

Inland Empire Utilities Agency

Asset Management Plan

Fiscal Year 2014/15



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Acknowledgments

This Asset Management Plan was developed by staff members of the Inland Empire Utilities Agency. The Agency gratefully acknowledges the important contributions of the authors of the various sections of this plan. In particular, the authors of the Asset Management System Summaries put forth a great deal of effort to develop system summaries that are proving to be a valuable tool in guiding asset management decisions.

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Executive Summary

The Inland Empire Utilities Agency is committed to providing services for its rate payers to reliably meet the business goals approved by the Agency's Board of Directors. This commitment requires the Agency to diligently and carefully manage their assets. Through asset management, the Agency can coordinate decisions and take actions that allow them to meet these business goals at the lowest lifecycle cost.

This Asset Management Plan is the first developed at the Agency. It is intended for this plan to be a useful document for those who have a deep understanding of the Agency as well as for those who are only somewhat familiar with it. To meet the needs of both audiences, this plan contains introductory and overview chapters on the Agency's function, service area, business goals, and future growth (Chapters 1 – 4) as well as more detailed information on the Agency's asset valuation, financial projections, and physical assets, asset valuation (Chapters 5 – 7).

The current values for Agency assets are \$845 million for replacement and \$534 million for depreciation. The various components of these values are summarized in Table 5-1.

The Long-Range Plan of Finance (LRPF) aligns the Agency's financial capacity with long-term service objectives. The LRPF uses forecasts to provide insight into the Agency's future financial capacity so that Agency strategies can achieve long-term sustainability of financial and service objectives. Development of the LRPF is ongoing, with a complete robust and dynamic LRPF model anticipated in summer 2014. Some of the proposed features of the new financial model include extending the scope from 10 to 50 years, execution of multiple "what if" scenarios to highlight the effect of certain variables, and on-screen graphic presentations to more effectively communicate the alternatives and outcomes.

The Agency's physical assets are described in Chapter 7, Asset Management System Summaries, where they are organized according to the following systems:

1. Regional Water Recycling Plant No. 1 (RP-1)
2. Regional Water Recycling Plant No. 2 (RP-2)
3. Carbon Canyon Water Recycling Facility (CCWRF)
4. Regional Water Recycling Plant No. 4 (RP-4)
5. Regional Water Recycling Plant No. 5 (RP-5)
6. Recycled Water Distribution (RW) & Ground Water Recharge (GWR) Systems
7. Inland Empire Regional Composting Facility (IERCF)
8. Agency Lift Stations (LS)
9. Regional Conveyance System (RC)
10. Agency Laboratory (Lab)
11. Agency Headquarters (HQ)
12. Business (BIZ) & Process Automation Control (PAC) Networks

Each system summary comprises six sections: an asset profile, a capacity profile, an asset rating, key issues, history of key assets, and potential projects. Of particular note is that the system summaries identify both existing and potential projects to address needed rehabilitation,

replacement, and upgrades to assets. As such, these summaries provide key information for budgeting and project planning.

1. Introduction

1.1. Purpose of the Asset Management Plan

The Asset Management Plan presents the physical assets of the Inland Empire Utilities Agency and discusses the funding required to manage these assets to deliver the services expected by customers.

1.2. Full Economic Cost of Infrastructure Service Delivery

The cost of providing infrastructure services depends on the standard, or level of service, required by the Agency and the community. The Agency must show the full cost of providing that level of service so that they can set a realistic level of service based on customer expectations and appropriate service fees. The cost of infrastructure asset services is a function of the lifecycle costs and the current position of the asset in the asset lifecycle, as shown in Figure 1-1.

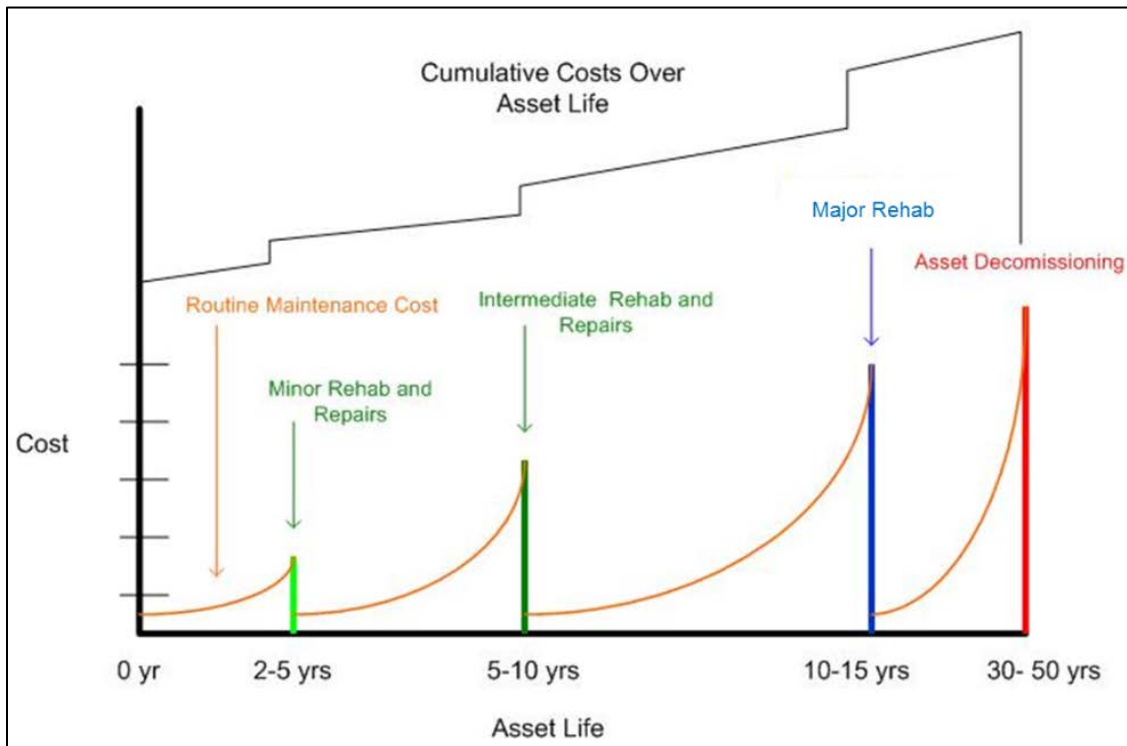


Figure 1-1: Lifecycle Cost

The Agency is better able to make decisions when they consider the lifecycle cost of assets. If costs increase in one area, then a suitable reduction or trade-off must be reflected in another area. For example, in order for the Agency to reduce operating and maintenance cost or business risk exposure, they can either invest capital or improve the offered levels of service.

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2. Inland Empire Utilities Agency Overview

2.1. Service Area

The Inland Empire Utilities Agency is a regional wastewater treatment and water agency that provides sewage treatment, biosolids handling, and recycled water to the west end of San Bernardino county. Its 242-square-mile service area includes the cities of Upland, Montclair, Ontario, Fontana, Chino, Chino Hills; the Cucamonga Valley Water District, which services the City of Rancho Cucamonga; and the unincorporated areas of San Bernardino County, including the Chino Agricultural Preserve.

The Agency, a special assessment district, is governed by a five-seat publicly elected Board of Directors. Each director is assigned to one of the five divisions: Division 1 – Upland/Montclair; Division 2 – Ontario/Agricultural Preserve; Division 3 – Chino/ Chino Hills; Division 4 – Fontana; Division 5 – Rancho Cucamonga. The regional technical and policy committees provide information on technical and policy issues and include representatives from each of the contracting agencies.

Five regional water recycling plants are used to treat raw wastewater from the Agency's service area: Regional Water Recycling Plant No. 1 (RP-1), located in the City of Ontario; Regional Water Recycling Plant No. 2 (RP-2), located in the City of Chino; Regional Water Recycling Plant No. 4 (RP-4), located in the City of Rancho Cucamonga; Carbon Canyon Water Recycling Facility (CCWRF), located in the City of Chino; and Regional Water Recycling Plant No. 5 (RP-5), located in the City of Chino.

The Agency has two main service areas: Northern Service Area and Southern Service Area. The area north of Riverside Drive in Ontario is referred to as the Northern Service Area, and the area south of Riverside Drive is the Southern Service Area. The Northern Service Area is about 162 square miles and has two active treatment plants, RP-1 and RP-4, and one decommissioned treatment plant, RP-3. The Southern Service Area has CCWRF, RP-2, RP-5, and the Agency's Administration Headquarters, certified by *Leadership in Energy & Environmental Design*.

Along with these facilities, the Agency maintains and operates a desalter facility in the City of Chino (Chino I Desalter) on behalf of the Chino Basin Desalter Authority and a biosolids composting facility in the City of Rancho Cucamonga (Inland Empire Composting Facility) on behalf of the Inland Empire Regional Composting Authority. The Agency is also the representative of the Metropolitan Water District of Southern California for the contracting agencies. Figure 2-1 shows the Agency service area.

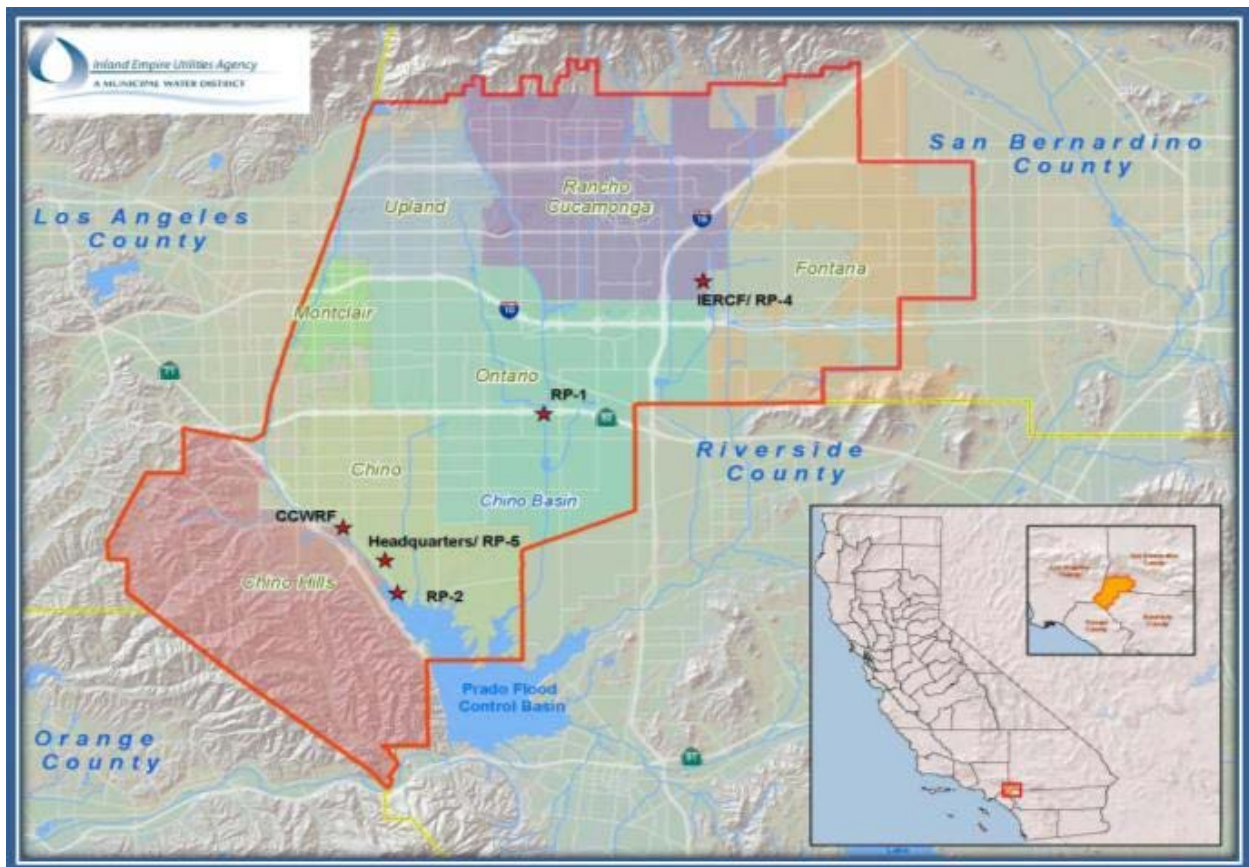


Figure 2-1: Agency Service Area

3. Agency Business Goals

3.1. Background of Agency Policy

Agency policy goals have guided the Agency's decisions and actions in executing their mission, while maintaining their values. Over the last several years, the Agency have categorized these Agency-wide policy goals into nine themes: (1) conservation and water quality, (2) technological innovation, (3) rate stabilization and cost effectiveness, (4) operational and maintenance efficiency, (5) strategic planning and capital implementation, (6) waste management and resource use, (7) interagency relationships and community partnerships, (8) fiscal accountability and regulatory compliance, and (9) staff training, development, and wellbeing. Each budget cycle, these Agency-wide policy goals guide them in developing the capital improvement program, operational budget, and organizational goals and objectives.

As a way to define the Agency's levels of service (LOS), the Agency held several workshops in 2011 with their Board of Directors. The levels of service developed during these workshops focused primarily on the Agency's operational functions. In early 2013, staff recommended that the levels of service be developed into more broad-based business goals. The Agency further decided that to better develop Agency Business Goals they should include input from their stakeholders, which include their Board of Directors, staff, Technical Committee members, and Policy Committee members.

3.2. Purpose of Agency Business Goals

Agency policy goals have guided the Agency's decisions and actions in executing their mission, while maintaining their values. To define the mission, vision, and values, the Agency looked to the needs of their stakeholders and the value of service provided to the public. To develop Agency-wide business goals, the Agency reviewed their existing policy goals and refined these goals according to their current and future needs. The Agency Business Goals sets the framework for developing additional planning documents that will shape and guide the Agency's fundamental decisions and actions over the next several years.

The adopted Agency Business Goals are fundamental to the development of several planning documents, including the Agency Strategic Plan, the Integrated Water Resources Plan, the individual Facility Master Plan Updates, and the Asset Management Plan. For any organization to remain relevant and effective, it must be able to prepare for change and to adapt. As illustrated in Figure 3-1, the Agency Business Goals must be continually evaluated as part of the planning process to ensure that the Agency meets the current and future needs of the region.



Figure 3-1: Relevance of Agency Business Goals to the Planning Process

3.3. Structure of Agency Business Goals

The Agency Business Goals were categorized into six main areas: (1) fiscal responsibility, (2) workplace environment, (3) business practices, (4) water reliability, (5) wastewater management, and (6) environmental stewardship. Within each business goal, the Agency established several objectives to support that business goal. For example, within water reliability, the Agency established the beneficial use of recycled water. For each objective, the Agency developed a commitment to define the level of service that they will provide. For example, the Agency is committed to developing the recycled water infrastructure, so they meet the objective of reusing 50,000 AFY by 2025. The structure of the Agency Business Goals is shown in Figure 3-2.



Figure 3-2: Structure of Agency Business Goals

3.4. Adopted Agency Business Goals

The remainder of this chapter presents the adopted Agency Business Goals, with each business goal presented on a single page.

A. Business Goal: Fiscal Responsibility

The Agency will safeguard their fiscal health through organizational efficiency, adoption of balanced multiyear budgets, and rates that (1) meet full cost-of-service targets, (2) maintain a high-quality credit rating, and (3) preserve established fund balance reserves to effectively address short-term and long-term economic variability. Furthermore, the Agency will provide open and transparent communication to educate member agencies on the Agency's fiscal policies.

1. Funding & Appropriation (Agency Management; Financial Planning; Accounting; Fiscal Management)

Objective: To appropriately fund operational, maintenance, and capital investment costs.

Recommended Commitment: The Agency will adopt service rates and fees that fully support the costs of service and provide a reliable and steady flow of operating revenue to support all operational expenses, capital replacement, and debt service costs. In addition, the Agency will ensure that service rates and fees support their goal to sustain high-quality commitment levels.

2. Budget Planning (Agency Management; Financial Planning; Accounting; Fiscal Management)

Objective: To forecast as accurately as possible costs for operation, repair and replacement, capital improvement, and debt service in an effort to provide financial stability for the Agency and member agencies.

Recommended Commitment: The Agency will provide multiyear forecast for costs of operation, repair and replacement, capital investment, and debt service to support the Agency's Board and member agencies' adoption of multiyear budgets and rates, enhancing the Agency's dependability and stability.

3. Reserves (Financial Planning; Accounting; Fiscal Management)

Objective: To preserve fund reserves that sustain the Agency's long-term fiscal health and high-quality credit rating and that ensure their ability to effectively address economic variability.

Recommended Commitment: The Agency will adopt financial policies to establish and preserve fund reserves above legally or contractually mandated levels so that they can maintain commitment levels. In addition, the Agency will support short- and long-term funding requirements. The Agency will also sustain their long-term fiscal health and high-quality credit rating to reduce future borrowing costs.

4. Creditworthiness (Financial Planning; Accounting; Fiscal Management)

Objective: To sustain a high-quality credit rating and debt-service-coverage ratio to safeguard the Agency's fiscal health and reduce future borrowing costs.

Recommended Commitment: The Agency will reinstate their credit rating to AAA by FY 202017/18 to reduce borrowing costs anticipated for expanding and improving existing facilities required to meet future growth in their service area.

B. Business Goal: Workplace Environment

The Agency is committed to providing a positive workplace environment by recruiting, retaining, and developing a highly skilled team dedicated to their mission, vision, and values.

1. Mission, Vision, and Values (All Agency Staff and Board)

Objective: To uphold Agency Business Goals, objectives, and commitment levels that support and advance the Agency's mission, vision, and values.

Recommended Commitment: The Agency will require the highest standard of ethical conduct from all Agency staff, promoting prudent leadership, integrity, collaboration, open communication, respect, accountability, high quality, passion, and efficiency.

2. Employer of Choice (Human Resources; Agency Management)

Objective: To be an employer of choice.

Recommended Commitment: The Agency will provide a work environment that will attract and retain highly skilled, motivated, professional, and committed employees.

3. Training (Agency Management; Human Resources)

Objective: To provide employees with state-of-the-art skills and knowledge to meet current and anticipated Agency needs.

Recommended Commitment: The Agency will facilitate and provide opportunities for staff to further their personal and professional development in support of maintaining a highly skilled workforce.

4. Staff Safety (Safety; Human Resources; Agency Management)

Objective: To promote and ensure a safe, healthy work environment to protect employees and stakeholders.

Recommended Commitment: The Agency will have no more than one day of lost time because of work-related illness or injury per 1,000 days worked.

C. Business Goal: Business Practices

The Agency is committed to applying ethical, fiscally responsible, and environmentally sustainable principles to all aspects of business and organizational conduct.

1. Efficiency and Effectiveness (All Departments)

Objective: To promote standards of efficiency and effectiveness in all Agency business practices and processes.

Recommended Commitment: The Agency will integrate *Lean* techniques to evaluate their current business practices and processes and will identify ways to improve the quality, cost, and value of their services to the member agencies and the public.

2. Customer Service (All Departments)

Objective: To provide excellent customer service that is cost-effective, efficient, innovative, and reliable.

Recommended Commitment: The Agency will respond to member agencies and meet the Member Agencies' expectation for enhanced value-added services. The Agency will solicit stakeholder feedback on performance and goal alignment each year.

3. Regional Leadership and Community Relations (Agency Management; Planning; Engineering)

Objective: To cultivate a positive and transparent relationship with stakeholders to enhance quality of life, preserve heritage, and protect the environment.

Recommended Commitment: The Agency will partner with stakeholders on common issues to create and implement integrated and innovative solutions, minimize duplication of efforts, and support education and outreach to the public. Furthermore, the Agency will incorporate member agencies and regional water agencies into their various related projects and programs to achieve a transparent and broader regional representation.

4. Policy Leadership (Agency Management; Planning; Engineering)

Objective: To effectively guide, advocate, and campaign for the development of policies and legislation that benefit the region that the Agency serve.

Recommended Commitment: The Agency will promote a collaborative approach to develop positions on policies, legislation, and regulations that affect Agency policy objectives.

D. Business Goal: Water Reliability

The Agency is committed to developing and implementing an integrated water resource management plan that promotes cost-effective, reliable, efficient, and sustainable water use along with economic growth within the Agency's service area.

1. Water Use Efficiency and Education (Planning; Engineering; Public Information)

Objective: To promote water-use efficiency through public education to enhance water supplies within the region and exceed state goals for reduction in per capita water use within the Agency's service area.

Recommended Commitment: The Agency will reduce water use in their service area to less than 200 gallons per capita per day by 2018.

2. New Water Supplies (Planning; Engineering)

Objective: To support member agencies and regional water agencies, the Agency will develop reliable, drought-proof, and diverse local water resources and supplemental water supplies to reduce dependence on imported water supplies.

Recommended Commitment: The Agency will promote efforts to reduce demand for imported water during dry and normal years and to store imported water into the Chino Groundwater Basin during wet years. In addition, The Agency will support maximizing the beneficial use of existing water infrastructure, while meeting future increased demands through investment in local water resources, supplemental water supplies, and conservation efforts.

3. Recycled Water (Planning; Engineering; Operations & Maintenance)

Objective: To support maximizing the beneficial reuse of recycled water to enhance reliability and to reduce dependence on imported water.

Recommended Commitment: The Agency will finish developing a recycled-water infrastructure and will support the member agencies in achieving reuse of 50,000 AFY by 2025.

4. Groundwater Recharge (Planning; Engineering; Operations & Maintenance)

Objective: To maximize all sources of groundwater recharge.

Recommended Commitment: The Agency will support the recharge of all available stormwater and maximize the recharge of recycled water within the Chino Groundwater Basin. Furthermore, the Agency will pursue the purchase and storage of cost-effective supplemental water supplies.

E. Business Goal: Wastewater Management

The Agency will develop master plans for Agency systems and manage and construct these systems to ensure that when expansion planning is triggered, designs and construction can be completed to meet regulatory and growth needs in an expeditious, environmentally responsible, and cost-effective manner.

1. Capacity (Planning; Engineering; Construction Management)

Objective: To maintain capacity within systems and facilities to meet essential service demands and to protect public health and environment.

Recommended Commitment: The Agency will ensure that systems are managed and constructed so that 90 percent of capacity is never exceeded.

2. On-Time Construction (Engineering; Construction Management)

Objective: To ensure capital projects are designed and implemented in a timely and economically responsible manner.

Recommended Commitment: The Agency will design and construct facilities through efficient project management to ensure that 80 percent of projects are completed on schedule and 90 percent of projects are on budget.

3. Biosolids Management (Operations & Maintenance)

Objective: To manage all Agency-produced biosolids in a US EPA compliant, fiscally prudent, and environmentally sustainable manner.

Recommended Commitment: The Agency will ensure that 95 percent of the capacity of the Inland Regional Compost Facility is used, that all biosolids produced by the Agency are treated at this facility, that Agency solids generation is minimized through efficient dewatering operations, and that all compost is marketed for beneficial use.

4. Energy Management (Planning; Engineering; Operations & Maintenance)

Objective: To optimize facility energy use and effectively manage renewable resources to achieve peak power independence, contain future energy costs, achieve statewide renewable energy, distribute generation and greenhouse-gas reduction goals, and provide for future rate stabilization.

Recommended Commitment: The Agency will achieve peak power independence by 2020 by implementing renewable projects, energy management agreements, and operational efficiencies.

F. Business Goal: Environmental Stewardship

The Agency is committed to the responsible use and protection of the environment through conservation and sustainable practices.

1. Regulatory Compliance (Compliance; Operations & Maintenance)

Objective: To comply with all federal, state, and local laws at each Agency facility.

Recommended Commitment: The Agency will have no more than two notices of violation annually from the State Water Resources Control Board, Air Quality Management District, or Non-Reclaimable Waste System for all Agency-owned and operated facilities.

2. Good Neighbor Policy (Compliance; Operations & Maintenance)

Objective: To control odors at all Agency facilities for the purpose of improving the environment and being a good neighbor to the local community.

Recommended Commitment: The Agency will perform a quarterly odor-monitoring assessment to develop actual and acceptable baseline odor thresholds. Acceptable baseline thresholds will be used to measure treatment plant performance and drive necessary capital improvements.

3. Response and Complaint Mitigation (Compliance; Operations & Maintenance)

Objective: To investigate any environmental issue or complaint received at any Agency facility and to respond appropriately and promptly.

Recommended Commitment: The Agency will immediately respond to any event that threatens public health and safety and will respond within five working days to any non-emergency complaint or suggestion.

4. Environmental Responsibility (Agency Management; Planning; Engineering)

Objective: To strive to implement actions that enhance or promote environmental sustainability and preservation of the region's heritage.

Recommended Commitment: The Agency will consider and assess environmental sustainability, public use, and heritage preservation options for all programs and projects.

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4. Future Demand and Growth

4.1. Wastewater Flow Projection

The Agency conducts wastewater flow forecasts annually, deriving the forecast from three components: (1) historical wastewater flow trends; (2) per capita or per dwelling-unit wastewater-generation factors; and (3) expected future growth numbers provided by contracting agencies. Using these projections, the Agency determines future demands on their facilities and anticipates needed modifications to Regional Water Recycling Plants (RWRP).

Based on analyses of the three components, the Agency has made ten-year flow projections for each of their RWRPs and for the service area as a whole. The Agency then compares the projected flows to current and future-planned plant capacities, presenting alternative scenarios that reflect possible diversions, bypasses, and recycle streams. For these forecasts, the “tributary area flow” is defined as raw wastewater flow from the service area that is a natural tributary to a particular RWRP without pumps, diversion, or bypasses. In contrast, the “treated influent flow” is the actual flow that is received and treated at the RWRP. The treated influent flow is different from the tributary area flow because the RWRPs are interconnected, allowing some of the tributary flow to be re-routed between plants. In addition, treated influent flow includes the recycle streams generated during solids processing that are sent back to the plant’s headworks for additional treatment.

4.2. Wastewater Flow Trends

Table 4-1 shows the current flows being treated at each of the Agency’s RWRPs.

| AGENCY | RP-1 | RP-4 | RP-5 | CCWRF | TOTAL |
|--------------------|-------------|-------------|-------------|--------------|--------------|
| Chino | 0.1 | | 1.9 | 2.1 | 4.1 |
| Chino Hills | | | 3.8 | 2.0 | 5.8 |
| Ontario | 8.9 | | 4.2 | | 13.1 |
| Montclair | 0.2 | | | 2.1 | 2.3 |
| Upland | 4.1 | | | 1.0 | 5.0 |
| Fontana | 6.9 | 5.5 | | | 12.4 |
| CVWD | 7.7 | 4.6 | | | 12.3 |
| TOTAL | 27.9 | 10.0 | 9.9 | 7.0 | 54.9 |

Note: Table 4-1 does not include recycle flows.

Figure 4-1 illustrates the general wastewater flow pattern within the Agency service area. For FY 2012/13, the average raw wastewater flow treated was 54.9 MGD. Since FY 2006/07, the Agency’s wastewater flows have declined by about 10 percent (similar to other local agencies). However, even though wastewater flows declined, the Agency has been able to increase the amount of recycled water supplied to users. The Agency has done so by using the San Bernardino Avenue lift station and the Montclair lift station to route additional raw wastewater to the recycling plants in the Northern Service Area, where the system has been expanded and where groundwater recharge basins are located.

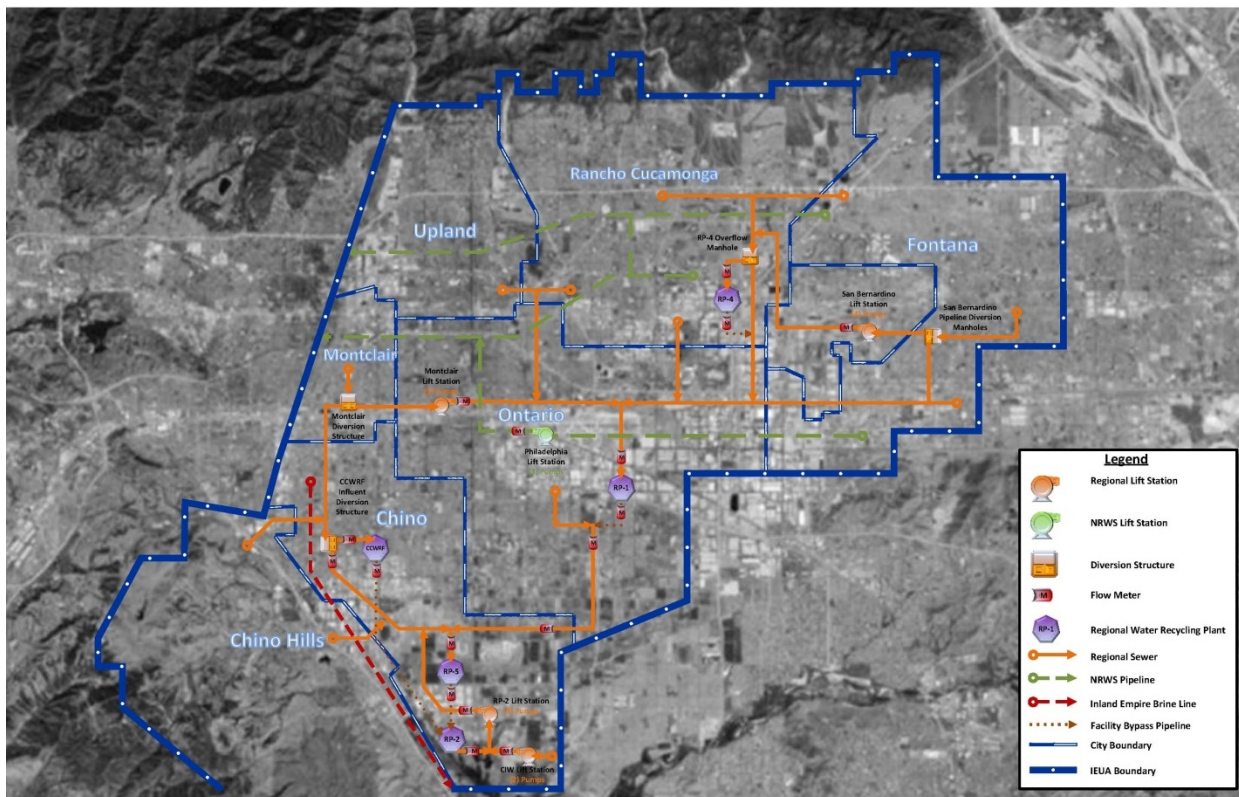


Figure 4-1: General Wastewater Flow Pattern

The Agency’s historical wastewater-flow trend is shown below in Figure 4-2. This figure depicts the raw wastewater from each RWRP’s tributary area and the total wastewater for all facilities combined.

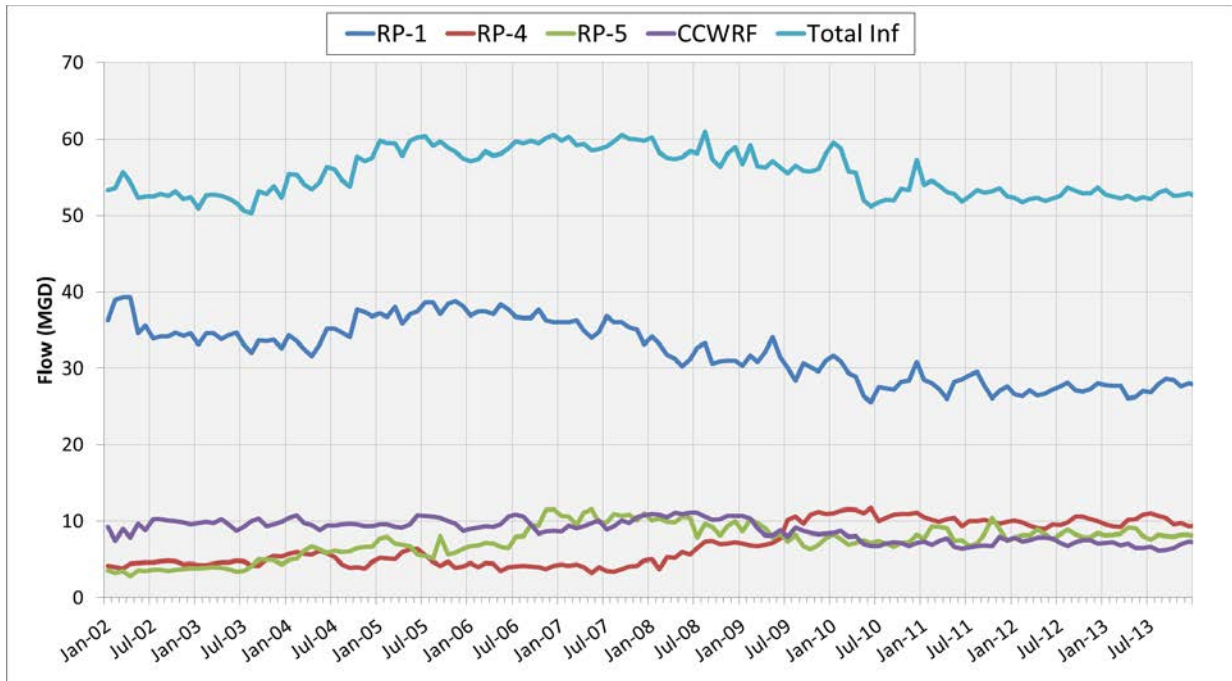


Figure 4-2: Regional Plant Wastewater Flow History

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5. State of the Assets Summary

5.1. Asset Valuation

The current replacement and depreciated values for Agency assets are summarized in Table 5-1.

Table 5-1: Agency Replacement and Depreciated Values

| Asset Group | Acquisition Value | Book Value (Depreciated Value) | Book Value / Replacement Value |
|--------------------------------------|-----------------------|-----------------------------------|-----------------------------------|
| Land | \$ 14,000,000 | \$ 14,000,000 | 100% |
| Land Improvements | \$ 19,000,000 | \$ 11,100,000 | 58% |
| Collection, Outfall & Transfer Lines | \$ 120,800,000 | \$ 59,800,000 | 50% |
| Interceptors, Tie-Ins | \$ 29,100,000 | \$ 21,000,000 | 72% |
| Recycled Water System | \$ 96,600,000 | \$ 85,300,000 | 88% |
| Wells | \$ 5,400,000 | \$ 4,800,000 | 89% |
| Reservoirs, Basins, Ponds | \$ 104,600,000 | \$ 83,400,000 | 80% |
| Treatment Plants, Pump Stations | \$ 216,700,000 | \$ 122,900,000 | 57% |
| Plant Office Buildings | \$ 30,000,000 | \$ 20,300,000 | 68% |
| Office Facilities | \$ 12,100,000 | \$ 9,800,000 | 81% |
| Equipment | \$ 130,100,000 | \$ 65,600,000 | 50% |
| Office Furniture and Fixtures | \$ 2,800,000 | \$ 300,000 | 11% |
| Auto and Trucks | \$ 3,300,000 | \$ 200,000 | 6% |
| Computer Software | \$ 7,900,000 | \$ 3,800,000 | 48% |
| CSLAC-Facility & Capacity Rights | \$ 38,200,000 | \$ 23,800,000 | 62% |
| SAWPA-Capacity Rights | \$ 12,500,000 | \$ 6,700,000 | 54% |
| MWD Connections | \$ 200,000 | \$ - | 0% |
| Organizational Costs | \$ 1,800,000 | \$ 1,300,000 | 72% |
| Total | \$ 845,100,000 | \$ 534,100,000 | 63% |

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6. Long-Term Asset Management

6.1. Long-Range Plan of Finance (LRPF) Model

The Long-Range Plan of Finance (LRPF) aligns the Agency's financial capacity with long-term service objectives. The LRPF uses forecasts to provide insight into the Agency's future financial capacity so that Agency strategies can achieve long-term sustainability of financial and service objectives. Actions taken in the short-term can have implications over multiple years. By projecting financial trends over a long period, the Agency can better anticipate and prepare for necessary adjustments and reduce any sudden impact to its stakeholders and operations. This projection allows for the most cost-effective funding strategy for supporting operations and capital requirements that are in line with established policies and goals of the Agency. As outlined in the FY 2011/12 LRPF, the Agency's financial policies are to

- Maintain programs that are self-supported through user fees and charges;
- Levy moderate rate increases to support program requirements;
- Employ cost containment measures that will ensure achievement of debt-coverage ratio targets recommended by the Board of Directors;
- Maintain adequate fund balances consistent with bond covenant requirements; and
- Minimize the Agency's borrowing costs.

Development of the LRPF is ongoing, with a complete robust and dynamic LRPF model anticipated in summer 2014. Some of the proposed features of the new financial model include extending the scope from 10 to 50 years, execution of multiple "what if" scenarios to highlight the effect of certain variables, and on-screen graphic presentations to more effectively communicate the alternatives and outcomes.

This chapter will be developed further in subsequent Asset Management Plans to present results of modeling work.

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7. Asset Management System Summaries

7.1. Introduction

To assemble a comprehensive description of assets, the Agency developed summaries of each asset management system. These summaries provide the Agency with a useful tool to determine those assets that are most critical to focus on. The Agency assets are organized according to the following twelve systems.

1. Regional Water Recycling Plant No. 1 (RP-1)
2. Regional Water Recycling Plant No. 2 (RP-2)
3. Carbon Canyon Water Recycling Facility (CCWRF)
4. Regional Water Recycling Plant No. 4 (RP-4)
5. Regional Water Recycling Plant No. 5 (RP-5)
6. Recycled Water Distribution (RW) & Ground Water Recharge (GWR) Systems
7. Inland Empire Regional Composting Facility (IERCF)
8. Agency Lift Stations (LS)
9. Regional Conveyance System (RC)
10. Agency Laboratory (Lab)
11. Agency Headquarters (HQ)
12. Business (BIZ) & Process Automation Control (PAC) Networks

When appropriate, systems have been divided into subsystems to aid in the logical presentation of information. For example, the regional water recycling plants have been divided into the following treatment process subsystems:

- Preliminary Treatment
- Primary Treatment
- Secondary Treatment
- Tertiary Treatment
- Solids Treatment
- Dewatering Treatment
- Auxiliary Systems

For Recycled Water & Ground Water Recharge, the following pressure zone subsystems:

- 800-foot pressure zone
- 930-foot pressure zone
- 1050-foot pressure zone
- 1158-foot pressure zone
- 1299-foot pressure zone
- 1630-foot pressure zone (east and west)

Each summary has been developed by engineers with extensive operations experience to ensure that the systems have been thoroughly evaluated and the critical assets identified.

7.2. Structure of Asset Management System Summaries

The Asset Management System Summaries have been developed with a common base structure, providing a foundation for their continued use and development. The summaries are updated to reflect the current condition of each system. Each system summary follows the structure described below, beginning with a schematic, followed by a project summary table, and culminating in a summary sheet:

- **System Schematic** – Displays a schematic representation of the system.
- **Project Summary Table for System** – Lists the existing projects relating to the system along with yearly budget allocations over a ten-year period.
- **Subsystem Summaries** – Describes the subsystem of a given system on a single 11 x 17-inch sheet divided into the following six sections:
 - Asset Profile – Describes the assets and their primary functions.
 - Capacity Profile – Describes the key capacity-design values for assets in terms of average flow requirements.
 - Asset Ratings – Presents a summary score on a 1 (best) to 5 (worst) scale, based on the current performance of the asset. The standards for the scoring scale are defined in Appendix A.
 - Key Issues – Lists treatment process and equipment issues (deficiencies) based on performance data and Operations and Maintenance Department Staff knowledge and f indicates which existing project will address the issue. If an issue is not being addressed by existing project, then the need for a potential project will be noted within the key issue description.
 - History of Select Assets – Provides dates of past capital improvement project activity and of planned or completed condition-assessment reports.
 - Potential Projects – Lists potential projects to consider for addressing deficiencies not being addressed by existing projects.

7.3. Future Development of Asset Management System Summaries

The Agency will continue to maintain, update, and expand Asset Management System Summaries for future Asset Management Plans. The Asset Management System Summary for the Regional Conveyance System could be only partially developed for this Asset Management Plan and will be developed further in the future.

7.4. Asset Management System Summaries

This section starts with a table that summarizes Agency-wide projects relating to multiple systems—that is, those not included in project tables for individual systems—followed by the Asset Management System Summaries.

Table 7-1: Agency-wide Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|---|---|---------------------------|-------------------|------------------------------|---------|---------|-----------|-----------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN17005 | Septage Dump System | Provide septage dump system at the most appropriate location within the Agency. | CC | GG | 0 | 0 | 100,000 | 800,000 | 0 | 0 | 0 | 0 | 0 | 0 | 900,000 |
| 2 | PA15007 | Facility Access Improvements | Provide FOB access where keys and cipher locks are currently employed. | OM | GG | 300,000 | 300,000 | 300,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 900,000 |
| 3 | PA15008 | Major Asset Rehab/Replace | Agency-wide annual R&R of major assets (buildings, vehicles, etc.). | OM | GG | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 2,000,000 |
| 4 | FP10200 | Financial Planning Forecast GG Fund | Placeholder for ERP Improvements per Kanes 3/3/14. | RP | GG | 298,000 | 298,000 | 298,000 | 310,000 | 400,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,854,000 |
| 5 | EN12020 | Chino Creek Invert Repair | Repair of Chino Creek invert near CCWRF where differential settling occurred. | RP | RC | 288,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 288,000 |
| 6 | EN13056 | Agency-wide HVAC Improvements – Package No. 2 | Agency-wide HVAC Improvements – Package No. 2. | CC | RC | 600,000 | 300,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 900,000 |
| 7 | EN14006 | Misc RC Constr & Emergency Proj FY13/14 | Miscellaneous emergency construction under RC fund. | CC | RC | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,500,000 |
| 8 | EN14009 | CM Misc RC Constr & Emergency Proj FY13/14 | Construction management: miscellaneous emergency construction under RC fund. | CC | RC | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,500,000 |
| 9 | EP14004 | Cl2 Residual Analyzer Replacement | Maintenance project to replace all the chlorine analyzers Agency-wide that are no longer being supported by the manufacturer. | EQ | RC | 160,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160,000 |
| 10 | EN17003 | Aeration System Improvements | Agency-wide aeration system improvements. | CC | RC | 0 | 0 | 250,000 | 3,000,000 | 3,000,000 | 0 | 0 | 0 | 0 | 0 | 6,250,000 |
| 11 | SR12001 | Agency-wide Security Equipment Upgrade | Agency-wide security equipment upgrade. | EQ | RC | 50,000 | 50,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000 |
| 12 | PA15005 | Biofilter Media Replacement | Agency-wide annual biofilter media replacement. | OM | RO | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 2,000,000 |
| 13 | PA15004 | Tertiary Facility Rehab | Agency-wide annual rehab to the tertiary facilities (e.g., sedimentation basin, filters, and chlorine contact basins) | OM | RO | 100,000 | 100,000 | 100,000 | 1,500,000 | 1,500,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 3,800,000 |
| 14 | PA15006 | Aeration Systems Rehab | Agency-wide annual rehab (e.g., diffuser rehab) of aeration systems. | OM | RO | 300,000 | 300,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 2,200,000 |
| 15 | EP15002 | Major Equipment Rehab/Replace | Agency-wide annual R&R of major equipment (pumps, heat exchangers, compressors, etc.). | EQ | RO | 700,000 | 500,000 | 400,000 | 400,000 | 400,000 | 400,000 | 400,000 | 400,000 | 400,000 | 400,000 | 4,400,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|---|--|---------------------------|-------------------|------------------------------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 16 | PA15002 | Agency-wide Coatings and Paving | Agency-wide annual maintenance for coatings and paving. | OM | GG | 200,000 | 200,000 | 200,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 1,300,000 |
| 17 | EN17004 | Energy Efficiency Improvements | Agency-wide upgrades to the lighting systems and process equipment systems to improve efficiency. Start design in FY2018/19. | CC | RO | 0 | 100,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 1,700,000 |
| 18 | PA15001 | Underground Piping Rehab | Annual underground piping rehab Agency-wide within facilities. | OM | RO | 500,000 | 500,000 | 500,000 | 500,000 | 1,000,000 | 400,000 | 400,000 | 400,000 | 400,000 | 400,000 | 5,000,000 |
| 19 | EN14024 | CM Misc RO Constr & Emergency Proj FY13/14 | Construction management: miscellaneous emergency construction under RO fund. | CC | RO | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,500,000 |
| 20 | EN14026 | Misc RO O&M Emergency Proj FY13/14 | Miscellaneous emergency O&M work under RO fund. | OM | RO | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,500,000 |
| 21 | PA15003 | Agency-wide Annual Rehab of Clarifiers | Agency-wide annual rehab of clarifiers. | OM | RO | 350,000 | 350,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 1,500,000 |
| 22 | EP15001 | RP1/RP2 Digester Cleaning Project | Removal of the solids from RP-2 Digester #1 or RP-1 Digester #4, perform structural analysis, repair/modify as needed and replace valves as required. | OM | RO | 420,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 420,000 |
| 23 | EN15026 | CM Misc RO Constr & Emergency Proj FY2014/15 | Fund unforeseen Wastewater Capital Improvement Fund projects that require immediate attention. | CC | RO | 250,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 250,000 |
| 24 | EN15032 | Agency-Wide HVAC Improvements – Package No. 3 | Evaluate electrical and control building HVAC systems and provide solutions/upgrades for the RP-1 Chemical Storage Warehouse, RP-5 Control Room, and RP-5 Power Center No.3. | CC | RC | 100,000 | 950,000 | 150,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,200,000 |
| 25 | EN15027 | Misc RO Constr & Emergency Proj FY2014/15 | Fund unforeseen Wastewater Capital Improvement Fund projects that require immediate attention. | CC | RO | 250,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 26 | EN15028 | Misc RO O&M Emergency Proj FY2014/15 | Fund unforeseen Wastewater Capital Improvement Fund projects (O&M) that require immediate action. | OM | RO | 250,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

Regional Water Recycling Plant No. 1

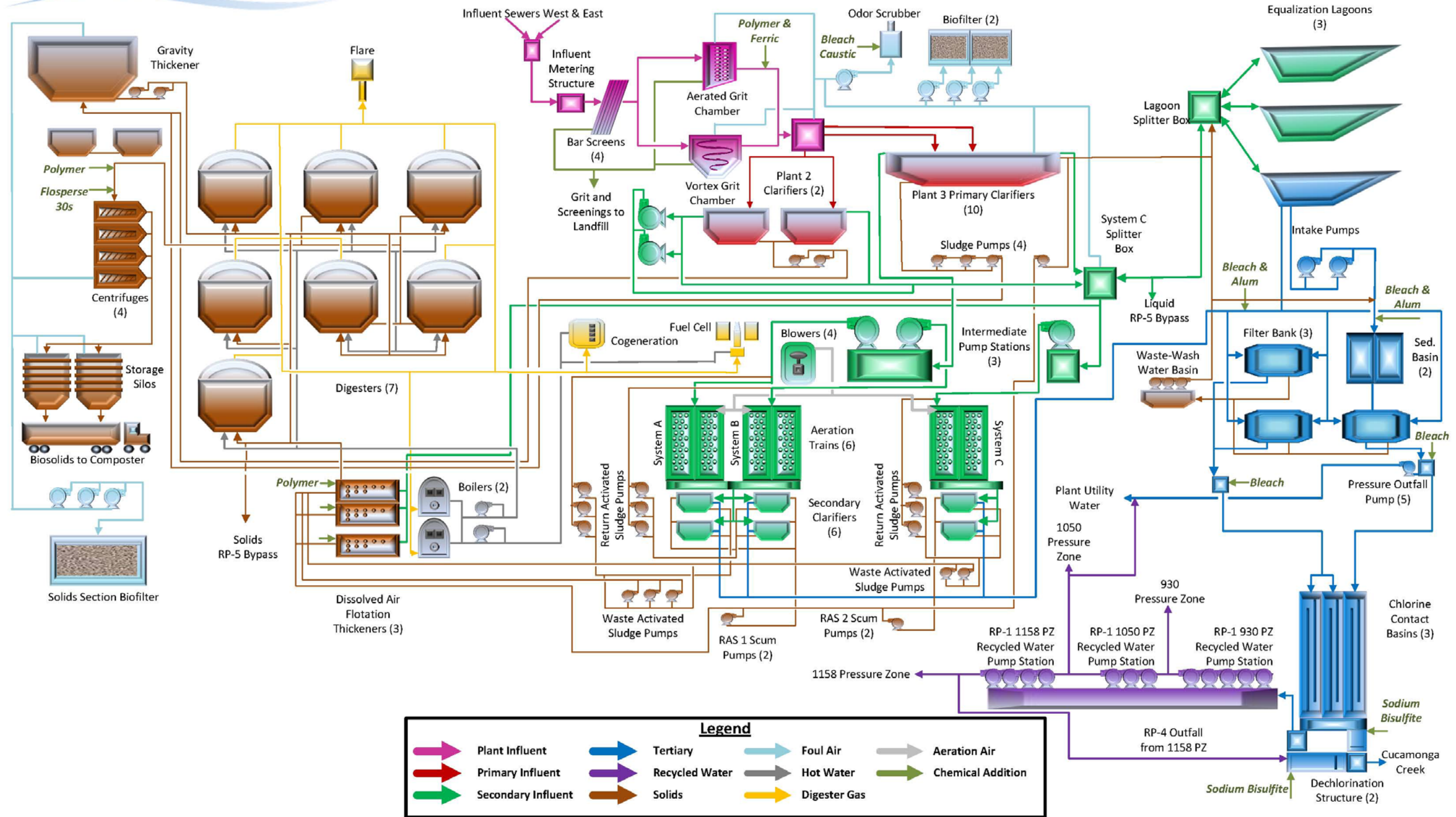


Figure 7-1: Regional Water Recycling Plant No. 1 (RP-1) – Schematic

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Table 7-2: Regional Water Recycling Plant No.1 – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|--|---|---------------------------|-------------------|------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN11039 | TP-1 Disinfection Pump Improvements | Engineering project to upgrade dosing facilities at OES and NES to allow full post filtration chlorination. | RP | RC | 95,000 | 225,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 320,000 |
| 2 | EN12022 | RP-1 Aeration Ducting Rehab | Project to repair leaks in aeration ducting system. | RP | RC | 25,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25,000 |
| 3 | EN13046 | RP-1 Flare System Improvements | Project to upgrade the flare control system and increase flare capacity. Evaluation being done to determine design intent. | RP | RC | 0 | 0 | 1,550,000 | 1,850,000 | 0 | 0 | 0 | 0 | 0 | 0 | 3,400,000 |
| 4 | EN14019 | RP-1 Headworks Rehab (aka Headworks Gate Replacement) | Engineering project to comprehensively rehab and upgrade the preliminary treatment process. Start design in FY2018/19. | CC | RC | 0 | 0 | 210,000 | 1,500,000 | 6,000,000 | 2,800,000 | 0 | 0 | 0 | 0 | 10,510,000 |
| 5 | EN14020 | RP-1 Sludge Thickening Upgrades | Project to upgrade the sludge thickening processes for primary and secondary sludge. Start design in FY2018/19. | CC | RC | 0 | 0 | 0 | 0 | 240,000 | 1,250,000 | 3,478,000 | 3,478,000 | 0 | 0 | 8,446,000 |
| 6 | EN15019 | RP-1 Odor Control Improvements | Odor control improvements (clarifier covers, foul air equipment, etc.). | CC | RC | 100,000 | 550,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 650,000 |
| 7 | EN19007 | RP-1 Flow Equalization Upgrade and Odor Control | Scope will be determined by findings of Master Plan update. Potential project to address odor related to equalizing primary effluent. | CC | RC | 0 | 0 | 0 | 0 | 1,000,000 | 0 | 0 | 0 | 0 | 0 | 1,000,000 |
| 8 | EN15020 | RP-1 Plant 3 Primary Scum Well Upgrade | Potential project to address scum pumping capacity issues, as well as evaluate MCC in primary pumping gallery. | CC | RC | 75,000 | 325,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 400,000 |
| 9 | EN18004 | RP-1 IPS System Improvements | Project to address deficiencies in system (e.g., replace eddy clutches with VFDs). | CC | RC | 0 | 0 | 0 | 250,000 | 750,000 | 0 | 0 | 0 | 0 | 0 | 1,000,000 |
| 10 | EN20006 | RP-1 Digester Mixing Upgrade | Potential engineering project to upgrade the digester mixing systems. Start design in FY2019/20. | CC | RC | 0 | 0 | 0 | 0 | 0 | 250,000 | 500,000 | 500,000 | 500,000 | 500,000 | 2,250,000 |
| 11 | EN15012 | RP-1 East Primary Effluent Pipe Rehab | Rehab of the east primary effluent piping between the rectangular primary clarifiers and the Intermediate Pump Station wet well. | CC | RO | 600,000 | 150,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750,000 |
| 12 | EN15013 | RP-1 TWAS and Primary Effluent Piping Replacement 2014 | Failures in the TWAS and primary effluent piping require pipe to be replaced. | CC | RO | 400,000 | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

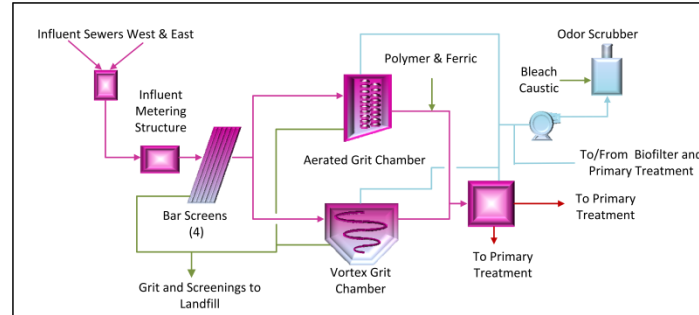
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – RP-1 Preliminary Treatment Process

1. Asset Profile



Influent Channel and Metering Station

Two main trunk lines (east and west) bring influent sewer flows into RP-1 through the influent structure with gates to divert flow to either of two Parshall flume flow meters. Flow from the influent metering station enters a common channel before the bar screening structure.

