%	13,841,166	11,400,875	2.31 x	5,155,750	5,184,375	1.64 x
19	2033	105,500,556	3.0%	10,329,623	115,830,180	55,307,652	2.0%	13,819,069	11,403,500	2.40 x	5,154,875	5,184,000	1.70 x
20	2034	108,665,573	3.0%	10,639,512	119,305,085	56,413,805	2.0%	13,800,217	11,401,500	2.50 x	5,158,000	5,188,125	1.77 x
21	2035	111,925,540	3.0%	10,958,697	122,884,238	57,542,081	2.0%	13,783,395	11,399,000	2.59 x	5,154,875	5,186,500	1.84 x
22	2036	115,283,306	3.0%	11,287,458	126,570,765	58,692,923	2.0%	13,762,509	11,399,875	2.70 x	5,155,250	5,184,000	1.91 x
23	2037	118,741,805	3.0%	11,626,082	130,367,888	59,866,781	2.0%	13,741,464	11,402,875	2.80 x	5,153,750	5,185,250	1.99 x
24	2038	122,304,060	3.0%	11,974,865	134,278,924	61,064,117	2.0%	13,723,925	11,401,875	2.91 x	5,155,000	5,184,875	2.06 x
25	2039	125,973,181	3.0%	12,334,111	138,307,292	62,285,399	2.0%	13,698,676	11,400,750	3.03 x	5,153,625	5,187,500	2.15 x
26	2040	129,752,377	3.0%	12,704,134	142,456,511	63,531,107	2.0%	13,674,501	11,403,125	3.15 x	5,154,250	5,187,750	2.23 x
27	2041	133,644,948	3.0%	13,085,258	146,730,206	64,801,729	2.0%	-	-	-	5,156,375	5,185,375	7.92 x
28	2042	137,654,297	3.0%	13,477,816	151,132,112	66,097,764	2.0%	-	-	-	5,154,625	5,185,000	8.22 x
29	2043	141,783,925	3.0%	13,882,150	155,666,076	67,419,719	2.0%	-	-	-	5,153,625	5,186,125	8.53 x
30	2044	146,037,443	3.0%	14,298,615	160,336,058	68,768,113	2.0%	-	-	-	5,157,750	5,188,250	8.85 x
31	2045	150,418,567	3.0%	14,727,573	165,146,140	70,143,476	2.0%	-	-	-	5,156,500	5,186,000	9.19 x
32	2046	154,931,124	3.0%	15,169,400	170,100,524	71,546,345	2.0%	-	-	-	5,154,500	5,184,000	9.53 x
33	2047	159,579,057	3.0%	15,624,482	175,203,539	72,977,272	2.0%	-	-	-	5,156,125	5,186,625	9.88 x
34	2048	164,366,429	3.0%	16,093,217	180,459,646	74,436,818	2.0%	-	-	-	5,155,750	5,188,250	10.25 x
35	2049	169,297,422	3.0%	16,576,013	185,873,435	75,925,554	2.0%	-	-	-	-	5,188,375	21.19 x
36	2050	174,376,344	3.0%	17,073,294	191,449,638	77,444,065	2.0%	-	-	-	-	5,186,500	21.98 x

Assumptions

Phase II \$140 mm project fund gross funded with 1% earnings
 Project draws based on Carollo's spreadsheet
 Dated Date of May 1, 2014 for Phase II, May 1, 2016 for 2016 Issue and May 1, 2018 for 2018 Issue
 Principal and Interest Payments on Feb 1 and Aug 1
 No Debt Service Reserve Fund
 Does not incorporate interest on Bond Proceeds
 [G] based on reduced BABs subsidy of 32.48% (7.2% reduction based on sequestration)
 2016 and 2018 Bond issues assume 36 months capitalized interest

Appendix E

REVENUE REQUIREMENT RESULTS – FINANCIAL FORECAST

Riverside Wastewater Utility
Financial and Rate Model - 2014 Rate Study
Carollo Engineers
Revenue Requirements Results and Financial Forecast

Detailed Revenue Forecast			FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
Item:													
A	Revenue Requirement Increase (Rate Increase)		7.50%	8.50%	8.50%	8.50%	8.50%	8.50%	5.00%	5.00%	5.00%	5.00%	5.00%
B	Growth		0.98%	0.45%	0.45%	0.45%							
C	General Inflation		3.00%										
D	CSD Revenue Escalation		0.00%	4.10%	7.39%	4.11%	4.11%	4.12%	4.12%	4.13%	3.95%	3.96%	3.97%
Revenue Detail			FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
User Rate Revenue													
		Escalator(s)											
E	Commercial	A and B	\$6,436,317	\$6,986,847	\$7,655,021	\$8,387,093	\$9,189,176	\$10,067,965	\$11,030,794	\$11,695,841	\$12,400,983	\$13,079,627	\$13,795,409
F	Residential Sewage	A and B	20,138,454	21,860,997	23,951,630	26,242,196	28,751,816	31,501,438	34,514,015	36,594,865	38,801,169	40,924,563	43,164,160
G	Commercial Sewer Spec Billing	A and B	1,973,898	2,142,735	2,347,651	2,572,164	2,818,148	3,087,656	3,382,938	3,586,895	3,803,149	4,011,276	4,230,794
H	Residential Pumping	A and B	8,588,559	9,323,181	10,214,785	11,191,655	12,261,947	13,434,594	14,719,384	15,606,816	16,547,751	17,453,327	18,408,460
I	Commercial Pumping	A and B	1,580,534	1,715,725	1,879,805	2,059,577	2,256,540	2,472,340	2,708,777	2,872,089	3,045,248	3,211,899	3,387,670
J	Subtotal User Rate Revenue		\$38,717,762	\$42,029,486	\$46,048,892	\$50,452,685	\$55,277,627	\$60,563,992	\$66,355,909	\$70,356,506	\$74,598,300	\$78,680,692	\$82,986,493
Non Rate Revenue													
	Other												
K1	Recycled Water	B	\$42,336	\$42,751	\$43,170	\$43,593	\$44,020	\$44,451	\$44,887	\$45,327	\$45,771	\$45,977	\$46,184
K2	Grading Plan Review Fees	B + C	5,065	5,500	5,719	5,947	6,183	6,429	6,685	6,951	7,228	7,477	7,735
K3	Pub Benefit Chg-Sewer-Comm	B + C	155,927	167,400	174,063	180,990	188,194	195,684	203,472	211,570	219,991	227,580	235,432
K4	Pub Benefit Chg-Sewer-Res	B + C	52,622	53,600	55,733	57,951	60,258	62,656	65,150	67,743	70,439	72,869	75,383
K5	Sewer Unit of Benefit Fee	B + C	49,916	10,000	10,398	10,812	11,242	11,690	12,155	12,639	13,142	13,595	14,064
K6	Waste Disposal Fees	B + C	325,727	300,000	311,940	324,355	337,265	350,688	364,645	379,158	394,248	407,850	421,921
K7	Industrial Waste Permits	B + C	11,830	23,360	24,290	25,256	26,262	27,307	28,394	29,524	30,699	31,758	32,854
K8	Enforcement - Inspection Fees	B + C	4,441	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0
K9	Ag Park Cleanup - Rev-Other Agency	None	33,667	0	0	0	0	0	0	0	0	0	0
K10	SR 91 Util Relo-Adams to Univ - Rev-Other Agency	None	131,554	0	0	0	0	0	0	0	0	0	0
	Rubidoux CSD Improvement Fees	None	13,564	13,564	13,564	13,564	13,564	13,564	13,564	0	0	0	0
	Jurupa CSD Improvement Fees	None	20,798	20,798	20,798	20,798	20,798	20,798	20,798	0	0	0	0
	Edgemont CSD Improvement Fees	None	6,692	6,692	6,692	6,692	6,692	6,692	6,692	0	0	0	0
K	Subtotal Other		\$854,140	\$643,665	\$666,366	\$689,958	\$714,477	\$739,959	\$766,441	\$752,911	\$781,517	\$807,107	\$833,572
L	Connection Fees	B	973,742	1,002,100	1,041,984	1,083,455	1,126,576	1,171,414	1,218,036	1,266,514	1,316,921	1,362,355	1,409,356
M	CSD O&M Revenue	D	4,461,742	3,327,500	3,539,632	3,934,541	4,233,888	4,550,628	4,885,772	5,209,675	5,519,373	5,859,691	6,140,516
N	Use of Money and Property		1,112,294	1,002,500	730,434	714,972	726,362	774,413	757,519	778,173	830,135	710,784	719,876
O	Subtotal Other Revenue Sources		\$7,401,917	\$5,975,765	\$5,978,416	\$6,422,926	\$6,801,302	\$7,236,413	\$7,627,768	\$8,007,273	\$8,447,946	\$8,739,936	\$9,103,321

Riverside Wastewater Utility
Financial and Rate Model - 2014 Rate Study
Carollo Engineers
Revenue Requirements Results and Financial Forecast

Item Notes:

- 1 User Rate Revenues after rate increase shown in Item A.
- 2 The sum of offsetting revenues, Item O in revenue detail.
- 3 Total revenues available available to the Sewer Fund
- 4 All recurring O&M expenditures, does not include sewer capital projects from the O&M budget or debt service.
- 5 Debt Service includes all existing debt service, as well as service for the Phase II Bonds (from Wells Fargo Phase II Bond Memo), and the debt service associated with the Phase III Bonds (calculated by financial and rate model)
- 7 These values are escalated from the recurring capital costs budgeted for FY 2013/14.
- 8 Net deposit or use of reserves for sewer capital projects.
- 9 Debt coverage factor using a traditional coverage test.
- 10 Debt coverage factor using the Rate Stabilization Fund Coverage Test as described in the 2009 AB Bonds official statement.
- 12 Funds held within the Rate Stabilization fund are adjusted annually as need to meet bond coverage requirements.
- 13 Operating reserve is assumed to be the combination of the Rate Stabilization Fund and the Operating Fund.
- 14 Days in reserve including the applicable portion of each fiscal year's debt service.
- 15 Days of operating only expenses in reserve, does not include debt service.
- 21 Does not include the use of revenues or draw down of operating reserve to fund Recurring Capital Expenditures From O&M Budget.
- 22 Does not include Recurring Capital Expenditures From O&M Budget.
- 23 Discrepancy in FY 2016/17 due to approximate Bond sizing assumptions in Well's Fargo analysis, actual bond sizing will be adjusted accordingly.

Phase II and III Bonds

		Proceeds	Issuance	
Phase II Bond	Single Issuance	\$140,000,000	FY 2013/14	Issuance amount based on the remaining Plant Expansion costs from the "Sewer 14 CIP Cash Flow" Sheet
Phase III Bonds	First Issuance	\$68,000,000	FY 2015/16	Issuance amount calculated based on the modeled CIP.
Phase III Bonds	Second Issuance	\$68,000,000	FY 2017/18	Issuance amount calculated based on the modeled CIP.

Appendix F

CALCULATION OF USER RATES

Riverside Wastewater Utility
Financial and Rate Model - 2014 Rate Study
Carollo Engineers
User Rate Calculations

RATES RETAINING CURRENT COS STRUCTURE

This table show the proposed rates that maintain the City's existing COS based rate structure that was developed in 2008.

These are the PROPOSED RATES.