Screening Equipment

Gates divert flow to six channels, four mechanical climber bar screens, one manual bar screen, and one bypass channel. The 5/8-inch-spaced bar screens hold large debris from flowing-to-downstream processes. A mechanical climber rake collects debris and drops the screenings on the screening conveyance/disposal system. Liquid flow passes through the bar screen into a common channel that feeds the grit removal systems.

Aerated Grit System

Flow enters a series of three square aerated grit chambers (AGC) through five gates. Three air lift pumps, supplied by two air blowers, pump collected grit up to the grit washing/disposal system. Air from the blowers also provides air for agitation. Liquid flows pass through gates to a common channel and then to the headworks splitter box.

Vortex Grit System

Flow from the bar screens is directed to the influent of the circular vortex grit chamber. A paddle mixer pushes flow in a circular path; grit collects at the bottom, where it is pumped to the grit washing/disposal system.

Grit Washing/Disposal System

Grit pumped from the AGC and vortex grit chamber enter the Headworks Building where it flows to two grit classifiers. The grit sinks to a submerged screw that pulls the grit out of the water and drops grit into two screw conveyors. The conveyors lift and transport the grit to a roll-off bin. The excess liquid spills out of the grit classifiers and is directed back to the bar screen structure effluent channel.

Screenings Conveyance/Disposal System

Screenings collected by the bar screens are transported by a conveyor and dropped into a hydraulic compactor. The compactor compresses the collected screenings, squeezes out excess water, and pushes the screenings to the roll-off bin.

Ferric Chloride System

Ferric chloride is added to the liquid flow after grit removal to enhance primary treatment and to control sulfide emissions. Ferric chloride can also be valved to the digesters. The ferric station consists of a truck filling station, storage tank, three chemical metering pumps, and associated piping.

Polymer System

Polymer is added to the liquid flow after grit removal to enhance primary treatment. The polymer system includes a tote stand, chemical metering pump, mixing chamber, and associated piping.

Headworks Splitter Box

The headworks splitter box receives flow from both grit systems, the bar screens structure bypass, and the overflow from the solids section gravity thickener. Flow can be diverted to the Plant 3 rectangular clarifiers or to the Plant 2 circular clarifiers for primary treatment.

Odor Scrubber

Foul air collected in the preliminary and primary treatment processes is forced through the odor scrubber tower with plastic porous media, where a solution of bleach and caustic soda trickles against the air flow to oxidize hydrogen sulfide and other compounds. The odor scrubber is used to supplement the foul air treatment provided by the biofilter.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|-----------------------|
| Preliminary Treatment Process | 44 MGD | |
| Influent Channel and Metering Station East Sewer West Sewer Parshall Flumes Gates | 42-inch 42-inch 2 @ 55 MGD 2 units | Per Unit |
| Screening Equipment Mechanical Screen Manual Screen Gates | 4 @ 27.5 MGD 2 @ 27.5 MGD 15 units | Per Unit |
| Aerated Grit System Chambers Pumps Blowers Gates | 1 @ 44 MGD 3 @ 150 gpm 2 @ 360 scfm 10 units | Per Unit Per Unit |
| Vortex Grit System Chamber Pump Gates | 1 @ 20.4 MGD 1 @ 300 gpm 4 units | |
| Grit Washing/Disposal System Classifiers Conveyors | 2 @ 300 gpm 2 @ 3 wet tons per hr | Per Unit Per Unit |
| Screening Conveyance/Disposal System Conveyor Compactor | 5.0 hp 5.0 hp | |
| Ferric Chloride System Tank Pumps | 13,000 gallons 3 @ 37.4 gph | Per Unit |
| Polymer System Pump | 1 @ 4.5 gph | |
| Headworks Splitter Box Gates | 3 units | |
| Odor Scrubber Blowers Valves | 2 @ 8,000 scfm 2 units | Per Unit > 18-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|---------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Influent Channel and Metering Station | 3 | 2 | 3 | 3 |
| Screening Equipment | 3 | 2 | 3 | 3 |
| Aerated Grit System | 3 | 3 | 4 | 3 |
| Vortex Grit System | 3 | 3 | 4 | 5 |
| Grit Washing/Disposal System | 3 | 3 | 3 | 3 |
| Screening Conveyance/Disposal System | 4 | 5 | 3 | 5 |
| Ferric Chloride System | 3 | 3 | 3 | 3 |
| Polymer System | 3 | 3 | 3 | 3 |
| Headworks Splitter Box | 3 | 5 | 3 | 3 |
| Odor Scrubber | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

Influent Channel and Metering Station

The east isolation gate leaks. In addition, there is currently no odor control directly tied into the influent channel. A project is being planned by Maintenance under EP14002 to replace the isolation gates.

Screening Equipment

The bar spacing allows a significant amount of debris to reach downstream processes. A substantial number of the gates are broken and inoperable. In addition, the foul air containment leaks, as evident by internal smoke tests. Project EN14019 will replace the broken and inoperable gates.

Aerated Grit System

The AGC allows large amounts of grit to pass through to downstream processes. Many of the gates are broken and inoperable. Project EN14019 will replace the broken gates and upgrade or replace the AGC.

Vortex Grit System

The vortex grit chamber is not operated because the grit piping clogs frequently when the chamber is in operation. A potential maintenance project will rehab this system.

Grit Washing/Disposal

Recent failures of the classifier and the conveyors screws have indicated excessive wear from heavy use. The availability of spare parts results in parts from both systems being pieced together to have one working system. A potential maintenance project will rehab this system.

Screenings Conveyance/Disposal System

The conveyor equipment is corroded and has limited accessibility for cleaning and repair. The compactor welds and hoses fail regularly (3 to 4 times per year). maintenance project EP14002 will replace the screenings conveyor and compactor in 2014.

Ferric Chloride System

The ferric chloride system operates effectively, but the equipment is approaching the end of its useful life. Project EN14019 will rehab this system.

Polymer System

This system will be rehabbed by Project EP14002 or EN14019.

Headworks Splitter Box

Many of the gates are broken and inoperable. Project EN14019 will replace these gates.

Odor Scrubber

The odor scrubber is a viable alternative if the primary section biofilter needs to be taken offline. Project EN14019 will rehab this system.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|---------------------------------------|--------------------------------------|-----------------------------|
| Influent Channel and Metering Station | 1977 1987 | Planned 2014 |
| Screening Equipment | 1977 1987 | Planned 2014 |
| Aerated Grit System | 1987 | Planned 2014 |
| Vortex Grit System | 1987 | |
| Grit Washing/Disposal System | 1977 1987 2009 | |
| Screening Conveyance/Disposal System | 1977 1987 | |
| Ferric Chloride System | 1987 1992 | |
| Polymer System | | |
| Headworks Splitter Box | 1977 | Planned 2014 |
| Odor Scrubber | 1996 | Planned 2014 |

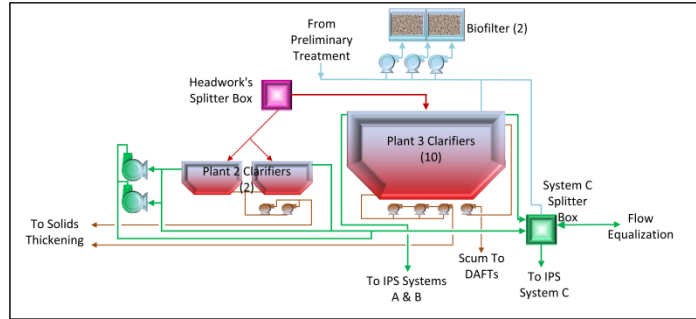
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------------------|-------------------------------|---|
| Vortex Grit System | RP1 Vortex Grit Chamber Rehab | Rehab and upgrade the vortex grit system. |

System Summary Continued on Next Page

Asset Management System Summary – RP-1 Primary Treatment Process

1. Asset Profile



Plant 3

Influent Channel

Two pipes from the headwork's splitter box divert flow to the Plant 3 influent channel. Each clarifier has three gates from the influent channel to allow flow to enter each clarifier. The channel is aerated with air from blowers to keep solids in suspension.

Primary Clarifiers

The rectangular clarifiers consist of chain-driven flights, which push settled solids and collected floatables to a sludge hopper for pumping or to scum troughs for solids processing. Each clarifier consists of three or four effluent troughs with V-notch weirs. The clarifiers are covered for odor control.

Effluent Channel

Each effluent trough discharges into a common channel. Two legs with bladder valves direct flow from the effluent channel to the intermediate pump system A&B wet well or the system C splitter box. The effluent channel is covered and has odor control ducting to the biofilter.

Sludge Pumping System

A series of valves opens and closes to direct solids collected in each clarifier to three pumps, sending flow to solids thickening processes.

Scum System

Scum collected by the primary clarifiers is directed to a common wet well. Periodically a pump will pull from the wet well and pump to solids thickening processes.

Plant 2

Primary Clarifiers

Flow from the headworks splitter box is directed through a flow meter and a series of valves/gates to two circular clarifiers. The clarifiers are center feed with a rotating arm to push solids to a sludge hopper and floatables to the scum removal trough. Effluent from the clarifiers is piped to the Intermediate pump station wet wells. These clarifiers are put in service when flow needs to be diverted from Plant 3, but are not used during normal operation.

Solids Pumping System

Solids collected from the Plant 2 clarifiers are directed to two pumps. The pumps send flow to solids thickening processes in the solids section.

Trickling Filter Pumps

Effluent from the west Plant 2 clarifier can be pumped via the trickling filter pumps to the system C splitter box. The effluent collects in an old trickling filter wet well and is pumped through a series of splitter boxes until it reaches the system C splitter box.

Biofilter

Three blowers pull foul air from the Plant 3 primary clarifiers, system C splitter box, and the preliminary treatment section, forcing the air through two beds of carbon rich media to allow for the biological consumption of hydrogen sulfide and other compounds.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------------|---|-----------|
| Plant 3 | 33.6 MGD | |
| Influent Channel Blowers | 3 @ 25 hp | Per Unit |
| Primary Clarifiers | 10 @ 2,400 gpd/ft ² 3,500 ft ² | Per Unit |
| Flight Drives Gates | 5 @ 0.5 hp 34 units | Per Unit |
| Effluent Channel Bladder Valves | 2 units | |
| Sludge Pumping System Pumps | 3 @ 412 gpm 30/20/20 hp | Per Unit |
| Scum Pumping System Pump | 1 @ 130 gpm 7.5 hp | Per Unit |
| Plant 2 | 15.1 MGD | |
| Primary Clarifiers | 2 @ 2,400 gpd/ft ² 7,854 ft ² | Per unit |
| Gates Valve | 4 units 1 unit | |
| Sludge Pumping System Pumps | 2 @ 175 gpm 15 hp | |
| Trickling Filter Pumps | 2 @ 9,000 gpm 100 hp | |
| Biofilter | | |
| Media | 9,293 ft ² 4.5 ft depth | |
| Blowers | 2 @ 11,700 scfm 40 hp 1 @ 12,205 scfm 50 hp | Per Unit |
| Valves | 15 units | > 18-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Plant 3 | | | | |
| Influent Channel | 3 | 3 | 3 | 3 |
| Primary Clarifiers | 3 | 1 | 3 | 3 |
| Effluent Channel | 4 | 3 | 3 | 3 |
| Sludge Pumping System | 3 | 3 | 3 | 3 |
| Scum Pumping System | 3 | 4 | 3 | 3 |
| Plant 2 | | | | |
| Primary Clarifiers | 3 | 3 | 3 | 3 |
| Sludge Pumping System | 3 | 3 | 3 | 3 |
| Trickling Filter Pumps | 3 | 3 | 4 | 3 |
| Biofilter | 2 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

Plant 3

Influent Channel

The influent channel operates effectively; however, floatable solids have a tendency to collect in the channel, requiring collections crew to make semi-regular cleanings of the channel. The upgrade of the scum removal system, through Project EN08023.05 (2014 completion), will provide an opportunity for the scum gates to be opened so that the floatable solids can be removed by the primary's scum removal system.

Primary Clarifiers

Small pieces of the chain/flight system break requiring significant maintenance activities to repair. Primary clarifiers 1 through 7 are currently being rehabbed through Project EN08023.05.

Effluent Channel

The effluent channel is currently in the process of being recoated through Project EN08023.05. The bladder valves leading from the effluent channel to the intermediate pump stations have failed and do not divert flow as originally designed. Recent evaluations of underground piping to the intermediate pump stations have indicated extensive corrosion. Project EN14052 will replace underground piping from the effluent channel to the intermediate pump stations. The other underground piping is likely in a similar condition and will require repairs.

Sludge Pumping System

No issues require special attention.

Scum System

The scum wet well has limited controls and instrumentation. The floatables form a raft in the wet well, and the scum pump suction pulls from the bottom of the scum box. The floatables are required to be vacted regularly. The scum collection system is currently being retrofitted to a tipping trough under project EN08023.05; however, the scum accumulation in the wet well is not being addressed; a future project is required.

Plant 2

Primary Clarifiers

The clarifiers are not covered to control odors and have a limited capacity. The current flow meter for the system is a temporary strap-on flow meter placed after the original flow meter and headwork's isolation gate failed. Because of the limited use of these clarifiers, the cost-effectiveness of a rehab will have to be evaluated.

Solids Pumping System

No issues require special attention.

Trickling Filter Pumps

No critical issues. The equipment is left over from an abandoned trickling filter system. Although it's not the original intent, the equipment is used occasionally to increase capacity of the Plant 2 system.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------|--------------------------------------|-----------------------------|
| Plant 3 | | |
| Influent Channel | 1977 1982 | |
| Primary Clarifiers | 1977 1982 2007 2013 | |
| Effluent Channel | 1977 1982 | |
| Sludge Pumping System | 1977 1982 | |
| Scum System | 1977 1982 2013 | |
| Plant 2 | | |
| Primary Clarifiers | 1966 1987 1997 | Planned 2016 |
| Solids Pumping System | 1966 1985 1987 | |
| Trickling Filter Pumps | 1966 | |
| Biofilter | 2008 2013 | Planned 2015 |

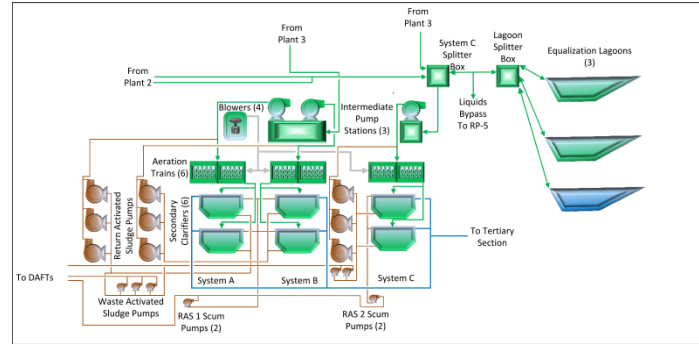
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RP-1 Secondary Treatment Process

1. Asset Profile



Intermediate Pumps Stations

Primary effluent flows to the intermediate pump station wet wells. The wet wells can divert high flows to the flow equalization system. Three sets of pumps (System A – 3 pumps, System B – 3 pumps, System C – 4 Pumps) pump to each designated aeration system.

Flow Equalization System

Primary effluent can flow to three flow equalization lagoons to hold flows and introduce them back to the intermediate pump station at a later time. Flow is diverted to the three lagoons via motorized gates. Two lagoons have floating aerators to slow the rate at which the stored flows become septic.

Activated Sludge System

The three activated sludge systems consist of two aeration trains each (six total). Influent gates divert a combined flow of primary effluent and return activated sludge to each train. Each train consists of four basins. The first basin mixes flows with a paddle mixer. The next three basins can add air via the fine bubble diffusion system supplied by four large blowers with automated valves to control the dissolved oxygen concentrations such that biochemical oxygen demand and total inorganic nitrogen removals are optimized.

Secondary Clarifiers

Effluent from two aeration trains flows in a common channel to two circular clarifiers per system (six total). Each peripheral feel clarifier has a rotating sludge and skimmer arm. Solids settle out of the liquid flow and are pushed to a center sludge hopper for pumping. Liquid overflows the V-notched weirs.

Return Activated Sludge (RAS) Pumping System

The settled sludge in the secondary clarifiers is pumped back to the influent of the aeration system as return activated sludge (RAS) to mix with primary effluent from the intermediate pump station. The organisms in the RAS must be returned to sustain the biological process. Also, the RAS flow returns nitrate for further removal. Each system has three dedicated pumps (nine total). The return activated sludge and wasted activated sludge pumps are located inside two separate buildings: RAS 1 (Systems A and B) and RAS 2 (System C).

Waste Activated Sludge (WAS) Pumping System

The waste activated sludge (WAS) pumping system controls the activated sludge (biomass) concentrations in the aeration system. A portion of the settled solids from the secondary clarifiers is pumped out of the secondary system to solids processing as WAS.

Scum Pumping System

Scum collected by the skimmer arm of the secondary clarifiers is routed to two scum wells, where it is pumped out of the system to solids processing.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------|--|-----------|
| Secondary Treatment Process | 50 MGD | |
| Intermediate Pump Station | | |
| System A Pumps | 3 @ 4,200 gpm | Per Unit |
| Valves | 60 hp | > 18-inch |
| System B Pumps | 4 units | Per Unit |
| System C Pumps | 3 @ 5,600 gpm | |
| Valves | 75/60/60 hp | > 18-inch |
| System C Pumps | 5 units | Per Unit |
| Valves | 4 @ 5,600 gpm | > 18-inch |
| Gates | 75 hp | |
| | 5 units | > 18-inch |
| | 5 units | |
| Flow Equalization System | | |
| Lagoon 1 | 1 @ 5.8 MG | |
| Lagoon 2 | 1 @ 6.2 MG | |
| Lagoon 3 | 1 @ 10.3 MG | |
| Gates | 3 units | |
| Activated Sludge System | | |
| Blowers | 2 @ 14.1 MGD 1 @ 15.9 MGD 4 @ 13,426 scfm 700 hp 9.25 psig | Per Unit |
| System A & B | | |
| Trains | 4 @ 1.91 MG | Per Unit |
| Depth | 17.8 ft | |
| Mixers | 4 @ 15 hp | Per Unit |
| System C | | |
| Trains | 2 @ 1.96 MG | Per Unit |
| Depth | 17.8 ft | |
| Mixers | 2 @ 15 hp | Per Unit |
| Air Panels | 142 per train | |
| Gates | 22 per train | |
| Valve | 1 per system | > 18-inch |
| Valves (air) | 6 units | > 18-inch |
| Secondary Clarifiers | | |
| System A & B | 4 @ 700 gpd/ft ² 11,310 ft ² | Per Unit |
| System C | 2 @ 700 gpd/ft ² 13,273 ft ² | Per Unit |
| RAS Pumping System | | |
| RAS 1: Pumps | 6 @ 5,600 gpm 60 hp | Per Unit |
| RAS 2: Pumps | 3 @ 5,600 gpm 60 hp | Per Unit |
| Valves | 40 units | > 14-inch |
| WAS Pumping System | | |
| RAS 1: Pumps | 3 @ 450 gpm 7.5 hp | Per Unit |
| RAS 2: Pumps | 2 @ 600 gpm 7.5 hp | Per Unit |
| Scum Pumping System | | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------|---------------------------------------|----------|
| RAS 1 | 2 @ 400 gpm | Per Unit |
| RAS 2 | 2 @ 200 gpm | Per Unit |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|----------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Intermediate Pump Stations | 4 | 3 | 4 | 3 |
| Flow Equalization System | 3 | 3 | 3 | 3 |
| Activated Sludge System | 3 | 4 | 4 | 4 |
| Secondary Clarifiers | 3 | 4 | 3 | 3 |
| RAS Pumping System | 3 | 3 | 3 | 3 |
| WAS Pumping System | 3 | 3 | 3 | 3 |
| Scum Pumping System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

Intermediate Pump Stations

New variable frequency drive technology is available to replace older clutch drives. The System C primary effluent splitter box concrete is corroding, and the gates are not functional. A potential engineering project is needed to address this area.

Flow Equalization System

Recent crack-repair projects have eliminated the cracks in one of the lagoons. Operations and Maintenance staff monitor the status of cracks in the lagoons. A potential engineering project will provide odor control for the flow equalization system or will provide the ability to equalize secondary effluent.

Activated Sludge System

Leaks in the air ducting system will be addressed by Project EN12022 in 2014. A potential project will address upgrades to improve nutrient removal (e.g., mixed-liquor recirculation and anoxic mixers).

Secondary Clarifiers

A rehab of Clarifier No.1 and 2 was done in 2008. A potential project will rehab Clarifier No.5 and 6, including upgrading the weir and launder washing system for algae control.

Return Activated Sludge (RAS) Pumping System

A Maintenance project will address the rehab of valves and flow meters.

Waste Activated Sludge (WAS) Pumping System

The waste activated sludge piping clogs frequently. Flush water is provided; however, the plugging reduces process efficiency. Project EN14020 will address this issue.

Scum Pumping System

The scum discharge piping combines with flow from primary Plant 3 scum pumping system. When all the pumps are running at the same time, the pump station output decreases dramatically, reducing process reliability. This issue will be addressed by Project EN14020.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|----------------------------|--------------------------------------|-----------------------------|
| Intermediate Pump Stations | 1977 1987 | |
| Flow Equalization System | 1977 1987 1995 2013 | |
| Activated Sludge System | 1977 1987 1997 | |
| Secondary Clarifiers | 1977 1987 | Planned 2014 |
| RAS Pumping System | 1977 1987 | |
| WAS Pumping System | 1977 1987 | |
| Scum Pumping System | 1977 1987 | |

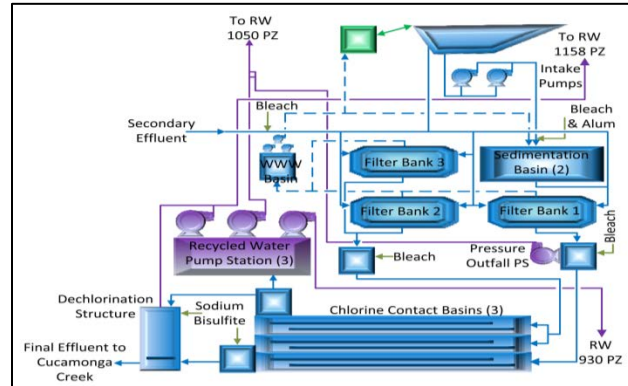
Table 4 Potential Projects

| System | Project Name | Project Description |
|----------------------------|-------------------------------|--|
| Intermediate Pump Stations | RP1 IPS Rehab | Rehab worn concrete and replace gates for the System C influent splitter box. |
| Activated Sludge System | RP1 MLR Pump Improvements | This project will install mixed liquor return pumps into the activated sludge system to improve nutrient removal. |
| Secondary Clarifiers | RP1 Secondary Clarifier Rehab | This project will rehab Clarifiers 5 and 6 and will upgrade the weir and launder washing system for algae control. |

System Summary Continued on Next Page

Asset Management System Summary – RP-1 Tertiary Treatment Process

1. Asset Profile



Intake Pump Station

Secondary effluent is conveyed across the Cucamonga Creek through a 60-inch pipeline, which feeds the tertiary section or can be diverted to Lagoon 3. The intake pumps convey flow from Lagoon 3 to the sedimentation basin.

Aluminum Sulfate (Alum) System

The aluminum sulfate system consists of two large storage tanks, four pumps, piping, and appurtenances. Alum is added to the process at two locations: (1) flash mixer (FM) 1 and (2) flash mixer 2. FM-1 injects chemical into the main feed to the tertiary section. Alum is a coagulant that helps with the removal of suspended materials in the flow path. FM-2 injects alum into the sedimentation basin influent flow, acting as a coagulant for the suspended material from the waste-wash water basin.

Sedimentation Basin

The sedimentation basin can receive tertiary section drainage and filter backwash water from the waste-wash water basin. The flow is mixed with aluminum sulfate at FM-2 and introduced to the mixing tank. The solids in the flow coagulate and settle to the bottom of the tank. The collected solids are pumped to solids processing, while the overflowing liquid is sent to the filters.

Chlorination System

Three chemical tanks hold 12.5 percent bleach. Two pumps draw from the tanks to feed an injection point ahead of the filters at FM-1. Two additional pumps supply chlorine to a looped pipe system from the tanks to the filter effluent structures (OES and NES). The effluent structures each have a duty and standby peristaltic dosing pump. The duty pumps inject bleach through a mixer into the process streams. Chlorine residual is measured throughout the tertiary process to control the chlorine dose.

Filters

There are three filter banks, consisting of a total of 26 down-flow filters. The flow travels through layers of anthracite, sand, and gravel. The filters are regularly backwashed to remove the solids that have been filtered from the secondary effluent. Backwash water is sent to the waste-wash water basin and pumped back into the lagoons or sedimentation basin.

Waste-Wash Water (WWW) Basin

The waste-wash water (WWW) basin collects drainage from the entire tertiary section of RP-1 and also collects filter backwash and leakage from the three filter banks. The collected water is pumped by three pumps to: (1) equalization lagoons or (2) the sedimentation basin.

Filter Effluent Structures

Flow from the filters enters OES or NES. The structures are equipped with chlorine analyzers and peristaltic bleach pumps to maintain the chlorine residual set point at the end of each effluent structure. Chlorinated flow is conveyed to the chlorine contact basins.

Chlorine Contact Basin (CCB)

The chlorine contact basins (CCB) have a serpentine flow path that allows for the injected chlorine to gain contact time with the treated water to meet permit requirements. The contact basins are covered and have continuous monitoring of chlorine residual. Flow from all three contact basins merge into a common effluent channel and flow to the CCB splitter box.

Effluent Splitter Box

Flow entering the CCB splitter box is directed to the dechlorination structure, recycled water wet well, or the pressure outfall pipeline. Flow is controlled by gates.

Dechlorination System

Flow entering the dechlorination structures is dosed with sodium bisulfite (SBS) and travels through a serpentine flow path to allow for the SBS to neutralize any chlorine residual before flowing into Cucamonga Creek. SBS is stored in two large chemical tanks and is metered into the system via six chemical metering pumps.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|--|
| Tertiary Treatment Process | 44 MGD | |
| Intake Pump Station | 2 @ 14,000 gpm 60 hp | Per Unit |
| Alum System Tanks Pumps | 2 @ 20,000 gallons 2 @ 20.25 gph 1 @ 32.20 gph 1 @ 58.50 gph | |
| Sedimentation Basin Total Weir Length Total Settling Tube Area Chemical Mixer Traveling Bridge Pump | 800 ft 7,600 ft ² 8 @ 3 hp 1 @ 1.5 hp 2 @ 130 gpm | |
| Filters Bank No.1 Bank No.2 & 3 Filter Loading Rate Valves | 8 @ 299 ft ² 18 @ 299 ft ² 5 gpm/ft ² 118 units | Per Unit Per Unit 12 - 42-inch |
| Waste-Wash-Water Basin Pumps Valve | 3 @ 2,100 gpm 2 units | Per Unit > 18-inch |
| Filter Effluent Structures Gate Valves | 4 units 2 unit | > 18-inch |
| Chlorination System Tanks ME-18 Pumps OES Pumps NES Pumps Mixers | 3 @ 10,300 gal 2 @ 317 gph 2 @ 205 gph 2 @ 205 gph 3 water champs | Per Unit Per Unit Per Unit Per Unit |
| Chlorine Contact Basins Gates Valves | 3 @ 1.3 MG 6 units 1 unit | Per Unit >18-inch |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|--|----------------------------------|
| Effluent Splitter Box Gates | 3 units | |
| Dechlorination System Tanks Pumps | 2 @ 12,500 gal 4 @ 9-90 gph 2 @ 2-20 gph | Per Unit Per Unit Per Unit |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|----------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Intake Pump Station | 3 | 3 | 3 | 3 |
| Alum System | 4 | 3 | 3 | 3 |
| Sedimentation Basin | 5 | 3 | 3 | 4 |
| Chlorination System | 4 | 3 | 4 | 4 |
| Filters | 3 | 3 | 3 | 3 |
| Waste-Wash Water Basin | 3 | 3 | 3 | 3 |
| Filter Effluent Structures | 3 | 3 | 3 | 3 |
| Chlorine Contact Basins | 3 | 3 | 3 | 3 |
| Effluent Splitter Box | 3 | 3 | 3 | 3 |
| Dechlorination System | 2 | 2 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

Intake Pump Station

No issues require special attention.

Aluminum Sulfate (Alum) System

The main alum pumps feeding FM-2 have not been run since the sedimentation basin was taken offline. The pumps may need to be rehabilitated before the sedimentation basin can be put back in service.

Sedimentation Basin

The sedimentation basin has not been in operation for several years after the sludge line to solids processing was found to be leaking. During this time the settling tubs were removed from one of the tanks. Pending an evaluation of the benefits provided by this system, a rehab may be done through a potential maintenance project to make the sedimentation basin operable again.

Chlorination System

Project EN11039 will upgrade this system to provide more efficient and effective chemical dosing. In 2014, Project EP14004 will replace the outdated chlorine analyzers.

Filters

The filters' backwash valves leak continuously sending flow to the waste-wash water basin, where the flow must be pumped, resulting in process inefficiencies. Some of the observed underground pipe appears to have significant corrosion. A potential maintenance project will address the valve issue and rehab the internals components of the filters.

Waste-Wash Water (WWW) Basin

The increased on/off cycling of the WWW-basin pumps from the leaking filter-backwash valves results in significantly higher run time than expected. This problem will be addressed by a potential maintenance project.

Effluent Structures

No issues that require special attention.

Chlorine Contact Basins (CCB)

A potential maintenance project will rehab these basins and address any leaks.

Effluent Splitter Box

No issues require special attention.

Dechlorination System

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|----------------------------|--------------------------------------|-----------------------------|
| Intake Pump Station | 1977 | |
| Alum System | 1977 1998 | |
| Sedimentation Basin | 1977 1998 | Planned 2015 |
| Chlorination System | 1977 2004 | |
| Filters | 1977 1982 1987 | Planned 2015 |
| Waste-Wash Water Basin | 1977 1987 | |
| Filter Effluent Structures | 1977 1987 | |
| Chlorine Contact Basins | 1997 | |
| Effluent Splitter Box | 2002 | |
| Dechlorination System | 1992 2011 | |

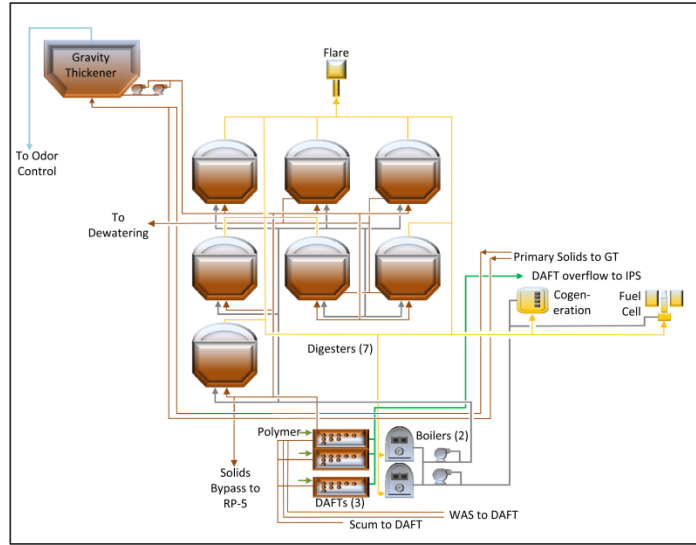
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RP-1 Solids Treatment Process

1. Asset Profile



Gravity Thickener System

Solids collected from the primary clarifiers are pumped to the gravity thickener (GT) and mixed with sweetener water supplied by the utility water system. Solids are allowed to settle to the bottom of the GT. Solids are thickened from 1 percent total solids to 2 to 4 percent total solids. The thickened solids are pumped to the digestion system. The liquid overflow is conveyed back to the RP-1 headworks splitter box.

Dissolved Air Flotation Thickener (DAFT) System

The three DAFTs receive solids from the scum collection systems of the primary and secondary clarifiers and also receive waste activated sludge from the secondary system. Solids entering the DAFTs are mixed with recycled flow that has been pressurized with compressed air from two large compressors and dosed with polymer. Solids float to the top, where they are skimmed off and pumped to the digestion system. Solids are thickened from ~1 percent to 4 percent total solids through this process. The liquid underflow of the DAFT flows to the system C splitter box. A solids bypass allows for the diversion of solids to the regional collection system, which flows to RP-5.

Digestion System

Seven digesters receive thickened sludge. Digesters 1 and 2 have floating domes, while Digesters 3, 4, 5, 6, and 7 have fixed covers. The hot water system provides heat, and the sludge recirculation system transfers heat to maintain temperatures from 97 to 128 degrees Fahrenheit. Each recirculation system is equipped with a grinder. Gas-mixing systems mix the contents of the digesters. Gas piping connected to the top of each digester allows the produced gas to enter the gas conveyance system. Several pressure/vacuum relief valves and J-tube safety blow-offs are on each digester to prevent over and under pressurization.

Sludge Transfer System

To allow for phased digestion, RP-1 is equipped with several pump stations and automated valves to transfer sludge throughout the digestion system. The transfer system is designed to offer the greatest flexibility of transferring sludge to each of the seven digesters. Valves are operated from a centralized compressed air system.

Hot Water System

The hot water system consists of two loops: (1) primary (heating) and (2) secondary (delivery). The primary loop collects heat from heat exchangers at the boilers and the fuel cell (note: fuel cell owned by private firm). The secondary loop pulls heated water from the primary loop and sends it to the heat exchangers at each digester. Two boilers

are fueled by digester or natural gas, or both. The cogeneration heat exchangers collect heat from the water jacket and the exhaust of the cogeneration engines when the engines are in service. The fuel cell has a heat exchanger on the exhaust stack that collects waste heat.

Gas Conveyance and Waste Gas System

Gas collected from the digestion system enters the gas loop, which can deliver low-pressure gas to the compressors for use in the boiler or fuel cell or to the flare. The gas loop has several J-tubes to prevent over-pressurization. Iron sponges are used to remove hydrogen sulfide from the digester gas. Digesters 1 and 2 have a waste gas line that can deliver low-methane content gas directly to the flare.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--------------------------|---|----------|
| Solids Treatment Process | 60 MGD | |
| GT System Tank | 1 @ 299 gal/ft ² /day 3,848 ft ² | Per Unit |
| Drive Pumps | 1 @ 1.0 hp 2 @ 150 gpm 15 hp | Per Unit |
| DAFT System Tanks | 3 @ 85 gal/ft ² /day 2,100 ft ² | Per Unit |
| Recirculation Pumps | 3 @ 1,260 gpm | Per Unit |
| Sludge Pumps | 6 @ 200 gpm | Per Unit |
| Polymer Blending Units | 4 @ 8.0 gph | Per Unit |
| Pressurization Tanks | 3 @ 2,000 gal. | Per Unit |
| Compressors | 2 @ 40 hp | Per Unit |
| Digester System | | |
| Digester No.1 & 2 | 2 @ 112,122 ft ³ | Per Unit |
| Digester No.3 & 4 | 2 @ 99,500 ft ³ | Per Unit |
| Digester No.5 | 1 @ 172,995 ft ³ | |
| Digester No.6 & 7 | 2 @ 224,332 ft ³ | Per Unit |
| Recirc. Pumps | 5 @ 600 gpm 30 hp 2 @ 500 gpm 30 hp | Per Unit |
| Heat Exchangers | | |
| Tube in Tube | 1 @ 6.0 MMBTU/hr | Per Unit |
| Spiral | 6 @ 1.5 MMBTU/hr | Per Unit |
| Gas Mixers | 4 @ 504 SCFM 30 hp 3 @ 3,839 SCFM 70 hp | Per Unit |
| Sludge Transfer System | | |
| Transfer A Pumps | 2 @ 400 gpm | Per Unit |
| Transfer B Pumps | 6 @ 400 gpm | Per Unit |
| Hot Water System | | |
| Boiler | 2 @ 10.5 MMBTU/hr | Per Unit |
| Fuel Cell | 1 @ 4.4 MMBTU/hr | Per Unit |
| Primary Loop Pumps | 2 @ 25 hp 900 gpm | Per Unit |
| Secondary Loop Pumps | 3 @ 15 hp 550 gpm | Per Unit |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------|---|----------|
| Gas Conveyance System | | |
| Flare | 1 @ 40,000 SCFH | Per Unit |
| Iron Sponges | 2 @ 210 ft ³ 1 @ 546 ft ³ 1 @ 350 ft ³ | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Gravity Thickener System | 4 | 5 | 4 | 4 |
| DAFT System | 3 | 3 | 3 | 3 |
| Digester System | 3 | 3 | 3 | 3 |
| Sludge Transfer System | 2 | 2 | 2 | 3 |
| Hot Water System | 3 | 3 | 3 | 3 |
| Gas Conveyance System | 4 | 3 | 4 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

Gravity Thickeners System

Currently, the gravity thickener is heavily loaded, and regular upsets require the diversion of primary solids to the DAFT system or the bypass system. Project EN14020 will address optimizing the current thickening system or addressing alternative sludge thickening methods.

A condition assessment was performed in 2013 to inspect the interior metallic components and the concrete structure. The assessment identified that the overall condition of the internal structures advocates coating refurbishment and other repairs. In addition, the main gear and scum skimmer arm assemblies are to be replaced. Project EP14002 will address recoating the internal structures and replace the equipment.

Dissolved Air Flotation Thickeners (DAFT) System

Project EN14020 will address upgrades to this system. Project EN14052 will replace above-ground sludge piping to the digester system.

Digester System

Maintenance has an established regimen to clean and rehab one digester a year to remove collected grit, replace piping, install new seals, and maintain critical pieces of equipment. A potential engineering project will upgrade the mixing systems in 5–10 years. The Digester No.1 heat exchanger has been losing heat transfer efficiency because of vivianite buildup. Maintenance currently has a project to replace the sludge tubes to regain heat transfer capabilities

Sludge Transfer System

The sludge transfers system was designed to be robust. However, during phased digester with an acid phase digester online, there is a single point of failure on the main transfer pump from the first/acid phase to the second phase digesters. A potential engineering project will upgrade the mixing systems in 5–10 years.

Hot Water System

To meet the strict emission requirements of the Southern California Air Quality Management District, the Agency installed new boilers in FY2012/13. The fuel cell heat exchanger was also installed in FY2012/13. The new additions and limited time of operations have posed challenges for operations related to the controls of the boiler system.

Gas Conveyance and Waste System

Project EN13046 will upgrade the flare system and piping system to ensure adequate control of the digester gas pressures. Project PA140001 will replace the iron sponges at the Energy Recovery Building that are starting to deteriorate.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--------------------------|--|--|
| Gravity Thickener System | 1987 | 2013 |
| DAFT System | 1977 1987 | |
| Digester System | 1975 1977 1985 1982 1992 1999 2008 | Dig 1 - 2010 Dig 2 - 2010 Planned Dig 4 - 2014 |
| Sludge Transfer System | 2008 | |
| Hot Water System | 1977 1985 2012 | |
| Gas Conveyance System | 1975 1985 2008 | Planned 2015 |

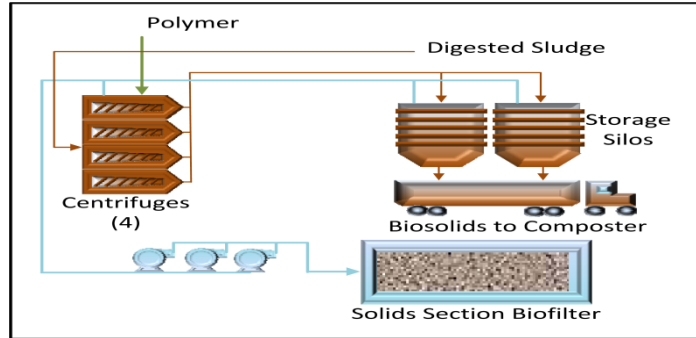
Table 4 Potential Projects

| System | Project Name | Project Description |
|-----------------|--------------------------------|--|
| Digester System | RP1 Dig 1 Heat Exchanger Rehab | Project needed to replace the sludge tubes of the RP1 Digester No.1 sludge heat exchanger. |

System Summary Continued on Next Page

Asset Management System Summary – RP-1 Dewatering Treatment Process

1. Asset Profile



Sludge Grinding System

Two inline grinders ensure that large solid objects in the sludge flow are broken up into small pieces to limit the possibility of large objects causing obstructions in downstream piping or equipment.

Sludge Feed Pump System

Four rotary lobe pumps pull sludge from the grinders and pumps flow to the influent of the centrifuges. The sludge pumps are variable speed with flow meters, instrumentation, and controls. A series of cross-connects in the pump discharge piping allows for sludge pumps to feed different centrifuges.

Polymer Blending System

Totes of polymer are transferred to a large day tank via two rotary lobe transfer pumps. Four polymer blending units meter polymer and dilution water to a mixing chamber. The discharge of the polymer blending unit is conveyed through a network of pipes and cross connection valves to three separate dosing points in the sludge piping.

Centrifuge System

The sludge flow mixed with polymer enters the feed tube of the centrifuge and discharges into a spinning bowl. The centrifugal force of the spinning bowl forces the heavier solids to the edge of the bowl and the centrate to rest on top of the solids. A scroll, spinning slightly faster than the bowl, scrapes the solids around the edge of the bowl to one end of the centrifuge, up a beach, and into the discharge shoot to the conveyor. The bowl has dam plates to maintain a depth of centrate until it overflows at the other end to the centrate wet well.

Conveyor System

Two separate screw conveyor systems, configured in parallel, collect dewatered solids (cake) from each centrifuge. Solids are diverted to each system via a diverter gate and then through a series of shaftless screws until solids are discharged into the storage silos.

Storage Silo System

Solids from the conveyor system are dropped into two separate storage silos. The silos hold collected cake until a loading sequence is initiated, and solids are dropped through a series of gates and discharge screws into a truck trailer for hauling to an offsite facility.

Centrate and Drainage Pump System

Centrate collected from the centrifuge operation is conveyed to the centrate pump station where it is pumped to the Non-Reclaimable Wastewater System. The centrate pumps are variable speed to maintain a wet well level. Process flows generated during centrifuge startup and shutdown are conveyed to the drainage pump station, where they are pumped back into the RP-1 process by constant speed drainage pumps.

Anti-Struvite System

Five pumps pull chemical from a storage tote and inject into the centrate pipes of each centrifuge and the centrate wet well. The chemical inhibits struvite formation that forms naturally in centrate and adheres to walls of downstream piping.

Odor Control/Biofilter System

Three blowers pull foul air from the gravity thickener, miscellaneous sumps, and either the belt press or centrifuge buildings, forcing the air through a bed of carbon-rich media to allow for the biological consumption of hydrogen sulfide and other compounds.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--------------------------------|---|-----------|
| Dewatering Treatment Process | 60 MGD | |
| Sludge Grinding System | 2 @ 10 hp | Per Unit |
| Sludge Feed System Pump | 4 @ 360 gpm | Per Unit |
| Polymer System Blending System | 4 @ 5 to 30 gph | Per Unit |
| Centrifuge System Centrifuge | 4 @ 360 gpm | Per Unit |
| Conveyor System | 2 trains w/ 5 conveyors ea. from 7.5 to 30 hp | |
| Storage Silo System | 2 @ 5,636 ft ³ | Per Unit |
| Centrate Pump System | 3 @ 450 gpm | Per Unit |
| Drainage Pump System | 2 @ 450 gpm | Per Unit |
| Anti-Struvite System Pump | 4 @ 4.0 gpm 1 @ 8 gpm | Per Unit |
| Odor Control/Biofilter System | | |
| Blower | 1 @ 4,600 scfm 2 @ 13,700 scfm | Per Unit |
| Media Depth | 5 ft | |
| Valves | 10 units | > 18-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-----------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Sludge Grinding System | 1 | 3 | 3 | 3 |
| Sludge Feed Pump System | 1 | 2 | 3 | 3 |
| Polymer Blending System | 1 | 2 | 3 | 3 |
| Centrifuge System | 1 | 2 | 3 | 3 |
| Conveyor System | 1 | 3 | 4 | 3 |
| Storage Silo System | 1 | 3 | 3 | 3 |
| Centrate and Drainage Pump System | 1 | 3 | 3 | 3 |
| Anti-Struvite System | 1 | 2 | 3 | 3 |
| Odor Control/Biofilter System | 3 | 3 | 4 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

Centrifuge System

The Centrifuge System will be evaluated in 2014 to assess the effectiveness of the Anti-Struvite System.

Conveyor System

The performance of the Conveyor System will be monitored to determine if modifications are needed to mitigate plugging of transfer points between conveyor units.

Storage Silo System

The performance of the flexible connections between the live bottoms will be monitored to determine if the reliability is acceptable.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-----------------------------------|--------------------------------------|-----------------------------|
| Sludge Grinding System | 2013 | |
| Sludge Feed Pump System | 2013 | |
| Polymer Blending System | 2013 | |
| Centrifuge System | 2013 | Planned 2014 |
| Conveyor System | 2013 | Planned 2018 |
| Storage Silo System | 2013 | Planned 2018 |
| Centrate and Drainage Pump System | 2013 | Planned 2018 |
| Anti-Struvite System | 2013 | Planned 2018 |
| Odor Control/Biofilter System | 2003 | Planned 2018 |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RP-1 Auxiliary Systems

1. Asset Profile

RP-1 Plant Drain

The RP-1 plant drain collects and pumps surface runoff from storm events, wash-down water, and drains some of the treatment plants tanks and processes in the preliminary, primary, secondary, solids, and dewatering sections. The drain system receives gravity flows to a wet well, where it is pumped to the System C splitter box.