		Rate Increase						
			8.50%	8.50%	8.50%	8.50%	8.50%	
Rate Code	Description	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	
0	S800	Residence on Septic System	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
28	S474	Basic Multi-Family Dwelling Unit	\$25.77	\$27.96	\$30.34	\$32.92	\$35.71	\$38.75
56	S475	Basic Single Family Dwelling Unit	\$28.55	\$30.98	\$33.61	\$36.47	\$39.57	\$42.93
84	S590	Basic Single Family Dwelling - Pumping	\$32.97	\$35.77	\$38.81	\$42.11	\$45.69	\$49.58
112	S591	Basic Multi-Family Dwelling Units - Pumping	\$29.76	\$32.29	\$35.03	\$38.01	\$41.24	\$44.75
140	S473	Basic Commercial (Flat Rate)	\$28.55	\$30.98	\$33.61	\$36.47	\$39.57	\$42.93
168	S594	Basic Commercial - Pumping (Flat Rate)	\$32.97	\$35.77	\$38.81	\$42.11	\$45.69	\$49.58
0	S500	Department & Retail Stores	\$2.05	\$2.22	\$2.41	\$2.62	\$2.84	\$3.08
27	S501	Hotels & Motels	\$2.50	\$2.71	\$2.94	\$3.19	\$3.46	\$3.76
54	S502	Laundromats	\$2.43	\$2.64	\$2.86	\$3.10	\$3.37	\$3.65
81	S503	Laundries	\$3.99	\$4.33	\$4.70	\$5.10	\$5.53	\$6.00
108	S504	Markets	\$5.37	\$5.83	\$6.32	\$6.86	\$7.44	\$8.07
135	S505	Mortuaries	\$2.89	\$3.14	\$3.40	\$3.69	\$4.01	\$4.35
162	S506	Professional Offices	\$1.69	\$1.83	\$1.99	\$2.16	\$2.34	\$2.54
189	S507	Repair Shops & Service Stations	\$2.94	\$3.19	\$3.46	\$3.76	\$4.07	\$4.42
216	S508	Restaurants	\$5.50	\$5.97	\$6.47	\$7.03	\$7.62	\$8.27
243	S509	Other Commercial	\$2.42	\$2.63	\$2.85	\$3.09	\$3.35	\$3.64
270	S510	Hospitals	\$2.61	\$2.83	\$3.07	\$3.33	\$3.62	\$3.92
297	S511	Churches & Halls	\$1.32	\$1.43	\$1.55	\$1.69	\$1.83	\$1.98
324	S514	Schools "B"	\$0.73	\$0.79	\$0.86	\$0.93	\$1.01	\$1.10
351	S515	Other Commercial "A"	\$1.62	\$1.76	\$1.91	\$2.07	\$2.25	\$2.44
378	S516	Other Commercial "B"	\$0.81	\$0.88	\$0.95	\$1.03	\$1.12	\$1.22
405	S525	Department & Retail Stores - Pumping	\$2.43	\$2.64	\$2.86	\$3.10	\$3.37	\$3.65
432	S526	Hotels & Motels - Pumping	\$2.88	\$3.12	\$3.39	\$3.68	\$3.99	\$4.33
459	S527	Laundromats - Pumping	\$2.87	\$3.11	\$3.38	\$3.67	\$3.98	\$4.32
486	S528	Laundries - Pumping	\$4.43	\$4.81	\$5.22	\$5.66	\$6.14	\$6.66
513	S529	Markets - Pumping	\$5.82	\$6.31	\$6.85	\$7.43	\$8.07	\$8.75
540	S530	Mortuaries - Pumping	\$3.11	\$3.37	\$3.66	\$3.97	\$4.31	\$4.68
567	S531	Professional Offices - Pumping	\$2.03	\$2.20	\$2.39	\$2.59	\$2.81	\$3.05
594	S532	Repair Shops & Service Stations - Pumping	\$3.39	\$3.68	\$3.99	\$4.33	\$4.70	\$5.10
621	S533	Restaurants - Pumping	\$5.91	\$6.41	\$6.96	\$7.55	\$8.19	\$8.89
648	S534	Other Commercial - Pumping	\$2.86	\$3.10	\$3.37	\$3.65	\$3.96	\$4.30
675	S535	Hospitals - Pumping	\$3.03	\$3.29	\$3.57	\$3.87	\$4.20	\$4.56
702	S536	Churches & Halls - Pumping	\$1.54	\$1.67	\$1.81	\$1.97	\$2.13	\$2.32
729	S539	Schools "B" - Pumping	\$0.88	\$0.95	\$1.04	\$1.12	\$1.22	\$1.32
756	S540	Other Commercial "A" - Pumping	\$1.92	\$2.08	\$2.26	\$2.45	\$2.66	\$2.89
783	S541	Other Commercial "B" - Pumping	\$0.97	\$1.05	\$1.14	\$1.24	\$1.34	\$1.46
	SPEC	Industrial Users - Non Pumping						
		Flow (per ccf)	\$1.76	\$1.91	\$2.07	\$2.25	\$2.44	\$2.65
		COD (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
		TSS (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
		Industrial Users - Pumping						
		Flow (per ccf)	\$2.34	\$2.54	\$2.75	\$2.99	\$3.24	\$3.52
		COD (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
		TSS (per pound)	\$0.32	\$0.35	\$0.38	\$0.41	\$0.44	\$0.48
	S801							

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The functional allocation of required revenues is used to calculate the unit costs that are subsequently used to develop user rates. These tables summarize the functional allocation.

Functional Allocation	Test Year	FY 2014/15	-Blank-	Pumping	Flow	BOD	TSS	-Blank-	-Blank-	-Blank-	As All Other	Total	
Revenue Requirement Allocation	Cost	Allocation									As All Other	Total	
Notes:													
1	Allocated O&M	\$ 34,697,289	[Calculated]	0%	3%	54%	29%	14%	0%	0%	0%	0%	100.0%
2	Debt Service	18,876,186	As Fixed Assets	0%	0%	60%	31%	9%	0%	0%	0%	0%	100.0%
Less Offsetting Revenues													
3	Other	(666,366)	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	100.0%
3	Connection Fees	(1,041,984)	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	100.0%
3	CSD O&M Revenue	(3,539,632)	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	100.0%
3	Use of Money and Property	(730,434)	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	100.0%
4	Use of Reserves for Sewer Projects	(1,546,167)	As Capital	0%	4%	72%	16%	7%	0%	0%	0%	0%	100.0%
<hr/>													
Subtotal Revenue Requirement Allocation		\$ 11,351,603		\$ -	\$ 1,106,245	\$ 29,176,606	\$ 15,463,539	\$ 6,280,917	\$ -	\$ -	\$ -	\$ (5,978,416)	
Reallocation of As All Other				-	(127,118)	(3,352,660)	(1,776,903)	(721,735)	-	-	-	5,978,416	
Total Revenue Requirement Allocation		\$ 46,048,892		\$ -	\$ 979,127	\$ 25,823,946	\$ 13,686,636	\$ 5,559,182	\$ -	\$ -	\$ -	\$ -	
Revenue Requirement Allocation Percentages				0%	2%	56%	30%	12%	0%	0%			

2014/15 Functional Allocation Results		-Blank-	Pumping	Flow	BOD	TSS	-Blank-	-Blank-	-Blank-
Allocation Percentages	Allocation Percentage	0%	2%	56%	30%	12%	0%	0%	0%
Allocated Costs for 2014	Allocated Costs	\$ -	\$979,127	\$25,823,946	\$13,686,636	\$5,559,182	\$ -	\$ -	\$ -
Unit Cost Factor	Unit Cost Factor	Meters	Pumping Flow (HCF)	Flow (HCF)	BOD (lbs)	TSS (lbs)			
Units	Units		2,753,349	12,017,935	24,436,763	20,665,172			
Unit Costs	Unit Cost		\$0.36 Per HCF	\$2.15 Per HCF	\$0.56 Per Lb	\$0.27 Per Lb			

Revenue Requirements for Multi-Year Functional Allocation	2015	2016	2017	2018	2019	2020	2021	2022	2023	#
	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	
Total Revenue with Rate Increase	\$ 52,027,307	\$ 56,875,612	\$ 62,078,929	\$ 67,800,406	\$ 73,983,677	\$ 78,363,780	\$ 83,046,246	\$ 87,420,629	\$ 92,089,814	
Less Offsetting Revenues										
Other	\$ (666,366)	\$ (689,958)	\$ (714,477)	\$ (739,959)	\$ (766,441)	\$ (752,911)	\$ (781,517)	\$ (807,107)	\$ (833,572)	
Connection Fees	\$ (1,041,984)	\$ (1,083,455)	\$ (1,126,576)	\$ (1,171,414)	\$ (1,218,036)	\$ (1,266,514)	\$ (1,316,921)	\$ (1,362,355)	\$ (1,409,356)	
CSD O&M Revenue	\$ (3,539,632)	\$ (3,934,541)	\$ (4,233,888)	\$ (4,550,628)	\$ (4,885,772)	\$ (5,209,675)	\$ (5,519,373)	\$ (5,859,691)	\$ (6,140,516)	
Use of Money and Property	\$ (730,434)	\$ (714,972)	\$ (726,362)	\$ (774,413)	\$ (757,519)	\$ (778,173)	\$ (830,135)	\$ (710,784)	\$ (719,876)	
5 Total Rate Revenue Required	\$ 46,048,892	\$ 50,452,685	\$ 55,277,627	\$ 60,563,992	\$ 66,355,909	\$ 70,356,506	\$ 74,598,300	\$ 78,680,692	\$ 82,986,493	

- Notes:**
- The projected operating and maintenance (O&M) costs for FY 2014/15 have been allocated on a line item by line item basis as discussed in Chapter 6. This line shows the total O&M allocations to each functional component.
 - Debt service requirements are allocated based on the allocation of the Sewer Divisions fixed assets. The allocation of fixed assets represents a reasonable expectation of long-term capital spending. Allocating debt service in this manner can help to avoid cost shifts caused by capital spending.
 - These offsetting revenues have been allocated as the weighted average of all other revenue requirements as they provide a general benefit to the sewer utility, and are therefore used as proportional offsets.
 - Use of reserves for capital projects included in the O&M budget are allocated based on the capital projects that they fund. These percentage allocations represent the overall allocation of capital projects in the O&M budget.
 - This line shows projected required rate revenue. The allocation of projected requires rate revenue to pumping, flow, BOD, and TSS is shown on the next page.

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ALLOCATION OF COSTS TO CUSTOMER CATEGORIES AND 2014 COS RATE CALCULATION

Flat rate account calculations are shown in blue tables, volumetric rate calculations are shown in grey tables, industrial user rates are shown in the orange table.

One full example calculation has been shown for each calculation method.

The rates calculated in these tables are NOT the proposed rates.

1	Rate Class:	S800	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Residence on Septic System										
	Pumping:	NO										
		Rate per HCF Sewer Flow	\$	-	\$	-	\$	-	\$	-	\$	-
		Average Monthly Flow Per Account		0.00		0.00		0.00		0.00		0.00
		Monthly Flat Rate	\$	-	\$	-	\$	-	\$	-	\$	-

2	Rate Class:	S474	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Basic Multi-Family Dwelling Unit										
	Pumping:	NO										
		Rate per HCF Sewer Flow	\$	3.68	\$	3.99	\$	4.33	\$	4.69	\$	5.09
		Average Monthly Flow Per Account		7.53		7.53		7.53		7.53		7.53
		Monthly Flat Rate	\$	27.67	\$	30.02	\$	32.57	\$	35.34	\$	38.35

3	Rate Class:	S475	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Basic Single Family Dwelling Unit										
	Pumping:	NO										
	Accounts			44,641	45,078	45,520	45,966	46,416	46,871	47,331	47,544	47,758
	RTS Factor											
	Pumping	ccf		-	-	-	-	-	-	-	-	-
	Flow	ccf		4,480,719	4,524,630	4,568,971	4,613,747	4,658,962	4,704,620	4,750,725	4,772,103	4,793,578
	BOD	lbs		8,401,746	8,671,505	8,940,252	9,207,357	9,472,172	9,734,039	9,992,289	10,192,467	10,385,346
	TSS	lbs		7,938,561	8,193,448	8,447,379	8,699,759	8,949,975	9,197,405	9,441,418	9,630,560	9,812,806
	Nitrogen	lbs		1,467,004	1,514,105	1,561,030	1,607,669	1,653,907	1,699,631	1,744,723	1,779,676	1,813,354
	Pumping	cost	\$	-	\$	-	\$	-	\$	-	\$	-
	Flow	cost		9,628,096	10,548,860	11,557,679	12,662,975	13,873,973	14,710,435	15,597,327	16,450,891	17,351,166
	BOD	cost		4,705,682	5,155,701	5,648,756	6,188,964	6,780,833	7,189,649	7,623,113	8,040,288	8,480,293
	TSS	cost		2,135,569	2,339,800	2,563,562	2,808,723	3,077,330	3,262,862	3,459,580	3,648,906	3,848,592
	Nitrogen	cost		-	-	-	-	-	-	-	-	-
	Pumping	per ccf	\$	-	\$	-	\$	-	\$	-	\$	-
	Flow	per ccf	\$	2.15	\$	2.33	\$	2.53	\$	2.74	\$	2.98
	BOD	per ccf		1.05		1.14		1.24		1.34		1.46
	TSS	per ccf		0.48		0.52		0.56		0.61		0.66
	Nitrogen	per ccf		-		-		-		-		-
			\$	17.97								
		Rate per HCF Sewer Flow	\$	3.68	\$	3.99	\$	4.33	\$	4.69	\$	5.09
		Average Monthly Flow Per Account		8.36		8.36		8.36		8.36		8.36
		Monthly Flat Rate	\$	30.74	\$	33.36	\$	36.19	\$	39.27	\$	42.61