TP-1 Plant Drain

The TP-1 plant drain collects and pumps surface runoff from storm events, wash-down water, and drains TP-1 tanks and processes in the tertiary section. The drain system receives gravity flows to a wet well, where it is pumped to the waste-wash water basin.

Electrical System

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 Power Reliability Building, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-1 electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. Three generators are located in the Energy Recovery Building and supply power to the preliminary, primary, secondary, solids and dewatering sections. One generator supplies power to the tertiary section. A final generator supplies power to the Dechlorination System.

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water System

Utility water is used for cleaning, supplying pump seal water, cooling, dilution, flushing of clogged pipes, irrigation, and other inner plant uses. The system can be supplied by the 1050-foot pressure zone pump station or the pressure outfall (PO) pump station. The PO pump station is operated on occasion during shutdowns and other activities to supply process water to the treatment plant. The utility water system piping consists of several isolation valves and point-of-use connections.

Potable Water System

Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a service on Philadelphia Street and another service on Walnut Avenue from the city of Ontario. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System

An extensive array of instruments is used to monitor and control the processes at RP-1. Nearly all of the processes at the plant are observed and controlled from a centralized control system known as the Supervisory Control and Data Acquisition or SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to three main control terminals at (1) Main Control Building, (2) Dewatering Building, and (3) the Tertiary Control Building.

Yard Piping

A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely. A yard piping diagram is show in Appendix C.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|--------------|
| RP-1 Plant Drain | 2 @ 1,585 gpm 40 hp | |
| TP-1 Plant Drain | 2 @ 1,000 gpm 15 hp | |
| Electrical System Utility Voltage Transformers | 12 kV 12 kV to 480 V 2 @ 12 kV to 4,160 V | MCCs MCCs |
| Switchgear Distribution | 1 @ 12 kV 22 @ 480 V 1 @ 4160 V | |
| Emergency Generation RP-1 Generator | 3 @ 1,250 kW 1,801 Bhp | |
| TP-1 Generator | 1 @ 670 kW 896 Bhp | |
| Dechlorination Generator | 1 @ 30 kW | |
| Mounted Lighting | > 145 units | |
| Utility Water System Pipelines Pressure Outfall Pump Station | Various sizes 3 @ 800 gpm 2 @ 1500 gpm | |
| Potable Water System Backflow Devices | 31 units | |
| Instrumentation and Control System HMI Workstations PLC I/O Hub Radio Transmitter | 6 Units 16 Units 1 unit | |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-1 Plant Drain | 3 | 3 | 3 | 3 |
| TP-1 Plant Drain | 3 | 3 | 3 | 3 |
| Electrical System | 3 | 4 | 3 | 3 |
| Utility Water System | 4 | 3 | 4 | 4 |
| Potable Water System | 3 | 3 | 4 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Yard Piping | TBD | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues

RP-1 Plant Drain

No issues.

TP-1 Plant Drain

No issues.

Electrical System

Project EN13048 will address the installation of a second 12 kV feeder from the power reliability building to TP-1. Additional information for this project can be found in the asset summary section for recycled water.

The System C main control computer (MCC) panel is located outdoors. Maintenance is planning a project to rehab and provide protection for the MCC.

The Plant 3 primary MCC is aging and no longer supported by the manufacturer. Maintenance is planning a project to rehab and replace the MCC.

RP-1 power sources have drastically changed over the past several years with the installation of solar panels and the construction of the fuel cell. These new power sources required upgrades to RP-1 electrical equipment; these upgrades are still being tested and evaluated.

Lighting rehab and improvements are being evaluated and implemented by the Engineering Department.

Utility Water System

A potential maintenance project will rehab deteriorated portions of this system.

The pressure outfall pump station is minimally maintained since the 1050 RW pumps are used to supply utility water throughout RP-1.

Potable Water System

A potential maintenance project will rehab deteriorated portions of this system.

Instrumentation and Control System

The control system will be updated in 2017 as part of Project EN13016.

Yard Piping

A 2011 condition assessment of the secondary effluent piping showed it to be in good condition. Observations suggest that piping around preliminary, primary, and solids processes that do not run full may have significant deterioration. Condition assessment planned for 2014 will

determine the scope of a potential maintenance project to rehab this system.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------|--------------------------------------|-----------------------------|
| RP-1 Plant Drain | 1999 | |
| TP-1 Plant Drain | 2001 | |
| Emergency Generation | 1994 | |
| Lighting | 1977 | 2011 |
| Utility Water System | 1977 | |
| Potable Water System | 1977 | |
| Instrumentation and Controls | 1977 | |
| Yard Piping | 1977 | Planned 2014 |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Regional Water Recycling Plant No. 2

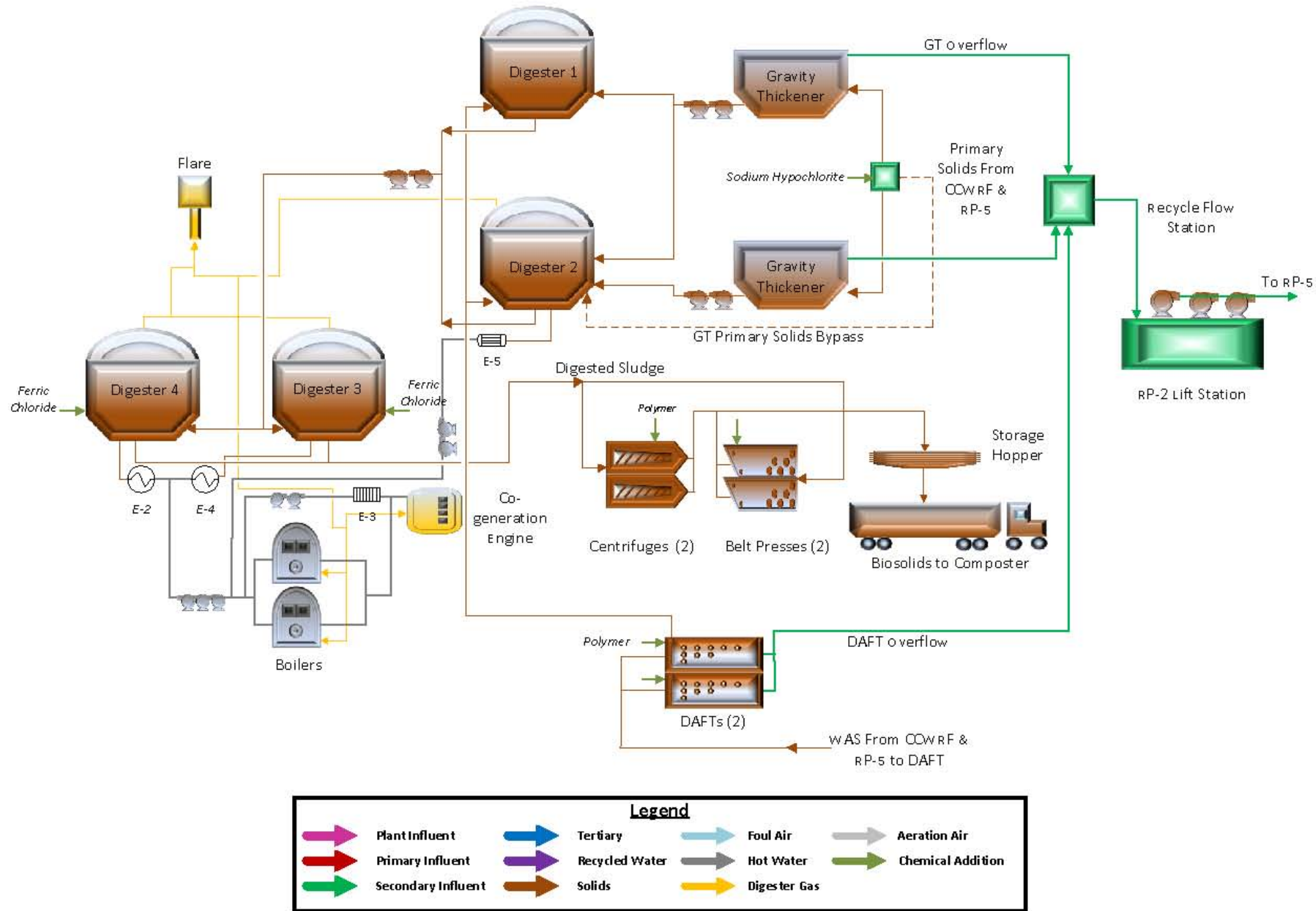


Figure 7-2: Regional Water Recycling Plant No. 2 (RP-2) – Schematic

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Table 7-3: Regional Water Recycling Plant No.2 – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|---|-----------------------------|-----------------------------------|---|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN11042 | RP-2 Boiler Replacement | Project to replace boilers at RP-1 and RP-2. | RP | RC | 55,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55,000 |
| 2 | EN13049 | RP-2 Digester #4 Dome Replacement | Project to modify dome from floating to fixed. | CC | RO | 400,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 400,000 |
| 3 | EN14012 | RP-2 Drying Beds Rehab | Rehab of drying to allow proper handling of vector truck material and more efficient air drying of biosolids. | CC | RO | 600,000 | 510,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,110,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

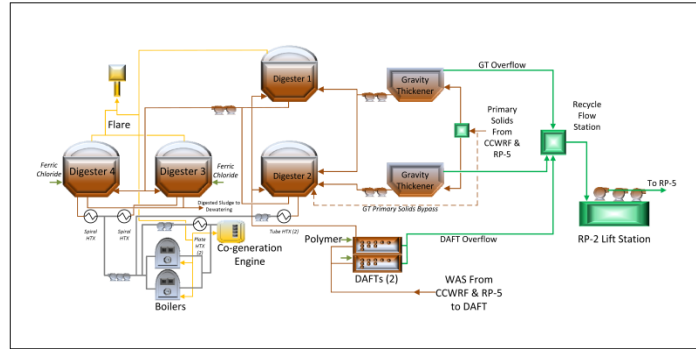
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – RP-2 Solids Treatment Process

1. Asset Profile



Gravity Thickener (GT) System START HERE

The gravity thickener (GT) distribution box receives primary clarifier sludge and scum from Carbon Canyon Water Recycling Facility (CCWRF) and RP-5 and distributes flow to GT #1 or #2 or both. Sodium hypochlorite may be introduced to the GT if needed from a 1600-gallon storage tank onsite. Solids are allowed to settle at the bottom of the GT. Solids are increased from ~1 percent total solids (TS) to ~4 percent TS. The thickened solids are then pumped to the digestion system.

Dissolved Air Flotation Thickener (DAFT) System

The DAFT system consists of two circular tanks. Waste activated sludge from the secondary system from CCWRF and RP-5 enters the DAFT and is mixed with recycled flow that has been pressurized with compressed air and dosed with polymer. Solids float to the top, where they are skimmed off and pumped to the digestion system. Solids are thickened from 1 percent TS to 4 percent TS. The overflow of the DAFT flows to the recycle flow station. Flow from the recycle flow station flows to the RP-2 lift station, where it is returned to the RP-5 headworks.

Digestion System

The digestion system consists of three anaerobic digesters and one aerobic digester. Digester 1 is operated only when capacity is limited. Digester 2 is a fixed-dome acid anaerobic digester and receives thickened sludge from the GT and DAFT systems. Digested sludge from Digester 2 is transferred to Digesters 3 and 4. Digesters 3 and 4 are floating-dome digesters and may be fed in series or parallel depending on the mode of operation. Plate and frame heat exchangers from the hot water system and recirculation pumps maintain temperatures from 97 to 128 degrees Fahrenheit. Gas mixers recirculate digester gas and use it to mix the digesters' sludge content with gas cannon mixers. Gas piping connected to the top of each digester allows the digester gas produced to enter the gas conveyance system. Several pressure vacuum regulated valves and J-tube safety blow-offs are installed on each digester to prevent over-pressurization.

Sludge Transfer System

RP-2 is equipped with several pumps and automated valves to transfer sludge through the digestion system.

Hot Water System

The hot water system generates heat in the boilers and cogeneration engines. Two boilers are fueled by digester or natural gas or both. Two tubes in tube heat exchangers are dedicated to heat Digester 2 and two spiral heat exchangers are dedicated to Digesters 3 and 4. The hot water is pumped into a hot water loop, where heat exchangers are used to heat the digestion system.

Gas Conveyance and Waste System

Digester gas collected from the digestion system enters the gas loop and is used for sludge mixing, fuel for boiler, and engine co-generation, or could be wasted to a waste gas burner (flare) when excess gas is in the system. The digester gas may be stored in either a low- or high-pressure tank. Gas compressors are used to compress digester gas into the high-pressure tank. The gas loop has several J-tubes and pressure-vacuum

relief valves to prevent over-pressurization. An iron sponge using ferric oxide-impregnated media is used to reduce the hydrogen sulfide content in the gas of Digester 2 before entering the gas loop.

RP-2 Lift Station

The RP-2 lift station collects raw sewage from the Mountain Avenue interceptor, Chino Institute for Women (CIW) sewer, Butterfield force main, and recycle flows from the solids treatment facilities at RP-2, and discharges through a 24-inch pipeline to the RP-5 headworks.

Gas Conveyance and Waste Gas System

Gas collected from the digestion system enters the gas loop, which can deliver low-pressure gas to the compressors for use in the boiler or fuel cell or to the flare. The gas loop has several J-tubes to prevent over-pressurization. Iron sponges are used to remove hydrogen sulfide from the digester gas. Digester 2 has a waste gas line that can deliver low-methane-content gas directly to the flare.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--------------------------|--|----------|
| Solids Treatment Process | 26.4 MGD | |
| GT System | | |
| Tank | 2 @ 760 gpd/ft ² 1,590 ft ² | Per Unit |
| Drive Pumps | 2 @ 10 hp 210 gpm 15 hp | Per Unit |
| DAFT System | | |
| Tanks | 2 @ 25 gpd/ft ² 707 ft ² | Per Unit |
| Recirculation Pumps | 5 @ 40 hp | Per Unit |
| Sludge Pumps | 3 @ 210 gpm 10 hp | Per Unit |
| Polymer Blending Units | 2 @ 8.0 gph | Per Unit |
| Compressors | 4.5 hp | |
| Digester System | | |
| Digester No.1 & 2 | 2 @ 489,565 gallon | Per Unit |
| Digester No.3 & 4 | 2 @ 1.79 MG | Per Unit |
| Recirc. Pumps | 3 @ 530 gpm 10 hp 3 @ 412 gpm 15 hp | Per Unit |
| Heat Exchangers | | |
| Tube in Tube | 2 @ 2.5 MMBTU/hr | Per Unit |
| Spiral | 2 @ 2.0 MMBTU/hr | Per Unit |
| Plate | 2 @ 2.6 MMBTU/hr | Per Unit |
| Gas Mixers | 3 @ 200 SCFM 25 hp | Per Unit |
| Sludge Transfer System | | |
| Digester No.2 | 2 @ 300 gpm | Per Unit |
| Pumps | 15 hp | |
| Digester 3 & 4 | 2 @ 500 gpm | Per Unit |
| Pumps | 25 hp | |
| Hot Water System | | |
| Boiler | 1 @ 3.1 MMBTU 1 @ 3.7 MMBTU | |
| Hot Water Pumps | 2 @ 400 gpm | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------|--|-------|
| Engine Recovery | 3 @ 500 gpm 2 @ 640 gpm 2.15 MMBTU/hr 2.68 MMBTU/hr | |
| Gas Conveyance System | | |
| Waste Gas Burner | 1 @ 350 ACFM 12.6 MMBTU/hr | |
| Iron Sponges | 1 @ 224 ft ³ | |
| Gas Compressors | 2 @ 60 hp 1 @ 50 hp | |
| RP-2 Lift Station | | |
| Pumps | 3 @ 3,300 gpm 100 hp | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| GT System | 3 | 3 | 4 | 3 |
| DAFT System | 3 | 3 | 3 | 3 |
| Digester System | 3 | 3 | 4 | 5 |
| Sludge Transfer System | 3 | 3 | 3 | 3 |
| Hot Water System | 3 | 4 | 4 | 3 |
| Gas Conveyance System | 3 | 4 | 4 | 3 |
| RP-2 Lift Station | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Gravity Thickeners System

Rags and large debris pass through the influent distribution box and into the GT influent center-feed columns, where frequent clogging occurs.

DAFT System

No issues require special attention.

Digester System

The RP-2 digester system is aging, and the associated equipment has undergone increased wear and tear. The Agency has established an Agency-wide digester annual cleaning and rehabilitation regimen to remove solids and inorganics collected at the bottom of the digesters, replace piping, install new seals and maintain critical pieces of equipment.

The floating dome rail system on Digester 4 is critically damaged and is currently being investigated for repair options. The repair includes fixing the dome in place. Digester 4 is currently out of service, which critically reduces the digestion capacity of RP-2.

Digester 3 has no redundant gas-release points into the gas system when foaming occurs. Modifications are needed for additional gas-release points. The sludge recirculation system on Digester 2 frequently airs up and needs constant attention, causing inadequate mixing.

Sludge Transfer System

The variable frequency drive doesn't operate as designed and are constantly cycling resulting in non-continuous and un-stable volumes fed to Digester 3 and 4.

Hot Water System

The hot water system is inadequate for phased digestion.

Gas Conveyance System

No issues require special attention.

RP-2 Lift Station

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------|--|--------------------------------|
| GT System | 1971 1988 2009 | |
| DAFT System | 1988 | |
| Digester System | 1960 1971 1979 1988 2003 2009 2011 | Dig. 3 – 2011 Dig. 4 – 2013 |
| Sludge Transfer System | 1979 1988 2003 | |
| Hot Water System | 1988 2003 2013 | |
| Gas Conveyance System | 1988 2003 | |
| RP-2 Lift Station | 2004 | |

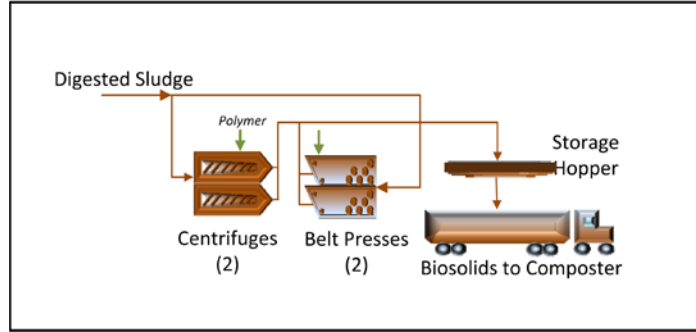
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

**Asset Management System Summary – RP-2
Dewatering Treatment Process**

1. Asset Profile



Sludge Grinding System

Digested sludge from Digesters 3 and 4 pass through dedicated sludge grinders before entering the dewatering feed pumps. Three inline grinders ensure that large solid objects are broken up into small pieces to limit the possibility of plugging downstream piping or equipment.

Sludge Feed Pump System

Three sludge feed pumps pump sludge to the belt press system or the Centrifuge System, or both. The sludge pumps are variable speed with flow meters, instrumentation, and controls.

Polymer Blending System

The dewatering polymer system consists of three chemical metering pumps, three polymer blending units, and static mixers to mix the polymer with the sludge. Polymer is delivered in totes and pumped by the chemical metering pumps, mixed with dilution water, and dosed to the sludge flow.

Belt Press System

The RP-2 belt press system consists of two belt filter presses. A feed box receives sludge flow mixed with polymer and spreads flow across the width of a rotating porous belt. The sludge flow on the belt passes through a series of wedges that separate the sludge and allow collected filtrate to pass through the belt to a drip pan that is piped to the filtrate and centrate pumping system. The sludge flow then passes through the pressured zone, where sludge is pressed between two belts and allowed to drain. The compressed sludge then passes over a series of rollers that squeeze out remaining filtrate to drip pans. The belts then separate, and two scraper blades scrape the dewatered solids (cake) off of each belt, dropping the processed cake on to the conveyor system. Wash-water pumps supply water to spray each belt with high-pressure water to prevent the porous belts from clogging.

Centrifuge System

The sludge flow mixed with polymer enters the feed tube of the centrifuge and discharges into a spinning bowl. The centrifugal force of the spinning bowl forces the heavier solids to the edge of bowl and centrate to rest on top of the solids. A scroll spinning, slightly faster than the bowl, scraps the solids around the edge of the bowl to one end of the centrifuge, up a beach and into the discharge shoot to the conveyor. Dam plates near the center of the spinning bowl hold a depth of centrate until it overflows the opposite end of the centrifuge where it is piped to the centrate wet well.

Conveyor System

Two belt press conveyors transfer cake from the discharge of each belt press and then transfer the collected solids up to the top of the cake hopper. Six shaftless screw conveyors transfer cake from the discharge of each centrifuge to a common belt conveyor. The dewatered cake then travels up to the cake hopper, where it is distributed evenly on the trailer of a sludge hauling truck.

Cake Hopper

The cake hopper receives cake from the conveyor system and holds the cake until a loading sequence has been initiated to discharge the solid cake to a truck trailer for hauling to an offsite facility.

Filtrate and Centrate Pump System

Filtrate and centrate collected from the belt press and centrifuge processes are conveyed to a common wet well where they are pumped into the RP-2 lift station wet well and discharged to RP-5.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|-------|
| Dewatering Treatment Process | 30 MGD 211K wet tons per year | |
| Sludge Grinding System | 3 @ 210 gpm | |
| Sludge Feed System Pump | 3 @ 210 gpm 10 hp | |
| Polymer Blending System Polymer Pump Dilution | 3 @ 8.0 gph 3 @ 1200 gph | |
| Belt Press System Belt Press Wash-water pump | 2 @ 150 gpm 1,700 dry lbs/hr 3 @ 100 gpm 7.5 hp | |
| Centrifuge System Centrifuge Main Drive Back Drive | 2 @ 325 gpm 1,200 hp 40 hp | |
| Conveyor System Belt Conveyor Screw Conveyors | 2 @ 44,000 lbs/hr 1 @ 350 ft ³ /hr 3 hp 3 @ 700 ft ³ /hr 3 hp 2 @ 700 ft ³ /hr 7.5 hp 1 @ 1600 ft ³ /hr 15 hp | |
| Cake Hopper | 1 @ 1,956 ft ³ | |
| Filtrate and Centrate Pump Station Pumps | 2 @ 480 gpm, 7.5 hp | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Sludge Grinding System | 3 | 3 | 3 | 3 |
| Sludge Feed Pump System | 3 | 3 | 3 | 3 |
| Polymer Blending System | 3 | 3 | 3 | 3 |
| Belt Press System | 3 | 3 | 3 | 3 |
| Centrifuge System | 5 | 5 | 4 | 5 |
| Conveyor System | 3 | 3 | 3 | 3 |
| Cake Hopper | 3 | 3 | 3 | 3 |
| Filtrate and Drainage Pump Station | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Sludge Grinding System

No issues require special attention.

Sludge Feed Pump System

No issues require special attention.

Polymer Blending System

No issues require special attention.

Belt Press System

No issues require special attention. The belt presses were rehabilitated in 2013.

Centrifuge System

One of the two centrifuges is out of service because of obsolete parts. RP-2 operations operates two belt presses now as the normal mode of operation and the one remaining centrifuge on an emergency basis. Because of the anticipated decommissioning of RP-2 within ten years, it is unlikely that improvements to the centrifuge system will be undertaken.

Conveyor System

No issues require special attention.

Cake Hopper

No issues require special attention.

Filtrate and Centrate Pump System

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Sludge Grinding System | 1988 | |
| Dewatering Sludge Feed Pump System | 1988 | |
| Polymer Blending System | 1979 1988 2011 | |
| Belt Press System | 1979 1988 | |
| Centrifuge System | 2001 | |
| Conveyor System | 1979 1988 2008 | |
| Cake Hopper | 1988 2008 | |
| Filtrate and Centrate Pump Station | 1979 1988 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RP-2 Auxiliary Systems

1. Asset Profile

Plant Drain

The plant drain collects surface storm runoff, excess irrigation, and wash-down water collected in submersible drains located throughout the facility. The drain system receives gravity flows throughout the facility and is pumped to the RP-2 lagoon, the RP-2 lift station and finally to RP-5 headworks.

Co-Generation

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE and Direct Access) and onsite co-generation. The electrical feed from the grid is composed of two 12 kV feeders to the power panel switchgear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-2 electrical system is shown in Appendix B.

A 300 kW diesel emergency generator is used in the event of a power failure to power the RP-2 lift station.

Utility Water System

Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by the pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System

Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a service on a potable line off El Prado Rd. from the City of Chino. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System

An extensive array of instruments is used to monitor and control the processes at RP-2. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to three main control terminals at RP-2.

Yard Piping

A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely. A yard piping diagram is show in Appendix C.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|-------|
| Plant Drain | 2 @ 200 gpm | |
| Electrical System Utility Voltage Transformers Switchgear Distribution | 2 @ 12 kV 2 @ 12 kV to 480 V 2 @ 12 kV 5 @ 480 V | |
| Emergency Generation Co-Generator Generator | 1 @ 580 kW 1 @ 600 kW 1 @ 300 kW | |
| Utility Water System Pipelines Pump Station Valves | Various sizes Fed from RP-5 PS >10 units | |
| Potable Water System Backflow Devices | >10 units | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | | |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Plant Drain | 3 | 3 | 3 | 3 |
| Electrical System | 3 | 3 | 3 | 3 |
| Utility Water System | 3 | 4 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Yard Piping | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Plant Drain

Draining issues from the RP-2 drying beds need to be diverted into the RP-2 lift station or plant drain. These issues are addressed in the RP-2 Drying Bed Rehab Project.

Electrical System

No issues require special attention.

Utility Water (UW) System

Main isolation valves to key sectors of the plant are limited and require evaluation. Some of the UW isolation valves do no seal and need to be replaced. Replaced valves should be exercised routinely.

Potable Water System

No issues require special attention.

Instrumentation and Control System

No issues require special attention.

Yard Piping

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Plant Drain | 1979 | |
| Electrical System | 1979 1988 2008 | |
| Utility Water System | 2004 | |
| Potable Water System | 1979 | |
| Instrumentation and Control System | 1979 1988 2008 | |
| Yard Piping | 1979 1988 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Carbon Canyon Water Recycling Facility

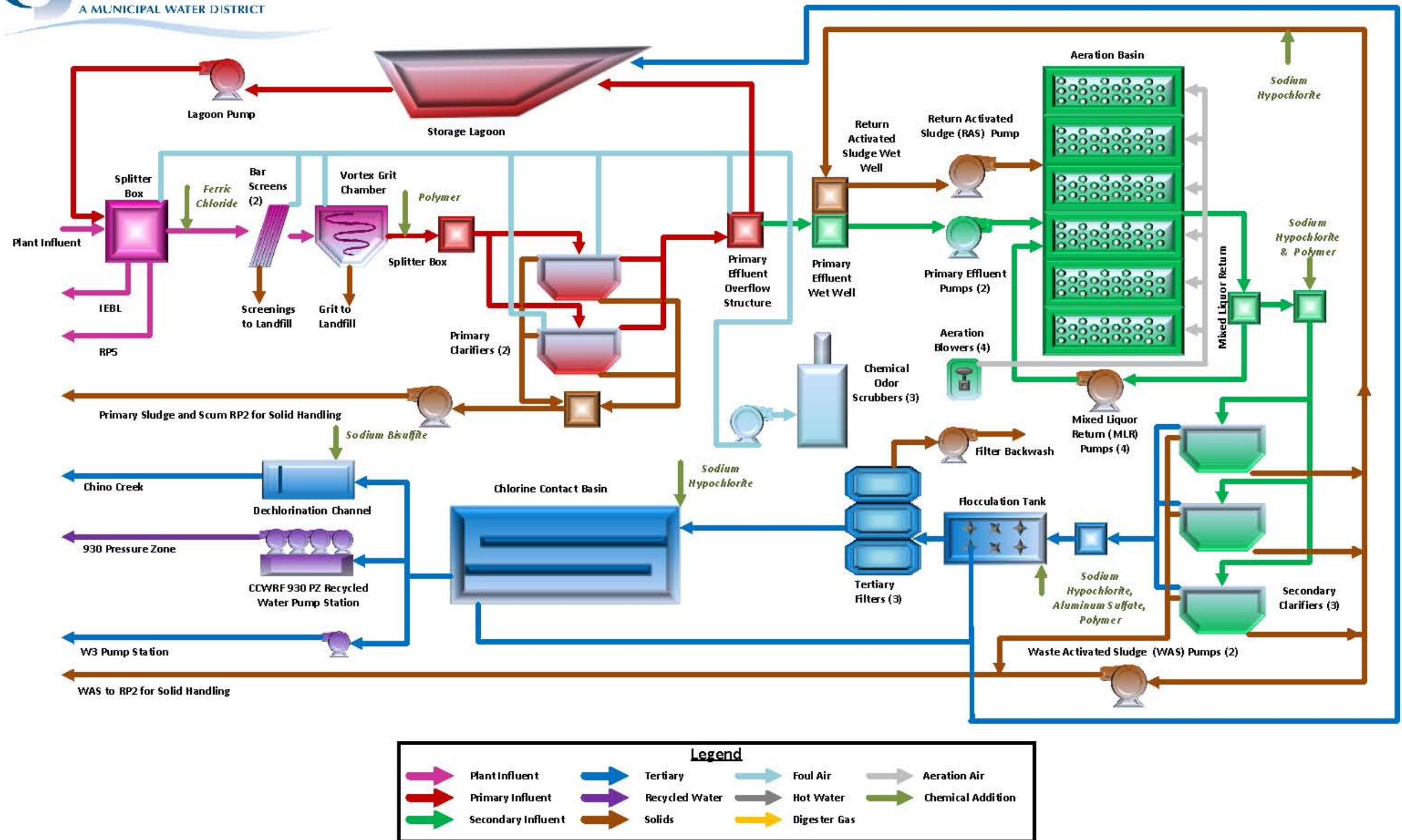


Figure 7-3: Carbon Canyon Water Recycling Facility (CCWRF) – Schematic

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Table 7-4: Carbon Canyon Water Recycling Facility – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|---|-----------------------------|---|--|---------------------------|-------------------|------------------------------|---------|-----------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN13018 | CCWRF Odor Control System Replacement | The project entails replacing the existing odor control systems and screens. | RP | RC | 500,000 | 600,000 | 1,780,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,880,000 |
| 2 | EN14027 | CCWRF Secondary Clarifier #3 Rehabilitation | Rehab steel components and coat concrete of clarifier. | CC | RO | 800,000 | 110,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 910,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

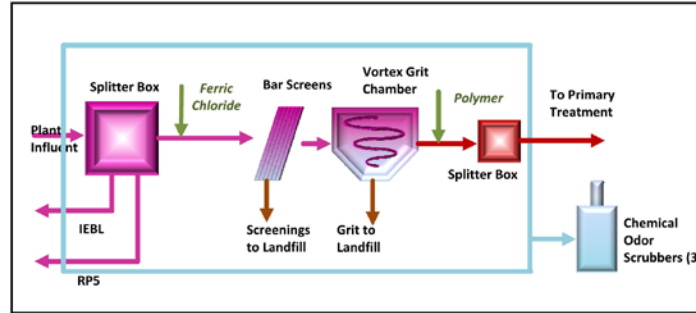
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – CCWRF Preliminary Treatment Process

1. Asset Profile



Influent Channel

Raw wastewater enters Carbon Canyon Water Recycling Facility (CCWRF) through the influent diversion structure. The influent diversion structure enables CCWRF to operate as a skimming plant, taking the majority of raw wastewater and sending the remainder to RP-5. The amount of flow to RP5 is measured at the Parshall flume downstream of the diversion structure, and CCWRF influent is measured at the Parshall flume downstream of the vortex grit chamber.

Screening Equipment

Gates divert flow to three channels: two mechanical bar screens and one manual bars screen. The 5/8-inch bar screens remove rags and large debris that could damage the downstream process equipment or reduce the overall reliability and effectiveness of the treatment process. A manual bar screen provides standby capacity for the mechanical units.

Vortex Grit System

Flow from the bar screens structure is tangentially directed to the 16-foot-diameter circular vortex grit chamber. A paddle mixer pushes flow in a circular path; grit collects at the bottom, where it is pumped to the grit washing/disposal system.

Grit Washing/Disposal System

Grit pumped from the vortex grit chamber is routed to two grit classifiers, where organic matters are removed from the grit. The grit sinks to a submerged inclined screw and moves up the ramp while being washed. The organic rich liquid from the grit classifiers is directed back to the liquid handling stream.

Screening Conveyance/Disposal System

Screening collected by the bar screens is transported by a conveyor and dropped into a hydraulic compactor. The collected rag is compacted in the hydraulic compactor, which squeezes out the excess water, reducing the moisture content. The compacted rags are pushed out to the roll-off bin for disposal.

Ferric Chloride System

Ferric chloride is added to the raw wastewater flow immediately after the influent diversion structure to enhance the solids capture during primary treatment and to control odors caused by hydrogen sulfides. The ferric station consists of a truck filling station, 7,000-gallon storage tank, two chemical metering pumps, and associated piping.

Polymer System

Polymer can be injected to the liquid flow after grit removal to enhance primary treatment. The polymer system includes a 500-gallon tote stand, chemical metering pump, mixing chamber, and associated piping.

Headworks Splitter Box

The headworks splitter box receives flow from the vortex grit chamber. The flow is normally routed to primary clarifiers; however, it can also be routed to the primary effluent structure, bypassing the primary treatment.

Odor Control Chemical Scrubber

Foul air collected in the preliminary and primary treatment processes are forced through three chemical odor control scrubbers where bleach solution is atomized to chemically remove and oxidize hydrogen sulfide and odor causing gases. The system consists of co-current scrubbing vessel, bleach metering pumps, foul air blowers, air blowers and the associated conveyance pipes.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---|-----------------------|
| Preliminary Treatment Process | 20.3 MGD | |
| Influent Channel Sewer Parshall Flume Gates | 54-inch 1 @ 43.9 MGD 2 units | |
| Screening Equipment Mechanical Screen Manual Screen Gates | 2 @ 20 mgd 1 @ 40 mgd 3 units | Per Unit |
| Vortex Grit System Chamber Grit Pump Gates | 1 @ 20.3 mgd 2 @ 220 gpm 15 hp 2 units | Per Unit |
| Grit Washing & Disposal System Classifiers | 2 @ 200 gpm | Per Unit |
| Screening Conveyance & Disposal System Conveyor Compactor | 1 hp N/A hp | |
| Ferric Chloride System Tank Pumps | 7,000 gallons 2 @ 92 gph | Per Unit |
| Polymer System Pump | 1 @ 4.5 gph | |
| Headworks Splitter Box Gates | 3 units | |
| Odor Control Chemical Scrubbers Blower(1A) Blower(1B1,1B2) Valves | 1 @ 6,500 scfm 2 @ 4,400 scfm 3 units | Per Unit > 18-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Influent Channel | 2 | 2 | 2 | 2 |
| Screening Equipment | 3 | 3 | 3 | 3 |
| Vortex Grit System | 3 | 3 | 3 | 3 |
| Grit Washing & Disposal System | 2 | 2 | 2 | 3 |
| Screening Conveyance/Disposal System | 4 | 3 | 4 | 4 |
| Ferric Chloride System | 2 | 2 | 3 | 2 |
| Polymer System | 4 | 2 | 3 | 3 |
| Headworks Splitter Box | 3 | 3 | 3 | 3 |
| Odor Scrubber | 4 | 4 | 4 | 4 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Influent Channel

CCWRF lagoon pump discharges to upstream of RP5 and CCWRF control gates in the influent diversion structure. The flow may go to both (or either) RP5 and CCWRF. There is no flow meter, and the flow is double counted as CCWRF influent.

Screening Equipment

The bar spacing allows a large volume of rags to reach downstream processes. The clearance between the bar screens and the enclosure for the structure is tight, making it difficult for maintenance or housekeeping. Gates (FGBI-5002, GATE BS-2 Inlet) leading to the west mechanical bar screen have failed in the open position since September 2013.

Project EN 13018 would address the issues stipulated above.

Vortex Grit System

The performance of the vortex grit system is satisfactory. However, it has been 20 years since the original install, and the system is nearing the end of its service life. The downstream processes are vulnerable in a mechanical failure.

Grit Washing/Disposal System

No issues require special attention.

Screening Conveyance/Disposal

The conveyor equipment is corroded and has limited accessibility for cleaning and repair. The screening conveyance system fails regularly (3 to 4 times per year). The screening (rag) washing system does not exist, resulting in high organic content in rags and screening.

An in-house project is in progress to install a new rag washer and rag compaction unit. Project En 13018 may replace the corroded electrical conduit in this area.

Ferric Chloride System

Ferric chloride system operates effectively, but the equipment is 20 years old and is approaching the end of its useful life.

Polymer System

No issues require special attention.

Headworks Splitter Box

No issues require special attention.

Odor Control Chemical Scrubbers

The existing concurrent odor control system is in poor condition. The pH, H₂S, pressure transmitters, pumps, and control equipment are broken and inoperable. Sections of bleach conveyance system are clogged with deposits, restricting the flow chemical and requiring additional manpower for upkeep. Bleach and caustic storage tanks are more than 20 years old, and there is evidence of leakages at the flanges. A viable alternative is immediately needed for compliance and reliability.

Project EN 13018 would address the issues stipulated above.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--------------------------------------|--------------------------------------|-----------------------------|
| Influent Channel | 1993 2006 | |
| Screening Equipment | 1993 | |
| Vortex Grit System | 1993 | Planned 2016 |
| Grit Washing/Disposal System | 1993 | |
| Screening Conveyance/Disposal System | 1993 | |
| Ferric Chloride System | 1993 | |
| Polymer System | 1993 | |
| Headworks Splitter Box | 1993 | Planned 2016 |
| Odor Scrubber | 1993 2011 2012 | |

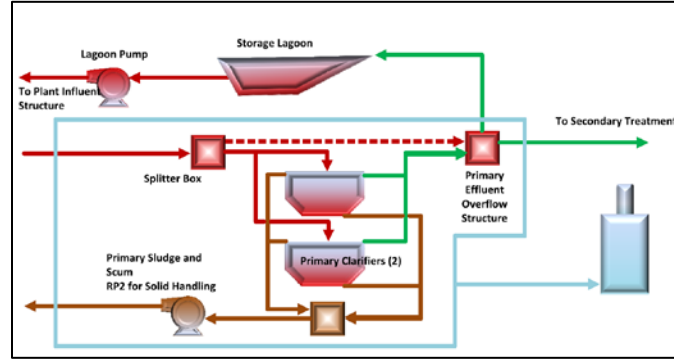
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – CCWRF
Primary Treatment Process

1. Asset Profile



Primary Splitter Box

The splitter box receives flow from the vortex grit chamber. By using a system of gates, we can route flow to one or two clarifiers or bypass the primary clarifier(s). The splitter box has provisions for future expansions and points of connections are established. The splitter box shares a common wall with the primary effluent structure.

Primary Clarifiers

Two 95-foot-diameter, center-feed, circular primary clarifiers provide sedimentation. Gear-driven flights direct settled solids to the center, and floatable scum to a system of pumps that discharge to an intermediate wet well for temporary storage. The primary effluent is routed by gravity to the splitter box, where it is combined with the effluent from other primary clarifiers, and then flows by gravity to the primary effluent pump station.

Sludge Pumping System

Primary sludge is pumped out of the primary clarifiers continuously into an intermediate wet well. A system of valves is manually operated to direct solids to an intermediate wet well where, depending on the level, the sludge is pumped to RP2 for solid handling.

Scum Pumping System

Scum collected in the primary clarifiers is directed to an intermediate wet well and combined with primary sludge. Depending on the level, a transfer pump will pull from the wet well and pump to RP2 for solids thickening. The scum collection system and intermediate wet well are covered, and the vapor space is connected to the odor control chemical scrubbers.

Primary Effluent Overflow Structure

Primary treated water is routed to the primary effluent overflow structure by gravity before it reaches the primary effluent pump station. By a system of preinstalled pipes at different elevation, the primary treated water is routed to the (1) primary effluent pump station for secondary treatment or the (2) storage lagoon if there is a power failure or mechanical problem or if the system is hydraulically overloaded.

Storage Lagoon System

Storage lagoon features an onsite, short-term storage capacity of primary effluent, secondary effluent, or tertiary effluent. The primary effluent passively overflows into the storage lagoon in the event of primary effluent pump failure or power outage. Secondary effluent can overflow into the storage lagoon if the filter influent gate closes. In addition, if a noncompliant condition is reached at the tertiary section, tertiary effluent can be overflowed into the storage lagoon. The floor of the lagoon is covered with concrete, and the side slope has vegetation to counter the effect of erosion. Stored water is pumped back into the influent diversion structure during a low flow condition to be retreated.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|--|----------|
| Primary Treatment Process | 13.2 MGD | |
| Primary Splitter Box Gates | 3 units | |
| Primary Clarifiers | 2 @ 1,760 gpd/ft ² 7,088 ft ² | Per Unit |
| Drives Gates | 1 @ 0.5 hp 4 units | Per Unit |
| Sludge Pumping System Pumps | 2 @ 220 gpm 30 hp | Per Unit |
| Scum Pumping System Pump | 2 @ 220 gpm 10.5 hp | Per Unit |
| Intermediate Wet Well Gates | N/A units | |
| Storage Lagoon System Gates Pump | 1 @ 9.0 MG N/A units 1 @ 1,500 gpm 30 hp | |
| Primary Effluent Overflow Structure Gates | N/A Units | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Primary Splitter Box | 3 | 3 | 3 | 3 |
| Primary Clarifier | 3 | 4 | 3 | 3 |
| Sludge Pumping System | 4 | 4 | 4 | 3 |
| Scum Pumping System | 3 | 3 | 3 | 3 |
| Intermediate Wet Well | 3 | 3 | 3 | 2 |
| Storage Lagoon System | 4 | 2 | 4 | 4 |
| Primary Effluent Overflow Structure | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Primary Splitter Box

Three gates route flow to primary clarifiers. The gates are normally opened but are typically not exercised. The functionality of these gates is largely unknown. Gates operating in similar environment in the sister plants showed severe corrosion. The primary splitter box and three gates should be taken down and inspected.

Primary Clarifiers

Concrete sidewalks surrounding the primary clarifiers are detached from the sidewall and have settled more than five inches. In recent years, there have been numerous pipe line breakages: an 8-inch primary sludge line break and utility water line breakages (2012) near this area. The breakages may be related to the settlement of the soil.

Sludge Pumping System

The piston pumps that convey primary sludge are nearing their useful lives. The in-house project to bypass the existing pumps and intermediate wet well may address this issue.

Scum Pump System

The scum wet well has limited controls and instrumentation. The floatables form a raft in the wet well, and the scum pump suction pulls from the bottom of the scum box. The floatables must be cleaned regularly.

Intermediate Wet Well

No issues require special attention.

Storage Lagoon System

It is unknown whether the storage lagoon system is intended as a containment system. A survey of historical record does not reveal whether compacted clay liner or geomembrane was used. The bottom of the storage lagoon is concrete, and the side slope is soil with shallow rooted vegetation.

Primary Effluent Overflow Structure

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-------------------------------------|--------------------------------------|-----------------------------|
| Primary Splitter Box | 1993 | Planned 2016 |
| Primary Clarifiers | 1993 2006 | 2014 |
| Sludge Pumping System | 1993 | |
| Scum Pumping System | 1993 2006 | |
| Intermediate Wet Well | 1993 | |
| Storage Lagoon System | 1993 | |
| Primary Effluent Overflow Structure | 1993 | |

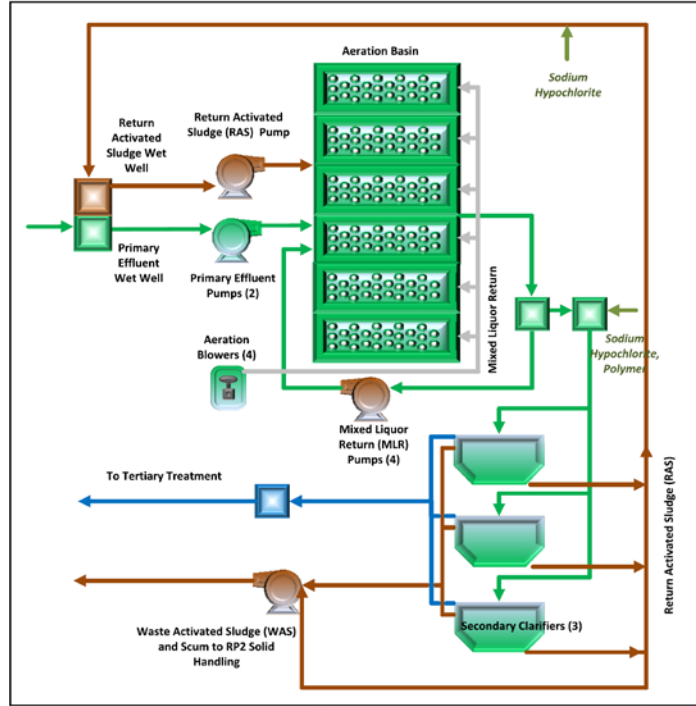
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – CCWRF
Secondary Treatment Process

1. Asset Profile



Primary Effluent Pump System

Primary effluent flows by gravity to the primary effluent pump station wet well. The wet well can be interconnected with return activated sludge (RAS) wet well by opening a gate. The normal mode of operation is to operate the primary effluent wet well and RAS wet well independently. One of two vertical-turbine pumps lift water to the aeration basin.

Activated Sludge System

There are two distribution channels for the aeration basin. By manipulating a system of gates, we can introduce various combinations of primary effluent, RAS, and MLR to the aeration basin. Normal mode of operation is to combine primary effluent, RAS, and MRL flows into one stream and distribute the stream equally to six different aeration basins. Propeller mixers are located at the distribution channel and aeration basin to promote mixing and prevent stratification of the mixed liquor.

The trains, with the exception of Train1, have baffled partitions. Each train operates in modified Ludzak-Ettinger configuration with an anoxic followed by three oxic zones to achieve the nitrate removal. A system of aeration sheath, aeration control valves, and dissolved oxygen probes is used to limit or increase the volume of air introduction. The effluent from the aeration basin flows into a common channel, and a percentage of this mixed liquor is rerouted to the front of the aeration basin.

Secondary Clarifiers

Mixed liquor from the aeration trains flows into the mixed liquor return pump station, and any unpumped mixed liquor passively flows into the secondary influent diversion structure. From the diversion structure, the flow is distributed evenly to three units of 120-foot-diameter, center-feed, circular secondary clarifiers. Each clarifier has a rotating sludge and skimmer arm. Solids settle to the bottom and are recycled to the aeration basin. The overflow of the secondary clarification is combined in the secondary effluent splitter box and is routed to the flocculation basin for further treatment.

Return Activated Sludge (RAS) Pumping System

The settled sludge in the secondary clarifiers is combined in the common header and routed by gravity into the RAS wet well located upstream of the aeration basin. The desired RAS flow rate at each clarifier is controlled by modulating a 16-inch flow-control valve on the RAS line. From the RAS wet well, RAS is pumped to the aeration basin distribution channel to mix with primary effluent and mixed liquor return.

Waste Activated Sludge (WAS) Pumping System

To control the microorganism concentrations in the aeration system, a portion of the settled solids from the secondary clarifiers is wasted. The known volume of WAS is pumped out of the secondary system to RP2 for solid handling.

Scum Pumping System

Scum collected from the skimmer arm of the secondary clarifiers is routed to RP2 for solid handling in a common line along with WAS.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------|--|------------------------|
| Secondary Treatment Process | 12.0 MGD | |
| Primary Effluent Pump System | 2 @ 17.6 MGD 125 hp | |
| Activated Sludge System | | |
| Blowers | 6 @ 2.02 MGD 3 @ 6000 scfm 400 hp 10.3 psig 1 @ 6400 scfm 400 hp 12.1 psig | Per Unit |
| Trains | 6 @ 1.49 MG | Per Unit |
| Depth | 21 ft | |
| Mixers | 22 @ 12 hp | |
| Gates | 5 per train | |
| Valve | 4 per system | |
| Valves (air) | 1 (FCV), 3 (manual) per unit | > 12-inch > 12-inch |
| MLR Pump | 4 @ 7,425 gpm 50 hp | |
| Secondary Clarifiers | 3 @ 360 gpd/ft ² 120 ft ² | |
| Gates | 6 units | |
| RAS Pumping System | 1 @ 17.6 MGD 125 hp 2 units 13 units | > 18-inch |
| WAS Pumping System | 2 @ 350 gpm 7.5 hp | |
| Scum Pumping System | 3 @ 450 gpm 5 hp | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Primary Effluent Pump System | 3 | 2 | 3 | 2 |
| Activated Sludge System | 3 | 2 | 4 | 3 |
| Secondary Clarifiers | 3 | 3 | 3 | 3 |
| RAS Pumping System | 3 | 2 | 3 | 2 |
| WAS Pumping System | 3 | 2 | 2 | 3 |
| Scum Pumping System | 3 | 3 | 2 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Primary Effluent Pump System

The primary effluent and RAS pump are reconditioned at a scheduled interval and provide adequate pumping capacity and reliability. One of the two primary effluent pumps and the RAS pump were reconditioned in 2013. The concrete structure (primary effluent distribution channel) is showing some evidences of leakage on top, near the output side of the primary effluent pumps.

Activated Sludge System

The aeration flexible sheaths need to be replaced at regular (every five year) intervals because of solid build up or tears in the flexible sheath that reduce oxygen transfer efficiency .

The blowers do not have sufficient turn-down ratio. During the low flow condition, the activated sludge system is over-aerated, resulting in excessively high dissolved oxygen concentration. The over-aeration results in waste of energy and operational challenges.

Many of the gates in the RAS channel that route flows to the aeration basins are severely corroded and do not travel up and down.

Secondary Clarifiers

There is a significant geotechnical settlement near secondary clarifiers that may affect the structural integrity of the buried pipes and electrical conduits. Secondary Clarifiers 1 (EN11045; 2012) and 2 (EN12018; 2013) are rehabilitated, and secondary Clarifier 3 is scheduled to be rehabilitated under Project EN 14027.

RAS Pumping System

The RAS flow meters and RAS flow control valves are more than 20 years old and are nearing the end of their useful service life. The ability to flow desired volume of RAS is important for process control.

WAS Pumping System

The isolation valve upstream of WAS pumping has a broken valve stem and is out of service at unknown valve position (mixed liquor side). Project EN 14027 may address this deficiency.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------|--------------------------------------|-----------------------------|
| Primary Effluent Pump System | 1993 1998 2013 | |
| Activated Sludge System | 1993 | Planned 2016 |
| Secondary Clarifiers | 1993 2012 2013 | |
| RAS Pumping System | 1993 2013 | |
| WAS Pumping System | 1993 | Planned 2016 |
| Scum Pumping System | 1993 2012 2013 | |

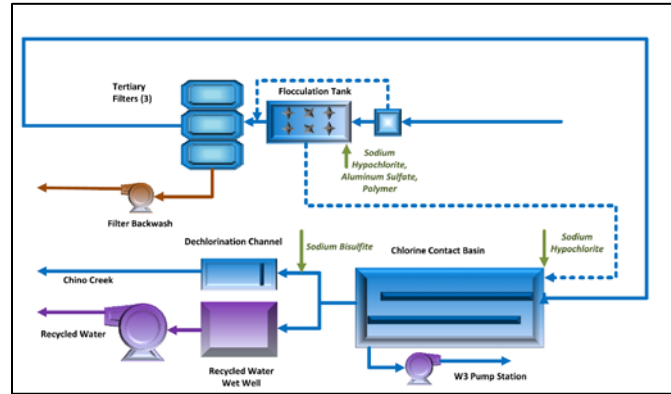
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – CCWRF Tertiary Treatment Process

1. Asset Profile



Aluminum Sulfate (Alum) System

Secondary effluents from three secondary clarifiers are combined and travel to the rapid mix system, where aluminum sulfate, sodium hypochlorite, or polymer are introduced. The chemicals neutralize and destabilize the colloidal particles and enhance the solid/liquid separation. After the chemical addition and rapid mix, the water travels through a hydraulic flocculation basin in a baffled serpentine and ends up at three sand filters that are running in parallel.

Filters

The water passes through three automatic backwashing sand filters. The backwashes are initiated by either timer or the head loss. Backwash water is sent to the filter backwash pump station and pumped back into the aeration basin. The effluent from the filters flows by gravity to the chlorine contact basin for disinfection.

Filter Backwash Pump Station

The scum, backwash water, and drainage from the filter are collected by gravity in the filter backwash pump station. Upon reaching the pre-set level, the filter backwash water is pumped back into the aeration basin for treatment.

Chlorination System

Two 10,000-gallon bleach tanks housed indoor receive and hold 12.5 percent sodium hypochlorite (bleach) solution. Two chemical metering pumps inject bleach into the water champ located at the chlorine contact basin and provide disinfection. Two other pumps inject bleach into either filter influent or RAS for process control.

Two chemical metering pumps and one 3,000-gallon bleach tank located outside can provide additional bleach injection into the recycled water wet well. This equipment is hardly ever used (no use in last three years).

Chlorine Contact Basins

The chlorine contact basin is a dual-cell concrete structure that uses a serpentine flow path to achieve required contact time and disinfection of treated water. The bleach is introduced at the beginning of the serpentine, and free chlorine remains in the water while undergoing a plug flow. The influent flow rate is measured by a Parshall flume, and chlorine residual is measured at three different locations: influent, mid, and final.

Dechlorination System

The final 5137 cubic feet of last pass of the chlorine contact basin is used as a dechlorination structure, where sodium bisulfite solution (SBS) is introduced. The excess effluent that is not used in the recycled water system is discharged into Chino Creek. Before the discharge, chlorine residual present in the flow is neutralized with SBS by a chemical reaction. Two units of propeller mixers and under-flow baffle promote the mixing. SBS is stored in two 5,500-gallon chemical tanks and is metered into the system via five chemical metering pumps.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---|---|
| Tertiary Treatment Process | 15.4 MGD | |
| Alum System Tank Pump Mechanical Mixer | 1 @ 5000 gallons 2 @ 3.7 gph 1 @ 15 hp | |
| Filters Travelling bridge Backwash pump Skimmer pump Filter Loading Gates Valves | 3 @ 1,600 ft ² 3 @ 0.5 hp 3 @ 400 gpm 7.5 hp 6 @ 40 gpm 0.5 hp 4 gpm/ft ² 7 units 6 units | Per Unit Per Unit Per Unit Per Unit > 18-inch |
| Filter Backwash Pump Station | 3 @ 950 gpm 14.8 hp | Per Unit |
| Chlorination System Tanks Pumps Mixers | 2 @ 10,000 gallons 4 @ 77 gph 1 water champ 2 propeller mixers | Per Unit Per Unit |
| Chlorine Contact Basins Gates Valves | 1 @ 1.0 MG 11 units N/A units | > 18-inch |
| Effluent Splitter Box Gates | 2 units | |
| Dechlorination System Tanks Pumps Gates | 2 @ 5500 gallon 2 @ 2.5 gph; 2 @ 20 gph; 1 @ 77 gph 2 units | Per Unit Per Unit |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Alum System | 4 | 3 | 3 | 3 |
| Filters | 3 | 3 | 3 | 3 |
| Filter Backwash System | 3 | 3 | 3 | 3 |
| Chlorination System | 2 | 2 | 2 | 2 |
| Chlorine Contact Basins | 3 | 4 | 3 | 3 |
| Effluent Splitter Box | 1 | 3 | 3 | 3 |
| Dechlorination System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Alum System

No issues require special attention, but the equipment is 20 years old and is approaching the end of its useful life.

Filters

The performance of three shallow bed filters is adequate. Under Project EN 11041, CCWRF tertiary filter media was replaced and rehabilitated in 2012. However, most of the ancillary equipment, such as the influent gates, weir plates, and drain valves, has never been serviced since the original installation in 1993. As the service life of the ancillary equipment is nearing the end of its useful life, a provision to, at minimum, inspect the condition should be made.

Filter Backwash System

No issues require special attention, but the equipment is 20 years old and is approaching the end of its useful life.

Chlorination System

The chlorination system for the chlorine contact basin disinfection is adequate.

The chlorine dosing system for the recycled-water wet well is hardly ever used. The sodium hypochlorite solution contained in the outdoor tank loses its strength over time. If there is no need to have a recycled-water chlorination system, the system should be removed.

Chlorine Contact Basins

The chlorine contact basins operate effectively at a designed capacity of 11.4 MGD.

Effluent Splitter Box

No issues require special attention.

Dechlorination System

The existing sodium bisulfite solution (SBS) pumping system has sufficient maximum capacity. However, during summer months, the plant's discharge to the Chino Creek decreases and subsequently requires minimal SBS. The existing SBS pumps do not have sufficient turn-down ratio and have a tendency to overdose SBS. Ongoing Project EN 7010 addresses this issue.

In earlier years of CCWRF operation, chlorine gas and sulfur dioxide gas were used to disinfect and dechlorinate the water. The chlorine/sulfur

dioxide scrubber system was designed to reduce the release of chlorine gas or sulfur dioxide in any emergency condition that produces a leak of these gases in the chlorine storage area, evaporator room, sulfur dioxide storage area, all located in the chlorine building. The subsequent conversion to more manageable sodium hypochlorite and sodium bisulfite liquid solution resulted in an abandonment of the chlorine and sulfur dioxide scrubber system. The caustic tank, pumps, and scrubber fans have been abandoned onsite and are unsightly. This equipment should be removed offsite for proper disposal. An in-house project may address this issue.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------|--------------------------------------|-----------------------------|
| Alum System | 1993 | Planned 2015 |
| Filters | 1993 2012 | Planned 2015 |
| Filter Backwash System | 1993 | Planned 2015 |
| Chlorination System | 1993 2004 | |
| Chlorine Contact Basin | 1993 | |
| Effluent Splitter Box | 2014 | |
| Dechlorination System | 1993 2004 2013 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – CCWRF Auxiliary Systems

1. Asset Profile

Plant Drain

The plant drain collects surface storm runoff, excess irrigation, and wash-down water collected in submersible drains located throughout the facility. The drain system receives gravity flows to a wet well, where it is then pumped and recycled toward the secondary clarifier influent, aeration basin, or head of the treatment process.

Emergency Generation

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (solar and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the maintenance building, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the CCWRF electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. A 1500 kw generator is located in the maintenance building and supplies power to the preliminary, primary, secondary, and tertiary sections.

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water (UW) System

Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by either 930-foot pressure zone or the W3 pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System

Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a service on Telephone Avenue from the City of Chino. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System

An extensive array of instruments is used to monitor and control the processes at CCWRF. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to two main control terminals at the main control building and the chlorine building.

Yard Piping

A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely. A yard piping diagram is show in Appendix C.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|-------|
| Plant Drain | 10 @ 150 gpm 3 hp | |
| Electrical System Utility Voltage Transformers | 12 kV 12 kV to 480 V 12 kV to 4,160 V | |
| Switchgear Distribution | 12 kV 480 V | |
| Emergency Generation Generator | 1 @ 1500 kW 2010 Bhp | |
| Mounted Lighting | >26 units | |
| Utility Water System Pipelines W3 Pump Station | Various sizes 2 @ 780 gpm 40 hp 2 @ 270 gpm 20 hp | |
| Valves | 20 units | |
| Potable Water System Backflow Devices | 6 units | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | | |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Plant Drain | 3 | 3 | 3 | 3 |
| Electrical System | 4 | 3 | 3 | 4 |
| Utility Water System | 3 | 4 | 4 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Yard Piping | 4 | 3 | 4 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Plant Drain

No issues require special attention.

Electrical System

During 2012 wet seasons, a few components in the headworks electrical system were vulnerable to moisture. Project EN 13018 and the inhouse rag compactor project may improve this situation.

Utility Water (UW) System

The pumping capacity and the efficiency of the W3 pumps have greatly decreased over time. The pumps are designed to pump 2,100 gpm total, but they pump only half of their combined designed capacity.

Potable Water System

No issues require special attention.

Instrumentation and Control System

CCWRF is first plant that will benefit from the SCADA migration project.

Yard Piping

Many of the UW isolation valves do not hold, making it difficult to isolate flow during the shutdown maintenance events.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Plant Drain | 1993 | |
| Electrical System | 1993 | |
| Utility Water System | 1993 | |
| Potable Water System | 1993 | |
| Instrumentation and Control System | 1993 | |
| Yard Piping | 1993 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Regional Water Recycling Plant No. 4

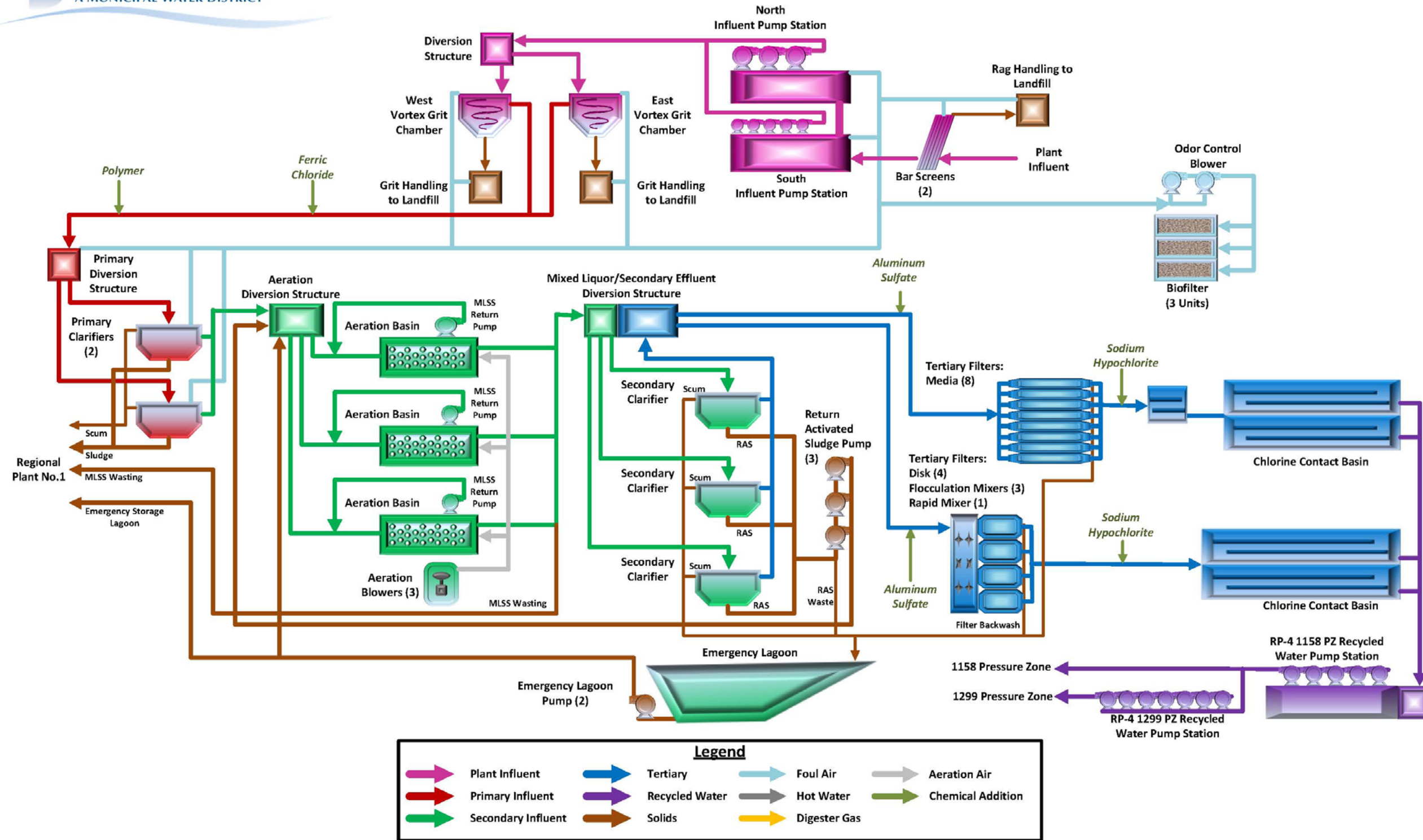


Figure 7-4: Regional Water Recycling Plant No. 4 (RP-4) – Schematic

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Table 7-5: Regional Water Recycling Plant No.4 – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|---|-----------------------------|---------------------------|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN14018 | RP-4 Process Improvements | The project may include various process improvements (RAS wasting piping, WAS station, lagoon pumps, chlorine system, alum dosing, blower cooling water, utility water flow meter). | CC | RC | 200,000 | 900,000 | 425,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,525,000 |
| 2 | EN09021 | RP-4 Headworks Retrofit | This project will include replacing both of the bar rack screens with fine screens, modifying the screening enclosure, repaving damaged concrete within the screening enclosure and replacing gates isolating the headworks screens. | CC | RO | 900,000 | 300,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,200,000 |
| 3 | EN18005 | RP-4 Secondary Drains | This project will replace the drain valves of the secondary clarifiers and address the pipeline profile to the emergency lagoon. Start design in FY2019/20. | CC | RO | 0 | 0 | 0 | 100,000 | 500,000 | 500,000 | 0 | 0 | 0 | 0 | 1,100,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

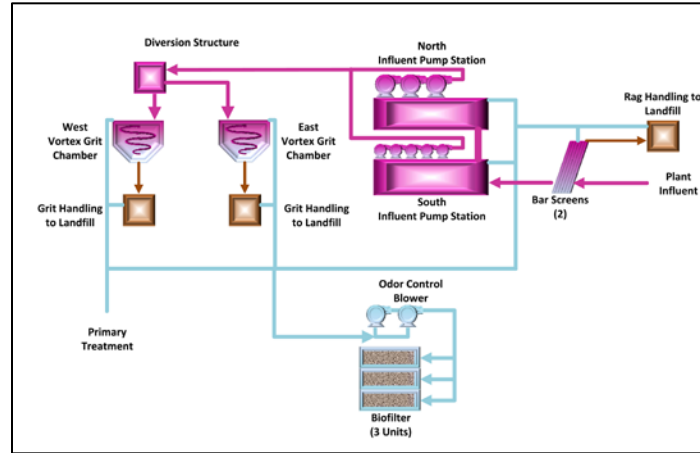
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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**Asset Management System Summary – RP-4
Preliminary Treatment Process**

1. Asset Profile



Influent Channel

Raw wastewater enters the plant through a 42-inch gravity sewer pipeline. A composite sample and other instrumentation are used to monitor the plant's influent flow, which establishes the official influent monitoring control point for the treatment plant.

Screening Equipment

Influent flow is diverted into two channels. Both channels are equipped with a mechanical rake and rigid bar screen. These units remove all solids before the solids enter the treatment plant. Screened solids are conveyed to a waste storage bin to await landfill disposal.

Influent Pump Station

The screened wastewater enters the south influent wet well and then flows into the north wet well. The southern influent pump station is equipped with five dry-mount pumps, and the north influent pump station is equipped with three submersible pumps. Both influent pump stations lift screened wastewater into a common pipeline, which enters the headworks flow diversion structure.

Influent Flow Metering

The lifted flow enters the common pipeline, equipped with a magnetic flow meter that records the daily flow through the plant. The common pipeline has a flow meter bypass for flow meter maintenance. Metered flow enters two diversion structures where gates regulate flow through the grit removal system.

Vortex Grit System

The metered flow is diverted into two separate grit-removal systems. Each grit-removal system is equipped with a vortex grit chamber and classifier. Grit and other inorganic material are removed before entering the primary treatment process. The material is conveyed to a waste storage bin to await landfill disposal.

Grit Washing/Disposal System

Grit pumped from the vortex grit chamber is routed to two grit classifiers, where organic matters are removed from the grit. The grit sinks to a submerged inclined screw and moves up the ramp while being washed. The organic rich liquid from the grit classifiers are directed back to the liquid handling stream.

Screening Conveyance/Disposal System

Screening collected by the bar screens is transported by a conveyor and dropped into a waste bin.

Odor Control System

The foul air is extracted from the influent screening enclosure, influent pump stations, the grit-removal vortex chambers, the grit-waste storage bins, and the primary clarifiers and conveyed to the media biofilters to remove odorous compounds. The odor control system is equipped with two blowers and three biofilters.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|--|----------------------------------|
| Preliminary Treatment Process | 16.1 MGD | |
| Influent Channel Sewer | 42-inch | |
| Screening Equipment Mechanical Screen | 2 @ 36.2 mgd | Peak Per Unit |
| Gates | 3 hp 4 units | |
| Influent Pump Station Pumps | 3 @ 6,000 gpm 100 hp | Per Unit |
| | 5 @ 3,275 gpm 50hp | Per Unit |
| Valves | 8 units | > 12-inch |
| Influent Flow Meter Valves | 1 @ 48.3 mgd 3 units | |
| Vortex Grit System Paddle Drive Pump | 2 @ 16.1 mgd 2 @ 1.5 hp 3 @ 250 gpm | Per Unit Per Unit Per Unit |
| Gates | 10 hp 8 units | |
| Grit Washing & Disposal System Classifier | 2 @ 50 gpm 5 hp | |
| Screening Conveyance & Disposal System Conveyor | 1 hp | |
| Odor Control System Foul Air Fan | 2 @ 12,500 scfm 30.8 hp | Per Unit |
| Biofilter Pump | 3 @ 5,011 ft ³ 2 @ 214 gpm 3 hp | Per Unit Per Unit |
| Valves | 10 units | > 18-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Influent Channel | 3 | 3 | 3 | 3 |
| Screening Equipment | 4 | 3 | 4 | 4 |
| Influent Pump Station | 3 | 3 | 3 | 3 |
| Influent Flow Metering | 3 | 3 | 3 | 3 |
| Vortex Grit System | 4 | 3 | 4 | 4 |
| Grit Washing/Disposal System | 3 | 3 | 3 | 3 |
| Screening Conveyance/Disposal | 4 | 4 | 4 | 4 |
| Odor Control System | 3 | 3 | 3 | 3 |

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Influent Channel

Isolation gates do not function appropriately. The isolation gate between screening channels traps solids when the east bar screen is offline and the west bar screen is online. Project EN09021 will modify the influent channel to reduce solids buildup. In addition, isolation gates are being replaced on the influent channel and screens.

Screening Equipment

Both bearings failures on guides and gear boxes as well as some bolts have sheared on the track. The east bar screen rake needs to be rebuilt and is inefficient. Project EN09021 will replace both bar screens with fine screens, also improving the solids capture.

Influent Pump Station

Wet wells have not been cleaned or inspected since construction. Project EN09021 will dewater and clean the structure.

Vortex Grit System

The suction piping to grit pumps in grit chamber no.1 clogs and cannot convey grit slurry. Maintenance has setup flushing and vacuum pump connections to expedite cleaning in the case of suction pump blockage. A permanent correction needs to be made to eliminate the clogging occurrences. Pumps cannot be remotely operated. The east grit chamber isolation gates need to be replaced because they cannot be used by operations. A potential maintenance project will rehab this system.

Grit Washing/Disposal System

The screenings and grit are handled separately. Project EN09021 will provide flexibility to add screenings and grit to a common dewatering bin.

Screening Conveyance/Disposal System

The screenings are not dewatered before final waste hauling disposal. The screenings and grit are handled separately. Project EN09021 will provide flexibility to add screenings and grit to a common dewatering bin. In addition, cleaning and compacting equipment will be installed for the screenings.

Odor Control System

No issues require special attention, but routine media replacement is required to maintain facility air-quality compliance. A planned recurring Agency-wide maintenance project ensures that media is replaced routinely for the odor control system.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--|--------------------------------------|-----------------------------|
| Influent Channel | 1997 | |
| Screening Equipment | 1997 2002 | Planned 2014 |
| Influent Pump Station | 1997 2009 | Planned 2014 |
| Influent Flow Meter | 2009 | |
| Vortex Grit System | 1997 2009 | Planned 2014 |
| Grit Washing/Disposal System | 1997 2009 | |
| Screening Conveyance & Disposal System | 1997 2009 | |
| Odor Control System | 2009 2012 | |

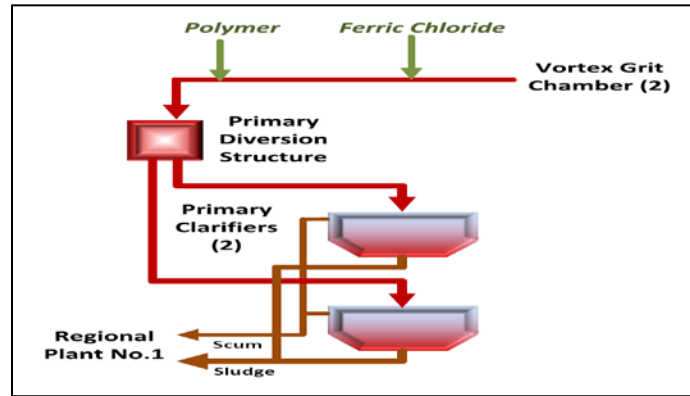
Table 4 Potential Projects

| System | Project Name | Project Description |
|-----------------------|----------------------------------|--|
| Preliminary Treatment | RP-4 Preliminary Treatment Rehab | A project every 10 to 15 years should rehab concrete, coatings and worn components of gates, channels, screens, grit removal, and influent pump station. |
| Grit Removal System | RP4 Grit Removal System Rehab | This project will replace the grit chamber isolation gates and retrofit the grit removal pumping system of System No.1. |

System Summary Continued on Next Page

Asset Management System Summary – RP-4
Primary Treatment Process

1. Asset Profile



Primary Diversion Structure

The preliminary treated flow enters a common 54-inch pipeline and is conveyed to the primary diversion structure. The flow is equally distributed into two 36-inch pipelines, each feeding a circular primary clarifier.

Ferric Chloride System

Ferric chloride is dosed into the raw wastewater before screening. The chemical is used to remove phosphorous and to improve the settling/removal characteristics within the primary clarifiers.

Polymer System

Polymer can be added to the treated flow to improve the settling/removal characteristics within the primary clarifiers, but typically polymer is not used at the plant. Polymer can be injected at the primary diversion structure.

Primary Clarifiers

The facility is equipped with two covered primary clarifiers. The treatment process removes settleable solids and floatable scum and grease. There is no solids handling at RP-4; therefore, all the settled and floatable solids are introduced back into the trunk sewer downstream of RP-4, where they can be processed at RP-1. Solids are wasted out of the clarifier by gravity through actuated valves. Each clarifier is equipped with a flow meter to monitor all solids wasted from the primary treatment process. Primary effluent is conveyed through a 54-inch pipeline.

Sludge/Scum Wasting System

The solids which settle and thicken into sludge are gently mixed by the rotating rake arms on the bottom of the primary clarifiers; this process releases gas bubbles and allows the sludge to compact. A pipe conveys sludge by gravity into the trunk sewer to RP-1; all wasted sludge is recorded by flow meter and automatic control valves. The solids that float and thicken into scum are skimmed into scum beach and stored in a small wet well. A pipe conveys scum by gravity into the trunk sewer to RP-1.

2. Asset Profile

Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------|---|----------|
| Primary Treatment Process | 14 MGD | |
| Primary Diversion Structure | | |
| Mixer | 1 @ 4 hp | |
| Gates | 3 units | |
| Ferric Chloride System | | Per Unit |
| Pump | 2 @ 53.1 gph | |
| Chemical Tank | 8,000 gallons | |
| Polymer System | | Per Unit |
| Metering Pump | 2 @ 4.5 gph | |
| Primary Clarifier | | Per Unit |
| Drive | 2 @ 1,617 gpd/ft ² 8,660 ft ² 0.33 hp | |
| Sludge/Scum Wasting System | | |
| Scum Valves | 2 units | 6-inch |
| Sludge Valves | 8 units | > 6-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-----------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Primary Diversion Structure | 4 | 3 | 3 | 3 |
| Ferric Chloride System | 3 | 3 | 3 | 3 |
| Polymer System | 3 | 4 | 3 | 4 |
| Primary Clarifiers | 3 | 3 | 3 | 3 |
| Sludge/Scum Wasting System | 3 | 3 | 4 | 4 |

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Primary Diversion Structure

The top of the diversion structure is showing signs of concrete corrosion. Therefore, a condition assessment is planned for 2014. A potential project may be needed to rehab the concrete, install larger inspection hatches for cleaning, and replace influent gates.

Ferric Chloride System

The ferric containment area needs to be recoated. The ferric chloride is being dosed through the polymer system because the original dosing point is upstream of the screening equipment; ferric should be dosed downstream of the grit removal system. A potential maintenance project is needed to rehab this system.

Polymer System

The chemical dosing pipeline is being used to inject ferric chloride, and the system is out of service. Polymer dosing to the secondary system would be beneficial for system upsets or to back-up the alum system. A potential maintenance project is required to rehab this system.

Primary Clarifiers

No issues require special attention. The primaries have never been cleaned or inspected since the original construction of both structures. Maintenance Project IS14004 will address any identified primary clarifier issues. A recurring Agency-wide maintenance project will address condition assessments and minor repairs identified through the process.

Primary Sludge/Scum Wasting System

Scum-well effluent piping tends to get clogged, a problem which requires flushing the piping or removing the material with a vacuum truck. This system should be evaluated to determine the potential for a pumping system in place of the current gravity wasting system.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-----------------------------|--------------------------------------|-----------------------------|
| Primary Diversion Structure | 2009 | Planned 2014 |
| Ferric Chloride System | 2009 | |
| Polymer System | 2009 | |
| Primary Clarifiers | 2009 | Planned 2014 |
| Sludge/Scum Wasting System | 2009 | |

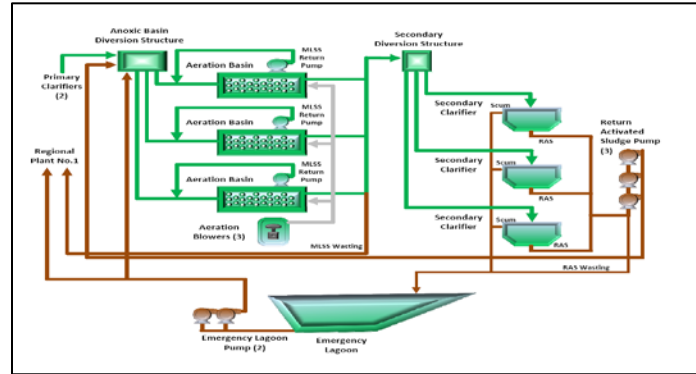
Table 4 Potential Projects

| System | Project Name | Project Description |
|-----------------------------|--|--|
| Primary Diversion Structure | RP-4 Primary Diversion Structure Rehab | This project will repair concrete and coat the diversion structure, install larger inspection hatches, and replace primary influent gates. |
| Ferric Chloride System | RP-4 Ferric System Rehab | This project will rehab the ferric chloride system to recoat the ferric containment area. |
| Polymer System | RP-4 Polymer System Rehab | This project will rehab the existing polymer dosing system. |

System Summary Continued on Next Page

Asset Management System Summary – RP-4 Secondary Treatment Process

1. Asset Profile



Anoxic Basin Diversion Structure

Primary effluent enters the anoxic basin diversion structure and is mixed with return activated sludge, creating mixed liquor. Mixed liquor is diverted equally through three 42-inch pipelines, each feeding an activated sludge system.

Anoxic Basin

One anoxic basin is designated for each of the three activated sludge treatment systems. Each system is composed of an anoxic basin and an aeration basin. The basin is equipped with three mixers to keep solids in suspension throughout the basin. The anoxic basin effluent is diverted through launders into two 30-inch pipelines, which equally feed both aeration basin trains.

Activated Sludge System

An aeration basin is designated for each of the three activated sludge treatment systems. The basins are divided into two trains, and each train is further subdivided into four zones: an extended anoxic zone, oxic zone, another anoxic zone, and another oxic zone. Each zone provides the correct biological environment to consume carbonaceous waste, breakdown ammonia, and reduce pathogens in the mixed liquor. The anoxic zones are equipped with mixers to ensure the solids remain in suspension throughout the treatment process. The oxic zones are equipped with fine-bubble-air diffusers. The diffused air supports the biological process and also provides mixing within the zone. A submersible mixed-liquor return pump is strategically placed at the end of the first oxic zone to recycle flow to the anoxic basin for more efficient treatment. The treatment system is equipped with three blowers to provide pressurized air to the oxic zones. Typically only one or two blowers are needed during the day for the treatment process.

Mixed Liquor Diversion Structure

The mixed liquor enters a common 66-inch pipeline, which feeds the bottom of the mixed liquor diversion structure. The flow is then split equally through three launders, and each launder feeds a secondary clarifier through a 48-inch pipeline.

Secondary Clarifiers

The facility is equipped with three secondary clarifiers. The secondary treatment process provides an environment for the gravity separation of solids from the mixed liquor. The clarified secondary effluent exits the clarifier through a 48-inch pipeline. Scum accumulated on the surface of each of the secondary clarifiers is wasted to the emergency lagoon. The settled solids are referred to as activated sludge. The activated sludge is recycled to the anoxic basin diversion structure through the return activated sludge pump station. The pump station is equipped with three pumps and has a common 24-inch suction pipeline from each secondary clarifier. To control the population of biological species, activated sludge can be wasted from the common effluent pipeline from the aeration basin; wasted activated sludge is diverted to RP-1 for further treatment.

Return Activated Sludge (RAS) Pumping System

The RAS pumping system is designed to return the settled biomass in the secondary clarifier to the head of the activated sludge system. The system is designed to pump at a rate of 30 to 100 percent of the full average daily flow of the facility.

Waste Activated Sludge (WAS) Station

The WAS station is designed to remove the excess biomass from the activated sludge system. Biomass can be removed as mixed liquor suspended solids (MLSS) from the common aeration basin effluent pipeline or from the discharge of the RAS pumping system. MLSS is wasted directly to the trunk sewer, which is treated at RP-1. Wasted RAS is discharged to the emergency lagoon.

Emergency Lagoon

The emergency lagoon is located at the southern end of the plant. The primary function of the lagoon is to recycle the filter effluent backwash from the trident filters and aqua aerobics filters. Secondary scum and plant drainage are also diverted to the lagoon. The recycled flow is pumped into the anoxic basin diversion structure or can be diverted to Regional Plant No. 1.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|--|----------------------|
| Secondary Treatment Process | 14.0 MGD | |
| Anoxic Basin Diversion Structure Gates | 6 units | |
| Anoxic Basin Mixer Gates | 3 @ 7.0 MGD 3 @ 6.2 hp 6 units | Per unit Per Unit |
| Activate Sludge System Blowers | 3 @ 7.0 MGD 2 @ 8,000 scfm 500 hp 13.07 psig 1 @ 8,000 scfm 450 hp 9.00 psig | Per Unit Per Unit |
| Blower Valves Trains | 6 units 6 @ 1.54 MG | >14-inch Per Unit |
| Depth | 15.7 ft | |
| Mixers | 6 @ 4 hp | Per Unit |
| Air Panels | 463 per train | |
| Valve | 1 per train | > 18-inch |
| Valve (air) | 6 units | > 12-inch |
| MLR Pump | 6 @ 14,800 gpm 40 hp | Per Unit |
| MLR Valve | 6 units | >30-inch |
| Mixed Liquor Diversion Structure Gates | 3 units | |
| Secondary Clarifier | 3 @ 848 gpd/ft ² 16,500 ft ² | |
| RAS Pumping System Pump | 3 @ 6,076 gpm 75 hp | Per unit |
| Valves | 15 units | > 18-inch |
| WAS Station Valves | 3 units | 6-inch |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------|--|-----------|
| Emergency Lagoon Pump | 1 @ 4.0 MG 2 @ - 3,155 gpm 75 hp | Per unit |
| Valves | 2 units | > 16-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|----------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Anoxic Basin Diversion Structure | 3 | 3 | 3 | 3 |
| Anoxic Basin | 3 | 3 | 3 | 3 |
| Activated Sludge System | 4 | 3 | 4 | 4 |
| Mixed Liquor Diversion Structure | 3 | 3 | 3 | 3 |
| Secondary Clarifiers | 4 | 3 | 3 | 4 |
| RAS Pumping System | 3 | 3 | 4 | 3 |
| WAS System | 3 | 4 | 4 | 4 |
| Emergency Lagoon | 3 | 3 | 3 | 3 |

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Anoxic Basin Diversion Structure

No issues require special attention.

Anoxic Basin

The anoxic mixer occasionally fails, requiring a replacement, rebuild, or repair.

Activated Sludge System

Miscellaneous equipment failures, such as anoxic mixers, mixed liquor return pump, thermal air flow meters, dissolved oxygen probes, and actuated air valves, may require equipment replacement, rebuild, or repair. Foam is trapped between basins, and there are no means or methods to remove the foam. There are multiple broken panels throughout the aeration basin system; panels are currently isolated locally. A planned Agency-wide maintenance project will replace the panels throughout the system.

The higher-pressure rated Kawasaki and Turblex blowers are inefficient. The blowers rated for higher pressure cannot run for long periods of time with lower-rated Turblex blowers without failing when in auto. The Kawasaki blower does not follow pressure set point. A potential engineering project will replace the Kawasaki blower.

Mixed Liquor Diversion Structure

No issues require special attention.

Secondary Clarifier

The secondary clarifier effluent launders and trough produce large amounts of algae, requiring operator hours for cleanup. The secondary clarifiers do not drain completely because of six feet of elevation rise between the drain and emergency lagoon. Clarifier 1 valve has failed and

has been replaced with a plug. A planned engineering project will address these issues.

RAS Pumping System

The RAS wasting valve can only waste to the lagoon; excess solids in the lagoon create a septic environment and increased odors. The wasted RAS flow should be discharged directly to the sewer. In addition, the wasting may be more efficient if pumped from the system rather than wasted by gravity. A planned Engineering Project EN14018 may address the system issues. A potential project is needed to address the ability to control flows from each clarifier.

WAS Station

The flow meter is erratic when the valve is partially opened. The flow meter piping needs to be augmented to flood the flow meter at all times. The flow meter may not be full at all times. In addition, the wasting may be more efficient if pumped from the system rather than wasted by gravity. A planned Engineering Project EN14018 may address the station issues.

Emergency Lagoon

The lagoon recovery-pump-station flow meter is a local readout only. A planned Engineering Project EN14018 may address the pump station issue.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|----------------------------------|--------------------------------------|-----------------------------|
| Anoxic Basin Diversion Structure | 2009 | |
| Anoxic Basin | 1997 2009 | Planned 2014 |
| Activated Sludge System | 1997 2003 2009 | Planned 2014 |
| Mixed Liquor Diversion Structure | 2009 | |
| Secondary Clarifiers | 2009 | Planned 2014 |
| RAS Pumping System | 2009 | |
| WAS Station | 2009 | |
| Emergency Lagoon | 1997 | |

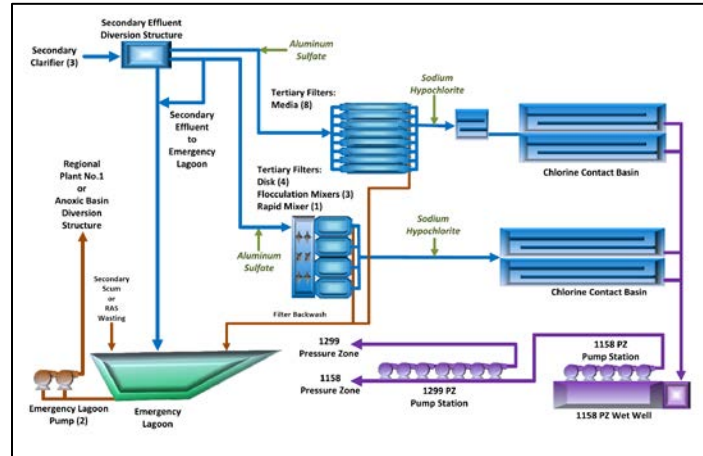
Table 4 Potential Projects

| System | Project Name | Project Description |
|-------------------------|----------------------------|---|
| Activated Sludge System | RP-4 Blower Replacement | This project will replace the Kawasaki blower. |
| RAS Pumping System | RAS Pumping System Upgrade | This project will install new valves and piping to provide flexibility to pull from each clarifier. |

System Summary Continued on Next Page

Asset Management System Summary – RP-4 Tertiary Treatment Process

1. Asset Profile



Secondary Effluent Diversion Structure

The secondary effluent structure is fed through the bottom by a 66-inch pipe. Flow can be diverted to three different locations: the Trident media filters, Aqua-Aerobics Disk filters, or the emergency lagoon. The media filters are fed by a 36-inch pipe, the cloth filters are fed by a 48-inch pipe, and a 48-inch pipe is used to bypass flow to the emergency lagoon. A 30-inch pipe connects the Aqua-Aerobics system to the 48-inch bypass pipe.

Aluminum Sulfate (Alum) System

Chemicals can be added to the secondary effluent that is feeding either filtration system for the purpose of coagulation or pre-filter disinfection. Alum is stored in the maintenance building in two bulk storage tanks and at the trident filter building in two smaller transfer tanks. Bleach is stored in three bulk storage tanks in the maintenance building and is typically applied to the chlorine contact basin.

Filters (Trident and Aqua-Aerobics)

The filtration systems consist of two different technologies: the Trident Anthracite Media Filters and the Aqua-Aerobics Disk Filters. Both technologies filter solids from the secondary effluent before undergoing their separate disinfection systems. The Trident filter must not exceed a filter loading rate of five gallons per minute per square foot (gpm/ft²), and the Aqua-Aerobics filter cannot exceed a filter loading rate of six gallons per minute per square foot (gpm/ft²). The Trident-filtered effluent feeds Chlorine Contact Basin 1A through a 36-inch pipe, and the Aqua-Aerobics-filtered effluent feeds Chlorine Contact Basin 2 through a 48-inch pipe.

Chlorination System

Disinfectant chemical, in the form of 12.5 percent solution sodium hypochlorite (bleach), is dosed to the filtered effluent at both locations: Chlorine Contact Basin 1A and Chlorine Contact Basin 2. The chlorine dose typically ranges from 5 to 15 milligrams per liter. The bleach is intimately mixed into solution using a mixer at the influent of both chlorine contact basins. Bleach is stored in three bulk storage tanks in the maintenance building.

Chlorine Contact Basins (CCB)

The facility is equipped with two chlorine contact basin systems. The Trident-filtered effluent feeds into a coupled chlorine contact basin consisting of Chlorine Contact Basin 1A and 1B, and Aqua-Aerobics-filtered effluent feeds into Chlorine Contact Basin 2. The chlorine contact basin effluent is required to meet California Department of Public Health's Title 22-approved disinfection contact time of 450 milligrams-minutes per liter and a modal contact time of 90 minutes to discharge into the recycled water distribution system. The final effluent is pumped into the recycled water distribution system; therefore, the final effluent does not need to be dechlorinated at RP-4.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|--|------------|
| Tertiary Treatment Process | 14.0 MGD | |
| Secondary Effluent Diversion Structure Gates | 3 units | |
| Alum System | | |
| Tank | 2 @ 2,200 gallons | Per unit |
| Transfer Tank | 2 @ 400 gallons | Per unit |
| Transfer Pump | 2 @ 90 gph 1 @ 124 gph | Per unit |
| Pump | | |
| Trident Filters | 2 @ 34.5 gph | Per unit |
| Aqua Filters | 2 @ 12.5 gph | Per unit |
| Trident Filters | | |
| Absorption Clarifier | 8 @ 11 gpm/ft ² 140 ft ² | Per unit |
| Media Filter | 8 @ 5 gpm/ft ² 313 ft ² | Per unit |
| Backwash Pump | 2 @ 4,200 gpm 100 hp | Per unit |
| Backwash Blower | 2 @ 1120 scfm 30 hp | Per unit |
| Valves | 16 units | > 18-inch |
| Aqua Disk Filters | 4 @ 5.8 gpm/ft ² 646 ft ² | Per unit |
| Rapid Mixer | 1 @ 5 hp | Per unit |
| Floculation Mixer | 3 @ 1 hp | Per unit |
| Backwash Pump | 8 @ 1,760 gpm 3 hp | Per unit |
| Helical Gear Drive | 4 @ 15,597 lb.-inch ¾ hp | Per unit |
| Gates | 3 units | > 18-inch |
| Valves | 4 units | > 18-inch |
| Chlorination System | | |
| Tank | 3 @ 2,200 gallons | Per unit |
| Pump | | |
| Trident Filters | 1 @ 77 gph 1 @ 22.5 gph | Per unit |
| RAS Pipeline | 1 @ 90 gph | Per unit |
| CCB1A | 2 @ 180 gph | Per unit |
| CCB2 | 2 @ 124 gph | Per unit |
| SBS (O/S) | 2 @ 46.9 gph | Per unit |
| Water champ Mixer | 2 @ 30 gpm 7.5 hp | Per unit |
| Chlorine Contact Basin | | |
| CCB1A & 1B | 7.0 MGD 1.15 MG | T22 Report |
| CCB2 | 7.0 MGD 1.01 MG | T22 Report |
| Gates | | |
| CCB1A | 1 units | |
| CCB1B | 2 units | |
| CCB2 | 2 units | |
| Valves | | |
| CCB1B | 1 units | > 18-inch |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Secondary Effluent Diversion Structure | 3 | 3 | 3 | 3 |
| Alum System | 3 | 3 | 4 | 3 |
| Trident Filters | 4 | 3 | 4 | 4 |
| Aqua-Aerobics Disk Filters | 4 | 3 | 3 | 3 |
| Chlorination System | 4 | 3 | 4 | 4 |
| Chlorine Contact Basin | 3 | 3 | 3 | 3 |
| Effluent Diversion Structure | 3 | 3 | 3 | 3 |

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Secondary Effluent Diversion Structure

No issues require special attention.

Alum System

The alum pumps have issues operating automatically, and they do not pace with flow. A planned Engineering Project EN14018 may address the system issues.

Trident Filters

Maintenance is needed for the air compressors. The absorption media and filter media are routinely replaced by maintenance staff. Operations has experienced multiple failures of the backwash, effluent, and waste valves. A thorough condition assessment needs to be performed on the filtration system. A potential project is needed to replace the worn equipment.

Aqua-Aerobics Disk Filters

The drive chain is occasionally adjusted or replaced. The cloth media is at the end of its useful life and has poor solids capture of the secondary effluent. Maintenance Project PA14003 will replace the filter fabric; the filter fabric will be bleach resistant.

Chlorination System

The chlorine containment area needs to be coated and is showing signs of leakage into the common walls of the maintenance building. The pipe fittings for the pumps and tanks leak into the containment area continuously. A potential engineering project is needed to coat the containment area and repair the leaking fittings. The 2,200-gallon bleach tanks are too small and require routine rotation during the day to maintain bleach supply to the metering pumps.

A bleach line is needed for algae control; the Agency is transitioning to bleach-resistant filter fabric, so bleach can be regularly dosed upstream of the disk filters.

CCB1A bleach pumps have issues operating automatically because the stroke is fixed at 50 percent length. CCB2 bleach pump is out of service because of a faulty control board.

The chlorine analyzers are no longer supported by the manufacturer and fail frequently. Agency-wide Project EP14004 will replace the outdated chlorine analyzers in 2014.

Chlorine Contact Basin (CCB)

There are cracks and gaps on the chlorine contact basin covers, and sand and debris infiltrate the structure. The CCB1A effluent gate needs to be repaired, replaced, or removed from operation. A potential maintenance project will assess the condition of the basins and repair points of infiltration.

Effluent Splitter Box

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--|--------------------------------------|-----------------------------|
| Secondary Effluent Diversion Structure | 2009 | |
| Alum System | 1997 2009 | |
| Trident Filters | 1997 | Planned in 2014 |
| Aqua-Aerobics Disk Filters | 2009 | |
| Chlorination System | 2003 2009 | |
| Chlorine Contact Basin | 2003 2009 | Planned in 2014 |
| Effluent Splitter Box | 2003 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|---------------------|----------------------------------|---|
| Filters | RP4 Filter Rehab | A recurring project every 10 to 15 years should rehab concrete, coatings, and worn components of the Trident and Aqua Disk filters. |
| Chlorination System | RP4 Chlorine Contact Basin Rehab | A recurring project every 10 to 15 years should rehab concrete, coatings, and worn components of the chlorine contact basins. |

System Summary Continued on Next Page

**Asset Management System Summary – RP-4
Auxiliary Systems**

1. Asset Profile

Emergency Generation

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (wind and emergency generators). The wind asset is owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switch gear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-4 electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. One outside generator is located in the northern portion of the facility and supplies power to the preliminary, primary, secondary, and tertiary sections.

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water System

Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by the 1158-foot pressure zone pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System

Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied by three connections on 6th Street from the Cucamonga County Water Department. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System

An extensive array of instruments is used to monitor and control the processes at RP-4. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to the main control centers.

Yard Piping

A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely. A yard piping diagram is show in Appendix C.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|--------------------|
| Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator Wind Turbine Mounted Lighting | 1 @ 12 kV 8 @ 12 kV to 480 V 10 @ 12 kV 5 @ 480 V 1 @ 2,000 kW 2,847 Bhp 1 @ 1 MW > 50 units | MCCs |
| Utility Water System Pipelines Pump Station Valves | Various sizes See 1158 Pressure Zone 2 units | 6-inch |
| Potable Water System Backflow Devices Valves | 5 units 10 units | >2-inch >2-inch |
| Instrumentation and Control System HMI Workstation PLC I/O Hub Radio Transmitter | 8 units 7 units 5 units 1 unit | |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Electrical System | 3 | 3 | 3 | 3 |
| Utility Water System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Yard Piping | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Electrical System

The current generator may not have sufficient capacity to supply power to the facility and the recycled water pump stations. Maintenance is evaluating the limitations of the emergency generator.

Utility Water System

The plant utility water is not monitored from the 1299 recycled water pump station.

The blower cooling water uses potable water; there are potential recycled water connections within 100 feet of the blower building to reduce the facility's potable water usage.

A planned Engineering Project EN14018 may address the system issues.

Potable Water System

No issues require special attention.

Instrumentation and Control System

No issues require special attention.