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4	Rate Class:	S590	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23								
	Desc:	Basic Single Family Dwelling - Pumping																		
	Pumping:	YES																		
		Rate per HCF Sewer Flow	\$	4.03	\$	4.37	\$	4.75	\$	5.15	\$	5.59	\$	5.87	\$	6.16	\$	6.47	\$	6.79
		Average Monthly Flow Per Account		8.36		8.36		8.36		8.36		8.36		8.36		8.36		8.36		8.36
		Monthly Flat Rate	\$	33.72	\$	36.58	\$	39.69	\$	43.07	\$	46.73	\$	49.07	\$	51.52	\$	54.10	\$	56.80
5	Rate Class:	S591	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23								
	Desc:	Basic Multi-Family Dwelling Units - Pumping																		
	Pumping:	YES																		
		Rate per HCF Sewer Flow	\$	4.03	\$	4.37	\$	4.75	\$	5.15	\$	5.59	\$	5.87	\$	6.16	\$	6.47	\$	6.79
		Average Monthly Flow Per Account		7.53		7.53		7.53		7.53		7.53		7.53		7.53		7.53		7.53
		Monthly Flat Rate	\$	30.35	\$	32.93	\$	35.73	\$	38.76	\$	42.06	\$	44.16	\$	46.37	\$	48.69	\$	51.12
6	Rate Class:	S473	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23								
	Desc:	Basic Commercial (Flat Rate)																		
	Pumping:	NO																		
		Rate per HCF Sewer Flow	\$	3.68	\$	3.99	\$	4.33	\$	4.69	\$	5.09	\$	5.35	\$	5.62	\$	5.90	\$	6.19
		Average Monthly Flow Per Account		8.36		8.36		8.36		8.36		8.36		8.36		8.36		8.36		8.36
		Monthly Flat Rate	\$	30.74	\$	33.36	\$	36.19	\$	39.27	\$	42.61	\$	44.74	\$	46.97	\$	49.32	\$	51.79
7	Rate Class:	S594	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23								
	Desc:	Basic Commercial - Pumping (Flat Rate)																		
	Pumping:	YES																		
		Rate per HCF Sewer Flow	\$	4.03	\$	4.37	\$	4.75	\$	5.15	\$	5.59	\$	5.87	\$	6.16	\$	6.47	\$	6.79
		Average Monthly Flow Per Account		8.36		8.36		8.36		8.36		8.36		8.36		8.36		8.36		8.36
		Monthly Flat Rate	\$	33.72	\$	36.58	\$	39.69	\$	43.07	\$	46.73	\$	49.07	\$	51.52	\$	54.10	\$	56.80
8	Rate Class:	S500	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23								
	Desc:	Department & Retail Stores																		
	Pumping:	NO																		
	Accounts			274		276		279		282		284		287		290		291		293
	RTS Factor			76%																
	Pumping	ccf		-		-		-		-		-		-		-		-		-
	Flow	ccf		81,426		82,224		83,030		83,844		84,666		85,495		86,333		86,722		87,112
	BOD	lbs		109,059		112,560		116,049		119,516		122,953		126,352		129,704		132,303		134,807
	TSS	lbs		100,985		104,228		107,458		110,668		113,851		116,999		120,103		122,509		124,827
	Nitrogen	lbs		21,639		22,334		23,026		23,714		24,396		25,070		25,736		26,251		26,748
	Pumping	cost	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	Flow	cost		174,968		191,701		210,034		230,120		252,127		267,327		283,445		298,956		315,316
	BOD	cost		61,082		66,923		73,323		80,336		88,018		93,325		98,951		104,367		110,078
	TSS	cost		27,166		29,764		32,611		35,729		39,146		41,506		44,009		46,417		48,957
	Nitrogen	cost		-		-		-		-		-		-		-		-		-
	Pumping	per ccf	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
	Flow	per ccf	\$	2.15	\$	2.33	\$	2.53	\$	2.74	\$	2.98	\$	3.13	\$	3.28	\$	3.45	\$	3.62
	BOD	per ccf		0.75		0.81		0.88		0.96		1.04		1.09		1.15		1.20		1.26
	TSS	per ccf		0.33		0.36		0.39		0.43		0.46		0.49		0.51		0.54		0.56
	Nitrogen	per ccf		-		-		-		-		-		-		-		-		-
		Rate per HCF Sewer Flow	\$	3.23	\$	3.51	\$	3.81	\$	4.13	\$	4.48	\$	4.70	\$	4.94	\$	5.19	\$	5.45
		Rate per HCF Water Consumption	\$	2.46	\$	2.67	\$	2.89	\$	3.14	\$	3.40	\$	3.57	\$	3.75	\$	3.94	\$	4.14