Yard Piping

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Electrical System | 1993 1995 2001 2005 | |
| Utility Water System | 2002 | |
| Potable Water System | 1993 2003 | |
| Instrumentation and Control System | 1995 2001 2003 2005 | |
| Yard Piping | 1993 1995 2001 2005 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Regional Water Recycling Plant No. 5

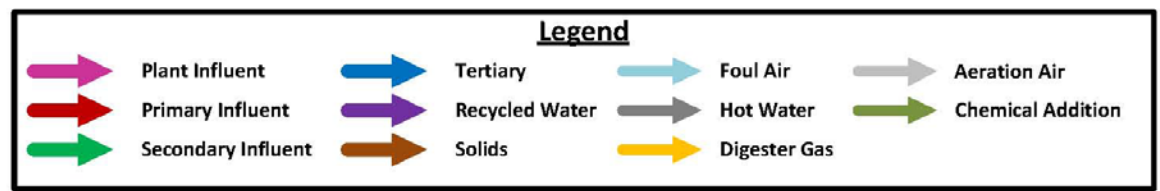
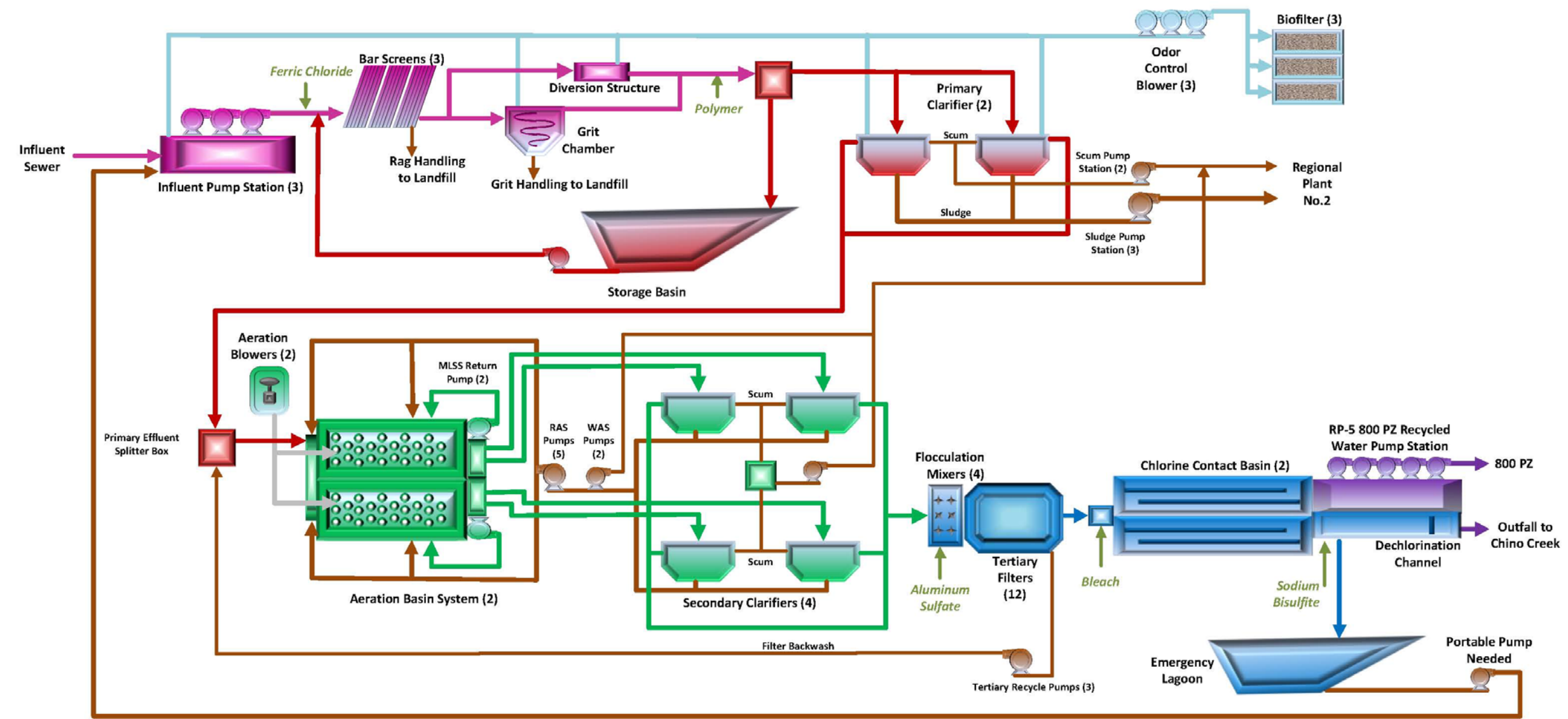


Figure 7-5: Regional Water Recycling Plant No. 5 (RP-5) – Schematic

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Table 7-6: Regional Water Recycling Plant No.5 – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|---|-----------------------------|--|---|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|------------|------------|------------|------------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN11031 | RP-5 Flow Equalization and Effluent Monitoring | Modifications in the primary effluent splitter box. The 12' weir gate and automation of the slide gate to allow flow to the aeration basin will better optimize the flow equalization of plant treatment process. | CC | RC | 700,000 | 763,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,463,000 |
| 2 | EN13047 | RP-5 Standby Generators Control Modifications | Install modifications to the standby generator controls. | CC | RC | 270,000 | 25,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 295,000 |
| 3 | EN19001 | RP-5 Expansion to 30 mgd | Expand existing RP-5 liquid treatment capacity from 15 to 30 mgd. Project cost estimated at \$150M. | CC | RC | 0 | 0 | 0 | 0 | 100,000 | 0 | 0 | 0 | 0 | 0 | 100,000 |
| 4 | EN19006 | RP-5 SHF | Construct new solids handling facility at RP-5 to decommission RP-2. | CC | RC | 0 | 0 | 0 | 0 | 250,000 | 25,000,000 | 25,000,000 | 25,000,000 | 25,000,000 | 0 | 100,250,000 |
| 5 | MM15002 | Purchase & Installation of RP-5 Satellite Warehouse & MM Shop Steel Bldgs. | Purchase and installation of RP-5 Satellite Warehouse & MM Shop Steel Bldgs. | CC | RC | 0 | 0 | 0 | 0 | 0 | 200,000 | 50,000 | 0 | 0 | 0 | 250,000 |
| 6 | EN23001 | RP-5 Biofilter Improvements | Consists of providing a new foul-air distribution system at the base of the biofilter to match the other Agency biofilters. | CC | RO | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000 | 250,000 | 350,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

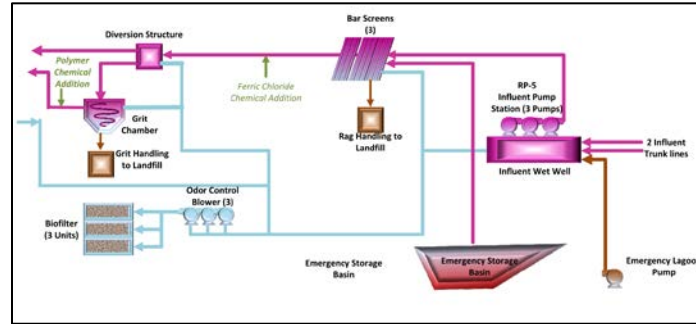
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – RP-5 Preliminary Treatment Process

1. Asset Profile



Influent Trunk Lines

Raw wastewater enters RP-5 through the 42-inch Chino interceptor diversion and 66-inch Kimball interceptor.

Influent Pump Station (IPS)

The influent pump station collects raw sewage from the 42-inch Chino interceptor diversion and 66-inch Kimball interceptor. The streams enter the influent junction box and flow through manually-operated isolation gates into two separate wet wells. The RP-5 influent pump station conveys plant influent flow to the headworks. Once lifted to the headworks, flow proceeds through the entire plant by gravity. Three VFD-controlled, wet-pit submersible, non-clog, centrifugal pumps located in the IPS wet wells lift the combined flow and convey the raw sewage to the headworks through a 42-inch diameter discharge line. The west wet well holds two pumps, while the east wet well holds the third pump, with space for one future pump. A 36-inch-diameter magnetic flow meter in the combined discharge line measures the flow.

Screening Equipment

The headworks consist of bar screens with screenings washers and compactors and also grit basins with grit washers. Two mechanical climber-type bar screens are installed along with a screw conveyor and screenings washer/compactor. One manual bar screen is also installed as a standby unit.

Vortex Grit Chamber

When wastewater leaves the bar screen channels, it enters a mechanically induced vortex grit basin, which separates the heavier grit particles from the lighter organics. The heavier particles settle to the bottom of the chamber from where they are removed from the basin by the constant-speed recessed impeller grit pumps.

Grit Washing/Disposal System

The grit removal system separates grit, sand, and other heavy particles from lighter organics in the influent wastewater flow, removing this material to protect downstream equipment and processes. The fluidized grit is pumped to the grit washers, where it is dewatered before being discharged into disposal bins. The grit washers include a cyclone separator to remove additional water and concentrate the solids. They also contain a classifier mechanism that accepts the underflow from the cyclone unit. This classifier further separates the solids using a screw mechanism to transport the grit upward out of a settling tank.

The grit removal system includes manually operated gates and valves to allow for bypassing each component of the facility. The duty pump and duty grit washer are selected by opening the appropriate manually operated plug valves. There are provisions to accommodate the expansion of the grit removal system if needed. A second grit basin could replace the existing grit basin bypass pipeline, and a third pump can be added to the grit pumping station.

The excess liquid spills out of the grit classifiers and is directed back to the bar screen structure effluent channel.

Screening Conveyance/Disposal System

Screening collected by the bar screens is transported by a conveyor and dropped into a hydraulic washer-compactor. The compactor compresses the collected rags, squeezing out excess water, and pushes the rags to the roll-off bin.

Ferric Chloride System

Ferric chloride is added to the liquid flow after grit removal to increase solids capture during primary treatment and to control odors caused by hydrogen sulfides.

The ferric station consists of a truck filling station, 9,600-gallon storage tank, three chemical metering pumps and associated piping.

Polymer System

Polymer is added to the liquid flow before grit removal to enhance primary treatment. The polymer system includes two 500-gallon tote stands, chemical metering pumps, mixing chamber, and associated piping. The anionic polymer system is located in the same area as the ferric chloride system. The polymer system consists of two polymer storage totes and two polymer blenders. Anionic polymer is drawn from the storage totes, mixed and diluted with potable water, and delivered to the primary clarifier splitter box. Space and connections for future polymer blenders are provided to accommodate future plant flows.

Biofilter

Odors collected in the preliminary and primary treatment processes are forced through three biofilter media cells, where hydrogen sulfide gas is removed through biological processes.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|--|-----------------------|
| Preliminary Treatment Process | 16.3 MGD | |
| Influent Trunk Sewer Kimball Interceptor Chino Interceptor | 66-inch 42-inch | |
| Influent Pump Station | 3 @ 8,333 gpm 200 hp 7 units | Per Unit > 18-inch |
| Screening Equipment Mechanical Screen Manual Screens | 2 @ 30 MGD each 1 @ 30 MGD | Per Unit |
| Vortex Grit Basin Chamber Pump Gates | 1 unit @ 30 MGD 2 @ 250 gpm 25 hp 2 units | Per Unit |
| Grit Washing/Disposal Classifiers | 2 @ 13 ft ³ /hr | Per Unit |
| Screening Conveyance & Disposal System Conveyor Washer Compactor | 1 @ 5.0 hp 1 @ 32 ft ³ /hr | |
| Ferric Chloride System Tank Pumps | 9,600 gallons 2 @ 53 gph | Per Unit |
| Polymer System Pump | 2 @ 4.5 gph | Per Unit |
| Biofilter Cells | 3 @ 667 ft ³ | Per Unit |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------|---------------------------------------|----------|
| Blowers | 3 @ 13,200 scfm 30 hp | Per Unit |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Influent Trunk Sewer | 3 | 3 | 3 | 3 |
| Influent Pump Station | 3 | 3 | 3 | 3 |
| Screening Equipment | 3 | 3 | 3 | 3 |
| Vortex Grit System | 3 | 3 | 3 | 3 |
| Grit Washing/ Disposal System | 3 | 3 | 3 | 3 |
| Screening Conveyance/Disposal System | 5 | 4 | 5 | 5 |
| Ferric Chloride System | 3 | 3 | 3 | 3 |
| Polymer System | 3 | 3 | 3 | 3 |
| Headworks Splitter Box | 3 | 3 | 3 | 3 |
| Biofilter | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Influent Trunk Sewer

No issues require special attention.

Influent Pump Station

The influent pump station wet well accumulates floating debris which does not get pumped by the submersible pumps. The wet well needs routine Vector cleaning, which is tedious and inefficient.

Screening Equipment

Fine screens are being considered to replace the current bar screens. The new fine screens will screen out smaller unwanted inorganics to pass through into the system, allowing for better and more efficient process treatment. A maintenance project is planned in 2014 to remove the existing equipment and replace it with a new JWC washer/compactor.

Vortex Grit System

The vortex grit chamber is not operated because the grit piping clogs frequently when the chamber is in operation.

Grit Washing/Disposal System

No issues require special attention

Screening Conveyance/Disposal

The RP-5 screenings washer/compactor has been unreliable from installation. Routine failures resulting from poor equipment design prompted the Agency to seek alternative equipment. The equipment has been taken out of service, and a new equipment installation is planned.

Ferric Chloride System

The ferric chloride system operates effectively, but because of process optimizations, minimal ferric chloride is dosed at RP-5.

Polymer System

No issues require special attention.

Biofilter

No issues require special attention, but routine media replacement is required to maintain facility air-quality compliance. A planned recurring maintenance project is required to ensure that routine media replacement is taking place for the odor control system. Media was last replaced in 2010, during which the Agency performed an internal condition assessment.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--|--------------------------------------|-----------------------------|
| Influent Trunk Sewer | 2004 | |
| Influent Pump Station | 2004 | |
| Screening Equipment | 2004 | |
| Vortex Grit Basin | 2004 | |
| Grit Washing/Disposal | 2004 | |
| Screening Conveyance & Disposal System | 2014 | |
| Ferric Chloride System | 2004 | |
| Polymer System | 2004 | |
| Biofilter | 2004 | |

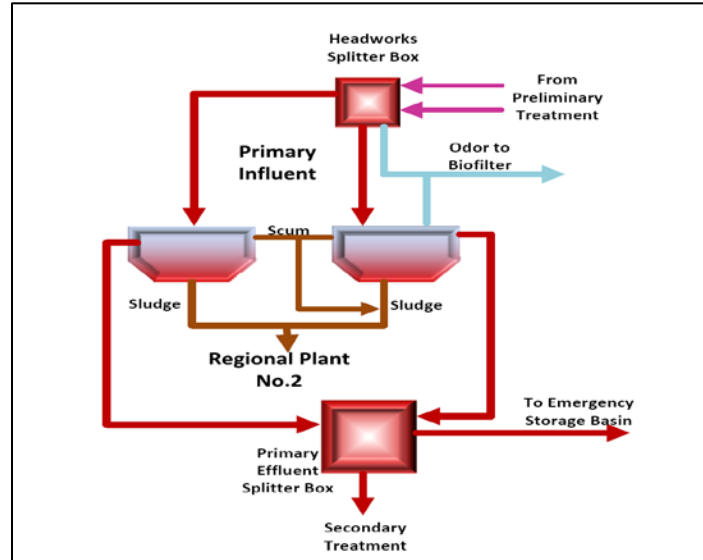
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RP-5
Primary Treatment Process

1. Asset Profile



Headworks Splitter Box

The headworks splitter box receives flow from the grit systems, bar screen channel, and the bar screens structure bypass. Distribution valves in this area direct the wastewater flow to Primary Clarifiers 3 and 4.

Primary Clarifiers

There are two circular primary clarifiers located north of the aeration basins at RP-5. Each covered clarifier is 100 feet in diameter, with a sidewall depth of 12 feet. The average surface overflow rate for each clarifier is 8.3 MGD, with a maximum of 15 MGD. The solids that settle out in the clarifiers are pumped to RP-2 for treatment. The clarified flow passes over a weir and into the aeration basins.

Primary Effluent Splitter Box

The primary effluent from the clarifiers flows into the primary effluent splitter box. The purpose of the splitter box is to allow diversion of the primary clarifier effluent to either the aeration basin or the emergency storage basin. The amount of flow directed to either structure can be adjusted from slide gates.

Sludge Pumping System

The primary sludge pump station pumps settled sludge from the primary clarifiers sludge hoppers to the solids handling facilities at RP-2. There are three primary sludge pumps: one dedicated to each primary clarifier and one that serves as a common standby. Each pump suction line contains a sludge grinder (Muffin Monster) to reduce the size of the pumped solids and help prevent plugging. Sludge withdrawal from each clarifier is controlled by adjustable pumping cycles to maintain a constant sludge blanket level within the clarifier.

Scum Pumping System

Scum arms with a skimmer mechanism remove scum from the clarifier water surface. Scum deposits into the scum beach and then flows by gravity into a main scum wet well that receives scum from both primary clarifiers. The scum well has a mixer to help ensure that the scum does not thicken and result in pumping difficulties.

Emergency Overflow Pond

The unlined 17 MG emergency storage basin (located downstream of the dechlorination basin at the end of the plant) can be used to store final plant effluent if the effluent does not meet the permit requirements. The basin does not have a permanent pumping facility, but it has the capability to return flow to the headworks through a 16-inch line with the use of temporary pumps. This same line can be used to divert flow (by

gravity) from the influent pump station wet well to the emergency overflow pond in an emergency situation.

Emergency Storage Basin (ESB) System

Downstream of the primary clarifiers, there is a primary effluent box with an adjustable weir gate that can be used to divert flow to the 6.8 MG emergency storage pond. The weir gate is manually set such that primary effluent in excess of a selected flow rate goes over the weir gate into the lagoon. The effluent is then pumped back to the headworks when the influent rate is low enough to allow all flow to continue to downstream processes.

The emergency storage basin pump station returns diverted primary effluent to the headworks-structure bar-screen influent channel. Three VFD-controlled, wet-pit submersible, non-clog, centrifugal pumps located in the wet well lift the diverted primary effluent and transmit it to the headworks through a 20-inch-diameter transmission line.

A variety of instruments is installed at the ESB pump station to collect data and control operation of the pumps. A 20-inch-diameter magnetic flow meter in the combined discharge line measures the combined discharge flow and transmits the information to the Supervisory Control and Data Acquisition (SCADA) control system. A level transmitter and high- and low-low level switches monitor the liquid level in the wet wells and provide information to control the pumps.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-------------------------------------|--|----------|
| Primary Treatment Process | 16.3 MGD | |
| Headworks Splitter Box Gates | 3 units | |
| Primary Clarifiers | 2 @ 2,075 gpd/ft ² 7,854 ft ² | Per Unit |
| Drive Gates | 1 @ ¾ hp 2 units | |
| Primary Effluent Splitter Box Gates | 2 units | |
| Sludge Pumping System Pumps | 3 @ 230 gpm 30 hp | Per Unit |
| Scum Pumping System Pump | 2 @ 230 gpm 15 hp | Per Unit |
| Emergency Storage Basin | 1 @ 17 MG | Unlined |
| ESB System Basin VFD Pumps | 1 @ 6.8 MG 3 @ 3,000 gpm 60 hp | Per Unit |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Headworks Splitter Box | 3 | 3 | 3 | 3 |
| Primary Clarifiers | 3 | 3 | 3 | 3 |
| Primary Effluent Splitter Box | 3 | 3 | 4 | 3 |
| Sludge Pumping System | 3 | 3 | 3 | 3 |
| Scum Pumping System | 3 | 3 | 3 | 3 |
| Emergency Overflow Pond | 3 | 3 | 4 | 3 |
| ESB System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Headworks Splitter Box

No issues require special attention.

Primary Clarifiers

No issues require special attention.

Primary Effluent Splitter Box

Modifications to the 12-foot weir gate and automation of the slide gate to allow flow to the aeration basin will better optimize the flow equalization of plant treatment process. Project EN11031 will address this issue.

Sludge Pumping System

No issues require special attention.

Scum Pumping System

No issues require special attention.

Emergency Overflow Pond

Temporary pumps must be used to pump flows from the pond to the headworks. Addressing this deficiency is a low priority and will likely be addressed when a new RP-5 solids handling facility is built.

ESB System

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-------------------------------|--------------------------------------|-----------------------------|
| Headworks Splitter Box | 2004 | |
| Primary Clarifiers | 2004 | East – 2013 |
| Primary Effluent Splitter Box | 2004 | Planned 2014 |
| Sludge Pumping System | 2004 | |
| Scum Pumping System | 2004 | |
| Emergency Storage Basin | 2004 | |
| ESB System | 2004 | |

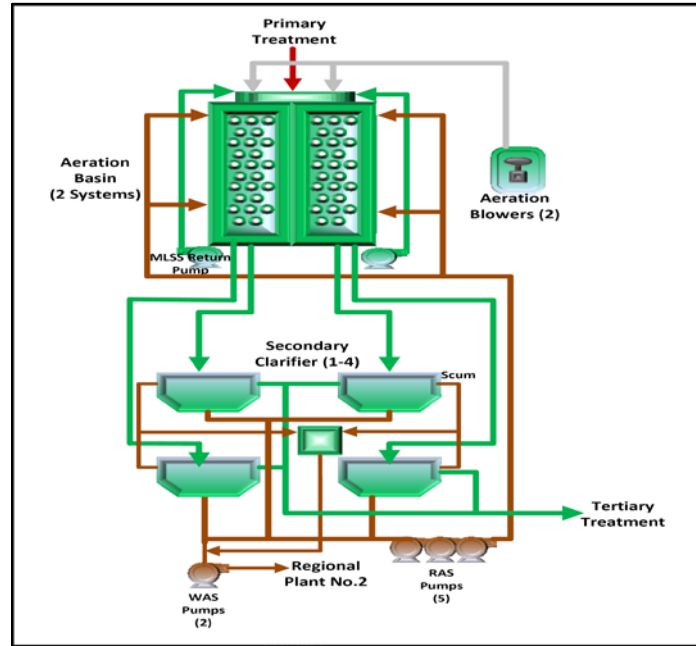
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

**Asset Management System Summary – RP-5
Secondary Treatment Process**

1. Asset Profile



Activated Sludge System

The activated sludge system is two-stage biological-nutrient-removal suspended-growth system that provides biological treatment to convert soluble BOD to biomass able to settle. The activated sludge consists of biological processes that use dissolved oxygen to promote the growth of biological floc, which then removes organic material. The process converts ammonia to nitrites, nitrates, and ultimately nitrogen gas. There are two aeration basins (four trains) located south of the primary clarifiers. Each aeration basin contains eleven zones. Four zones in each basin are dedicated anoxic zones, and seven zones are available aeration zones.

The aeration zones are aerated via the Parkson air membrane system supplied by two single-stage centrifugal blowers with inlet/variable diffuser guide vanes and motorized butterfly control valves that control dissolved oxygen concentrations. Each aeration basin contains up to eight pairs of anoxic mixers to minimize solids settlement in anoxic zones. Influent gates divert a combined flow of primary effluent and return activated sludge available to feed three zones on each aeration basin. Each aeration basin contains a mixed liquor return pump in the effluent channel, which can be used to pump nitrate-rich mixed liquor back to the aeration basin, where denitrification can occur.

Secondary Clarifiers

Effluent flow from the aeration basins flow through 36-inch gravity pipelines into the secondary clarifiers (four total) through the bottom of the center column. The flow then travels up into a feed well that contains a flocculation zone. The flow passes through diffusers in the side of the feed well and is directed toward the bottom of the clarifier by a baffle. Each clarifier has a rotating sludge and ducking skimmer arm to collect scum off the surface. The solids settle to the bottom of the clarifier and are either returned to the aeration basin or wasted to RP-2. The overflow effluent is directed through a 54-inch pipeline to the tertiary filters.

Return Activated Sludge (RAS) Pumping System

Some of the settled sludge in the secondary clarifiers is pumped back to the influent of the aeration system as return activated sludge (RAS) to mix with primary effluent, called mixed liquor suspended solids (MLSS). The RAS is returned to the aeration basin by the 5 RAS pumps to maintain the biological process.

Waste Activated Sludge (WAS) Pumping System

To control the excess biological concentrations in the aeration system, the settled solids from the secondary clarifiers are "wasted" and pumped out of the secondary system to solids processing as waste activated sludge (WAS). WAS is pumped to and treated at RP-2.

Scum Pumping System

Scum collected from the skimmer arm of the secondary clarifiers is routed to a scum well, where it is pumped out of the system to solids processing at RP-2.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------|---|------------|
| Secondary Treatment Process | 17.1 MGD | |
| Activated Sludge System | 2 @ 17.1 MGD | Per Unit |
| Blowers | 2 @ 7,500 scfm 500 HP 11.5 psig | |
| Trains | 2 @ 5.16 MG | Per Unit |
| Panels | 195 | |
| Depth | 19 ft | Per System |
| Mixers | 20 @ 7.5 hp | |
| Gates | 32 units | Per System |
| Valve | 1 unit | |
| MLR Pumps | 2 @ 6,300 gpm | |
| Secondary Clarifiers | 4 @ 356 gpd/ft ² 13,273 ft ² | Per Unit |
| Gates | 4 units | |
| RAS Pumping System | 5 @ 2,500 gpm | Per Unit |
| Valves | 3 - 20-inch units | |
| WAS Pumping System | 2 @ 100 gpm 7.5 hp | |
| Scum Pumping System | 2 @ 600 gpm 15 hp | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Activated Sludge System | 3 | 2 | 2 | 2 |
| Secondary Clarifiers | 3 | 3 | 3 | 3 |
| RAS Pumping System | 3 | 3 | 3 | 3 |
| WAS Pumping System | 3 | 3 | 3 | 3 |
| Scum Pumping System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Activated Sludge System

No issues require special attention.

Secondary Clarifiers

Algae control in the launders is a challenge. Automated weir-washing systems may be installed during future clarifier rehab work.

RAS Pumping System

No issues require special attention.

WAS Pumping System

No issues require special attention.

Scum Pumping System

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-------------------------|--------------------------------------|-----------------------------|
| Activated Sludge System | 2004 | |
| Secondary Clarifiers | 2004 | |
| RAS Pumping System | 2004 | |
| WAS Pumping System | 2004 | |
| Scum Pumping System | 2004 | |

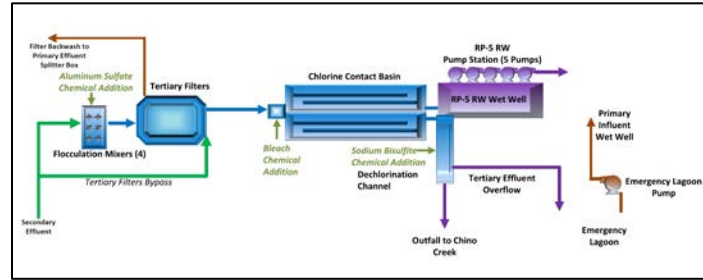
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RP-5 Tertiary Treatment Process

1. Asset Profile



Aluminum Sulfate (Alum) System

Alum is used with cationic polymer to provide flocculation upstream of the tertiary filters. The addition of these two chemicals should result in an increase in floc size, which will increase particulate removal by the filters. The alum system consists of a storage tank and two chemical metering pumps in a duty/standby mode of operation. Alum is drawn from the storage tank and pumped to the influent channel to the tertiary filters. Space and connections for an additional future tank and chemical pumps are provided to accommodate future plant flows.

Flocculation Tank

To provide optimum removal of particulates during the filtration process, chemicals are added at the flocculation tank at the influent side of the filters. There is one rapid mixer and four VFD-controlled flocculators at this site.

Filters

The Parkson continuous backwash tertiary filters provide physical treatment to remove suspended solids and lower the turbidity of the secondary effluent. There are twelve tertiary filters and a filter recycle pump station with three submersible pumps that return filter backwash to the primary effluent splitter box. The tertiary filters are located south of the secondary clarifiers. Each tertiary filter contains six 50-square-foot modules. Flow that enters the tertiary filters comes from the secondary clarifiers. After passing through the rapid mix and flocculation basin, where chemicals are added to aid in filtration, the secondary effluent flows through three pipes, each of which provides influent to a group of four filters. Filter influent then travels through the filter feed valves and into each filter influent manifold, where it is distributed to the bottom of each module.

Chlorination System

The sodium hypochlorite system has multiple applications throughout the plant. The main purpose of the system is to provide disinfection of the plant effluent before final discharge. Hypochlorite (bleach) may also be used for housekeeping purposes. It can be added to the return activated sludge (RAS) to prevent the growth of filamentous organisms, which inhibit good settling in the secondary clarifiers. It can also be added to the secondary clarifier weirs and to the tertiary filter influent channel to prevent the growth of algae in these areas.

The sodium hypochlorite system consists of four storage tanks and three sets of chemical metering pumps. One set, consisting of five pumps, is used for disinfection. This set pumps hypochlorite to the chlorine mixer at the beginning of the chlorine contact basin. The second set of two pumps is used for RAS dosing and sends hypochlorite to the RAS line before the aeration basin. The third set of two pumps is used for algae control. This set pumps hypochlorite into a dilution water line, and the mixture is sent to the secondary clarifier weirs and filter influent channel. Space and connections for future RAS and algae control chemical pumps are provided to accommodate future plant flows.

The filter recycle pump station consists of three submersible pumps, which return tertiary filter backwash to the primary effluent splitter box.

Chlorine Contact Basins

After flow passes through the tertiary filters, it enters the chlorine contact channels, where the water is chlorinated and then mixed to improve disinfectant contact and obtain the necessary compliance concentration and detention times. The chlorinated water then travels through a serpentine pattern of channels to recycled water demand or the dechlorination channel, where the chlorine is removed from the water before discharge to the outfall.

Dechlorination System

Flow entering the dechlorination structure is injected with sodium bisulfite (SBS) and travels through a serpentine flow path, allowing SBS to neutralize any chlorine residual before flowing into Chino Creek through a 48-inch effluent flow meter and out through an outfall 60-inch pipeline. SBS is stored in two large chemical tanks and is metered into the system via four chemical metering pumps.

The dechlorination basin final effluent gate is used to stop plant effluent flow to the outfall, if the final effluent flow does not meet water quality standards. The dechlorination basin final effluent gate is a motorized sluice gate. When it is closed, flow is diverted over a 23-foot-long, fixed, broad-crested weir and through a pipeline into the adjacent emergency lagoon.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|--|----------------------|
| Tertiary Treatment Process | 16.3 MGD | |
| Alum System Tank Pumps | 560 gallons 2 @ 14 gph | Per Unit |
| Flocculation Tank Rapid Mixer Mixer | 1 @ 30 hp 1 @ 3 hp 1 @ 2 hp 1 @ 1.5 hp 1 @ 1 hp | |
| Filters Filter Loading Recycle Pumps | 12 @ 300 ft ² 5 gpm/ft ² 3 @ 420 gpm 7.5 hp | Per Unit Per Unit |
| Gates | 1 units | |
| Chlorination System Tanks Pumps Water Champ Mixer | 4 @ 10,500 gallons 9 @ 77 gph 1 @ 20 hp 1 @ 30 hp | Per Unit Per Unit |
| Chlorine Contact Basins Gates | 2 @ 0.9 MG 4 units | Per Unit |
| Dechlorination System Tanks Pumps Gates | 2 @ 5,100 gallons 4 @ 53 gph 3 units | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Alum System | 3 | 3 | 3 | 3 |
| Flocculation Tank | 3 | 3 | 3 | 3 |
| Filters | 4 | 3 | 4 | 4 |
| Chlorination System | 4 | 3 | 3 | 3 |
| Chlorine Contact Basins | 3 | 3 | 3 | 3 |
| Dechlorination System | 4 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Alum System

No issues require special attention.

Flocculation Tank

No issues require special attention.

Filters

The filters require significant maintenance. The continuous and abrasive sand-washing action damages OEM stainless-steel air-lift pumps, which need to be replaced routinely with PVC air-lift pumps. Sand gets carried to the backwash water-wet well and then is pumped to the primary effluent splitter box. The performance of the sand-washing system is difficult to maintain. These issues will be addressed in future rehab work.

Chlorination System

The current sodium hypochlorite (bleach) dosing system requires significant maintenance as a result of leaking pumps. The pumps are located outdoors and have no protection against the elements. Crystallization of the bleach at the discharge of the pipe has caused issues. Chemical flow metering is being considered for chlorine dosing. Project EN11031 is expected to address these issues.

Chlorine Contact Basins (CCB)

The chlorine contact basin does not have a flow meter at the influent. Flow into the CCB influent is back-calculated, which causes delayed bleach-dosing issues. The mixing of bleach at the CCB is not optimal. Project EN11031 is expected to address these issues.

Dechlorination System

The sodium bisulfite (SBS) pumps are near the end of their useful life, and the pumps don't have the operating range to meet the variations in dechlorination needs resulting from variable recycled water demands. Project EN11031 is expected to address these issues.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-------------------------|--------------------------------------|-----------------------------|
| Filters | 2004 2009 | |
| Alum System | 2004 | |
| Flocculation Tank | 2004 | |
| Chlorination System | 2004 2010 | |
| Chlorine Contact Basins | 2004 | |
| Dechlorination System | 2004 2010 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

**Asset Management System Summary – RP-5
Auxiliary Systems**

1. Asset Profile

Plant Drain

The plant drain collects surface storm runoff, excess irrigation, and wash-down water collected in submersible drains located throughout the facility. The drain system receives gravity flows to a wet well, where the flow is then pumped and recycled toward the head of the treatment process.

Emergency Generation

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (solar and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switchgear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-5 electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. Two generators are located at the south section and supply power to the preliminary, primary, secondary, tertiary sections, and headquarters

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water System

Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by the RP-5 RW pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System

Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a 6-inch W1 line off Kimball Ave. from the City of Chino. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System

An extensive array of instruments is used to monitor and control the processes at RP-5. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to the main control terminals.

Yard Piping

A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely. A yard piping diagram is show in Appendix C.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|-------|
| Electrical System Utility Voltage Transformers Switchgear Distribution | 1 @ 12 kV 6 @ 12 kV to 480 V 8 @ 12 kV 3 @ 480 V | MCCs |
| Emergency Generation Generator Mounted Lighting | 2 @ 1,000 kW > 50 units | |
| Utility Water System Pipelines Pump Station Valves | Various sizes 2 @ 1,925 gpm 3 @ 1,925 gpm 30 units | |
| Potable Water System Backflow Devices Valves | >25 units >25 units | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 | |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Plant Drain | 3 | 3 | 3 | 3 |
| Electrical System | 3 | 3 | 3 | 3 |
| Utility Water System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 2 | 2 | 2 | 3 |
| Yard Piping | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Plant Drain

No issues require special attention.

Electrical System

No issues require special attention.

Utility Water System

Some of the UW isolation valves do no seal and need to be replaced. Replaced valves should be exercised routinely.

Potable Water System

No issues require special attention.

Instrumentation and Control System

No issues require special attention.

Yard Piping

No issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Plant Drain | 2004 | |
| Electrical System | 2004 | |
| Utility Water System | 2004 | |
| Potable Water System | 2004 | |
| Instrumentation and Control System | 2004 | |
| Yard Piping | 2004 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Recycled Water & Ground Water Recharge Systems

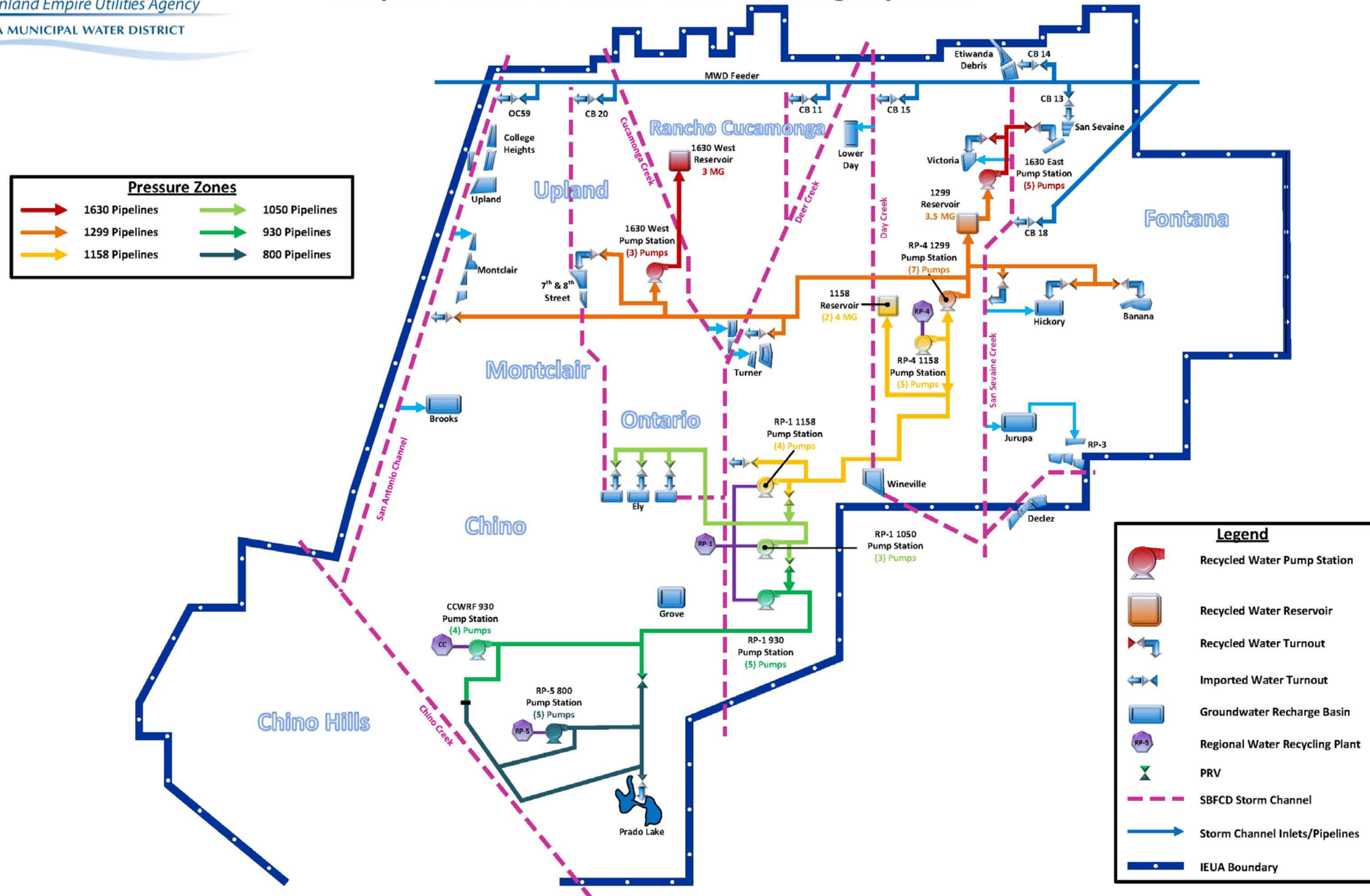


Figure 7-6: Recycled Water Distribution (RW) & Ground Water Recharge Systems (GWR) – Schematic

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Table 7-7: Recycled Water Distribution and Ground Water Recharge Systems – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|---|--|---------------------------|-------------------|------------------------------|------------|-----------|-----------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN14007 | Misc RW Projects | Misc RW Projects | CC | WC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | EN14010 | CM Misc RW Constr & Emergency Projects | CM Misc RW Constr & Emergency Projects | CC | WC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | EN14028 | Vulcan Pit Development | This project will convert the existing Vulcan mining pit into a functional 60-acre groundwater recharge basin. | CC | WC | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000 |
| 4 | EN14040 | Jurupa PS HVAC Improvements | VFD temperature control requires HVAC improvements. | CC | RW | 50,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50,000 |
| 5 | EN14041 | RP-4 1158 and 1299 Pump Station Upgrades | Pump upgrades to increase capacity, and new backup generator. | CC | WC | 50,000 | 550,000 | 3,000,000 | 2,000,000 | 0 | 0 | 0 | 0 | 0 | 0 | 5,600,000 |
| 6 | EN14042 | RP-1 1158 Pump Station Improvements | Pump station improvements to increase capacity. | CC | WC | 100,000 | 550,000 | 3,000,000 | 350,000 | 0 | 0 | 0 | 0 | 0 | 0 | 4,000,000 |
| 7 | EN14043 | RP-5 Pipeline Bottleneck | Evaluation of additional recycled water pipeline leaving RP-5 to allow more recycled water to be delivered from this facility into the 800 Pressure Zone. | CC | WC | 100,000 | 550,000 | 300,000 | 350,000 | 0 | 0 | 0 | 0 | 0 | 0 | 1,300,000 |
| 8 | EN14044 | RW Hydraulic Modeling | RW Hydraulic Modeling | CC | WC | 75,000 | 33,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108,000 |
| 9 | EN14045 | RW Program Strategy | RW Program Strategy | CC | WC | 35,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35,000 |
| 10 | EN14047 | GWR & RW SCADA Control Equipment Upgrades | This project will upgrade SCADA control system for all GWR and RW facilities. | CC | WC | 500,000 | 302,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 802,000 |
| 11 | CW15016 | RW OE Projects | RW OE Projects | OM | WC | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 500,000 |
| 12 | EN06025 | Wineville Extension Pipeline Segment A | A new 24-inch recycled water pipeline along Wineville Ave. from Airport Dr. to Jurupa St. continuing with a new 36-inch recycled water pipeline to RP-3 Groundwater Recharge Basin. The project includes a recycled water turnout to feed RP-3 Basin and a turnout to feed Declez Basin. | CC | WC | 3,000,000 | 12,700,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15,700,000 |
| 13 | EN07010 | CCWRF Pump Station Expansion | The pump station is being upgraded with five new, more efficient pumps: · (2) 300 hp vertical-turbine, VFD-driven, 2,585 gpm pumps · (3) 300 hp vertical-turbine, constant | CC | WC | 50,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|--|--|---------------------------|-------------------|------------------------------|-----------|---------|---------|---------|---------|-----------|-----------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| | | | speed, 2,585 gpm pumps | | | | | | | | | | | | | |
| 14 | EN09007 | 1630 East Reservoir & Segment B Pipeline | Construction of about 11,000 LF of 36-inch pipeline from the Segment A pipeline end to the new 1630 East Reservoir. Construction of an 8.0 MG recycled water reservoir at the Lloyd Michael's Water Treatment Plant. | CC | WC | 0 | 0 | 0 | 0 | 0 | 0 | 663,000 | 3,813,000 | 925,000 | 0 | 5,401,000 |
| 15 | EN12014 | 1630 East Pipeline Relocation | The project will relocate the 1630 East Pipeline at Baseline Ave. and East Ave to allow for improvements to the 15 freeway off-ramp. | CC | WC | 400,000 | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500,000 |
| 16 | EN12016 | North CIM Lateral | Construct recycled water lateral to the north side of CIM. | CC | WC | 100,000 | 110,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 210,000 |
| 17 | EN12019 | GWR & RW SCADA Communication System Upgrades | This project will upgrade the SCADA communication system for all GWR and RW facilities. | EQ | WC | 650,000 | 520,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,170,000 |
| 18 | EN13001 | San Sevaine Improvements | Project will modify the San Sevaine Basin Turnout to extend the discharge location from San Sevaine Cell No. 5 to the farthest north Cell No. 1. | CC | WC | 100,000 | 1,040,000 | 810,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,950,000 |
| 19 | EN13023 | 930 Pressure Zone Pipeline | Approximately 18,000 LF of 30-inch pipeline connects the CCWRF System Pipeline to the new 930 Reservoir. | CC | WC | 535,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 535,000 |
| 20 | EN13041 | RP-5 RW PS Process Control Sys Migration | Project to migrate the RP-5 RW PS to a Rockwell-based system. | CC | WC | 0 | 0 | 280,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 280,000 |
| 21 | EN15002 | 1158 Reservoir Site Cleanup Project | Cleanup associated with old piping and associated material. | CC | WC | 0 | 200,000 | 25,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 225,000 |
| 22 | EN16009 | CCWRF RW Flow Equalization | CCWRF RW Flow Equalization | CC | WC | 0 | 0 | 500,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500,000 |
| 23 | EN19002 | 800 Pressure Zone Reservoir | Construction of an 800 pressure zone reservoir in the City of Chino Hills. | CC | WC | 0 | 0 | 0 | 0 | 0 | 500,000 | 2,500,000 | 400,000 | 0 | 0 | 3,400,000 |
| 24 | EN19003 | RP-1 Parallel Outfall Pipeline | This project will provide for a parallel pipeline following the TP-1 out-fall Pipeline from RP-1 to Edison Ave. to address the existing pipeline capacity issues. | CC | WC | 0 | 0 | 0 | 0 | 0 | 500,000 | 4,000,000 | 1,200,000 | 0 | 0 | 5,700,000 |
| 25 | EN20001 | Lower Day Basin Pipeline | Construction of a pipeline to provide recycled water to Lower Day Basin. | CC | WC | 0 | 0 | 0 | 0 | 0 | 300,000 | 2,000,000 | 200,000 | 25,000 | 0 | 2,525,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|--|--|---------------------------|-------------------|------------------------------|-----------|-----------|---------|---------|---------|-----------|---------|-----------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 26 | EN20002 | Etiwanda Debris | Etiwanda Debris | CC | WC | 0 | 0 | 0 | 0 | 0 | 200,000 | 300,000 | 0 | 0 | 0 | 500,000 |
| 27 | EN20003 | Montclair Basin Pipeline | Construction of a pipeline to provide recycled water to Lower Day Basin. | CC | WC | 0 | 0 | 0 | 0 | 0 | 200,000 | 1,000,000 | 300,000 | 0 | 0 | 1,500,000 |
| 28 | EN20004 | Brooks Basin Improvements | Brooks Basin Improvements | CC | WC | 0 | 0 | 0 | 0 | 0 | 200,000 | 700,000 | 0 | 0 | 0 | 900,000 |
| 29 | EN20005 | 800 PZ-Bottleneck | Project to address hydraulic bottleneck(s) in the 800 pressure zone. | CC | WC | 0 | 0 | 0 | 0 | 0 | 150,000 | 500,000 | 300,000 | 350,000 | 0 | 1,300,000 |
| 30 | EN21001 | Upland Basin | Upland Basin | CC | WC | 0 | 0 | 0 | 0 | 0 | 0 | 500,000 | 300,000 | 2,200,000 | 0 | 3,000,000 |
| 31 | EN13045 | Wineville Extension Pipeline Segment B | A new 24-inch recycled water pipeline along Wineville Ave. from Airport Dr. to Jurupa St. continuing with a new 36-inch recycled water pipeline to RP-3 Groundwater Recharge Basin. The project includes a recycled water turnout to feed RP-3 Basin and a turnout to feed Declez Basin. | CC | WC | 3,000,000 | 8,794,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11,794,000 |
| 32 | EN13048 | Second 12 kV Feeder to TP-1 | Potential engineering project to provide a second 12 kV feeder to TP-1 to support the RP-1 1158 PS Upgrades. | CC | WC | 100,000 | 1,150,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,250,000 |
| 33 | WR15019 | RP-3 Basin Improvements | Groundwater Recharge Master Plan Update 2013 project #11. IEUA cost share= 50% total cost (committee approved 10/9/13; to board 10/16). | CC | WC | 200,000 | 5,090,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,290,000 |
| 34 | WR15020 | Victoria Basin Improvements | Groundwater Recharge Master Plan Update 2013 project #22a. IEUA cost share= 50% total cost (committee approved 10/9/13; to board 10/16) | CC | WC | 24,000 | 126,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150,000 |
| 35 | WR15021 | Napa Lateral | Napa Lateral | CC | WC | 50,000 | 3,150,000 | 2,800,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6,000,000 |
| 36 | RW15001 | Long-Term Basin-Wide 404 Permitting | Long-Term Basin-Wide 404 Permitting | OM | RW | 100,000 | 15,000 | 10,000 | 5,000 | 0 | 0 | 0 | 0 | 0 | 0 | 130,000 |
| 37 | EN15034 | CM Misc WC Construction & Emergency Proj FY2014/15 | CM Misc WC Construction & Emergency Proj FY2014/15 | CC | WC | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,500,000 |
| 38 | EN15035 | Misc RW Projects FY2014/15 | Misc RW Projects FY2014/15 | CC | WC | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 2,000,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|---|---|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 39 | RW15002 | Upper Santa Ana River Habitat Conservation Plan | Plan for the impact of federal endangered species regulation on future projects. Provide regional coordination of habitat mgmt. opportunities and access to a US Fish & Wildlife Service regional permit. | OM | RW | 150,000 | 10,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 160,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

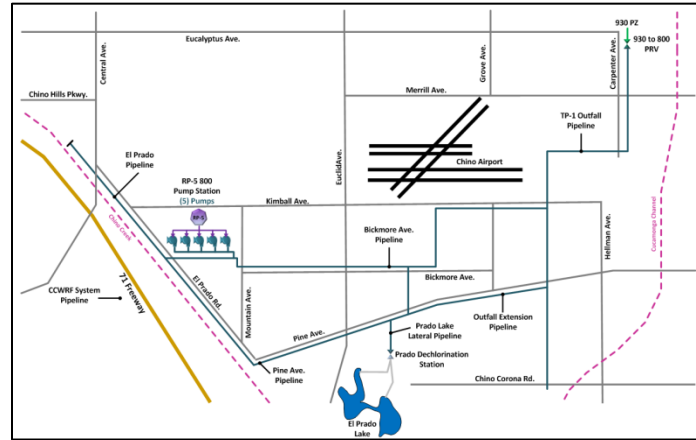
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

Asset Management System Summary –
RW/GWR

800 Pressure Zone

1. Asset Profile



RP-5 800 Pump Station

The RP-5 800 pump station provides recycled water to the 800 pressure zone for direct use by agricultural customers, the City of Chino, and San Bernardino County for feed water to El Prado Lake. The pump station is composed of five pumps:

- Two 150 hp vertical-turbine, VFD-driven, 1,925 gpm pumps
- Three 150 hp vertical-turbine, constant-speed, 1,925 gpm pumps

The RP5 800 pump station has two selectable automatic control philosophies:

- Wet Well Level Control – the pumps will be modulated to maintain an operator-adjustable wet-well level set point normally set at 14 feet.
- Pressure Control – the pumps will be modulated to maintain an operator-adjustable discharge-pressure set point normally set at 120 psi.

800 Pipelines

- TP-1 Outfall Pipeline – 15,700 linear feet (LF) of 30-inch pipeline from the 930 to 800 pressure reducing valve (PRV) to Chino Corona Rd.
- Outfall Extension Pipeline – 6,600 LF of 30-inch pipeline along Pine Ave. from the TP-1 outfall pipeline to the Prado Lake lateral, continuing with an additional 6,700 LF of 14-inch pipeline from the Prado Lake lateral to El Prado Golf Course.
- Prado Lake Lateral Pipeline – 535 LF of 30-inch pipeline from the outfall extension pipeline continuing with an additional 2,100 LF of 24-inch pipeline to the Prado Lake dechlorination station.
- Pine Ave. Pipeline – 2,200 LF of 16-inch pipeline from the El Prado Golf Course to RP-2.
- El Prado Pipeline – 12,800 LF of 10-inch pipeline from RP-2 to the Carbon Canyon Water Recycling Facility (CCWRF).
- Bickmore Pipeline – Consists of multiple pipeline segments including:
 - 5,500 LF of 18-inch pipeline along Kimball Ave. from the TP-1 outfall pipeline to Rincon Meadows Rd.
 - 5,600 LF of 18-inch pipeline along Rincon Meadows Rd. from Kimball Ave. to Bickmore Ave., continuing with an additional 1,550 LF of 12-inch pipeline from Bickmore Ave. to Pine Ave.
 - 6,300 LF of 30-inch pipeline along Bickmore Ave. from Rincon Meadows Rd. to San Antonio Ave.
 - 2,700 LF of 18-inch pipeline along Bickmore Ave. from San Antonio Ave. to Mountain Ave.
 - 2,500 LF of 18-inch pipeline from the intersection of Mountain Ave. and Bickmore Ave. to RP-5.
 - 1,000 LF of 10-inch pipeline from RP-5 to the El Prado pipeline.

Prado Dechlorination Station

The Prado dechlorination station provides dechlorinated recycled water to El Prado Lake. The station is composed of the following main components:

- A 12-inch flow-control sleeve valve with 14-inch magnetic flow meter and pressure transmitter.
- Two 5 gph sodium-bisulfite chemical metering pumps.
- Three 20 gph sodium-bisulfite chemical metering pumps.
- Two upstream chlorine analyzers.
- Two downstream chlorine analyzers biased to measure sodium bisulfite.

The flow control is automatically controlled to maintain either a flow control set point or an upstream pressure set point. The sodium-bisulfite chemical metering pumps are controlled to maintain a downstream sodium-bisulfite residual.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------|--|----------------------------|
| RP-5 800 Pumps | 2 @ 1,925 gpm 3 @ 1,925 gpm | VFD Constant |
| TP-1 Outfall Pipeline | 30-inch – 13,200 gpm | 6.0 ft/s max velocity (mv) |
| Outfall Extension Pipeline | 30-inch – 13,200 gpm 14-inch – 2,875 gpm | 6.0 ft/s mv |
| Prado Lake Lateral Pipeline | 30-inch – 13,200 gpm 24-inch – 8,500 gpm | 6.0 ft/s mv |
| Pine Ave. Pipeline | 16-inch – 3,755 gpm | 6.0 ft/s mv |
| El Prado Pipeline | 10-inch – 1,500 gpm | 6.0 ft/s mv |
| Bickmore Pipeline | 30-inch – 13,200 gpm 18-inch – 4,750 gpm 10-inch – 1,500 gpm | 6.0 ft/s mv |
| Prado Sleeve Valve | 300 – 14,000 gpm | |
| Prado SBS Pumps | 2 @ 0.5 – 5 gph 3 @ 2 – 20 gph | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-----------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-5 800 Pumps | 1 | 3 | 3 | 2 |
| TP-1 Outfall Pipeline | 3 | 3 | 3 | 2 |
| Outfall Extension Pipeline | 3 | 3 | 3 | 3 |
| Prado Lake Lateral Pipeline | 2 | 3 | 3 | 3 |
| Pine Ave. Pipeline | 2 | 3 | 3 | 3 |
| El Prado Pipeline | 2 | 3 | 3 | 3 |
| Bickmore Pipeline | 1 | 4 | 5 | 2 |
| Prado Sleeve Valve | 1 | 2 | 2 | 1 |
| Prado SBS Pumps | 1 | 2 | 2 | 1 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Bickmore Pipeline Capacity

At a maximum velocity of 6 ft/s, the 18-inch-diameter sections of the Bickmore pipeline have a capacity of 4,750 gpm. All recycled water supply from RP-5 is conveyed through the Bickmore pipeline; therefore, the current average daily RP-5 recycled water supply of 7,000 gpm exceeds the recommended capacity. In addition, when the RP-5 pump station is discharging 7,000 gpm, the discharge pressure at the pump station exceeds the pressure setting of the emergency pressure relief valve and discharges recycled water back into the RP-5 wet well.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-----------------------------|--------------------------------------|-----------------------------|
| RP-5 800 Pumps | 2011 | |
| TP-1 Outfall Pipeline | 1976 | |
| Outfall Extension Pipeline | 1977 | |
| Prado Lake Lateral Pipeline | 1977 | |
| Pine Ave. Pipeline | 2004 | |
| El Prado Pipeline | 1993 | |
| Bickmore Pipeline | 2006 | |
| Prado Sleeve Valve | 2011 | |
| Prado SBS Pumps | 2011 1996 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

Auxiliary Systems – 800 Pressure Zone

1. Asset Profile

RP-5 800 Pump Station

➤ *Electrical System* – The electrical energy to power the RP-5 800 pump station is obtained from the RP-5 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, biogas internal combustion engines, and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The biogas internal combustion engines are owned by the Agency, but leased to a private firm producing biogas at the RP-5 solids handling facility. The electrical feed from the grid is composed of two 12 kV feeders through the RP-5 treatment facility to Power Center 3, where transformers and switchgear are located to distribute electrical energy to the RP-5 800 pump station. A single line diagram of the RP-5 800 pump station electrical system is shown in Appendix B. Diesel emergency generators are used in the event of a power failure. Two 1.0 MW generators are located south of Power Center 3 and supply power to the RP-5 treatment facility including the RP-5 800 pump station.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the RP-5 800 pump station. All the processes of the pump station are observed and controlled by the RP-5 treatment facility SCADA system. Local control wiring is fed from the individual pieces of equipment to MCCs and input/output (I/O) hubs in Power Center 3. The I/O hubs then transmit the control data by fiber optic cable to the Foxboro SCADA servers.

Prado Dechlorination Station

➤ *Electrical System* – The electrical energy to power the Prado dechlorination station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 480 V feeder, a main power switch, and an automatic transfer switch before terminating in MCC-1. A single line diagram of the Prado dechlorination station electrical system is shown in Appendix B. A recently upgraded 27 kW Kohler diesel generator is located in the Prado sodium bisulfite pump room for use in a power failure.

➤ *Utility Water System* – The utility water system is supplied using recycled water from upstream of the sleeve valve and is used mainly for wash-down water in the pump and analyzer buildings. The piping consists of several isolation valves and point-of-use connections.

➤ *Potable Water System* – The potable water system is used throughout the Prado dechlorination station for restrooms, sinks, and eye-wash stations. The system is supplied from a service on Johnson Ave. from the City of Chino. The utility water system is supplied using recycled water from upstream of the sleeve valve and is used mainly for wash-down water in the pump and analyzer buildings. The piping consists of several isolation valves and point-of-use connections.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the Prado dechlorination station. All the processes of the dechlorination station are observed and controlled by the local programmable logic controller (PLC) system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and local PLC located in Control Panel 3300. Control data is then sent to RP-5 and RP-1 through a radio transmitter for remote access to the control system.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|------------------------------|
| RP-5 800 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 2 @ 12 kV to 480 V 1 @ 480 V 2 @ 480 V | 2 Feeders MCCs |
| Emergency Generation Generator | 2 @ 1,100 kW 1,490 Bhp | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A N/A 3 units 1 unit | RP-5 |
| Prado Dechlorination Station Electrical System Utility Voltage Transformers Switchgear Distribution | 480 V NA 1 @ 480 V 1 @ 480 V | 2 Feeders ATS MCCs |
| Emergency Generation Generator | 1 @ 27 kW 36 Bhp | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | CP 3300 CP 3300 |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-5 800 Pump Station | | | | |
| Electrical System | 1 | 2 | 2 | 2 |
| Instrumentation and Control System | 2 | 3 | 2 | 3 |
| Prado Dechlorination Station | | | | |
| Electrical System | 3 | 3 | 3 | 3 |
| Utility Water System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 2 | 1 | 2 | 1 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Electrical System

No issues require specific attention.

Utility Water System

No issues require specific attention.

Potable Water System

No issues require specific attention.

Instrumentation and Control System

No issues require specific attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| RP-5 800 Pump Station | | |
| Electrical System | 2004 2010 | |
| Instrumentation and Control System | 2004 2010 | |
| Prado Dechlorination Station | | |
| Electrical System | 1990 | |
| Utility Water System | 1990 | |
| Potable Water System | 1990 | |
| Instrumentation and Control System | 1990 2011 | |

Table 4 Potential Projects

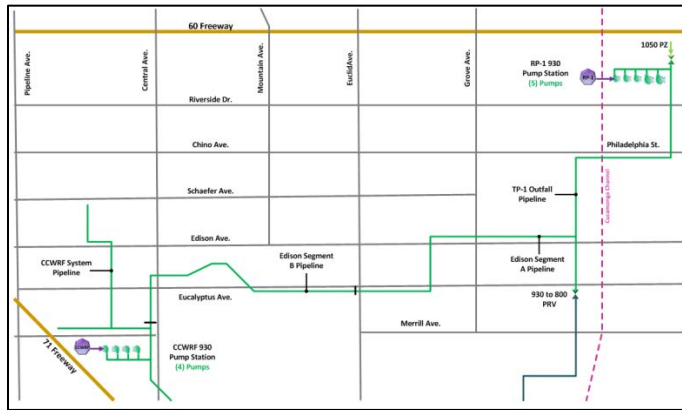
| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

930 Pressure Zone

1. Asset Profile



RP-1 930 Pump Station

The RP-1 930 pump station provides recycled water to the 930 pressure zone for direct use by agricultural customers, the City of Chino, and the City of Chino Hills. The pump station is composed of five pumps:

- Three 150 hp vertical-turbine, VFD-driven, 2,790 gpm pumps
- Two 500 hp vertical-turbine, VFD-driven, 9,330 gpm pumps

The RP-1 930 pump station is automatically controlled to maintain a discharge-pressure set point of about 55 psi.

CCWRF 930 Pump Station

The CCWRF 930 pump station provides recycled water to the 930 pressure zone for direct use by agricultural customers, the City of Chino, and the City of Chino Hills. The pump station is composed of (4) 200 hp vertical-turbine, VFD-driven, 2,000 gpm pumps. The CCWRF 930 pump station is automatically controlled to cycle pumps on and off based on level set points of the RP-1 recycled water wet well.

930 Pipelines

- *CCWRF System Pipeline* – 2,300 LF of 30-inch pipeline from CCWRF to the intersection of Monte Vista Ave. and Chino Hills Parkway, continuing with an additional 5,200 LF of 20-inch pipeline along Monte Vista Ave. between Chino Hills Parkway and Edison Ave.
- *Edison Segment A Pipeline* – 18,500 LF of 30-inch pipeline from the intersection of Chino Hills Parkway and Telephone Ave. to the intersection of Euclid Ave. and Eucalyptus Ave.
- *Edison Segment B Pipeline* – 15,900 LF of 30-inch from the intersection of Euclid Ave. and Eucalyptus Ave. to the TP-1 outfall pipeline.
- *TP-1 Outfall Pipeline* – 12,800 LF of 30-inch pipeline from RP-1 to the 930 to 800 pressure reducing valve (PRV).

930 to 800 Pressure Reducing Valve (PRV)

The 930 to 800 PRV is located at the intersection of Eucalyptus Ave. and Carpenter Ave. and is used to maintain the downstream pressure in the 800 pressure zone. The system includes a 16-inch Cla-Val PRV, flow meter, and pressure transmitter. The system has a design flow range of 200 gpm to 14,000 gpm.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------------|--|---------------------------|
| RP-1 930 Pumps | 3 @ 2,790 gpm 2 @ 9,330 gpm | VFD VFD |
| CCWRF 930 Pumps | 4 @ 2,000 gpm | VFD |
| CCWRF System Pipeline | 30 -inch – 13,200 gpm 20-inch – 5,900 gpm | 6.0 ft/s max velocity(mv) |
| Edison Segment A Pipeline | 30-inch – 13,200 gpm | 6.0 ft/s mv |
| Edison Segment B Pipeline | 30-inch – 13,200 gpm | 6.0 ft/s mv |
| TP-1 Outfall Pipeline | 30-inch – 13,200 gpm | 6.0 ft/s mv |
| 930 to 800 PRV | 200 – 14,000 gpm | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|---------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-1 930 Pumps | 2 | 3 | 2 | 3 |
| CCWRF 930 Pumps | 3 | 4 | 4 | 3 |
| CCWRF System Pipeline | 2 | 3 | 3 | 2 |
| Edison Segment A Pipeline | 2 | 3 | 3 | 1 |
| Edison Segment B Pipeline | 2 | 3 | 3 | 1 |
| TP-1 Outfall Pipeline | 4 | 5 | 4 | 1 |
| 930 to 800 PRV | 1 | 3 | 2 | 1 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

TP-1 Outfall Pipeline Capacity

During high recycled-water-demand periods, it has been common to flow more than 18,000 gpm through this pipeline to maintain system pressures. This equates to a flow velocity of more than 8 ft/s, which is not recommended for long-term operation. Because of the age of the pipeline and the operational requirements placed on the pipeline, condition assessment should be performed.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|---------------------------|--------------------------------------|-----------------------------|
| RP-1 930 Pumps | 2007 2012 | |
| CCWRF 930 Pumps | 2000 | |
| CCWRF System Pipeline | 2000 | |
| Edison Segment A Pipeline | 2006 | |
| Edison Segment B Pipeline | 2006 | |
| TP-1 Outfall Pipeline | 1976 | |
| 930 to 800 PRV | 2007 2013 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

Auxiliary Systems – 930 Pressure Zone

1. Asset Profile

RP-1 930 Pump Station

➤ *Electrical System – The electrical energy to power the RP-1 930 pump station is obtained from the RP-1 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 power reliability building (PRB), where transformers and switchgear are located to distribute electrical energy throughout the facility. TP-1 and the RP-1 930 pump station are powered through the H9 breaker. A single line diagram of the RP-1 930 pump station electrical system is shown in Appendix B. The RP-1 treatment facility has three 1.25 MW diesel generators located in the PRB, and TP-1 has one 670 kW diesel generator; however, these generators were not designed to maintain operation of the recycled water pump stations during a power failure.*

➤ *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-1 930 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to I/O hub and PLC in the RP-1 930 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

CCWRF 930 Pump Station

➤ *Electrical System – The electrical energy to power the CCWRF 930 pump station is obtained from the CCWRF treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the CCWRF electrical room, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the CCWRF 930 pump station electrical system is shown in Appendix B. The CCWRF treatment facility has one 1.50 MW diesel generator located in the main electrical room; however, this generator was not designed to maintain operation of the recycled water pump station during a power failure.*

➤ *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the CCWRF 930 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the CCWRF recycled-water pump-station control room. Fiber optic cable is then used to connect the local PLC to the CCWRF radio transmitter to send the signal to the new recycled-water master server located at RP-1.*

930 to 800 Pressure Reducing Valve (PRV)

➤ *Electrical System – The electrical energy to power the 930 to 800 PRV station is obtained from onsite energy generation located in the PRV and stored in onsite 12 V batteries. There is no electrical feed from the grid. A single line diagram of the 930 to 800 PRV station electrical system is shown in Appendix B. There is no emergency generation for this site.*

➤ *Instrumentation and Control System – Control of the PRV is maintained hydraulically and does not require an automated control*

system. System flow and pressure are monitored at the 930 to 800 PRV. Local wiring is fed from the individual pieces of equipment to a local PLC. The PLC is connected to a remote telemetry unit, which transmits the signals back to RP-1 over a 4G data network to the GWR PLC.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|-------------------------------|
| RP-1 930 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 2 @ 12 kV to 480 V 1 @ 480 V 1 @ 480 V | 2 Feeders MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | RP-1 |
| CCWRF 930 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 1 @ 12 kV to 480 V N/A 1 @ 480 V | MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | LCP 1200 LCP 1200 CCWRF |
| 930 to 800 PRV Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 V DC N/A N/A N/A | Onsite Generation |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | N/A 1 unit 1 unit N/A N/A | 4G |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-1 930 Pump Station | | | | |
| Electrical System | 3 | 2 | 3 | 4 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| CCWRF 930 Pump Station | | | | |
| Electrical System | 3 | 3 | 3 | 4 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| 930 to 800 PRV Station | | | | |
| Electrical System | 1 | 3 | 3 | 3 |
| Instrumentation and Control System | 1 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

RP-1 930 Pump Station Emergency Generation

RP-1 has three emergency diesel generators, and TP-1 has one emergency diesel generator to produce an effective electrical load of 3.5 MW. RP-1 has a varying electrical demand, ranging from 3.0 MW to as high as 4.8 MW depending on the amount of recycled water pumped. Therefore, RP-1 typically does not have the emergency generation capability to power the three recycled water pump stations located at the facility. The Agency would not be able to maintain the operation of the recycled water system if a sustained loss of utility power were to occur.

CCWRF 930 Pump Station Emergency Generation

CCWRF has one emergency diesel generator rated to produce an electrical load of 1.5 MW. CCWRF has a base electrical demand, without recycled water pumping, ranging from 600 kW to 800 kW. The expansion of the CCWRF recycled water pump station will provide five 300 hp pumps for a total power demand of about 1,100 kW. Therefore, the CCWRF emergency diesel generator will not be able to provide the required electrical load for CCWRF and the maximum production of the recycled water pump station.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| RP-1 930 Pump Station | | |
| Electrical System | 2007 | |
| Instrumentation and Control System | 2007 2012 | |
| CCWRF 930 Pump Station | | |
| Electrical System | 2000 2014 | |
| Instrumentation and Control System | 2000 2014 | |
| 930 to 800 PRV Station | | |
| Electrical System | 2013 | |
| Instrumentation and Control System | 2013 | |

Table 4 Potential Projects

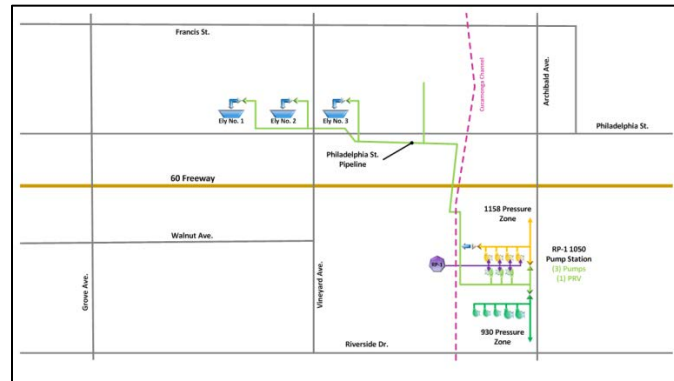
| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

1050 Pressure Zone

1. Asset Profile



RP-1 1050 Pump Station

The RP-1 1050 pump station provides recycled water to the RP-1 utility water system, the 1050 pressure zone for direct use by the City of Ontario, and to Ely Basin for groundwater recharge. The pump station is composed of three 350 hp vertical-turbine pumps, VFD-driven, 3,750 gpm pumps. The 1050 pump station is automatically controlled to maintain a discharge-pressure set point of about 115 psi.

1050 Pipelines

Philadelphia Street Pipeline – 2,650 LF of 30-inch pipeline from the 1050 pump station to the 60 freeway, continuing with an additional 6,950 LF of 24-inch pipeline to Ely Basin No. 1.

1050 to 930 Pressure Reducing Valve (PRV)

The 1050 to 930 PRV is located at RP-1 and is used to transfer excess recycled water from the 1050 pressure zone to the 930 pressure zone when low pressures are experienced in the 930 pressure zone. The system includes a 24-inch Cla-Val PRV and 24-inch magnetic flow meter. The system has an operating flow range from 700 gpm to 20,000 gpm.

Ely Basin Turnouts

This system is composed of three separate turnouts, each including a 12-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to Ely Basin Nos. 1, 2, and 3. Each turnout is designed for flow rates ranging from 700 gpm to 3,100 gpm.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------------|---|-------------|
| RP-1 1050 Pumps | 3 @ 3,750 gpm | VFD |
| Philadelphia St. Pipeline | 30-inch – 13,200 gpm 24-inch – 8,500 gpm | 6.0 ft/s mv |
| 1050 to 930 PRV | 700 – 20,000 gpm | |
| Ely Basin Turnouts | 3 @ 700 – 3,100 gpm | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|---------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-1 1050 Pumps | 2 | 3 | 2 | 3 |
| Philadelphia St. Pipeline | 2 | 2 | 2 | 1 |
| 1050 to 930 PRV | 2 | 3 | 2 | 2 |
| Ely Basin Turnouts | 3 | 3 | 4 | 4 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Ely Basin Turnouts

Remote control of the Ely basin turnouts have been lost, preventing shutdown of recycled water to these basins during low-supply events. Currently, the valves have to be opened and closed locally in the field. Valves need to be repaired to allow remote operation.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|---------------------------|--------------------------------------|-----------------------------|
| RP-1 1050 Pumps | 2004 | |
| Philadelphia St. Pipeline | 2005 | |
| 1050 to 930 PRV | 2011 | |
| Ely Basin Turnouts | 2005 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

Auxiliary Systems – 1050 Pressure Zone

1. Asset Profile

RP-1 1050 Pump Station

➤ *Electrical System – The electrical energy to power the RP-1 1050 pump station is obtained from the RP-1 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 power reliability building (PRB), where transformers and switchgear are located to distribute electrical energy throughout the facility. TP-1 and the RP-1 1050 pump station are powered through the H9 breaker. A single line diagram of the RP-1 1050 pump station electrical system is shown in Appendix B. The RP-1 treatment facility has three 1.25 MW diesel generators located in the PRB, and TP-1 has one 670 kW diesel generator; however, these generators were not designed to maintain operation of the recycled water pump stations during a power failure.*

➤ *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-1 1050 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the RP-1 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

1050 to 930 PRV

➤ *Electrical System – The electrical energy to power the 1050 to 930 PRV is looped powered through the RP-1 1158 and 1050 pump station PLC. A single line diagram of the 1050 to 930 PRV electrical system is shown in Appendix B. Since the power draw to operate this system is negligible, the 670 kW TP-1 diesel generator will power the 1158 and 1050 pump station PLC during a power failure.*

➤ *Instrumentation and Control System – The 1050 to 930 PRV consists of a 24-inch Cla-val PRV with position indication and control and a 24-inch flow meter. All of the processes of the PRV are observed and controlled by the 1158 and 1050 pump station PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

Ely Basin Turnouts

➤ *Electrical System – The electrical energy to power the three Ely Basin recycled water turnouts is provided by three independent solar panels. A single line diagram of the Ely basin turnouts is shown in Appendix B. The turnouts do not have emergency power generation in case of power failure.*

➤ *Instrumentation and Control System – Each of the three Ely Basin recycled water turnouts has a 10dB yagi antenna that transmits control data to a PLC located at Ely Basin No. 1. The PLC at Ely Basin No. 1 then transmits control data back to the GWR workstation server located at RP-1 for remote access.*

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---|----------|
| RP-1 1050 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 2 @ 12 kV to 480 V 2 @ 480 V 1 @ 480 V | MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | RP-1 |
| 1050 to 930 PRV Electrical System Utility Voltage Transformers Switchgear Distribution | 120 V N/A N/A N/A | PLC Loop |
| Emergency Generation Generator | 1 @ 670 kW 896 Bhp | TP-1 |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | RP-1 |
| Ely Basin Turnouts Electrical System Utility Voltage Transformers Switchgear Distribution | 24 VDC N/A N/A N/A | Solar |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | N/A 1 unit 1 unit 1 unit 4 units | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-1 1050 Pump Station | | | | |
| Electrical System | 3 | 2 | 3 | 4 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| 1050 to 930 PRV | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Ely Basin Turnouts | | | | |
| Electrical System | 3 | 4 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

RP-1 1050 Pump Station Emergency Generation

RP-1 has three emergency diesel generators, and TP-1 has one emergency diesel generator to produce an effective electrical load of 3.5 MW. RP-1 has a varying electrical demand ranging from 3.0 MW to as high as 4.8 MW, depending on the amount of recycled water pumped. Therefore, RP-1 typically does not have the emergency generation capability to power the three recycled water pump stations located at the facility. Normally, the 1050 pump station supplies utility water for RP-1. Utility water is critical to maintain operation of the facility.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| RP-1 1050 Pump Station | | |
| Electrical System | 2004 | |
| Instrumentation and Control System | 2004 2008 | |
| 1050 to 930 PRV | | |
| Electrical System | 2011 | |
| Instrumentation and Control System | 2011 | |
| Ely Basin Turnouts | | |
| Electrical System | 2005 | |
| Instrumentation and Control System | 2005 | |

Table 4 Potential Projects

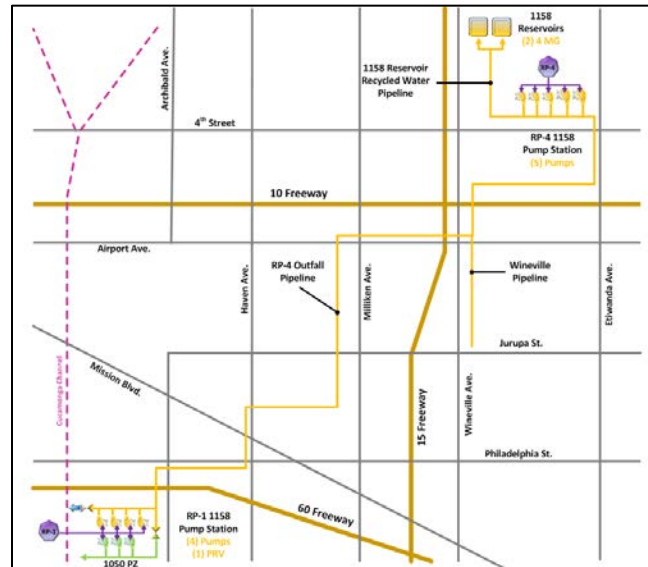
| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

1158 Pressure Zone

1. Asset Profile



1158 Reservoirs

The 1158 reservoirs provide recycled water supply to the 1299 pump station suction header and the 1158 pressure zone. The 1158 reservoirs are located at the intersection of Etiwanda Ave. and 6th St. in the City of Rancho Cucamonga within the GenON Power Generation Facility. Each 1158 reservoir has a design capacity of 4 million gallons (MG), a diameter of 145 feet, and a maximum water surface level of 34 feet, and each is equipped with a level transmitter, flow meter, and altitude valve. The 1158 reservoirs are normally operated between 4 feet and 32 feet, providing an operational capacity of 3.5 MG.

RP-4 1158 Pump Station

The RP-4 1158 pump station provides recycled water to the 1299 pump station suction header, to 1158 reservoirs, and to the 1158 pressure zone for direct use by the City of Fontana and the City of Ontario. The pump station is composed of five pumps:

- Three 200 hp vertical-turbine, VFD-driven, 2,500 gpm pumps
- Two 300 hp vertical-turbine, VFD-driven, 7,200 gpm pumps

The RP-4 1158 pump station is automatically controlled to maintain the level in the RP-4 effluent wet well structure.

RP-1 1158 Pump Station

The RP-1 1158 pump station provides recycled water to the 1299 pump station suction header, to 1158 reservoirs, and to the 1158 pressure zone for direct use by the City of Fontana and the City of Ontario. The pump station is composed of four 400 hp vertical-turbine, VFD-driven, 2,700 gpm pumps.

The RP-1 1158 pump station is automatically controlled to cycle pumps on and off to maintain a time-of-day level set point of the 1158 reservoirs. In addition, the pumps can automatically be switched to VFD control to maintain the RP-1 effluent wet well level when a low level setting is reached.

1158 Pipelines

➤ *RP-4 Outfall Pipeline* – 25,200 LF of 42-inch pipeline from RP-4 to the intersection of DuPont Ave. and Jurupa St., 15,000 LF of 36-inch pipeline from DuPont Ave. and Jurupa St. to the intersection of Archibald Ave. and Philadelphia Ave., and 4,200 LF of 42-inch pipeline from Archibald Ave. and Philadelphia Ave. to RP-1.

- *1158 Reservoir Pipeline* – 4,200 LF of 48-inch pipeline from RP-4 to the 1158 Reservoirs.
- *Wineville Pipeline* – 5,400 LF of 24-inch pipeline along Wineville Ave. from Airport Dr. to Jurupa St.

1158 to 1050 Pressure Reducing Valve (PRV)

The 1158 to 1050 PRV is located at RP-1 and used to transfer excess recycled water from the 1158 pressure zone to the 1050 pressure zone when the 1158 reservoirs reach a high level set point. The system includes a 16-inch Cla-Val PRV and 24-inch magnetic flow meter. The system has an operating flow range from 300 gpm to 17,000 gpm.

RP-4 Energy Displacement Valves (EDV)

The RP-4 EDVs are located at RP-1 and used to discharge excess recycled water when the 1158 reservoirs reach a high level set point. The excess recycled water is treated through the RP-1 north dechlorination structure before being discharged to the Cucamonga Channel. The turnout includes two 16-inch motor-operated globe-style EDVs, flow meter, and bypass pipeline. Each EDV has an operating flow range from 500 gpm to 11,000 gpm.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-------------------------|--|-------------------|
| 1158 Reservoirs | 2 @ 4 MG | 3.5 MG (Op. Cap.) |
| RP-4 1158 Pumps | 3 @ 2,500 gpm 2 @ 7,200 gpm | VFD VFD |
| RP-1 1158 Pumps | 4 @ 2,700 gpm | VFD |
| RP-4 Outfall Pipeline | 42-inch – 25,900 gpm 36-inch – 19,000 gpm | 6.0 ft/s mv |
| 1158 Reservoir Pipeline | 33,800 gpm | 6.0 ft/s mv |
| Wineville Pipeline | 8,500 gpm | 6.0 ft/s mv |
| 1158 to 1050 PRV | 300 – 17,000 gpm | |
| RP-4 EDVs | 2 @ 500–11,000 gpm | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| 1158 Reservoirs | 1 | 4 | 2 | 1 |
| RP-4 1158 Pumps | 2 | 2 | 2 | 3 |
| RP-1 1158 Pumps | 2 | 3 | 2 | 3 |
| RP-4 Outfall Pipeline | 3 | 2 | 3 | 4 |
| 1158 Reservoir Pipeline | 2 | 2 | 2 | 2 |
| Wineville Pipeline | 2 | 3 | 3 | 2 |
| 1158 to 1050 PRV | 2 | 2 | 2 | 3 |
| RP-4 EDVs | 3 | 2 | 2 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

RP-4 Outfall Pipeline Condition Assessment

In 2004, the RP-4 outfall pipeline was converted from a gravity pipeline to a pressure pipeline to create the 1270 recycled water pressure zone. Pressure at RP-1 was normally in excess of 200 psi, which is within the pressure class of the pipeline; however, multiple joint failures of the 42-inch pipeline have occurred, requiring emergency repairs to the system. In late 2008, the pipeline was converted to the 1158 recycled water pressure zone. A condition assessment may be warranted as a result of the number of pipeline failures.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-------------------------|--------------------------------------|-----------------------------|
| 1158 Reservoirs | 2008 | |
| RP-4 1158 Pumps | 2004 2008 | |
| RP-1 1158 Pumps | 2004 2006 2008 | |
| RP-4 Outfall Pipeline | 1998 | |
| 1158 Reservoir Pipeline | 2004 | |
| Wineville Pipeline | 2004 | |
| 1158 to 1050 PRV | 2011 | |
| RP-4 EDVs | 1998 2005 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

Auxiliary Systems – 1158 Pressure Zone

1. Asset Profile

RP-4 1158 Pump Station

➤ *Electrical System* – The electrical energy to power the RP-4 1158 pump station is obtained from the local electrical grid (SCE) and from onsite energy generation (wind and emergency generators). The solar and wind assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switch gear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-4 electrical system is shown in Appendix B. The RP-4 treatment facility has one 2.0 MW diesel generator located in the northern portion of the facility; however, the generator was not designed to maintain operation of the recycled water pump stations during a power failure.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the RP-4 1158 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the RP-4 1158 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-4 server workstation for remote access.

RP-1 1158 Pump Station

➤ *Electrical System* – The electrical energy to power the RP-1 1158 pump station is obtained from the RP-1 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 power reliability building (PRB), where transformers and switchgear are located to distribute electrical energy throughout the facility. TP-1 and the RP-1 1158 pump station are powered through the H9 breaker. A single line diagram of the RP-1 1158 pump station electrical system is shown in Appendix B. The RP-1 treatment facility has three 1.25 MW diesel generators located in the PRB, and TP-1 has one 670 kW diesel generator; however, these generators were not designed to maintain operation of the recycled water pump stations during a power failure.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the RP-1 1158 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.

1158 Reservoirs

➤ *Electrical System* – The electrical energy to power the 1158 reservoirs is obtained from the local electrical grid (SCE), which is composed of a 120 V feeder to a local control panel on 6th Street. A single line diagram of the RP-1 1158 pump station electrical system is shown in Appendix B. The 1158 reservoirs do not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Level, flow, and valve position are monitored at the 1158 reservoirs. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158

reservoir local control panel. Fiber optic cable is then used to connect the local PLC to the RP-4 server workstation for remote access.

1158 to 1050 PRV

➤ *Electrical System* – The electrical energy to power the 1158 to 1050 PRV is looped powered through the 1158 and 1050 pump station PLC. A single line diagram of the 1158 to 1050 PRV electrical system is shown in Appendix B. Since the power draw to operate this system is negligible, the 670 kW TP-1 diesel generator will power the 1158 and 1050 pump station PLC during a power failure.

➤ *Instrumentation and Control System* – The 1158 to 1050 PRV consists of a 16-inch Cla-val PRV with position indication and control and a 24-inch flow meter. All of the processes of the PRV are observed and controlled by the 1158 and 1050 pump station PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.

1. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|--|---------------------|
| RP-4 1158 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator | 12 kV 4 @ 12 kV to 480 V 1 @ 480 V 2 @ 480 V 1 @ 2,000 kW 2,847 Bhp | MCCs Small Pumps |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | PLC 5 RP-4 |
| RP-1 1158 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator | 12 kV 2 @ 12 kV to 480 V 2 @ 480 V 1 @ 480 V N/A | MCCs |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | RP-1 |
| 1158 Reservoirs Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator Instrumentation and Control System | 120 V N/A N/A N/A N/A N/A | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|------------------|
| HMI Workstation RTU PLC I/O Hub Radio Transmitter | N/A 1 unit 1 unit 1 unit | PLC 5C RP-4 |
| 1158 to 1050 PRV Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator | 120 V N/A N/A N/A 1 @ 670 kW 896 Bhp | PLC Loop TP-1 |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | RP-1 |

2. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-4 1158 Pump Station | | | | |
| Electrical System | 2 | 2 | 3 | 4 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| RP-1 1158 Pump Station | | | | |
| Electrical System | 2 | 3 | 3 | 4 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| 1158 Reservoirs | | | | |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| 1158 to 1050 PRV | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

3. Key Issues for Further Investigation

RP-4 1158 Pump Station Emergency Generation

RP-4 has one 2.0 MW emergency diesel generator. The generator can produce only enough power to reliably power the RP-4 1158 small pumps, reducing the overall capacity of the pump station. The RP-4 1158 pump station is the only discharge location for the facility; therefore, a utility power failure will reduce the discharge capacity for the facility.

RP-1 1158 Pump Station Emergency Generation

RP-1 has three emergency diesel generators, and TP-1 has one emergency diesel generator to produce an effective electrical load of 3.5 MW. RP-1 has a varying electrical demand, ranging from 3.0 MW to as high as 4.8 MW depending on the amount of recycled water pumped. Therefore, RP-1 typically does not have the emergency generation capability to power the three recycled water pump stations located at the facility.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| RP-4 1158 Pump Station | | |
| Electrical System | 2004 2008 | |
| Instrumentation and Control System | 2004 2008 | |
| RP-1 1158 Pump Station | | |
| Electrical System | 2004 2006 | |
| Instrumentation and Control System | 2004 2008 | |
| 1158 Reservoirs | | |
| Electrical System | 2008 | |
| Instrumentation and Control System | 2008 | |
| 1158 to 1050 PRV | | |
| Electrical System | 2011 | |
| Instrumentation and Control System | 2011 | |

Table 4 Potential Projects

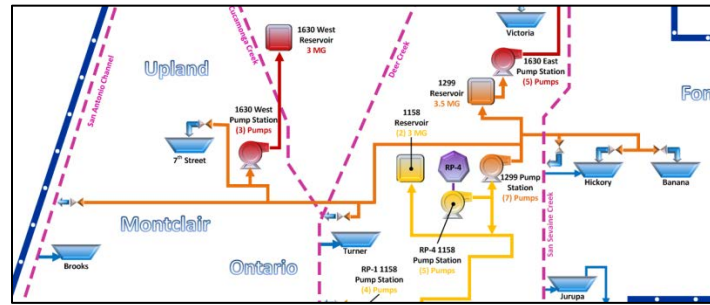
| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

1299 Pressure Zone

1. Asset Profile



1299 Reservoir

The 1299 reservoir provides recycled water supply to the 1630 east pump station suction header and the 1299 pressure zone. The 1299 reservoir is located at the intersection of East Ave. and Baseline Ave. in the City of Rancho Cucamonga on an existing Cucamonga Valley Water District (CVWD) potable water reservoir site. The 1299 reservoir has a design capacity of 3.5 million gallons (MG), a diameter of 165 feet, and a maximum water surface level of 22 feet, and is equipped with a level transmitter. The 1299 reservoir is normally operated between 4 feet and 20 feet, providing an operational capacity of 2.6 MG.

RP-4 1299 Pump Station

The RP-4 1299 pump station provides recycled water to the 1299 pressure zone for direct use by CVWD, Monte Vista Water District (MVWD), the City of Fontana, the City of Ontario, and the City of Upland, and for groundwater recharge at Brooks Basin, 8th St. Basin, Turner Basin, Hickory Basin, Banana Basin, Jurupa Basin, and RP-3 Basin. The pump station is composed of seven pumps:

- Two 350 hp horizontal-split case, VFD-driven, 4,185 gpm pumps
- Five 350 hp horizontal-split case, VFD-driven, 4,600 gpm pumps

The 1299 pump station is automatically controlled to cycle pumps on and off to maintain a time-of-day level set point of the 1299 reservoir.

1299 Pipelines

- *Etiwanda Pipeline* – 4,100 LF of 36-inch pipeline along Etiwanda Ave. from RP-4 to Whittram Ave.
- *North Etiwanda Pipeline* – 1,800 LF of 42-inch pipeline along Etiwanda Ave. from Whittram Ave. to Arrow Route.
- *Whittram Avenue Pipeline* – 7,500 LF of 16-inch along Whittram Ave. from Etiwanda Ave. to Banana Basin.
- *1299 Zone Recycled Water Pipeline* – 12,500 LF of 36-inch pipeline from the termination of the North Etiwanda Pipeline to the 1299 Reservoir.
- *RP-4 West Extension Phase I Pipeline* – 14,200 LF of 30-inch pipeline along 6th St. from Etiwanda Ave. to Cleveland Ave.
- *RP-4 West Extension Phase II Pipeline* – 10,400 LF of 30-inch pipeline from the termination of the RP-4 West Extension Phase I Pipeline at 6th St. and Cleveland Ave. to Archibald Ave. and 4th St., continuing with an additional 2,200 LF of 24-inch pipeline to 4th St. and Cucamonga Creek.
- *San Antonio Channel Segment A Pipeline* – 14,900 LF of 24-inch pipeline from the termination of the RP-4 West Extension Phase II pipeline at 4th St. and Cucamonga Creek to I St. and Sultana Ave.
- *San Antonio Channel Segment B Pipeline* – 12,200 LF of 30-inch pipeline from the termination of the San Antonio Channel Segment A Pipeline at I St. and Sultana Ave. to San Bernardino Ave. and Benson Ave., continuing with an additional 11,250 LF of 24-inch pipeline to Orchard St. Turnout.
- *7th and 8th St. Pipeline* – 10,500 LF of 16-inch pipeline from 4th St. and Corona Ave. to 8th St. Basin turnout.

Force Main Manifold (FMM) Turnout

The turnout includes two 12-inch motor-operated butterfly valves, a flow meter, and a pressure transmitter to provide recycled water to Hickory Basin and Banana Basin. The turnout is designed for flow rates ranging from 200 gpm to 6,000 gpm.

San Sevaine Channel Turnout

The turnout includes a 10-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to San Sevaine Channel. Recycled water discharged in the channel can then be conveyed to Hickory Basin or to Jurupa Basin for groundwater recharge. The turnout is designed for flow rates ranging from 200 gpm to 2,200 gpm.

Turner Basin Turnout

The turnout includes a 10-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to Deer Creek. Recycled water discharged in the lined creek can then be conveyed to Turner Basin Nos. 3 and 4 for groundwater recharge. The turnout is designed for flow rates ranging from 300 gpm to 3,500 gpm.

8th St. Basin Turnout

The turnout includes a 12-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to 8th St. Basin. The turnout is designed for flow rates ranging from 200 gpm to 3,000 gpm.

Orchard Turnout

The turnout includes a 16-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to San Antonio Channel. Recycled water discharged in the channel can then be conveyed to Brooks Basin for groundwater recharge. The turnout is designed for flow rates ranging from 1,000 gpm to 10,000 gpm.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---|----------------------------|
| 1299 Reservoir | 3.5 MG | 2.6 MG (Op. Cap.) |
| RP-4 1299 Pumps | 2 @ 4,185 gpm 5 @ 4,600 gpm | |
| Etiwanda Pipeline | 19,000 gpm | 6.0 ft/s max velocity(mv) |
| North Etiwanda Pipeline | 25,900 gpm | 6.0 ft/s mv |
| Whittram Ave. Pipeline | 3,750 gpm | 6.0 ft/s mv |
| 1299 Zone Recycled Water Pipeline | 19,000 gpm | 6.0 ft/s mv |
| RP-4 West Extension Phase I Pipeline | 13,200 gpm | 6.0 ft/s mv |
| RP-4 West Extension Phase II Pipeline | 30-inch – 13,200 gpm 24-inch – 8,500 gpm | 6.0 ft/s mv |
| San Antonio Channel Segment A Pipeline | 8,500 gpm | 6.0 ft/s mv |
| San Antonio Channel Segment B Pipeline | 30-inch – 13,200 gpm 24-inch – 8,500 gpm | 6.0 ft/s mv |
| 7 th & 8 th St. Pipeline | 3,750 gpm | 6.0 ft/s mv |
| FMM Turnout | 200 – 6,000 gpm | Hist. Data |
| San Sevaine Channel Turnout | 200 – 2,200 gpm | Hist. Data |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------------|---------------------------------------|------------|
| Turner Basin Turnout | 300 – 3,500 gpm | Hist. Data |
| 8 th St. Basin Turnout | 200 – 3,000 gpm | Des. Spec. |
| Orchard Turnout | 1,000 – 10,000 gpm | Des. Spec. |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| 1299 Reservoir | 1 | 2 | 2 | 1 |
| RP-4 1299 Pumps | 2 | 1 | 1 | 3 |
| Etiwanda Pipeline | 2 | 3 | 2 | 2 |
| North Etiwanda Pipeline | 2 | 2 | 2 | 2 |
| Whittram Ave. Pipeline | 2 | 4 | 2 | 2 |
| 1299 Zone Recycled Water Pipeline | 2 | 2 | 2 | 2 |
| RP-4 West Ext. Phase I Pipeline | 2 | 3 | 2 | 2 |
| RP-4 West Ext. Phase II Pipeline | 2 | 3 | 2 | 2 |
| San Antonio Channel Segment A Pipeline | 2 | 3 | 2 | 2 |
| San Antonio Channel Segment B Pipeline | 3 | 3 | 2 | 2 |
| 7 th & 8 th St. Pipeline | 2 | 4 | 2 | 2 |
| FMM Turnout | 3 | 3 | 2 | 3 |
| San Sevaine Channel Turnout | 1 | 1 | 1 | 3 |
| Turner Basin Turnout | 1 | 3 | 3 | 3 |
| 8 th St. Basin Turnout | 3 | 3 | 4 | 3 |
| Orchard Turnout | 1 | 2 | 2 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Recycled Water Turnout Functionality

Remote control of the 8th St. turnout and Hickory butterfly valve at FMM has been lost, preventing shutdown of recycled water to these basins during low-supply events. Currently, the valves have to be opened and closed locally in the field. Valves need to be repaired to allow remote operation.

7th and 8th St. Pipeline Capacity

At a maximum velocity of 6 ft/s, the 7th and 8th St. pipeline has a capacity of 3,750 gpm. The 8th St. basin turnout has a maximum flow of 3,000 gpm, and the 1630 west recycled water pump station has a maximum flow of 4,000 gpm. Therefore, the 1630 west recycled water pump station and 8th St. basin turnout cannot be operated simultaneously without exceeding the maximum recommended velocity of the pipeline.

Whittram Ave. Pipeline Capacity

At a maximum velocity of 6 ft/s, the Whittram Ave. pipeline has a capacity of 3,750 gpm. The San Sevaine Channel turnout has a maximum flow of 2,200 gpm, and the FMM turnout has a maximum flow of 6,000 gpm, which exceeds the Whittram Ave. pipeline maximum recommended velocity.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--|--------------------------------------|-----------------------------|
| 1299 Reservoir | 2011 | |
| RP-4 1299 Pumps | 2008 | |
| Etiwanda Pipeline | 2003 | |
| North Etiwanda Pipeline | 2008 | |
| Whittram Ave. Pipeline | 2004 | |
| 1299 Zone Recycled Water Pipeline | 2011 | |
| RP-4 West Ext. Phase I Pipeline | 2005 | |
| RP-4 West Ext. Phase II Pipeline | C2006 | |
| San Antonio Channel Segment A Pipeline | 2007 | |
| San Antonio Channel Segment B Pipeline | 2007 | |
| 7 th & 8 th St. Pipeline | 2007 | |
| FMM Turnout | 2006 | |
| San Sevaine Channel Turnout | 2006 | |
| Turner Basin Turnout | 2006 | |
| 8 th St. Basin Turnout | 2007 | |
| Orchard Turnout | 2007 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

Auxiliary Systems – 1299 Pressure Zone

1. Asset Profile

RP-4 1299 Pump Station

➤ *Electrical System* – The electrical energy to power the RP-4 1299 pump station is obtained from the RP-4 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (wind and emergency generators). The wind assets are owned and operated by a private firm as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switch gear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-4 electrical system is shown in Appendix B. The RP-4 treatment facility has one 2.0 MW diesel generator located in the northern portion of the facility; however, the generator was not designed to maintain operation of the recycled water pump stations during a power failure.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the RP-4 1299 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the RP-4 1299 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-4 server workstation for remote access.

1299 Reservoir

See 1630 East Auxiliary System Summary Sheet.

FMM Turnout

➤ *Electrical System* – The electrical energy to power the FMM Turnout is obtained from the local electrical grid (SCE). A single line diagram of the FMM Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position for the both Hickory and Banana basins is fed back to the remote telemetry unit. The turnout has a 10dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

San Sevaine Channel Turnout

➤ *Electrical System* – The electrical energy to power the San Sevaine Turnout is obtained from the Hickory Basin Rubber Dam Control House, which receives power from the local electrical grid (SCE). A single line diagram of the San Sevaine Channel Turnout and Hickory Basin Rubber Dam Control House is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to the local valve control panel, which then directs the information to a local control panel in the Hickory Basin Rubber Dam Control House. The Control House has a 10dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

Turner Basin Turnout

➤ *Electrical System* – The electrical energy to power the Turner Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Turner Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to a local control panel and PLC. The turnout has a 9dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

8th Street Basin Turnout

➤ *Electrical System* – The electrical energy to power the 8th Street Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Turner Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to a local PLC. The turnout has a 9dB yagi antenna that transmits control data to an additional local PLC panel for 8th Street Basin before being transmitted by radio to RP-1 to the GWR workstation server for control and remote access.