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9	Rate Class: S501	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Hotels & Motels										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	3.85	\$ 4.18	\$ 4.53	\$ 4.92	\$ 5.34	\$ 5.60	\$ 5.89	\$ 6.18	\$ 6.49
	Rate per HCF Water Consumption	\$	3.00	\$ 3.26	\$ 3.54	\$ 3.84	\$ 4.16	\$ 4.37	\$ 4.59	\$ 4.82	\$ 5.06
10	Rate Class: S502	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Laundromats										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	3.24	\$ 3.52	\$ 3.82	\$ 4.14	\$ 4.49	\$ 4.72	\$ 4.95	\$ 5.20	\$ 5.46
	Rate per HCF Water Consumption	\$	2.92	\$ 3.17	\$ 3.44	\$ 3.73	\$ 4.04	\$ 4.25	\$ 4.46	\$ 4.68	\$ 4.92
11	Rate Class: S503	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Laundries										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	5.37	\$ 5.82	\$ 6.32	\$ 6.85	\$ 7.44	\$ 7.81	\$ 8.20	\$ 8.61	\$ 9.04
	Rate per HCF Water Consumption	\$	4.83	\$ 5.24	\$ 5.69	\$ 6.17	\$ 6.69	\$ 7.03	\$ 7.38	\$ 7.75	\$ 8.14
12	Rate Class: S504	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Markets										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	7.33	\$ 7.96	\$ 8.63	\$ 9.37	\$ 10.16	\$ 10.67	\$ 11.21	\$ 11.77	\$ 12.35
	Rate per HCF Water Consumption	\$	6.60	\$ 7.16	\$ 7.77	\$ 8.43	\$ 9.15	\$ 9.60	\$ 10.09	\$ 10.59	\$ 11.12
13	Rate Class: S505	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Mortuaries										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	8.05	\$ 8.73	\$ 9.48	\$ 10.28	\$ 11.15	\$ 11.71	\$ 12.30	\$ 12.91	\$ 13.56
	Rate per HCF Water Consumption	\$	3.54	\$ 3.84	\$ 4.17	\$ 4.52	\$ 4.91	\$ 5.15	\$ 5.41	\$ 5.68	\$ 5.97
14	Rate Class: S506	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Professional Offices										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	2.97	\$ 3.22	\$ 3.50	\$ 3.79	\$ 4.12	\$ 4.32	\$ 4.54	\$ 4.77	\$ 5.00
	Rate per HCF Water Consumption	\$	2.02	\$ 2.19	\$ 2.38	\$ 2.58	\$ 2.80	\$ 2.94	\$ 3.09	\$ 3.24	\$ 3.40
15	Rate Class: S507	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Repair Shops & Service Stations										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	3.93	\$ 4.26	\$ 4.62	\$ 5.02	\$ 5.44	\$ 5.72	\$ 6.00	\$ 6.30	\$ 6.62
	Rate per HCF Water Consumption	\$	3.54	\$ 3.84	\$ 4.16	\$ 4.52	\$ 4.90	\$ 5.14	\$ 5.40	\$ 5.67	\$ 5.96
16	Rate Class: S508	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Restaurants										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	8.52	\$ 9.25	\$ 10.03	\$ 10.89	\$ 11.81	\$ 12.40	\$ 13.02	\$ 13.67	\$ 14.36
	Rate per HCF Water Consumption	\$	6.90	\$ 7.49	\$ 8.13	\$ 8.82	\$ 9.57	\$ 10.05	\$ 10.55	\$ 11.07	\$ 11.63
17	Rate Class: S509	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Other Commercial										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	3.23	\$ 3.51	\$ 3.81	\$ 4.13	\$ 4.48	\$ 4.70	\$ 4.94	\$ 5.19	\$ 5.45
	Rate per HCF Water Consumption	\$	2.91	\$ 3.16	\$ 3.42	\$ 3.72	\$ 4.03	\$ 4.23	\$ 4.45	\$ 4.67	\$ 4.90
18	Rate Class: S510	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Hospitals										
	Pumping: NO										
	Rate per HCF Sewer Flow	\$	3.75	\$ 4.07	\$ 4.42	\$ 4.79	\$ 5.20	\$ 5.46	\$ 5.73	\$ 6.02	\$ 6.32
	Rate per HCF Water Consumption	\$	3.15	\$ 3.42	\$ 3.71	\$ 4.02	\$ 4.37	\$ 4.58	\$ 4.81	\$ 5.05	\$ 5.31

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19	Rate Class:	S511	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Churches & Halls										
	Pumping:	NO										
		Rate per HCF Sewer Flow	\$	3.60 \$	3.91 \$	4.24 \$	4.60 \$	4.99 \$	5.24 \$	5.50 \$	5.78 \$	6.07
		Rate per HCF Water Consumption	\$	1.58 \$	1.72 \$	1.87 \$	2.02 \$	2.20 \$	2.31 \$	2.42 \$	2.54 \$	2.67
20	Rate Class:	S514	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Schools "B"										
	Pumping:	NO										
		Rate per HCF Sewer Flow	\$	2.96 \$	3.21 \$	3.48 \$	3.78 \$	4.10 \$	4.30 \$	4.52 \$	4.74 \$	4.98
		Rate per HCF Water Consumption	\$	0.89 \$	0.96 \$	1.04 \$	1.13 \$	1.23 \$	1.29 \$	1.36 \$	1.42 \$	1.49
21	Rate Class:	S515	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Other Commercial "A"										
	Pumping:	NO										
		Rate per HCF Sewer Flow	\$	3.23 \$	3.50 \$	3.80 \$	4.12 \$	4.47 \$	4.70 \$	4.93 \$	5.18 \$	5.44
		Rate per HCF Water Consumption	\$	1.94 \$	2.10 \$	2.28 \$	2.47 \$	2.68 \$	2.82 \$	2.96 \$	3.11 \$	3.26
22	Rate Class:	S516	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Other Commercial "B"										
	Pumping:	NO										
		Rate per HCF Sewer Flow	\$	3.24 \$	3.51 \$	3.81 \$	4.14 \$	4.49 \$	4.71 \$	4.95 \$	5.19 \$	5.45
		Rate per HCF Water Consumption	\$	0.97 \$	1.05 \$	1.14 \$	1.24 \$	1.35 \$	1.41 \$	1.48 \$	1.56 \$	1.64
23	Rate Class:	S525	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Department & Retail Stores - Pumping										
	Pumping:	YES										
		Rate per HCF Sewer Flow	\$	3.59 \$	3.89 \$	4.22 \$	4.58 \$	4.97 \$	5.22 \$	5.48 \$	5.76 \$	6.04
		Rate per HCF Water Consumption	\$	2.73 \$	2.96 \$	3.21 \$	3.48 \$	3.78 \$	3.97 \$	4.17 \$	4.37 \$	4.59
24	Rate Class:	S526	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Hotels & Motels - Pumping										
	Pumping:	YES										
		Rate per HCF Sewer Flow	\$	4.21 \$	4.57 \$	4.95 \$	5.37 \$	5.83 \$	6.12 \$	6.43 \$	6.75 \$	7.09
		Rate per HCF Water Consumption	\$	3.28 \$	3.56 \$	3.86 \$	4.19 \$	4.55 \$	4.78 \$	5.01 \$	5.26 \$	5.53
25	Rate Class:	S527	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Laundromats - Pumping										
	Pumping:	YES										
		Rate per HCF Sewer Flow	\$	3.60 \$	3.90 \$	4.24 \$	4.60 \$	4.99 \$	5.24 \$	5.50 \$	5.77 \$	6.06
		Rate per HCF Water Consumption	\$	3.24 \$	3.51 \$	3.81 \$	4.14 \$	4.49 \$	4.71 \$	4.95 \$	5.19 \$	5.45
26	Rate Class:	S528	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Laundries - Pumping										
	Pumping:	YES										
		Rate per HCF Sewer Flow	\$	5.72 \$	6.21 \$	6.74 \$	7.31 \$	7.93 \$	8.33 \$	8.74 \$	9.18 \$	9.64
		Rate per HCF Water Consumption	\$	5.15 \$	5.59 \$	6.06 \$	6.58 \$	7.14 \$	7.49 \$	7.87 \$	8.26 \$	8.68
27	Rate Class:	S529	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc:	Markets - Pumping										
	Pumping:	YES										
		Rate per HCF Sewer Flow	\$	7.69 \$	8.34 \$	9.05 \$	9.82 \$	10.66 \$	11.19 \$	11.75 \$	12.34 \$	12.95
		Rate per HCF Water Consumption	\$	6.92 \$	7.51 \$	8.15 \$	8.84 \$	9.59 \$	10.07 \$	10.57 \$	11.10 \$	11.66