Orchard Turnout

➤ *Electrical System* – The electrical energy to power the Orchard Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Orchard Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position as well as pressure are fed back to a local control panel and PLC. The data is transmitted by phone line to the GWR workstation server at RP-1 for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|---|----------------|
| RP-4 1299 Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 2 @ 12 kV to 480 V 1 @ 480 V 1 @ 480 V | MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit 1 unit | PLC 5B RP-4 |
| FMM Turnout Electrical System Utility Voltage Transformers | 120 V N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | N/A 1 unit N/A 1 unit 1 unit | |
| San Sevaine Turnout Electrical System Utility Voltage Transformers | 480 V 1 @ 480 V to 120 V | |
| Instrumentation and Control System HMI Workstation | N/A | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|--|-------|
| RTU PLC I/O Hub Radio Transmitter | N/A N/A 1 unit 1 unit | |
| Turner Basin Turnout Electrical System Utility Voltage Transformers Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 120 V N/A N/A 1 unit 1 unit 1 unit 1 unit | |
| 8 th Street Basin Turnout Electrical System Utility Voltage Transformers Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 120 V N/A 2 units N/A 2 units 1 unit 3 units | |
| Orchard Turnout Electrical System Utility Voltage Transformers Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 120 V N/A 1 unit N/A 1 unit 1 unit N/A | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| RP-4 1299 Pump Station | | | | |
| Electrical System | 2 | 3 | 3 | 4 |
| Instrumentation and Control System | 2 | 3 | 3 | 3 |
| FMM Turnout | | | | |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| San Sevaine Turnout | | | | |
| Electrical System | 3 | 3 | 3 | 3 |

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Turner Basin Turnout | | | | |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| 8 th Street Basin Turnout | | | | |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Orchard Turnout | | | | |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

RP-4 1299 Pump Station Emergency Generation

RP-4 has one 2.0 MW emergency diesel generator. The generator can produce only enough power to reliably power the RP-4 1158 small pumps; therefore, it cannot maintain the operation of the 1299 pump station during a power failure.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--------------------------------------|--------------------------------------|-----------------------------|
| RP-4 1299 Pump Station | | |
| Electrical and I&C | 2008 | |
| FMM Turnout | | |
| Electrical and I&C | 2006 | |
| San Sevaine Turnout | | |
| Electrical and I&C | 2006 | |
| Turner Basin Turnout | | |
| Electrical and I&C | 2006 | |
| 8 th Street Basin Turnout | | |
| Electrical and I&C | 2007 | |
| Orchard Turnout | | |
| Electrical and I&C | 2007 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

1630 East Pressure Zone

1. Asset Profile



1299 Reservoir (1299 Pressure Zone Asset)

The 1299 reservoir provides recycled water supply to the 1630 east pump station suction header. Both the 1299 reservoir and 1630 east pump station are located at the intersection of East Ave. and Baseline Ave. in the City of Rancho Cucamonga on an existing Cucamonga Valley Water District (CVWD) potable water reservoir site. The 1299 reservoir has a design capacity of 3.5 million gallons (MG), a diameter of 165 feet, and a maximum water surface level of 22 feet, and is equipped with a level transmitter. The 1299 reservoir is normally operated between 4 feet and 20 feet, providing an operational capacity of 2.6 MG.

1630 East Pump Station

The 1630 east pump station provides recycled water to the 1630 east pressure zone for direct use by CVWD and the City of Fontana and for groundwater recharge at Victoria and San Sevaire basins. The pump station is composed of five pumps:

- Two 100 hp vertical-turbine, VFD-driven, 750 gpm pumps
- One 200 hp vertical-turbine, constant speed, 1,500 gpm pump
- Two 400 hp vertical-turbine, constant speed, 3,000 gpm pumps

The 1630 east pump station is automatically controlled using a proportional-integral-derivative controller (PID) to maintain a discharge-pressure set point of 150 psi. In addition, the pump station has two 12-inch pressure-reducing valves (PRV) to transfer recycled water from the 1630 east pressure zone back to the 1299 pressure zone to be used with the future 1630 east reservoir.

1630 East Pipelines

- *Segment A Pipeline* – 11,300 LF of 36-inch pipeline from the 1630 East Pump Station to San Sevaire Turnout.
- *Baseline Pipeline* – 1,650 LF of 24-inch and 30-inch pipeline along Baseline Ave. from Etiwanda Ave. to Heritance Circle.
- *Church Street Lateral* – 2,350 LF of 12-inch pipeline along Etiwanda Ave. from Baseline Ave. to Church St.

Victoria Basin Turnout

The turnout includes an 8-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to the groundwater recharge basin. The turnout is designed for flow rates ranging from 200 gpm to 3,000 gpm.

San Sevaire Basin Turnout

The turnout includes a 12-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to the groundwater recharge basin. The turnout is designed for flow rates ranging from 400 gpm to 6,700 gpm.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------------|---|-----------------------------|
| 1299 Reservoir | 3.5 MG | 2.6 MG (Op. Cap.) |
| 1630 East Pumps | 2 @ 750 gpm 1 @ 1,500 gpm 2 @ 3,000 gpm | VFD Constant Constant |
| 1630 East PRVs | 2 @ 10,000 gpm | Need to verify in field |
| Segment A Pipeline | 19,000 gpm | 6.0 ft/s max velocity |
| Baseline Pipeline | 13,000 gpm | 6.0 ft/s max velocity |
| Church Street Lateral | 2,000 gpm | 6.0 ft/s max velocity |
| Victoria Basin Turnout | 200 – 3,000 gpm | |
| San Sevaire Basin Turnout | 400 – 6,700 gpm | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|---------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| 1299 Reservoir | 1 | 2 | 2 | 1 |
| 1630 East Pumps | 1 | 1 | 2 | 2 |
| 1630 East PRVs | 1 | 1 | 2 | 2 |
| Segment A Pipeline | 1 | 2 | 1 | 1 |
| Baseline Pipeline | 1 | 2 | 2 | 1 |
| Church Street Lateral | 1 | 2 | 2 | 1 |
| Victoria Basin Turnout | 1 | 2 | 2 | 2 |
| San Sevaire Basin Turnout | 1 | 1 | 2 | 2 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

1630 East Surge Tank Compressor

The existing surge tank compressor does not have the capacity to effectively displace the water in the tank after surge events. Multiple failures of the surge tank compressor have been documented and reported to Engineering. A project has been initiated to upsize the existing compressor.

1630 East Pressure Zone Nuisance Flow

When both Victoria and San Sevaire basins are not receiving recycled water, the minimum 1630 east pressure zone flow is causing the small 100 hp pumps to operate continuously at minimum speed with zero measurable flow. Further investigation is needed to determine whether programming changes can resolve the issue or whether a small jockey pump may be required.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|---------------------------|--------------------------------------|-----------------------------|
| 1299 Reservoir | 2011 | |
| 1630 East Pumps | 2011 | |
| 1630 East PRVs | 2011 | |
| Segment A Pipeline | 2011 | |
| Baseline Pipeline | 2011 | |
| Church Street Lateral | 2011 | |
| Victoria Basin Turnout | 2011 | |
| San Sevaire Basin Turnout | 2011 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

Auxiliary Systems – 1630 East Pressure Zone

1. Asset Profile

1630 East Pump Station and 1299 Reservoir

➤ *Electrical System* – The electrical energy to power the 1630 east pump station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 12 kV feeder to the 1630 east pump station electrical room, where transformers and switchgear are located to distribute electrical energy throughout the pump station. A single line diagram of the 1630 east pump station electrical system is shown in Appendix B. The 1630 east pump station does not have emergency power generation in case of power failure; however, it does have a generator termination cabinet to allow for quick connection of a portable generator.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the 1630 east pump station and 1299 reservoir. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1630 east pump station electrical room. Radio is then used to connect the local PLC to the RP-4 server workstation for remote access.

Victoria Basin Turnout

➤ *Electrical System* – The electrical energy to power the Victoria Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Victoria Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to a local control panel and PLC, which transmits control data to the Victoria Basin Main remote terminal unit (RTU). The Victoria Basin Main RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

San Sevaine Basin Turnout

➤ *Electrical System* – The electrical energy to power the Victoria Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Victoria Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to a remote I/O hub, which radios control data to the San Sevaine Basin No. 3 RTU. The San Sevaine Basin No. 3 RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access. In addition, there is a San Sevaine Basin Turnout Main RTU that radios information back to RP-4.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---|-------|
| 1630 East Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 1 @ 12 kV to 480 V 1 @ 480 V 1 @ 480 V | MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit 1 unit 2 units 1 unit 1 unit | |
| Victoria Basin Turnout Electrical System Utility Voltage Transformers | 120 V N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit 1 unit 1 unit 2 units 3 units | |
| San Sevaine Basin Turnout Electrical System Utility Voltage Transformers | 120 V N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit 2 units 2 units 3 units 4 units | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| 1630 East Pump Station | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| Victoria Basin Turnout | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| San Sevaine Basin Turnout | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Electrical System

No issues require specific attention.

Instrumentation and Control System

No issues require specific attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| 1630 East Pump Station | | |
| Electrical System | 2011 | |
| Instrumentation and Control System | 2011 | |
| Victoria Basin Turnout | | |
| Electrical System | 2011 | |
| Instrumentation and Control System | 2011 | |
| San Sevaine Channel Turnout | | |
| Electrical System | 2011 | |
| Instrumentation and Control System | 2011 | |

Table 4 Potential Projects

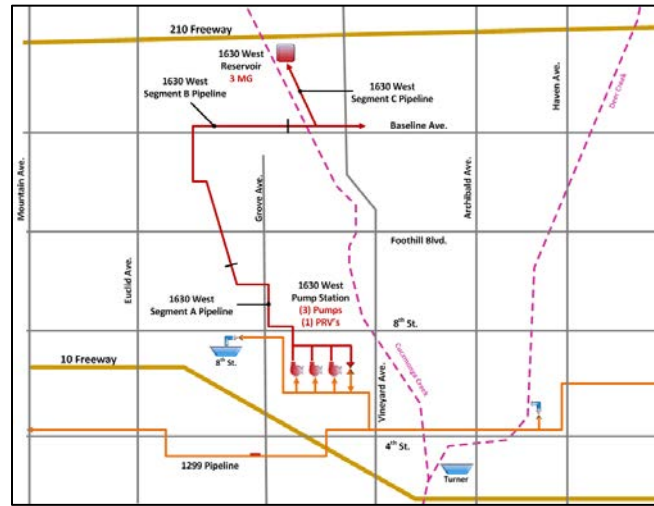
| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

1630 West Pressure Zone

1. Asset Profile



1630 West Reservoir

The 1630 west reservoir provides recycled water storage for the 1630 west pressure zone. The 1630 west reservoir is located at the intersection of 19th St. and Cucamonga Creek in the City of Rancho Cucamonga on an existing Cucamonga Valley Water District (CVWD) pump station site. The 1630 east reservoir has a design capacity of 3 million gallons (MG), a diameter of 130 feet, and a maximum water surface level of 32 feet, and is equipped with a level transmitter. The 1630 west reservoir is normally operated between 4 feet and 28 feet, providing an operational capacity of 2.4 MG.

1630 West Pump Station

The 1630 west pump station provides recycled water to the 1630 west pressure zone for direct use by CVWD and the City of Upland. The pump station is composed of three 250 hp vertical-turbine, constant-speed, 2,000 gpm pumps. The 1630 east pump station is automatically controlled to cycle pumps on and off to maintain a time-of-day level set point of the 1630 west reservoir. In addition, the pump station has one 10-inch pressure reducing valve (PRV) to transfer recycled water from the 1630 west pressure zone back to the 1299 pressure zone.

1630 West Pipelines

- *Segment A Pipeline* – 10,500 LF of 24-inch pipeline from the 1630 West Pump Station to Upland Memorial Park.
- *Segment B Pipeline* – 13,000 LF of 24-inch pipeline from Upland Memorial Park to the intersection of 16th St. (Baseline Rd.) and Tanglewood Ave.
- *Segment C Pipeline* – 800 LF of 24-inch pipeline and 3,100 LF of 30-inch pipeline along Baseline Rd. from Tanglewood Ave. to Vineyard Ave. Segment C Pipeline includes an additional 4,400 LF of 30-inch pipeline along Cucamonga Creek from Baseline Rd. to the 1630 west reservoir.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------|---|-------------------------|
| 1630 West Reservoir | 3 MG | 2.4 MG (Op. Cap.) |
| 1630 West Pumps | 3 @ 2,000 gpm | Constant |
| 1630 West PRV | 300 – 3,000 gpm | Need to verify in field |
| Segment A Pipeline | 8,500 gpm | 6.0 ft/s max velocity |
| Segment B Pipeline | 8,500 gpm | 6.0 ft/s max velocity |
| Segment C Pipeline | 24-inch – 8,500 gpm 30-inch – 13,200 gpm | 6.0 ft/s max velocity |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|---------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| 1630 West Reservoir | 1 | 1 | 1 | 1 |
| 1630 West Pumps | 1 | 1 | 2 | 2 |
| 1630 West PRV | 1 | 3 | 3 | 2 |
| Segment A Pipeline | 1 | 1 | 1 | 1 |
| Segment B Pipeline | 1 | 1 | 1 | 1 |
| Segment C Pipeline | 1 | 1 | 1 | 1 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

1630 West Pump Station Surge Issue

Operations has noticed surge in both the 1299 and 1630 pressure zones when the 1630 west pumps are started or stopped. The surge can be in excess of 40 psi from standard operating conditions. The 1630 west surge tank and pump start controls are being reviewed to see if this condition can be eliminated with existing equipment.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|---------------------|--------------------------------------|-----------------------------|
| 1630 West Reservoir | 2012 | |
| 1630 West Pumps | 2012 | |
| 1630 West PRV | 2012 | |
| Segment A Pipeline | 2012 | |
| Segment B Pipeline | 2012 | |
| Segment C Pipeline | 2012 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary –
RW/GWR

Auxiliary Systems – 1630 West Pressure Zone

1. Asset Profile

1630 West Pump Station

➤ *Electrical System* – The electrical energy to power the 1630 west pump station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 12 kV feeder to the 1630 east pump station electrical room, where transformers and switchgear are located to distribute electrical energy throughout the pump station. A single line diagram of the 1630 west pump station electrical system is shown in Appendix B. The 1630 west pump station does not have emergency power generation in case of power failure; however, it does have a generator termination location in the MCC to allow for quick connection of a portable generator.

➤ *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the 1630 west pump station. All of the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1630 west pump station electrical room. Radio is then used to connect the local PLC to the RP-4 server workstation for remote access.

1630 West Reservoir

➤ *Electrical System* – The electrical energy to power the 1630 west reservoir is obtained from the local electrical grid (SCE). A single line diagram of the 1630 west reservoir is shown in Appendix B. The reservoir does not have emergency power generation in case of power failure.

➤ *Instrumentation and Control System* – Local control wiring for level and valve position are fed back to a local control panel and PLC. The RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---|-------|
| 1630 West Pump Station Electrical System Utility Voltage Transformers Switchgear Distribution | 12 kV 1 @ 12 kV to 480 V 1 @ 12 kV to 120 V 1 @ 480 V 1 @ 480 V | MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 1 unit N/A 1 unit 1 unit 1 unit | |
| 1630 West Reservoir Electrical System Utility Voltage Transformers Switchgear Distribution | 480 1 @ 480 V to 120 V N/A N/A | MCCs |
| Emergency Generation Generator | N/A | |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | N/A 1 unit 1 unit 1 unit 1 unit | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| 1630 West Pump Station | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |
| 1630 West Reservoir | | | | |
| Electrical System | 2 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Electrical System

No issues require specific attention.

Instrumentation and Control System

No issues require specific attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| 1630 West Pump Station | | |
| Electrical System | 2012 | |
| Instrumentation and Control System | 2012 | |
| 1630 West Reservoir | | |
| Electrical System | 2012 | |
| Instrumentation and Control System | 2012 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

Inland Empire Regional Composting Facility

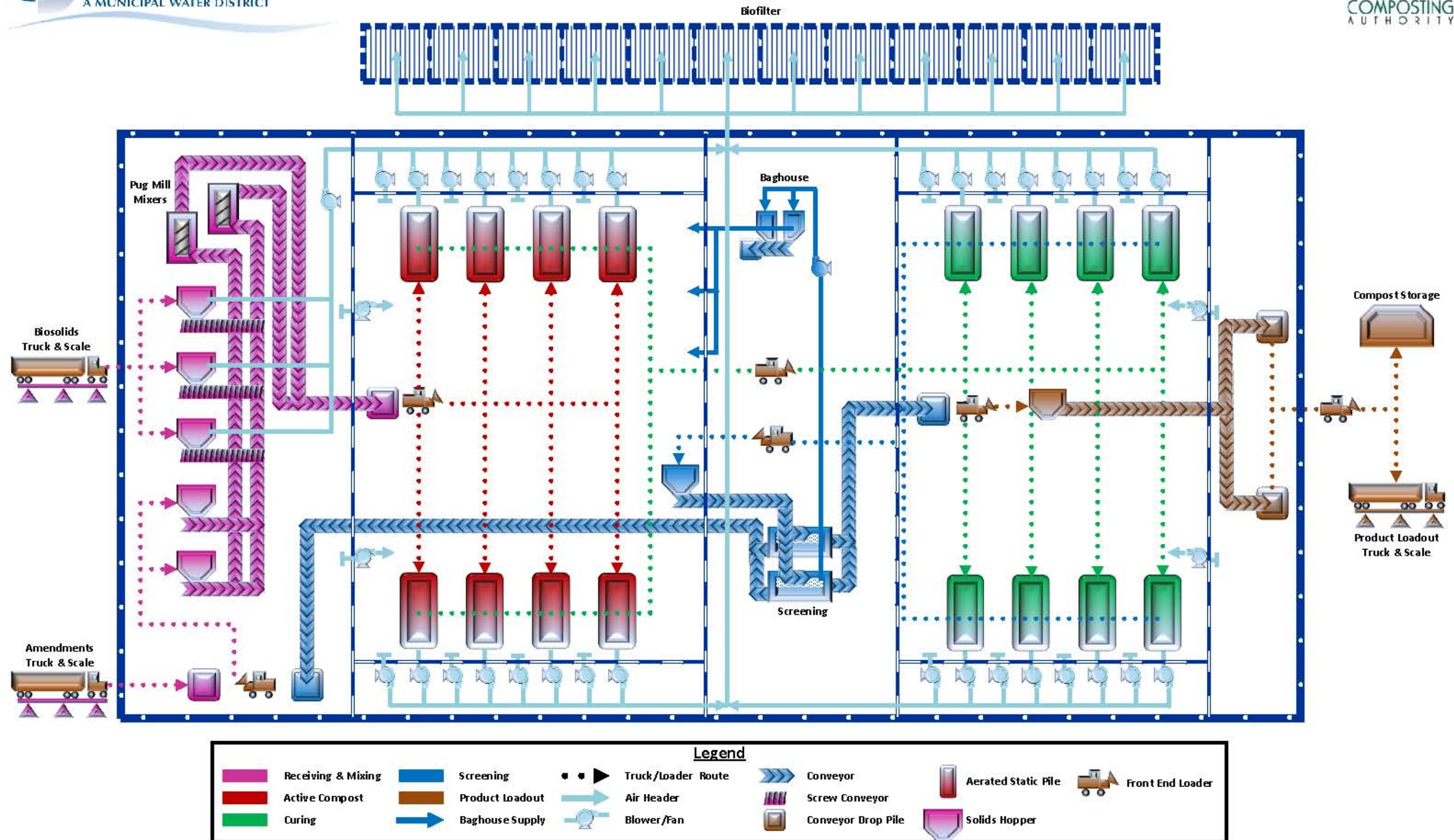


Figure 7-7: Inland Empire Regional Composting Facility (IERCF) – Schematic

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Table 7-8: Inland Empire Regional Composting Facility – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | Ten-Year Total |
|---|-----------------------------|--|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | |
| 1 | RA11001 | IERCF Capital Replacement | General project for facility/equipment repair and replacement, including replacement of front end loaders, and evaluation of the Baghouse. | RP | RCA | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 500,000 | 5,000,000 |
| 2 | RA11004 | IERCF Process Improvements | The belt conveyance system will be modified to transfer material from Active to Curing, then from Curing to Screening. Currently, the system transfers material from Active to Screening and then Screening to Curing. | CC | RCA | 900,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 900,000 |
| 3 | RA12009 | IERCF Structure Protection | Column protection and repair. | OM | RCA | 25,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25,000 |
| 4 | RA12011 | IERCF Lighting Improvements | Additional lighting is going to be installed in all process areas to increase visibility for front end loader operators. | OM | RCA | 200,000 | 200,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 400,000 |
| 5 | RA14003 | IERCF Receiving Pit & Fan Corridor Drains | Installation of drains in the receiving pit and fan corridors for housekeeping purposes. | CC | RCA | 400,000 | 300,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 700,000 |
| 6 | RA14004 | IERCF Harmonic Filter AC Improvements | IERCF Harmonic Filter AC Improvements | RP | RCA | 5,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,000 |
| 7 | TBD | IERCF Trommel Screen Conversion to Compact Logix PLC | Replace remote I/O with local PLC | RP | RCA | 18,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18,000 |
| 8 | RA15001 | IERCF Baghouse and Dust Collection System Enhancements | IERCF Baghouse and Dust Collection System Enhancements | RP | RCA | 200,000 | 750,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 950,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

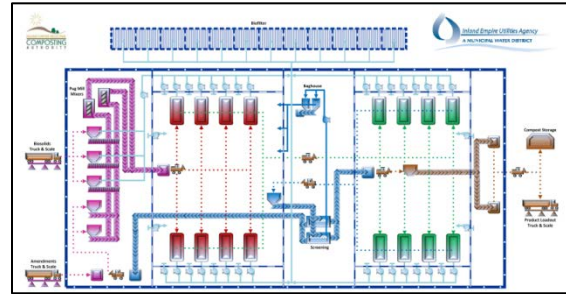
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – IERCF Treatment Process

1. Asset Profile



Biosolids Hoppers

Biosolids from Los Angeles County Sanitation District (LACSD), Inland Empire Utilities Agency, and third-party sources are transported by trucks to the Inland Empire Regional Composting Facility (IERCF). After being weighed, the trucks offload the biosolids into three biosolids hoppers. Each biosolids hopper has a capacity of 55 cubic yards, five 3 hp live-bottom screws, and one 25 hp screw conveyor.

Amendment Hoppers

Amendments from outside sources are transported to IERCF by truck and stored along the western wall of the active compost process area. These amendments are mixed with recycled screening material (overs) to produce specific amendment blends. Front end loaders (FEL) mix the material and load it into two amendment hoppers. Each amendment hopper has a 200-ton capacity, five 3 hp live-bottom screws, and one 33-foot, 110-ton-per-hour belt conveyor powered by a 15 hp motor.

Pug Mill Mixers

Material from the biosolids hoppers and the amendment hoppers is conveyed by belt conveyors to two redundant pug mill mixers. The pug mill mixers blend the biosolids and amendments together to create an appropriate blend of material to begin the active compost process. Each pug mill mixer has a capacity of 225 tons per hour and is powered by a 75 hp motor.

Belt Conveyors

Belt conveyors are used to move material throughout IERCF. Nine belt conveyors allow material to be moved from receiving and mixing to active compost. Seven belt conveyors allow material to be moved from active compost through screening to curing. An additional four belt conveyors return the overs from screening to receiving and mixing. Two belt conveyors allow material to be moved from curing to product loadout.

Active Compost HVAC

Supply air into the active compost process area is provided by the following:

- Seven 20 hp, 18,250 cfm fans pulling from receiving and mixing
- Nine 20 hp, 23,000 cfm roof fans
- Five 75 hp, 25,650 cfm fans pulling from screening/Baghouse

Air is exhausted from the active compost area to the biofilter by:

- Four 125 hp, VFD-driven, 35,500 cfm exhaust fans
- Twelve 125 hp, 28,400 cfm exhaust fans
- Twenty-two 30 hp, VFD-driven, 4,500 cfm process fans

Curing HVAC

Supply air into the curing process area is provided by:

- Four 25 hp, 20,500 cfm fans pulling from product loadout
- Five 10 hp, 18,000 cfm roof fans
- Fourteen 20 hp, 2,850 cfm process fans

Air is exhausted from the active compost area to the biofilter by:

- Four 150 hp, VFD-driven, 42,250 cfm exhaust fans
- Two 125 hp, 35,000 cfm exhaust fans

Trommel Screens

After the material has been treated in the active compost and curing processes, it is placed into a hopper and conveyed to two Trommel screens to remove the overs. The fine material is conveyed to product loadout as the final compost product and the overs are conveyed back to receiving and mixing to be recycled back into the amendments. Each Trommel screen has a 3/8-inch spacing and a 400-cubic-yard-per-hour production capacity and is powered by a 150 hp motor.

Baghouse

The Baghouse filters the air from the Trommel screens and the screenings process area and returns filtered air back to the active compost process area. The Baghouse is supplied by five 75 hp, 25,650 cfm fans and removes particulate matter from the air and conveys it to a storage area located in the screenings process area.

Biofilter

The biofilter is required to treat all air leaving IERCF to remove ammonia and VOCs. The biofilter is sized to treat 813,200 cfm of air, consists of twelve 135' x 87' cells, an irrigation system, and an inlet air humidification system.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------------|--|---------------------------------------|
| Facility | | |
| Biosolids | 600 wet tons per day | |
| Amendment | 160 wet tons per day | |
| Biosolids Hoppers | 3 @ 55 cy 5 @ 3 hp live bottom 1 @ 25 hp sc. conv. | ea. hop. ea. hop. |
| Amendment Hoppers | 2 @ 200 tons 5 @ 3 hp live bottom 1 @ 15 hp belt conv. | ea. hop. ea. hop. |
| Pug Mill Mixers | 2 @ 75 hp, 225 tph | |
| Receiving & Mixing Belt Conveyors | 1 @ 20 hp, 162 ft 1 @ 20 hp, 144 ft 1 @ 25 hp, 70 ft 1 @ 25 hp, 91 ft 1 @ 25 hp, 80 ft 1 @ 25 hp, 75 ft 1 @ 30 hp, 215 ft 1 @ 30 hp, 219 ft 1 @ 30 hp, 258 ft | All units are 225 tons per hour (tph) |
| Screening Belt Conveyors | 2 @ 20 hp, 91', 150 tph 1 @ 15 hp, 133', 150 tph 2 @ 15 hp, 27', 150 tph 1 @ 25 hp, 157', 190 tph 1 @ 25 hp, 136', 190 tph 1 @ 15 hp, 32', 110 tph 1 @ 15 hp, 77', 110 tph 1 @ 20 hp, 172', 110 tph 1 @ 30 hp, 537', 110 tph | |
| Product Loadout Belt Conveyors | 1 @ 20 hp, 135', 145 tph 1 @ 15 hp, 113', 145 tph | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---------------------|---|--|
| Active Compost HVAC | 7 @ 20 hp, 18,250 cfm 9 @ 20 hp, 23,000 cfm 5 @ 75 hp, 25,650 cfm 4 @ 125 hp, 35,500 cfm 12 @ 125 hp, 28,400 cfm 22 @ 30 hp, 4,500 cfm | R&M Fan Roof Fan BH Fan Ex. Fan Ex. Fan Pr. Fan |
| Curing HVAC | 4 @ 25 hp, 20,500 cfm 5 @ 10 hp, 18,000 cfm 14 @ 20 hp, 2,850 cfm 4 @ 150 hp, 42,250 cfm 2 @ 125 hp, 35,000 cfm | PL Fan Roof Fan Pr. Fan Ex. Fan Ex. Fan |
| Trommel Screens | 2 @ 3/8-inch, 150 hp, 400 cyh | |
| Baghouse | 2 @ 65,000 cfm 5 @ 75 hp, 25,650 cfm | Filters Fans |
| Biofilter | 813,200 cfm | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-----------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Biosolids Hoppers | 2 | 3 | 2 | 2 |
| Amendment Hoppers | 2 | 3 | 2 | 2 |
| Pug Mill Mixers | 3 | 2 | 2 | 3 |
| Receiving & Mixing Belt Conveyors | 2 | 2 | 2 | 3 |
| Screening Belt Conveyors | 4 | 3 | 3 | 3 |
| Product Loadout Belt Conveyors | 4 | 3 | 3 | 3 |
| Active Compost HVAC | 2 | 3 | 3 | 2 |
| Curing HVAC | 4 | 3 | 3 | 2 |
| Trommel Screens | 3 | 3 | 4 | 4 |
| Baghouse | 5 | 4 | 4 | 4 |
| Biofilter | 4 | 2 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Trommel Screen Operation

The Trommel screens have required monthly maintenance because of parts failures resulting in extended equipment downtime. IERCF is currently running a pilot study of a shaker screen to gather operational data on the effectiveness of this type of equipment. Based upon the findings of this study, a pre-design should be completed to investigate the best option for modifying/replacing the Trommel screens.

Baghouse Operation

The Baghouse operation has been ineffective in removing particulate matter from the Trommel screens and screenings process area. IERCF had to construct a temporary cover around the exhaust of the Trommel screens to allow adequate supply air flow to the Baghouse. In addition, concerns have been raised about the applicability of an indoor Baghouse as it relates to OSHA requirements. An initial study should be completed to review options for modifying or replacing the Baghouse.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-----------------------------------|--------------------------------------|-----------------------------|
| Biosolids Hoppers | 2007 | |
| Amendment Hoppers | 2007 | |
| Pug Mill Mixers | 2007 | |
| Receiving & Mixing Belt Conveyors | 2007 | |
| Screening Belt Conveyors | 2007 | |
| Product Loadout Belt Conveyors | 2007 | |
| Active Compost HVAC | 2007 | |
| Curing HVAC | 2007 | |
| Trommel Screens | 2007 2013 | |
| Baghouse | 2007 | |
| Biofilter | 2007 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|-------------------------|-------------------------------------|---|
| Facility Wide | Locker Room HVAC Improvements | Improve locker room HVAC. |
| Active Curing Screening | Transition Air Duct Improvements | The foul-air rectangular-transition air duct running north/south through screenings has multiple air leaks at the joints. This project will improve the system to prevent such leaks in the future. |
| Biofilter | IERCF Biofilter Media Replacement | Full replacement of the biofilter media in all 12 cells, recurring every 5 years. |
| Biofilter | IERCF Biofilter Media Replenishment | Turnover of existing biofilter media and replenishment of material as necessary, annually. This will not be conducted on years of a full media replacement. |

System Summary Continued on Next Page

Asset Management System Summary – IERCF Auxiliary Systems

1. Asset Profile

Plant Drain

The plant drain collects sewer from the truck scale house and administration building, wash-down water from the truck cleaning area and process areas, and excess irrigation and condensate from the biofilter system. The plant drain system consists of five submersible pump stations: north process area, south process area, biofilter west, biofilter east, and center aisle duct. These five pump stations pump to the plant drain pump station. The plant drain pump station pumps to either the inlet of RP-4 or to the Non-Reclaimable Waste System (NRWS). Currently, the system is being pumped to the NRWS.

Emergency Generation

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (solar and an emergency generator). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of dual 12 kV feeders from RP-4 to the IERCF north and south electrical rooms, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the IERCF electrical system is shown in Appendix B.

A diesel emergency generator is used in the event of a power failure. A 2.0 MW generator is located on the southeast corner of the IERCF property and can supply power to meet maximum daytime production of the facility.

An extensive lighting system is needed to illuminate the indoor facility. Lighting units are located in each of the process areas, on equipment walls, and on the building support columns.

Utility Water System

Utility water is used throughout the facility for irrigation, biofilter irrigation and humidification, truck wash-down, and general cleaning purposes. The system is supplied by the 1299 pressure zone from a connection on 6th Street. The piping consists of several isolation valves and point-of-use connections.

Potable Water System

Potable water is used throughout the plant for restrooms, cooling, and more. The system is supplied from two service connections on 6th Street from the City of Rancho Cucamonga. IERCF also has an independent fire suppression system with two connections on 6th Street.

Instrumentation and Control System

An extensive array of instruments is used to monitor and control the processes at IERCF. Nearly all of the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to a redundant PLC system located in the main control building. Fiber optic cable is then run to RP-4 for remote access.

Yard Piping

A substantial network of pipes exists mainly for the auxiliary systems. The material, sizes, and service conditions of these pipes vary widely. A yard piping diagram is show in Appendix C.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|---|--|-----------------|
| Plant Drain | 3 @ 620 gpm 20 hp | VFD |
| Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator | 12 kV 4 @ 12 kV to 480 V 5 @ 480 V to 120 V 4 @ 12 kV 2 @ 12 kV 8 @ 480 V 1 @ 2,000 kW 2,937 Bhp 345 units | MCCs |
| Mounted Lighting | | Process |
| Utility Water System Pipelines Valves | 8-inch PVC @ 3,750 gpm 6-inch PVC @ 2,100 gpm 5 units | Main Line |
| Potable Water System Pipelines | 2 @ 2.5-inch DI @ 350 gpm 10-inch DI @ 5,800 gpm | Potable Fire |
| Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter | 4 units N/A 4 units 6 units 1 unit | RP-4 |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Plant Drain | 3 | 2 | 2 | 2 |
| Electrical System | 2 | 2 | 3 | 3 |
| Utility Water System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 2 | 3 | 3 |
| Instrumentation and Control System | 3 | 2 | 3 | 3 |
| Yard Piping | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Plant Drain

No issues require specific attention.

Electrical System

No issues require specific attention.

Utility Water System

No issues require specific attention.

Potable Water System

No issues require specific attention.

Instrumentation and Control System

No issues require specific attention.

Yard Piping

No issues require specific attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Plant Drain | 2007 | |
| Electrical System | 2007 2011 | |
| Utility Water System | 2007 | |
| Potable Water System | 2007 | |
| Instrumentation and Control System | 2007 | |
| Yard Piping | 2007 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|---------------|---|---|
| Facility Wide | DCS Network Equipment Replacement | Recurring project every 5 years to replace network equipment. |
| Facility Wide | DCS Notebook & PC Workstation Replacement | Recurring project 5 year to replace computers and workstations. |
| Facility Wide | Tablet PC Replacement | Recurring project every 10 years to replace tablets. |
| Facility Wide | Server Replacement | Recurring project every 10 years to replace servers. |

End of System Summary

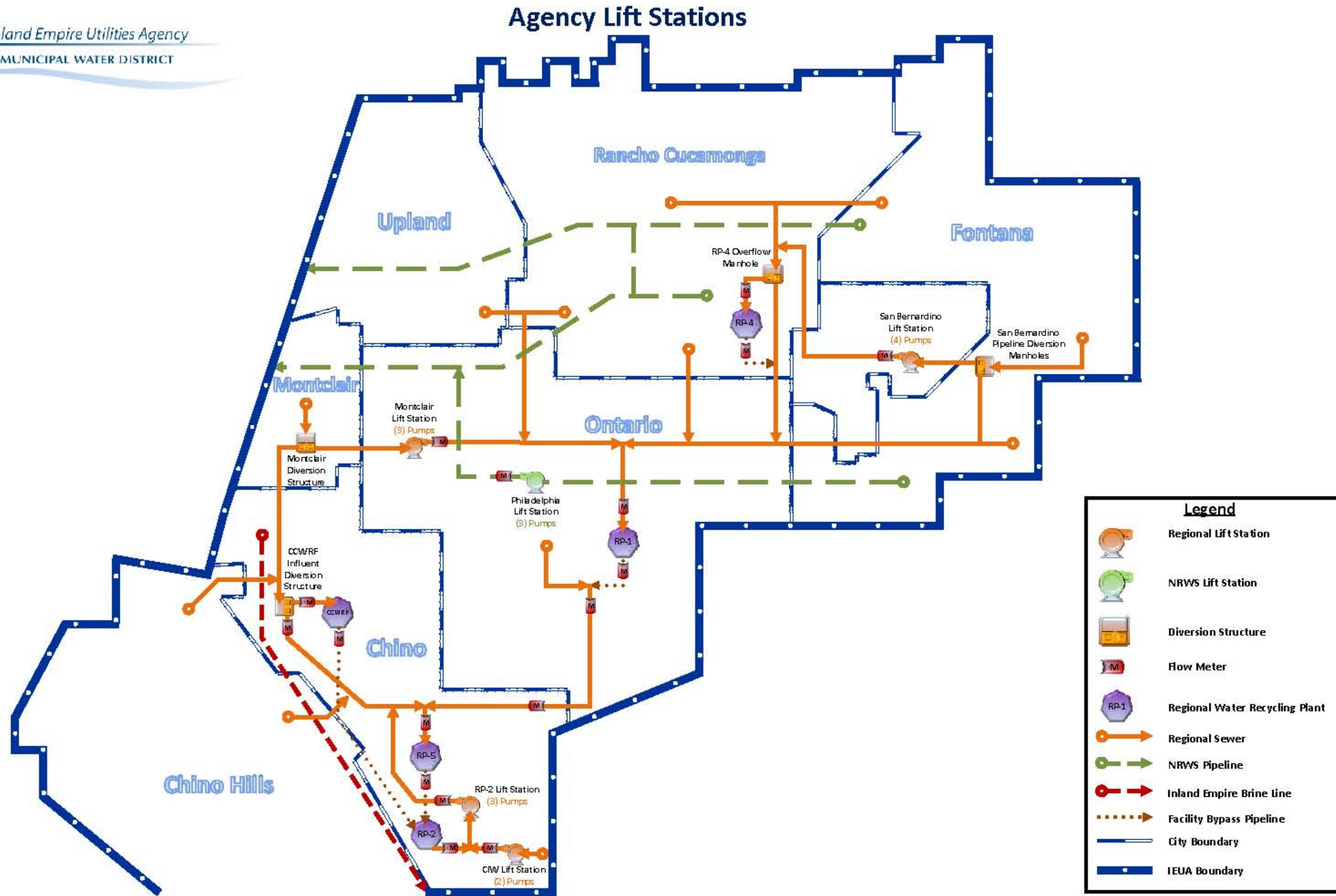


Figure 7-8: Agency Lift Stations (LS) – Schematic

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Table 7-9: Agency Lift Stations – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|---|-----------------------------|------------------------------------|---|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN11035 | Philadelphia Pump Station Upgrades | Repair and replacement of section of the force mains in the pump dry sump. Miscellaneous instrumentation and facility improvements will be made. A redundant PLC will also be supplied to provide control system reliability. | CC | NC | 1,400,000 | 574,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,974,000 |
| 2 | EN16011 | Whispering Lakes LS Improvements | Complete rehab of lift station. | CC | RC | 0 | 0 | 0 | 0 | 300,000 | 2,700,000 | 0 | 0 | 0 | 0 | 3,000,000 |
| 3 | EN19005 | Haven LS SCADA Improvements | Connect to the SCADA enterprise system and potential sewer construction | CC | RC | 0 | 0 | 0 | 0 | 300,000 | 2,700,000 | 0 | 0 | 0 | 0 | 3,000,000 |
| 4 | EN13054 | Montclair Lift Station Upgrades | Replacement of all three lift pumps as well as replacement and improvements of the control and instrumentation system and the electrical distribution system. | CC | RO | 2,500,000 | 415,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,915,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

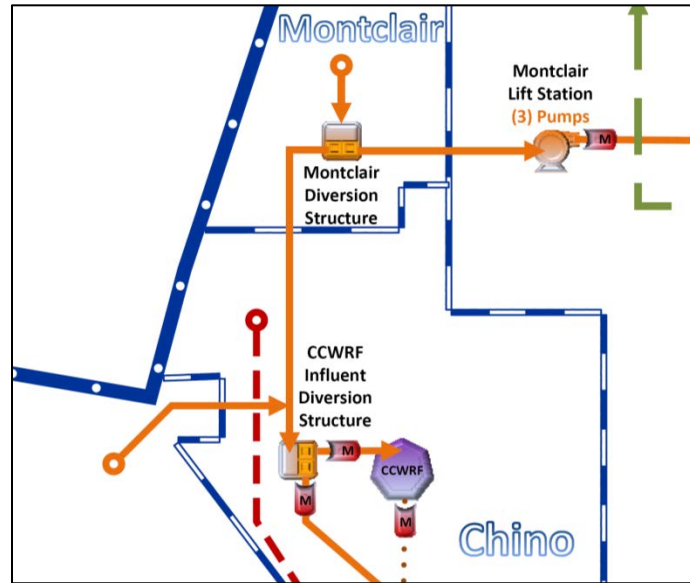
(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – LS
Montclair Lift Station

1. Asset Profile



Pump System

The Montclair lift station conveys flows collected from the Montclair service area as well as a portion of Ontario. The pump station consists of a small circular wet well and three lift pumps.

Emergency Generation

The electrical energy to power the lift station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 12 kV feeder to the transformer and switchgear. A single line diagram of the Montclair lift station electrical system is shown in Appendix B.

A diesel emergency generator is used in the event of a power failure. One generator is located inside the pump station and supplies power to the facility in the event of a utility outage.

Potable Water System

Potable water is supplied to the station for supply at several hose bibs. The water system formerly supplied seal water to the old pumps.

Instrumentation and Control System

All aspects of the pump station operations are monitored and controlled by the instrumentation and control system. The control system includes a redundant PLC and communication modules for maximum reliability.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------------|---------------------------------------|-------|
| Montclair Lift Station | 5.69 MGD | |
| Pump System | | |
| Pipelines | 18-inch 3,950 gpm | |
| Pump Station | 3 @ 2,990 gpm 85 hp | |
| Valves | 7 units | |
| Electrical System | | |
| Utility Voltage | 12 kV | |
| Transformers | 12 kV to 480 V | |
| Switchgear | 480 V | |
| Distribution | 480 V | |
| Emergency Generation Generator | 1 @ 250 kW 398 Bhp | |
| Mounted Lighting | 17 units | |
| Potable Water System | | |
| Backflow Devices | 1 units | |
| Valves | 2 units @ 2-inch | |
| Instrumentation and Control System | | |
| HMI Workstation | 1 Ea. | |
| PLC | 2 Ea. (Redundant Pair) | |
| I/O Hub | 1 Ea. | |
| Radio Transmitter | 1 Ea. | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Pump System | 2 | 2 | 2 | 2 |
| Electrical System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System

Project EN13054 will address replacing the lift station pumps to reduce ragging and maintenance labor. The pumps were selected for their ability to resist clogging from rags and other large objects. However, the need for grinders to be placed in front of the pumps will be evaluated to further increase reliability if needed.

Emergency Generation

After the lift station upgrade, the backup generator capacity no longer matches the capacity of the utility service. The backup generator may need to be upgraded to a unit with a higher capacity.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Pump System | 1978 2014 | |
| Electrical System | 1978 2014 | |
| Potable Water System | 1978 | |
| Instrumentation and Control System | 1978 2014 | |

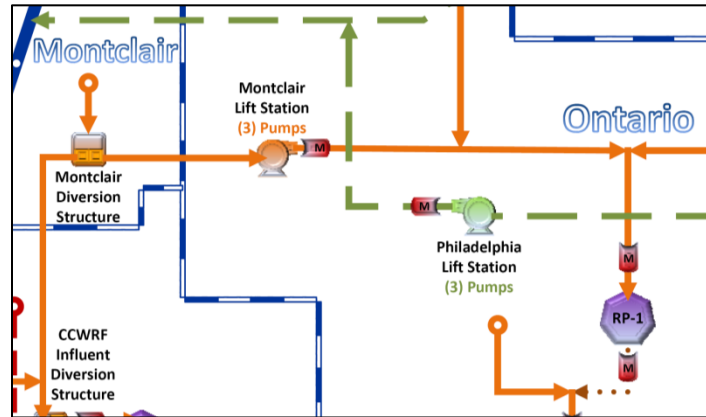
Table 4 Potential Projects

| System | Project Name | Project Description |
|---------------------|--|---|
| Pump System | Montclair Lift Station Grinder Improvement | If continued ragging of pumps is experienced upon starting up the new pumping system, grinders will be installed ahead of the pumps to prevent further clogging of the pumps. |
| Emergency Generator | Montclair Lift Station Emergency Generator Replacement | The backup generator will need to be replaced with a larger capacity unit to allow all three lift pumps to operate simultaneously when flows increase to the station. |
| Facility | Montclair Lift Station Rehabilitation | Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment. |

System Summary Continued on Next Page

Asset Management System Summary – LS
Philadelphia Lift Station

1. Asset Profile



Pump System

The Philadelphia lift station conveys non-reclaimable waste (NRW) collected from the northern half of the Agency service area to Los Angeles County. The lift station includes three pumps: two variable speed and one constant speed. Flows are conveyed through two parallel force mains that are about 2.6 miles long, with a total head increase of about 110 feet.

In case of emergency and to accommodate maintenance and construction activity, an engine-driven pump is also available. The pump connections are located outdoors, and the pump can be trailered away off-site when it is not needed.

Emergency Generation

The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE). The electrical feed from the grid is 480 V. A single line diagram of the electrical system is shown in Appendix B.

A diesel emergency generator is used in a power failure. The generator is located in the pump station and supplies power to all the pump station systems.

Utility Water System

Utility water is used for pump seal water. The water is delivered by the 1050 zone recycled water pipeline in Philadelphia Avenue.

Potable Water System

Potable water is supplied to the lift station for the restroom. Potable water can also be used as a backup for pump seal water in a recycled-water outage. The potable and recycled water is isolated by use of a removable pipe spool to prevent cross connections.

Instrumentation and Control System

The lift station is fully automated and monitored. Wet well level, force main discharge pressures, force main flows, and pump speeds are all controlled and monitored by a PLC. The lift station can also be monitored and controlled remotely.

Chemical Injection System

The lift station includes storage and injection systems for ferric chloride. The chemical can be injected to both force mains. Ferric chloride is used to control sulfides in the sewer system, reducing the effects of corrosion and odors. The injection pumps are started and stopped automatically.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------------|--|-----------|
| Philadelphia Lift Station | 5.2 MGD | |
| Pump System | | |
| Pipelines | 12-inch 1,150 gpm 18-inch 2,800 gpm | |
| Pump Station | 3 @ 1,800 gpm | |
| Wet Well | 100 hp | |
| Emergency Lagoon | 80,000 Gallons | |
| Valves | 1 @ 5 MG unlined | |
| 13 units | | |
| Electrical System | | |
| Utility Voltage | 480 V | |
| Switchgear | 480 V | |
| Distribution | 480 V | |
| Emergency Generation Generator | 1 @ 250 kW 335 Bhp | |
| Mounted Lighting | 19 units | |
| Utility Water System | | |
| Pipelines | < 2 in. diameter | |
| Valves | 1 units | |
| Potable Water System | | |
| Backflow Devices | 1 units | |
| Valves | 3 units | |
| Instrumentation and Control System | | |
| HMI Workstation | 1 units | |
| PLC | 1 units | |
| I/O Hub | 1 units | |
| Radio Transmitter | 1 units | |
| Chemical Injection | | |
| Chemical Pumps | 2 units | |
| Storage Tank | 1 @ 13,000 Gallons | Diaphragm |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Pump System | 3 | 3 | 3 | 3 |
| Force Mains | 4 | 4 | 4 | 4 |
| Electrical System | 3 | 3 | 3 | 3 |
| Utility Water System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 4 | 3 | 3 |
| Chemical Injection | 4 | 3 | 4 | 4 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System

Suction piping is showing signs of wear. Project EN11035 will repair and replace sections of pipeline from the wet well.

Force Mains

The force mains have experienced substantial degradation in capacity. The pipelines are being evaluated to determine if they can be repaired or need to be replaced. A potential engineering project is required to provide inspection manholes on the 18-inch pipeline as well as on a backup 18-inch pipeline.

Project EN11035 will increase the diameter of the force main to allow future discharge capacity, as well as install control valves to optimize flows at the station.

Electrical System

No issues require special attention.

Utility Water System

No issues require special attention.

Instrumentation and Control System

The PLC does not include any redundancy. The control system needs to be upgraded to include redundancy and increase reliability. Project EN11035 will improve miscellaneous instrumentation at the station.

Chemical Injection

Ferric feed pumps are not flow placed, leading to inefficient dosing throughout the day. A potential engineering project is needed to upgrade the chemical feed pumps.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Pump System | 1968 | 2013 |
| Electrical System | 1968 2007 | |
| Utility Water System | 2011 | |
| Potable Water System | 1968 | |
| Instrumentation and Control System | 2007 | |
| Chemical Injection | 1993 | |

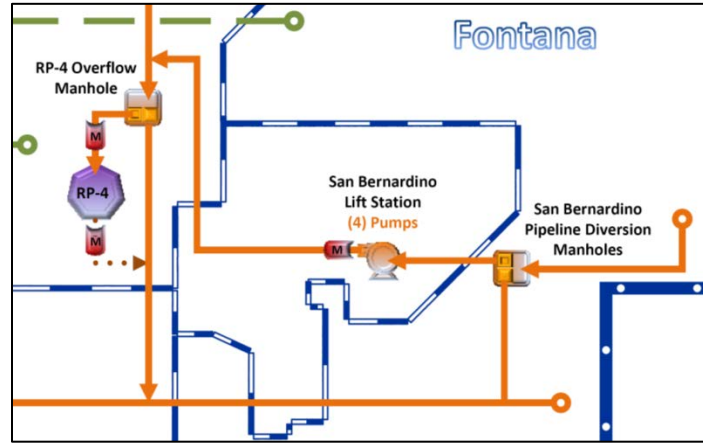
Table 4 Potential Projects

| System | Project Name | Project Description |
|-------------|---|--|
| Pump System | Philadelphia Lift Station Force Main improvements | Repair or replace the existing force mains. |
| Facility | Philadelphia Lift Station Rehabilitation | Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment. |

System Summary Continued on Next Page

Asset Management System Summary – LS
San Bernardino Avenue Lift Station

1. Asset Profile



Pump System

The San Bernardino Avenue lift station conveys flows from the Fontana area to Regional Plant No. 4. The flows are lifted about 60 feet through about 1.4 miles of force main. To maintain acceptable flow velocities, two force mains of different diameters were provided. Four vertical-turbine pumps are provided with provisions for a future pump to be added to the wet well.

Emergency Generation

The electrical energy to power the lift station is obtained from the local electrical grid (SCE) and from onsite energy generation (emergency generator). The electrical feed from the grid is composed of a 12 kV feeder to a transformer and switchgear to distribute electrical energy throughout the facility. A single line diagram of the electrical system is shown in Appendix B.

A diesel emergency generator is used in a power failure. The generator is located adjacent to the electrical room for the lift station.

Potable Water System

Potable water is supplied to the site to be used as seal water for the lift pumps. The water is supplied to a storage tank by an air gap, and the tank in turn supplies the seal-water pump system.