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28	Rate Class: S530	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Mortuaries - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	8.40	\$ 9.12	\$ 9.89	\$ 10.73	\$ 11.65	\$ 12.23	\$ 12.84	\$ 13.48	\$ 14.16
	Rate per HCF Water Consumption	\$	3.70	\$ 4.01	\$ 4.35	\$ 4.72	\$ 5.12	\$ 5.38	\$ 5.65	\$ 5.93	\$ 6.23
29	Rate Class: S531	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Professional Offices - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	3.33	\$ 3.61	\$ 3.92	\$ 4.25	\$ 4.61	\$ 4.84	\$ 5.08	\$ 5.34	\$ 5.60
	Rate per HCF Water Consumption	\$	2.26	\$ 2.45	\$ 2.66	\$ 2.89	\$ 3.13	\$ 3.29	\$ 3.46	\$ 3.63	\$ 3.81
30	Rate Class: S532	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Repair Shops & Service Stations - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	4.28	\$ 4.65	\$ 5.04	\$ 5.47	\$ 5.94	\$ 6.23	\$ 6.55	\$ 6.87	\$ 7.22
	Rate per HCF Water Consumption	\$	3.86	\$ 4.18	\$ 4.54	\$ 4.92	\$ 5.34	\$ 5.61	\$ 5.89	\$ 6.19	\$ 6.49
31	Rate Class: S533	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Restaurants - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	8.88	\$ 9.63	\$ 10.45	\$ 11.34	\$ 12.30	\$ 12.92	\$ 13.56	\$ 14.24	\$ 14.96
	Rate per HCF Water Consumption	\$	7.19	\$ 7.80	\$ 8.47	\$ 9.19	\$ 9.97	\$ 10.46	\$ 10.99	\$ 11.54	\$ 12.11
32	Rate Class: S534	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Other Commercial - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	3.59	\$ 3.89	\$ 4.22	\$ 4.58	\$ 4.97	\$ 5.22	\$ 5.48	\$ 5.76	\$ 6.04
	Rate per HCF Water Consumption	\$	3.23	\$ 3.50	\$ 3.80	\$ 4.12	\$ 4.48	\$ 4.70	\$ 4.93	\$ 5.18	\$ 5.44
33	Rate Class: S535	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Hospitals - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	4.11	\$ 4.46	\$ 4.83	\$ 5.24	\$ 5.69	\$ 5.98	\$ 6.27	\$ 6.59	\$ 6.92
	Rate per HCF Water Consumption	\$	3.45	\$ 3.74	\$ 4.06	\$ 4.41	\$ 4.78	\$ 5.02	\$ 5.27	\$ 5.53	\$ 5.81
34	Rate Class: S536	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Churches & Halls - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	3.96	\$ 4.29	\$ 4.66	\$ 5.05	\$ 5.48	\$ 5.76	\$ 6.05	\$ 6.35	\$ 6.67
	Rate per HCF Water Consumption	\$	1.74	\$ 1.89	\$ 2.05	\$ 2.22	\$ 2.41	\$ 2.53	\$ 2.66	\$ 2.79	\$ 2.93
35	Rate Class: S539	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Schools "B" - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	3.31	\$ 3.59	\$ 3.90	\$ 4.23	\$ 4.59	\$ 4.82	\$ 5.06	\$ 5.32	\$ 5.58
	Rate per HCF Water Consumption	\$	0.99	\$ 1.08	\$ 1.17	\$ 1.27	\$ 1.38	\$ 1.45	\$ 1.52	\$ 1.59	\$ 1.67
36	Rate Class: S540	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Other Commercial "A" - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	3.58	\$ 3.89	\$ 4.22	\$ 4.58	\$ 4.97	\$ 5.21	\$ 5.48	\$ 5.75	\$ 6.04
	Rate per HCF Water Consumption	\$	2.15	\$ 2.33	\$ 2.53	\$ 2.75	\$ 2.98	\$ 3.13	\$ 3.29	\$ 3.45	\$ 3.62
37	Rate Class: S541	2014 COS Rate Calc	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
	Desc: Other Commercial "B" - Pumping										
	Pumping: YES										
	Rate per HCF Sewer Flow	\$	3.59	\$ 3.90	\$ 4.23	\$ 4.59	\$ 4.98	\$ 5.23	\$ 5.49	\$ 5.76	\$ 6.05
	Rate per HCF Water Consumption	\$	1.08	\$ 1.17	\$ 1.27	\$ 1.38	\$ 1.49	\$ 1.57	\$ 1.65	\$ 1.73	\$ 1.82

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Reallocation of Revenue Shortfalls

This reallocation is used to adjust the 5 year phase in rates in order to avoid revenue shortfall.

Required Revenue	\$	46,048,892	\$	50,452,685	\$	55,277,627	\$	60,563,992	\$	66,355,909
Collected Revenue		45,984,097		50,387,525		55,221,168		60,528,120		66,355,909
Amount to be Reallocated	\$	64,794	\$	65,160	\$	56,459	\$	35,872	\$	-
EDU's										
Flat Accounts EDU's		86,196.9		87,041.7		87,894.7		88,756.1		89,625.9
Non-Residential Account EDU's		29,235.5		29,522.0		29,811.4		30,103.5		30,398.5
Special Industrial Users EDU's		6,878.2		6,945.6		7,013.7		7,082.4		7,151.9
Total		122,311		123,509		124,720		125,942		127,176
Reallocated Amount										
Flat Accounts EDU's	\$	45,663	\$	45,921	\$	39,789	\$	25,281	\$	-
Non-Residential Account EDU's		15,488		15,575		13,495		8,574		-
Special Industrial Users EDU's		3,644		3,664		3,175		2,017		-
Total	\$	64,794	\$	65,160	\$	56,459	\$	35,872	\$	-
Monthly Reallocation per Flat Account										
Flat Rate Accounts		88867		89738		90618		91506		92402
Reallocation per Account	\$	0.04	\$	0.04	\$	0.04	\$	0.02	\$	-
Reallocation per HCF Water Consumption - Non Residential										
Total Water Usage		4,589,429		4,634,405		4,679,822		4,725,684		4,771,996
Reallocation per HCF Water	\$	0.00	\$	0.00	\$	0.00	\$	0.00	\$	-
Reallocation per HCF Sewer Flow - Industrial										
Total Water Usage		483,726		488,467		493,254		498,088		502,969
Reallocation per HCF Water	\$	0.01	\$	0.01	\$	0.01	\$	0.00	\$	-

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5 YEAR PHASE IN WITH REALLOCATION

This the calculated rates with a 5 year phase in and reallocation to avoid revenue shortfalls.

These are NOT the proposed rates.

		Existing						
	Rate Code	Description	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
0	S800	Residence on Septic System						
28	S474	Basic Multi-Family Dwelling Unit	\$25.77	\$27.94	\$30.25	\$32.75	\$35.44	\$38.35
56	S475	Basic Single Family Dwelling Unit	\$28.55	\$30.97	\$33.55	\$36.34	\$39.35	\$42.61
84	S590	Basic Single Family Dwelling - Pumping	\$32.97	\$35.39	\$37.95	\$40.68	\$43.60	\$46.73
112	S591	Basic Multi-Family Dwelling Units - Pumping	\$29.76	\$31.93	\$34.22	\$36.66	\$39.27	\$42.06
140	S473	Basic Commercial (Flat Rate)	\$28.55	\$30.97	\$33.55	\$36.34	\$39.35	\$42.61
168	S594	Basic Commercial - Pumping (Flat Rate)	\$32.97	\$35.39	\$37.95	\$40.68	\$43.60	\$46.73
0	S500	Department & Retail Stores	\$2.05	\$2.27	\$2.51	\$2.78	\$3.08	\$3.40
27	S501	Hotels & Motels	\$2.50	\$2.77	\$3.07	\$3.40	\$3.76	\$4.16
54	S502	Laundromats	\$2.43	\$2.69	\$2.98	\$3.30	\$3.65	\$4.04
81	S503	Laundries	\$3.99	\$4.43	\$4.91	\$5.45	\$6.04	\$6.69
108	S504	Markets	\$5.37	\$5.98	\$6.65	\$7.40	\$8.22	\$9.15
135	S505	Mortuaries	\$2.89	\$3.22	\$3.58	\$3.97	\$4.42	\$4.91
162	S506	Professional Offices	\$1.69	\$1.87	\$2.07	\$2.29	\$2.53	\$2.80
189	S507	Repair Shops & Service Stations	\$2.94	\$3.26	\$3.61	\$4.00	\$4.43	\$4.90
216	S508	Restaurants	\$5.50	\$6.15	\$6.87	\$7.67	\$8.57	\$9.57
243	S509	Other Commercial	\$2.42	\$2.68	\$2.97	\$3.29	\$3.64	\$4.03
270	S510	Hospitals	\$2.61	\$2.90	\$3.21	\$3.56	\$3.94	\$4.37
297	S511	Churches & Halls	\$1.32	\$1.46	\$1.62	\$1.79	\$1.99	\$2.20
324	S514	Schools "B"	\$0.73	\$0.81	\$0.90	\$1.00	\$1.11	\$1.23
351	S515	Other Commercial "A"	\$1.62	\$1.80	\$1.99	\$2.20	\$2.43	\$2.68
378	S516	Other Commercial "B"	\$0.81	\$0.90	\$1.00	\$1.10	\$1.22	\$1.35
405	S525	Department & Retail Stores - Pumping	\$2.43	\$2.66	\$2.90	\$3.17	\$3.46	\$3.78
432	S526	Hotels & Motels - Pumping	\$2.88	\$3.16	\$3.46	\$3.79	\$4.15	\$4.55
459	S527	Laundromats - Pumping	\$2.87	\$3.14	\$3.44	\$3.76	\$4.11	\$4.49
486	S528	Laundries - Pumping	\$4.43	\$4.88	\$5.36	\$5.90	\$6.49	\$7.14
513	S529	Markets - Pumping	\$5.82	\$6.43	\$7.11	\$7.86	\$8.68	\$9.59
540	S530	Mortuaries - Pumping	\$3.11	\$3.44	\$3.80	\$4.20	\$4.64	\$5.12
567	S531	Professional Offices - Pumping	\$2.03	\$2.22	\$2.42	\$2.64	\$2.88	\$3.13
594	S532	Repair Shops & Service Stations - Pumping	\$3.39	\$3.72	\$4.07	\$4.46	\$4.88	\$5.34
621	S533	Restaurants - Pumping	\$5.91	\$6.56	\$7.29	\$8.09	\$8.98	\$9.97
648	S534	Other Commercial - Pumping	\$2.86	\$3.13	\$3.42	\$3.74	\$4.09	\$4.48
675	S535	Hospitals - Pumping	\$3.03	\$3.32	\$3.64	\$3.99	\$4.37	\$4.78
702	S536	Churches & Halls - Pumping	\$1.54	\$1.69	\$1.85	\$2.02	\$2.21	\$2.41
729	S539	Schools "B" - Pumping	\$0.88	\$0.97	\$1.06	\$1.15	\$1.26	\$1.38
756	S540	Other Commercial "A" - Pumping	\$1.92	\$2.10	\$2.29	\$2.50	\$2.73	\$2.98
783	S541	Other Commercial "B" - Pumping	\$0.97	\$1.06	\$1.16	\$1.26	\$1.37	\$1.49
	SPEC	Industrial Users - Non Pumping						
		Flow (per ccf)	\$1.76	\$1.96	\$2.18	\$2.42	\$2.68	\$2.98
		COD (per pound)	\$0.32	\$0.33	\$0.33	\$0.34	\$0.35	\$0.36
		TSS (per pound)	\$0.32	\$0.32	\$0.33	\$0.33	\$0.34	\$0.34
		Industrial Users - Pumping						
		Flow (per ccf)	\$2.34	\$2.54	\$2.75	\$2.97	\$3.21	\$3.47
		COD (per pound)	\$0.32	\$0.33	\$0.33	\$0.34	\$0.35	\$0.36
		TSS (per pound)	\$0.32	\$0.32	\$0.33	\$0.33	\$0.34	\$0.34
	S801							