Instrumentation and Control System

The lift station includes enough instrumentation and a PLC to allow for full control of the lift station remotely. The PLC and I/O include full redundancy for added reliability.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------------|---|----------------------|
| San Bernardino Lift Station | 7 MGD | |
| Pump System | | |
| Pipelines | 30-inch 5,902 gpm 24-inch 13,890 gpm | |
| Pump Station | 2 @ 3,300 gpm 50 hp 2 @ 6,945 gpm 125 hp | |
| Valves | 7 units | |
| Seal Water Tank | 1 @ 2,900 Gal. 1 @ 50 Gal. | Secondary Primary |
| Seal Water Pumps | 2 Ea. | |
| Electrical System | | |
| Utility Voltage | 12 kV | |
| Transformers | 12 kV to 480 V | |
| Switchgear | 480 V | |
| Distribution | 480 V | |
| Emergency Generation | | |
| Generator | 1 @ 500 kW 757 Bhp | |
| Mounted Lighting | 19 units | |
| Potable Water System | | |
| Backflow Devices | 1 units | |
| Valves | 2 units | |
| Instrumentation and Control System | | |
| HMI Workstation | 1 Ea. | |
| RTU | 2 Ea. | |
| PLC | 2 Ea. | |
| I/O Hub | 2 Ea. | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Pump System | 3 | 3 | 3 | 3 |
| Electrical System | 3 | 3 | 3 | 3 |
| Potable Water System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System

Currently no issues require special attention.

Electrical System

Currently no issues require special attention.

Potable Water System

Currently no issues require special attention.

Instrumentation and Control System

Currently no issues require special attention.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Pump System | 2007 | |
| Electrical System | 2007 | |
| Potable Water System | 2007 2013 | |
| Instrumentation and Control System | 2007 2012 | |

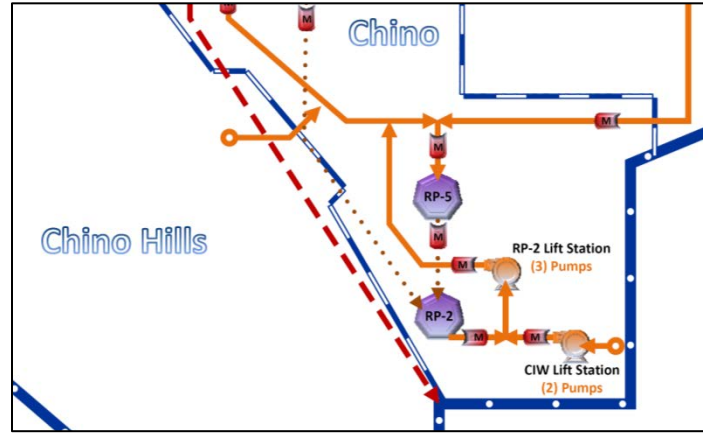
Table 4 Potential Projects

| System | Project Name | Project Description |
|----------|---|--|
| Facility | San Bernardino Avenue Lift Station Rehabilitation | Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment. |

System Summary Continued on Next Page

Asset Management System Summary – LS
Regional Plant No.2 (RP-2) Lift Station

1. Asset Profile



Pump System

The RP-2 lift station collects raw sewage from the Mountain Avenue interceptor, CIW sewer, Butterfield force main, and the recycle flows from the solids treatment facilities at RP-2, and discharges through a 24-inch pipeline to the RP-5 headworks. The lift station is located on the RP-2 treatment plant site.

Emergency Generation

The electrical energy to power the lift station is fed from the RP-2 treatment plant distribution system. A separate backup generator for the lift station has been provided if utility power or the RP-2 distribution systems fail.

Instrumentation and Control System

The lift station includes instrumentation and automation to allow full remote control of the facility.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------------|---------------------------------------|-------|
| RP-2 Lift Station | 9.5 MGD | |
| Pump System | | |
| Pipelines | 24-inch 6,600 gpm | |
| Pump Station | 3 @ 3,300 gpm 100 hp | |
| Valves | 6 units | |
| Electrical System | | |
| Utility Voltage | 12 kV | |
| Transformers | 12 kV to 480 V | |
| Switchgear | 480 V | |
| Distribution | 480 V | |
| Emergency Generation Generator | 1 @ 300 kW 443 Bhp | |
| Mounted Lighting | > 2 units | |
| Instrumentation and Control System | | |
| HMI Workstation | 1 Ea. | |
| RTU | 1 Ea. | |
| PLC | 1 Ea. | |
| I/O Hub | 1 Ea. | |
| Yard Piping | See Appendix C | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Pump System | 3 | 3 | 3 | 3 |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System

Currently no issues require special attention.

Electrical System

Currently no issues require special attention.

Instrumentation and Control System

Currently no issues require investigation.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Pump System | 2000 | |
| Electrical System | 2000 | |
| Instrumentation and Control System | 2000 | |

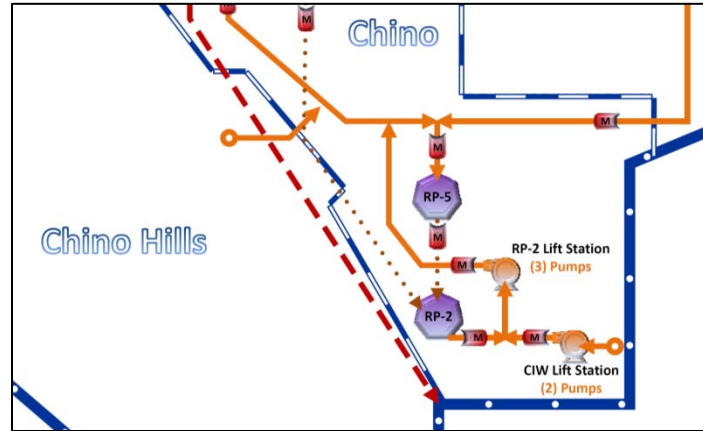
Table 4 Potential Projects

| System | Project Name | Project Description |
|----------|---------------------------------|--|
| Facility | RP2 Lift Station Rehabilitation | Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment. |

System Summary Continued on Next Page

Asset Management System Summary – LS
Chino Institute for Woman (CIW)

1. Asset Profile



Pump System

The CIW (or Prado) lift station serves the Chino Institute for Women Correctional Facility as well as Prado Park. The lift station consists of a small circular wet well with two submersible chopper pumps and a sewage grinder.

The area surrounding the CIW lift station has recently undergone development. The area, known as the Preserve, is currently bypassing sewage to the Inland Empire Brine Line and conveying it to Orange County. The City of Chino is designing and will construct a new lift station to convey the Preserve area flows to RP-5. The new lift station will also handle the flows lifted by the CIW, and the CIW lift station will be abandoned. The City of Chino will own the new lift station and reimburse the Agency for the operation and maintenance of the facility.

Instrumentation and Control System

The lift station is provided with local controls only. A control panel is tied to float switches and a sonic level transmitter to locally start and stop the pumps.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--|---------------------------------------|-------|
| CIW Lift Station | 1 MGD | |
| Pump System Pipelines | 8-inch 1,300 gpm | |
| Pump Station | 2 @ 650gpm 30 hp | |
| Sewage Grinder | 1 Ea. | |
| Electrical System Utility Voltage Transformers Distribution | 4,160 V 4,160 V to 480 V 480 V | |
| Instrumentation and Control System Control Panel | 1 Ea. | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Pump System | 3 | 3 | 3 | 3 |
| Electrical System | 3 | 3 | 3 | 3 |
| Instrumentation and Control System | 3 | 4 | 4 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System

The City of Chino plans to replace the pump station to accommodate flows from the recently developed area known as the Preserve. This lift station would be abandoned upon completion of the new lift station.

Electrical System

Currently no issues require special attention.

Instrumentation and Control System

The control system allows for only local control and has no alarm capabilities.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------------|--------------------------------------|-----------------------------|
| Pump System | 1976 1993 | |
| Electrical System | 1976 1993 | |
| Instrumentation and Control System | 1976 1993 | |

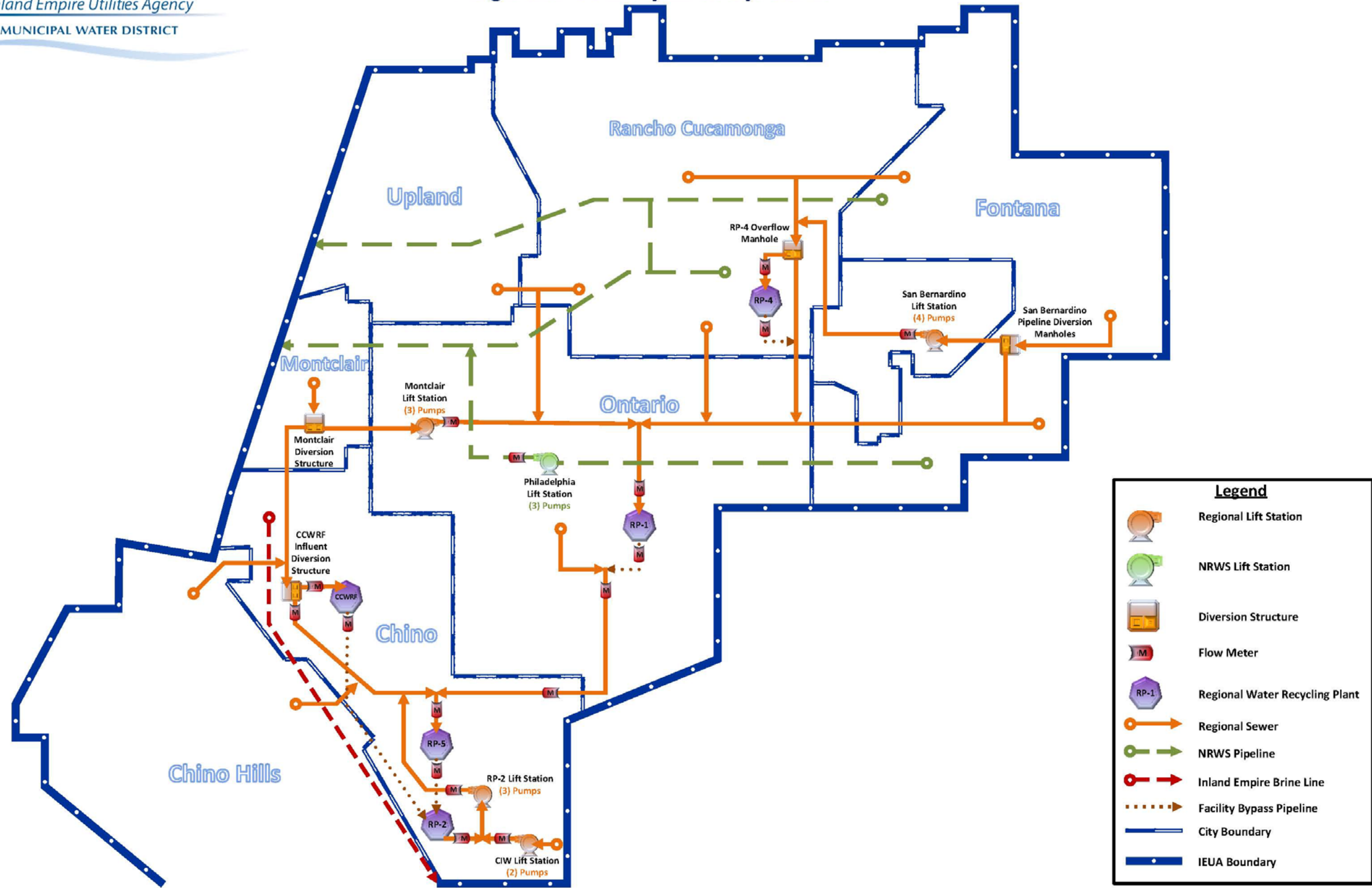
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Regional Conveyance Systems



Legend

- Regional Lift Station
- NRWS Lift Station
- Diversion Structure
- Flow Meter
- Regional Water Recycling Plant
- Regional Sewer
- NRWS Pipeline
- Inland Empire Brine Line
- Facility Bypass Pipeline
- City Boundary
- IEUA Boundary

Figure 7-9: Regional Conveyance System (RC) – Schematic

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Table 7-10: Regional Conveyance System – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | Ten-Year Total |
|----|-----------------------------|--|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | |
| 1 | EN14035 | 22-inch Manholes Along NRW North System North Trunk (NSNT) Rehab | 22-inch Manholes Along NRW North System North Trunk (NSNT) Rehab | CC | NC | 450,000 | 163,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 613,000 |
| 2 | EN22002 | NRW East End Flowmeter Replacement | Flowmeter replacement required by NRWS Agreement. | CC | NC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45,000 | 255,000 | 300,000 |
| 3 | EN14037 | Fontana Interceptor Relief Sewer Manholes Rehab | Fontana Interceptor Relief Sewer Manholes Rehab | CC | RC | 600,000 | 610,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,210,000 |
| 4 | EN14050 | Collection System Repairs Phase V, Westside Interceptor | Collection System Repairs Phase V, Westside Interceptor | CC | RC | 400,000 | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500,000 |
| 5 | CW15015 | NRW OE Projects FY2014/15 | Annual Allocation for NRW Office engineering projects. | OM | NC | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 100,000 |
| 6 | EN15024 | NRW Conn & Emergency Projects FY2014/15 | Fund unforeseen NRW projects that require immediate attention. | CC | NC | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 1,000,000 |
| 7 | EN15025 | CM Misc NRWS Constr & Emergency Proj FY2014/15 | Fund NRWS projects that require immediate attention. | CC | NC | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 2,500,000 |
| 8 | EN15031 | Regional Sewer Special Projects FY2014/15 | Fund contingency small regional sewer repairs, construction permits, and inspection of improvement projects requested by contracting agencies. | CC | RC | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000 |
| 9 | CW15019 | Sewer OE Projects FY2014/15 | Annual Allocation for sewer Office engineering projects. | CC | RC | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 500,000 |
| 10 | EN15029 | Misc RC Constr & Emergency Proj FY2014/15 | Fund unforeseen regional capital improvement projects that require immediate attention. | CC | RC | 250,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 250,000 |
| 11 | EN15030 | CM Misc RC Constr & Emergency Proj FY2014/15 | Fund unforeseen Wastewater Capital Improvement Fund projects that require immediate attention. | CC | RC | 250,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 250,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – RC Northern Regional Sewer System

1. Asset Profile

The Agency's regional wastewater treatment provides domestic and industrial disposal systems across a 242-square-mile service area to eight contracting agencies. These contracting agencies include the City of Chino, Chino Hills, Cucamonga Valley Water District, Fontana, Montclair, Ontario, Upland, and Monte Vista Water District.

The Regional Sewer System (RSS) conveys primarily domestic wastewater to IEUA's four regional water recycling facilities. The RSS has been separated into two systems and will be referred to in the system summary sheets as the Northern Regional Sewer System and Southern Regional Sewer System. The operation and maintenance of the RSS systems are the responsibility of the IEUA's Pretreatment and Source Control (PT&SC) Department's Collections System Group.

Northern Regional Sewer System

The Northern Regional Sewer System consists of sewer pipelines north of the 60 freeway terminating into RP-1.

Gravity Sewer System:

- Archibald Trunk – 18,776 LF of pipeline from Archibald Ave. and Inland Empire Blvd. to Haven Ave. and Francis St, consisting of 742 LF of 54-inch piping, 2,549 LF of 36-inch piping, 5,000 LF of 30-inch piping, 1,707 LF of 24-inch piping, 917 LF of 20-inch piping, and 7,860 LF of 18-inch piping.
- Cucamonga Interceptor Relief – 10,043 LF of RCP pipeline from Haven Ave. to RP-1 on Cedar Ave, consisting of 786 LF of 81-inch piping, 7,203 LF of 72-inch piping, 843 LF of 60-inch piping, and 1,210 LF of 54-inch piping.
- Cucamonga Interceptor – 11,382 LF of RCP pipeline from Haven Ave. to RP-1 on Cedar Ave, consisting of 208 LF of 84-inch piping, 1,310 LF of 72-inch piping, 8,255 LF of 42-inch piping, and 1,609 LF of 27-inch piping.
- Cucamonga Trunk Relief - 12,398 LF of RCP pipeline from 10 Fwy. to Francis St. on Hermosa Ave and Haven Ave.
- Etiwanda Trunk – 29,542 LF of VCP pipeline from Eastend Ave. to Jurupa Ave. on Etiwanda Ave, consisting of 3,596 LF of 42-inch piping, 4,882 LF of 36-inch piping, 2,056 LF of 30-inch piping, 3,049 LF of 27-inch piping, 12,157 LF of 24-inch piping, 1,761 LF of 21-inch piping, 968 LF of 15-inch piping, and 2042 LF of 12-inch piping.
- Fontana Interceptor – 40,691 LF: 33,128 LF of pipeline from Live Oak Ave. to Haven Ave. on Marlay St. and Francis St., consisting of 5,396 LF of 39-inch piping, 7,657 LF of 36-inch piping, 13,138 LF of 33-inch piping, 4,915 LF of 21-inch piping, and 393 LF of 18-inch piping.
- Fontana Interceptor Relief – 36,119 LF of pipeline from Beech Ave. to Milliken Ave on Jurupa Ave, consisting of 5,187 LF of 78-inch piping, 508 LF of 72-inch piping, 12,105 LF of 66-inch piping, 3,925 LF of 54-inch piping, 1,804 LF of 48-inch piping, 977 LF of 42-inch piping, 260 LF of 36-inch piping, 5,595 LF of 30-inch piping, 2,415 LF of 27-inch piping, 260 LF of 24-inch piping, and 3,080 LF of 21-inch piping.
- Freeway Trunk – 6,076 LF of VCP pipeline along 10 Fwy. from 6th St. to 4th St., consisting of 74 LF of 39-inch piping, 208 LF of 33-inch piping, 2,219 LF of 27-inch piping, 3,169 LF of 18-inch piping, 166 LF of 15-inch piping, and 166 LF of 12-inch piping.
- Grove Avenue Outfall – 22,888 LF of VCP piping from Grove Ave. and 8th St. to Cucamonga Ave. and Mission Ave. to Carlos Ave., consisting of 270 LF of 42-inch piping, 8,917 LF of 36-inch piping, 8,060 LF of 30-inch piping, 1,395 LF of 27-inch piping, 236 LF of 24-inch, 689 LF of 21-inch, and 3,318 LF of 18-inch piping.
- Grove Interceptor – 4,042 LF: 3,964 LF of VCP pipeline from 8th St. to 5th St. on Grove Ave, consisting of 465 LF of 36-inch piping and 3,508 LF of 30-inch piping.
- Montclair Interceptor – 41,197 LF: 37,432 LF of VCP pipeline from Roswell Ave. and Grand Ave. to RP-1 on Philadelphia St., consisting of 720 LF of 67-inch piping, 1,510 LF of 60-inch piping, 31,349 LF of 30-inch piping, 494 LF of 27-inch, 392 LF of 24-inch, 2,658 LF of 21-inch and 308 LF of 12-inch piping.

- Turner Trunk – 2,562 LF of 24-inch VCP pipeline from 4th St. to 10 Fwy. on Turner St.
- Upland Interceptor – 10,870 LF of 30-inch VCP pipeline from Imperial Ave. and Mission Ave. to Carlos Ave. and Philadelphia Ave.
- Upland Interceptor Relief – 19,623 LF of VCP pipeline from 4th St. to Mission Ave. on Imperial St, consisting of 2,525 LF of 36-inch piping, 2,325 LF of 30-inch, 1,205 LF of 27-inch, 749 LF of 24-inch, 7,422 LF of 21-inch, 3,295 LF of 18-inch, and 2,044 LF of 15-inch piping.

Force Main System:

- Montclair Lift Force Main – 4,366 LF of ductile iron pipeline from Montclair Lift Station to Euclid Ave.
- San Bernardino Lift Force Main

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------|---------------------------------------|----------|
| Archibald Trunk | 54-inch – 62 MGD | 3.1 ft/s |
| | 36-inch – 18.1 MGD | 2.9 ft/s |
| | 30-inch – 21.5 MGD | 2.0 ft/s |
| | 24-inch – 11.9 MGD | 2.3 ft/s |
| | 20-inch – 8.3 MGD | 6.0 ft/s |
| | 18-inch – 7.4 MGD | 6.0 ft/s |
| Cucamonga Interceptor Relief | 81-inch – 254 MGD | 6.2 ft/s |
| | 72-inch – 105 MGD | 4.0 ft/s |
| | 60-inch – 214 MGD | 6.0 ft/s |
| | 54-inch – 71.8 MGD | 5.6 ft/s |
| Cucamonga Interceptor | 84-inch – 238 MGD | 6.0 ft/s |
| | 72-inch – 158 MGD | 5.6 ft/s |
| | 42-inch – 21.2 MGD | 2.0 ft/s |
| | 27-inch – 15.3 MGD | 6.0 ft/s |
| Cucamonga Trunk Relief | 39-inch – 29.5 MGD | 4.4 ft/s |
| | 36-inch – 34.6 MGD | 5.8 ft/s |
| | 33-inch – 34.0 MGD | 6.0 ft/s |
| | 30-inch – 29.9 MGD | 5.6 ft/s |
| | 27-inch – 30.4 MGD | 6.0 ft/s |
| | 24-inch – 23.4 MGD | 5.2 ft/s |
| Etiwanda Trunk | 42-inch – 41 MGD | 3.0 ft/s |
| | 36-inch – 45 MGD | 7.0 ft/s |
| | 30-inch – 28 MGD | 5.0 ft/s |
| | 27-inch – 14 MGD | 5.0 ft/s |
| | 24-inch – 18 MGD | 7.0 ft/s |
| | 21-inch – 14 MGD | 6.0 ft/s |
| Fontana Interceptor | 18-inch – 6 MGD | 6.0 ft/s |
| | 39-inch – 15.9 MGD | 1.7 ft/s |
| | 36-inch – 19.4 MGD | 2.1 ft/s |
| | 33-inch – 11.1 MGD | |
| | 21-inch – 10.8 MGD | |
| | 18-inch – 12.7 MGD | |
| Fontana Interceptor Relief | 78-inch – 98.4 MGD | |
| | 72-inch – 79.8 MGD | |
| | 66-inch – 83.5 MGD | |
| | 54-inch – 67.4 MGD | |
| | 48-inch – 79.5 MGD | |
| | 42-inch – 18.6 MGD | |
| | 36-inch – 17.6 MGD | |
| | 30-inch – 18.3 MGD | |
| | 27-inch – 23.2 MGD | |
| 21-inch – 12.3 MGD | | |
| Freeway Trunk | 39-inch – 20.6 MGD | |
| | 33-inch – 18.4 MGD | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|--------------------------------|---|----------------------|
| | 27-inch – 23.6 MGD 18-inch – 8.0 MGD 15-inch – 14.7 MGD 12-inch – 8 MGD | |
| Grove Avenue Outfall | 42-inch – 21 MGD 36-inch – 34 MGD 30-inch – 31.8 MGD 27-inch – 29 MGD 24-inch – 23.6 MGD 21-inch – 9.7 MGD 18-inch – 10.4 MGD | |
| Grove Interceptor | 36-inch – 36.9 MGD 30-inch – 42.1 MGD | |
| Montclair Interceptor | 67-inch – 149 MGD | 5.8 ft/s |
| | 60-inch – 58 MGD | 3.6 ft/s |
| | 30-inch – 7 MGD | 1.2 ft/s |
| | 27-inch – 6.7 MGD | 1.2 ft/s |
| | 24-inch – 9 MGD | 2.0 ft/s |
| | 21-inch – 8.5 MGD | 2.5 ft/s |
| Turner Trunk | 24-inch – 16 MGD | 6 ft/s |
| Upland Interceptor | 30-inch – 25.9 MGD | 5.5 ft/s |
| Upland Interceptor Relief | 36-inch – 31.6 MGD | 5.4 ft/s |
| | 30-inch – 31.5 MGD | 7.8 ft/s |
| | 27-inch – 16.1 MGD | 5.9 ft/s |
| | 24-inch – 13.1 MGD | 5.7 ft/s |
| | 21-inch – 15.9 MGD | 7.0 ft/s |
| | 18-inch – 7.4 MGD 15-inch – 5.2 MGD | 3.6 ft/s 4.3 ft/s |
| Montclair Lift Force Main | 18-inch | |
| San Bernardino Lift Force Main | | |

3. Asset Ratings (to be developed in future updates)

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Archibald Trunk | | | | |
| Cucamonga Interceptor Relief | | | | |
| Cucamonga Interceptor | | | | |
| Cucamonga Relief | | | | |
| Etiwanda Trunk | | | | |
| Fontana Interceptor | | | | |
| Fontana Interceptor Relief | | | | |
| Freeway Trunk | | | | |
| Grove Avenue Outfall | | | | |

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Montclair Interceptor | | | | |
| Turner Trunk | | | | |
| Upland Interceptor | | | | |
| Upland Interceptor Relief | | | | |
| Montclair Lift Force Main | | | | |
| San Bernardino Lift Force Main | | | | |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation (to be developed in future updates)

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--------------------------------|--------------------------------------|-----------------------------|
| Archibald Trunk | 1963 | |
| Cucamonga Interceptor | 1973 | |
| Cucamonga Inter. Relief | 1987 | |
| Cucamonga Trunk Relief | 1983 | |
| Etiwanda Trunk | 1986 | |
| Fontana Interceptor | | |
| Fontana Interceptor Relief | | |
| Freeway Trunk | 1961 | |
| Grove Avenue Outfall | 1961, 2006, 2010 | |
| Grove Interceptor | 1961, 2006 | |
| Montclair Interceptor | 1975 | |
| Turner Trunk | 1969 | |
| Upland Interceptor | 1956 | |
| Upland Interceptor Relief | 1956, 1991 | |
| Montclair Lift Force Main | 1978 | |
| San Bernardino Lift Force Main | | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

**Asset Management System Summary – RC
Southern Regional Sewer System**

1. Asset Profile

The Agency's regional wastewater treatment provides domestic and industrial disposal systems across a 242-square-mile service area to eight contracting agencies. These contracting agencies include the City of Chino, Chino Hills, Cucamonga Valley Water District, Fontana, Montclair, Ontario, Upland, and Monte Vista Water District.

The Regional Sewer System (RSS) conveys primarily domestic wastewater to IEUA's four regional water recycling facilities. The RSS has been separated into two systems and will be referred to in the system summary sheets as the Northern Regional Sewer System and Southern Regional Sewer System. The operation and maintenance of the RSS systems are the responsibility of the IEUA's Pretreatment and Source Control (PT&SC) Department's Collections System Group.

Southern Regional Sewer System

The Southern Regional Sewer System consists of sewer pipelines south of the 60 freeway and RP-1.

Gravity Sewer System:

- Chino Interceptor – 16,059 LF of pipeline from CCWRF to RP-5 and RP-2, consisting of 150 LF of 54-inch piping, 1,933 LF of 42-inch piping, 6,212 LF of 30-inch piping, 1,645 LF of 27-inch piping, and 6,118 LF of 24 piping.
- Eastern Trunk Sewer – 29,321 LF of pipeline from RP-1 connecting to the Kimball Interceptor at Hellman Ave., consisting of 41 LF of 81-inch piping, 30 LF of 67-inch piping, 4,964 LF of 48-inch piping, 10,766 LF of 42-inch piping, 2,246 LF of 39-inch piping, 6,387 LF of 36-inch piping, 4,783 LF of 33-inch piping, and 100 LF of 27-inch piping.
- Kimball Interceptor – 18,923 LF of pipeline from RP-5 east to Hellman Ave., consisting of 2,137 LF of 66-inch piping, 4,809 LF of 60-inch piping, 10,889 of 54-inch piping, and 1,087 LF of 48" piping.
- Los Serranos Trunk – 2,807 LF of pipeline from Pomona Rincon Rd. to El Prado Rd. There are 52 LF of 36" piping and 2,755 LF of 30" piping.
- Westside Interceptor – 23,806 LF of pipeline from Walnut Ave. and Eastend Ave. to Chino Ave. along Pipeline and ending in CCWRF, consisting of 1,297 LF of 24" piping, 10,473 LF of 21" piping, 7,391 LF of 18" piping, 2,719 LF of 15" piping, 1,358 LF of 12" piping, and 565 LF of 10" piping.
- Westside Interceptor Relief Sewer – 40,715 LF of pipeline from Montclair diversion structure along Eastend Ave. to Chino Ave, Ramona Ave., Eucalyptus Ave., and Monte Vista Ave. to CCWRF, consisting of 2,575 LF of 54" piping, 4,948 LF of 42" piping, 1,623 LF of 36" piping, 8,803 LF of 33" piping, 1,358 LF of 30" piping, 18,300 of 27" piping, 866 LF of 24" piping, 1,773 LF of 21" piping, and 445 LF of 15" piping.
- CIW/Prado Park Lift Force Main
- RP-2 Lift Station Force Main

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------------|---------------------------------------|----------|
| Chino Interceptor | 54" – 67.0 MGD | 6.0 ft/s |
| | 42" – 21.0 MGD | 1.8 ft/s |
| | 30" – 13.0 MGD | 2.3 ft/s |
| | 27" – 14.3 MGD | 3.3 ft/s |
| Eastern Trunk Sewer | 24" – 12.0 MGD | 4.0 ft/s |
| | 81" – 194 MGD | 6.0 ft/s |
| | 67" – X MGD | 6.3 ft/s |
| | 48" – 47 MGD | 6.0 ft/s |
| | 42" – 60.3 MGD | 6.0 ft/s |
| | 39" – 18.4 MGD | 6.0 ft/s |
| Kimball Interceptor | 36" – 61.7 MGD | 6.0 ft/s |
| | 33" – 28.8 MGD | 6.0 ft/s |
| | 27" – 78.4 MGD | 6.0 ft/s |
| | 66" – 70.5 MGD | 4.7 ft/s |
| Los Serranos Trunk | 60" – 83.8 MGD | 6.3 ft/s |
| | 54" – 52.1 MGD | 5.2 ft/s |
| Westside Interceptor | 48" – 39.7 MGD | 5.6 ft/s |
| | 36" – 17.9 MGD | |
| | 30" – 28 MGD | |
| | 24" – 7.2 MGD | 2.3 ft/s |
| Westside Interceptor Relief Sewer | 21" – 7.7 MGD | 3.1 ft/s |
| | 18" – 5.8 MGD | 3.8 ft/s |
| | 15" – 4.9 MGD | |
| | 12" – 1.8 MGD | |
| | 10" – 2.0 MGD | |
| | 54" – 31.9 MGD | 2.3 ft/s |
| CIW/Prado Park Lift | 42" – 21.7 MGD | 2.4 ft/s |
| | 36" – 26.6 MGD | 3.2 ft/s |
| | 33" – 30.2 MGD | 4.8 ft/s |
| | 30" – 13.6 MGD | 2.0 ft/s |
| | 27" – 21.0 MGD | 3.5 ft/s |
| | 24" – 28.2 MGD | 6.2 ft/s |
| RP-2 Lift Station Force Main | 21" – 31.6 MGD | 2.2 ft/s |
| | | |

3. Asset Ratings (to be developed in future updates)

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|-----------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Chino Interceptor | | | | |
| Eastern Trunk Sewer | | | | |
| Kimball Interceptor | | | | |
| Los Serranos Trunk | | | | |
| Westside Interceptor | | | | |
| Westside Interceptor Relief Sewer | | | | |
| CIW/Prado Park Lift | | | | |
| RP-2 Lift Station Force Main | | | | |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation (to be developed in future updates)

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|-----------------------------------|--------------------------------------|-----------------------------|
| Chino Interceptor | | |
| Eastern Trunk Sewer | | |
| Kimball Interceptor | 1999 | |
| Los Serranos Trunk | | |
| Westside Interceptor | | |
| Westside Interceptor Relief Sewer | | |
| CIW/Prado Park Lift | 1964, 1976, 1991, 1998, 2010 | |
| RP-2 Lift Station Force Main | | |

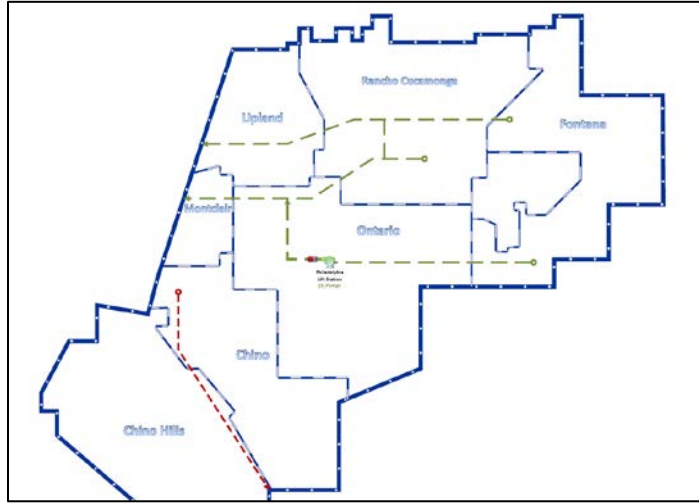
Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

System Summary Continued on Next Page

Asset Management System Summary – RC Non-Reclaimable Wastewater System

1. Asset Profile



The Agency operates the Non-Reclaimable Wastewater System (NRWS), which provides the disposal means for discharges of high-salt-content industrial wastewater. This wastewater is not suitable to be treated at the Agency’s treatment plants. The NRWS transports non-reclaimable, salt-laden, industrial wastewater out of the Agency’s service area to other treatment facilities in Los Angeles and Orange counties and to eventual discharge to the Pacific Ocean.

Northern Non-Reclaimable Waste System

- The North NRWS consists of five major trunk lines: the North, Central, and South trunk lines, the Edison Waste Line, and the Cucamonga Creek Trunk, which collect industrial wastewater discharges and convey the combined discharge to the County sanitation districts of Los Angeles County’s sewer system.
- North System North Trunk – 22,887 LF of VCP pipeline in Rancho Cucamonga from Day Creek St. and Arrow St. along 8th St. to Hellman Ave.
- North System Center Trunk – 71,343 LF of VCP pipeline starting on Etiwanda Ave. and RP-4 in the City of Ontario running south to Ontario Mills Pkwy., west to Hellman Ave., southwest to Phillips Ave., and west to LACSD.
- North System South Trunk – 65,720 LF of VCP pipeline from Sierra Ave. and Slover Ave. in the City of Fontana to Jurupa Ave., west to Mulberry Ave, south on to Francis St., south on to Etiwanda Ave., and west to Philadelphia Ave to the Philadelphia pump station, where it is connected to the North System Center Trunk by the Philadelphia lift station force main.
- Edison Waste Line – 33,757 LF VCP of pipeline starting from Helms Ave. and 9th St. in Rancho Cucamonga, running south on Hellman Ave., and turning southwest to 5th Ave. in the City of Ontario, and running west along 5th St. to LACSD pipelines.
- Cucamonga Creek Trunk – 8,659 LF VCP of pipeline connecting the Edison Waste Line to the North System Center Trunk along Hellman Ave.
- Philadelphia Lift Force Main – 26,452 LF of two parallel force mains 12-inch and 18-inch VCP pipeline from the Philadelphia Pump Station west on Philadelphia Ave. and north on Bon View Ave. to the North System Center Trunk.

Southern Non-Reclaimable Waste System

The South NRWS serves industries in the south service area of the Agency, and the combined discharge is conveyed to Inland Empire Brine Line (IEBL) and ultimately to the sewer system of the Orange County Sanitation District.

Inland Empire Brine Line – 25,948 LF VCP and RCP of pipeline from Yorba Ave. and Edison Ave. to Monte Vista Ave., with a connection at CCWRF along Chino Creek to El Prado Rd. at Kimball Ave., extending

southeast to Euclid Ave. and ultimately to OCSD. There are 15-inch VCP pipelines on Edison Ave., 15-inch VCP on Yorba Ave., 12-inch VCP on Monte Vista St., 27-inch RCP Central Ave/Easement, and 27-inch RCP along El Prado Rd.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------|---------------------------------------|-------|
| North System North Trunk | | |
| North System Center Trunk | | |
| North System South Trunk | 24-inch VCP 8-inch VCP | |
| Edison Waste Line | | |
| Cucamonga Creek Trunk | | |
| Philadelphia Lift Force Main | 18-inch 12-inch | |
| Inland Empire Brine Line | | |

3. Asset Ratings (to be developed in future updates)

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|------------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| North System North Trunk | 3 | 2 | 2 | 2 |
| North System Center Trunk | | | | |
| North System South Trunk | | | | |
| Edison Waste Line | | | | |
| Cucamonga Creek Trunk | | | | |
| Philadelphia Lift Force Main | 2 | 2 | 2 | 2 |
| Inland Empire Brine Line | 3 | 3 | 3 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation (to be developed in future updates)

North System North Trunk

North System Center Trunk

North System South Trunk

Edison Waste Line

Cucamonga Creek Trunk

Philadelphia Lift Force Main

Inland Empire Brine Line

According to the 2006 PBS&J condition assessment report of the IEBL line, 1/3 of the entire pipeline required rehabilitation/replacement, and 1/3 required re-inspection because of inaccessibility. The segments recommended for attention require considerable cleaning to remove debris, which has accumulated within the pipes and may contain hazardous constituents. Inspections were severely hampered by the debris accumulation. Additional inspection for many of the segments is recommended after the cleaning is complete.

Several manholes were found to be surcharged, while the manholes located at the southern-most end of the trunk sewer were inaccessible because of pressure lids.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|------------------------------|--------------------------------------|-----------------------------|
| North System North Trunk | | 2006 |
| North System Center Trunk | | 2006 |
| North System South Trunk | | 2006 |
| Edison Waste Line | | 2006 |
| Cucamonga Creek Trunk | | 2006 |
| Philadelphia Lift Force Main | | 2006 |
| Inland Empire Brine Line | | 2006 |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Agency Laboratory

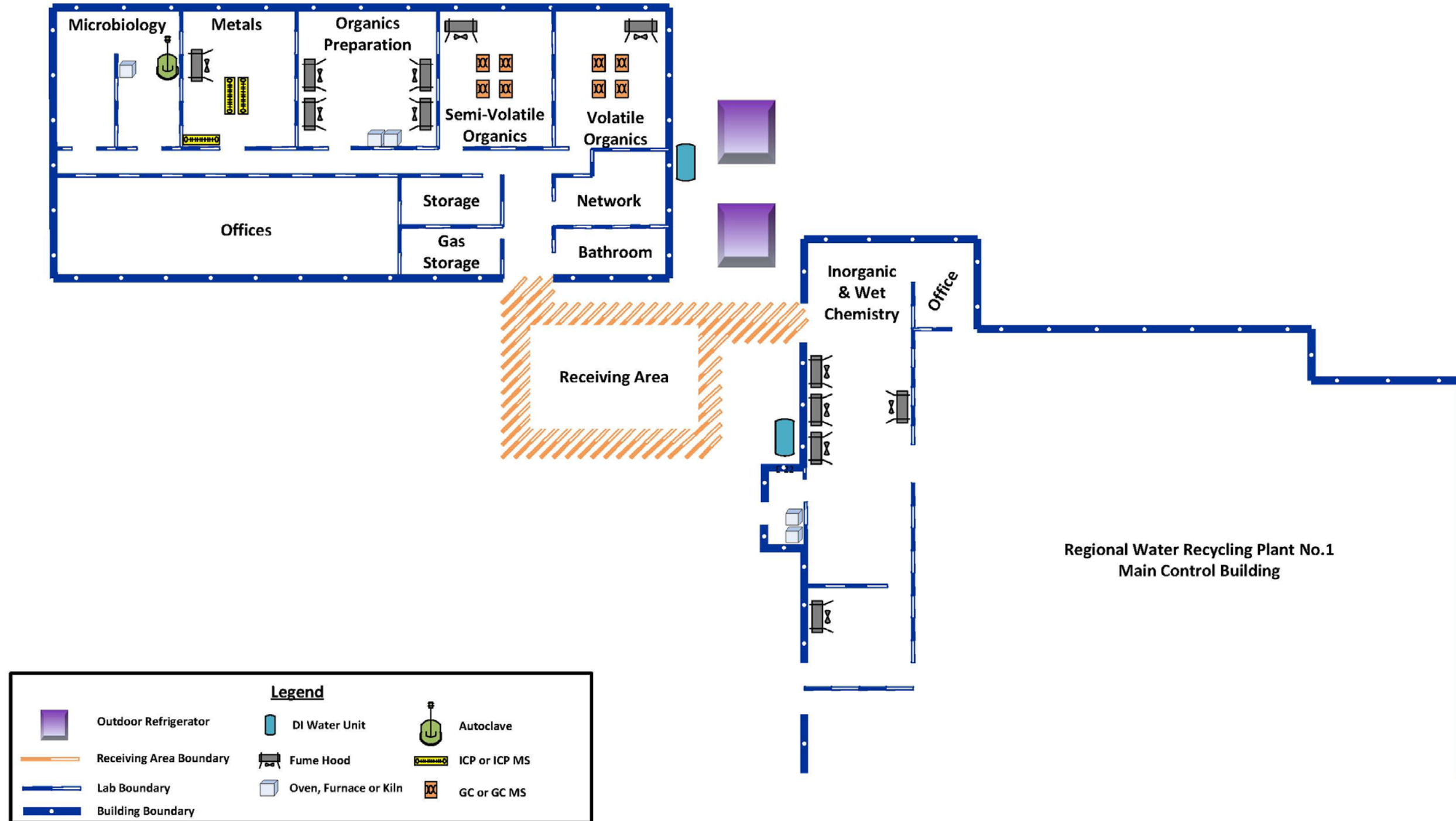


Figure 7-10: Agency Laboratory (Lab) – Schematic

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Table 7-11: Agency Laboratory – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|---|-----------------------------|------------------------------|--|---------------------------|-------------------|------------------------------|---------|-----------|------------|-----------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN15008 | New Water Quality Laboratory | This project will replace the existing operation laboratory at RP-1. A possible site location will be south of Headquarters at RP-5. | CC | RO | 0 | 0 | 1,100,000 | 10,000,000 | 6,000,000 | 0 | 0 | 0 | 0 | 0 | 17,100,000 |
| 2 | EN15007 | New Lab Equipment (New Lab) | New lab equipment (GCMS, Liquid Chromatography), depends on new lab construction. | CC | RO | 0 | 0 | 0 | 650,000 | 0 | 0 | 0 | 0 | 0 | 0 | 650,000 |
| 3 | EN15006 | Lab Equipment Replacement | Replacement of obsolete equipment in the Metals & Organic Chemistry, Inorganic & Wet Chemistry, and Microbiology Labs. | CC | RO | 0 | 50,000 | 0 | 0 | 50,000 | 0 | 0 | 50,000 | 0 | 0 | 150,000 |
| 4 | LB14003 | Autoclave | This project will replace the Autoclave in the Microbiology | EQ | RC | 17,500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17,500 |
| 5 | LB14001 | Pesticide GC Replacement | This project will replace the GC in the Metals & Organics Lab. | EQ | RC | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary – Lab Agency Laboratory

1. Asset Profile

Agency Laboratory (Lab)

The Agency Laboratory (Lab) is located at Regional Water Recycling Plant No.1 in Ontario. The Lab is certified by the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP) to perform 12 fields of testing and 35 specific approved methods. The lab was constructed in two phases: Phase 1 included a 1,900-square-foot laboratory space, and Phase 2 included a 4,300 square-foot-building. The Lab performs more than 80,000 analyses annually and sends out another 5,000 samples for analysis by a contracted laboratory. The Lab is broken into three groups: Wet Chemistry, Metals & Organic Chemistry, and Bioassay & Microbiology. The Lab analyzes samples from the Agency's wastewater plants, pretreatment and source control programs, desalination facility, and ground water recharge basins.

Metals & Organic Chemistry

The Metals & Organic Chemistry section is located in the expanded Phase 2 building. This type of chemistry uses specialized equipment to analyze a sample extract's makeup. Organic Chemistry specifically analyzes substances containing a carbon molecule. Metals/Inorganic Chemistry specifically analyzes substances that don't contain a carbon molecule. Some common analyses include mercury, metal salts, heavy metals, pesticides, and volatile and semi-volatile organics. Key pieces of equipment used are the Inductively Coupled Plasma Spectrometer (ICP), the ICP Mass Spectrometer (ICP MS), the Gas Chromatograph (GC), and GC Mass Spectrometer (GC MS).

Inorganic & Wet Chemistry

The Inorganic and Wet Chemistry section is located in the original Phase 1 building. This type of chemistry includes analyses performed in a liquid phase with beakers, test tubes and solvents. Some common analyses include TOC, BOC, COD, solids (total, dissolved, suspended, and volatile), ammonia, alkalinity, cyanide, and anions.

Microbiology

Microbiology is located in the expanded Phase 2 building. Microbiology is the study of microscopic organisms. Some common analyses include total and fecal coliform and bioassay. Bioassay is a specific scientific experiment that measures the effects of a substance on a living organism (Ceriodaphnia dubia; specie of water flea).

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Average) | Notes |
|----------------------------|--|-------|
| Metals & Organic Chemistry | | |
| Metals: | | |
| Fume Hood | 1 @ 100 fpm | Min |
| ICP | 2 @ 157 sample batch | Max |
| ICP MS | 1 unit | |
| Mercury Analyzer | 1 @ 62 sample batch | Max |
| Auto Block Digester | 1 @ 54 sample batch | Max |
| Peristaltic Pump | 2 units | |
| Organics Preparation: | | |
| Fume Hood | 4 @ 100 fpm | Min |
| Extractor System | 3 units; 1 controller | |
| Kiln | 1 @ 450°C | |
| Oven | 1 @ 300°C | |
| Evaporator | 3 @ 300 ml | |
| | 2 @ 50 or 200 ml | |
| Dishwasher | 2 units | |
| Semi-Volatile Organics: | | |
| Fume Hood | 1 @ 100 fpm | Min |
| GC | 2 @ 25 min per sample | Max |
| GC MS | 2 @ 25 min per sample | Max |
| Volatile Organics: | | |
| Fume Hood | 2 @ 100 fpm | Min |
| GC | 2 units | |
| Concentrator | 2 @ 51 sample batch | Max |
| Auto Sampler | 2 units | |
| Refrigerator | 1 unit | |
| Gas System: | | |
| Argon | 160 liters | |
| Helium | 300 ft ³ | |
| Nitrogen | 200 ft ³ | |
| DI Purification | 1 unit | |
| Refrigerator | 1 @ 960 ft ³ 13 to 41°F | |
| Inorganic & Wet Chemistry | | |
| Fume Hood | 6 @ 100 fpm | Min |
| Oven | 2 @ 180°C 2 @ 104°C | |
| Furnace | 2 @ 550°C | |
| Incubator | 2 @ 20°C | |
| TOC Analyzer | 1 @ 70 sample batch | Max |
| | 1 @ 75 sample batch | Max |
| Ion Chromatograph | 2 @ 49 sample batch | Max |
| Colorimeter | 1 @ 120 sample batch | Max |
| Auto Colorimeter | 2 unit | |
| Auto Sampler | 2 @ 120 sample batch | Max |
| Auto Titrator | 1 @ 36 sample batch | Max |
| Nano Pure Filter | 1 unit | |
| Dishwasher | 2 units | |
| Gas System: | | |
| Helium | 2 @ 200 ft ³ 2 @ 300 ft ³ | |
| Nitrogen | 2 @ 300 ft ³ | |
| DI Purification | 1 unit | |
| Refrigerator | 1 @ 960 ft ³ 13 to 41°F | |
| Microbiology | | |

| System Subsystem(s) | Design Capacity (Average) | Notes |
|---------------------|---------------------------|-------|
| Autoclave | 1 @ 35°C 1 @ 120°C | |
| Incubator | 2 @ 35°C | |
| Water Bath | 1 @ 44.5°C | |
| Oven | 2 @ 180°C | |
| Temp. Control | 1 unit | |
| Nano Pure Filter | 1 unit | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|----------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| Metals & Organic Chemistry | 4 | 4 | 3 | 4 |
| Inorganic & Wet Chemistry | 4 | 4 | 3 | 4 |
| Microbiology | 4 | 4 | 3 | 4 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Metals & Organic Chemistry

The building has ventilation problems and roof leaks. A black dusty and gritty substance covers the counters and expensive lab equipment through all areas. The temperature controls for the building, which are crucial for sensitive lab equipment, fail regularly.

The outdoor refrigerator requires routine spare parts, but the structure is sound.

Because of constant upgrades of equipment, spare parts become unavailable through the manufacturers. A contract is required for equipment for routine maintenance activity as recommended by the manufacturer; these contracts are expensive.

The GC and ICP-MS units have no redundancy. Project LB14001 and LB14002 are budgeted to replace both pieces of equipment through the Lab. The existing ICP-MS is fifteen years old, well past the expected life expectancy, and replacement is necessary. The ICP-MS is a critical piece of equipment and must be replaced prior to failure. The GC is currently being operated until failure.

A planned project through the Lab will replace obsolete equipment every ten years.

Inorganic & Wet Chemistry

The building has a lack of storage space and problems with roof leaks, and a portion is inadequately protected from weather elements. In addition, there is concern about the effectiveness of the fume hoods. Project EP13003 through the Maintenance Department will paint the walls and replace damaged tiles.

The outdoor refrigerator requires routine spare parts, but the structure is sound.

Because of constant upgrades of equipment, spare parts become unavailable through the manufacturers. A contract is required for

equipment for routine maintenance activity as recommended by the manufacturer; these contracts are expensive.

The TOC Analyzer fails frequently, requiring the use of a service contract.

A planned project through the Lab will replace obsolete equipment every ten years

Microbiology

Please refer to the Metals & Organic Chemistry discussion under Key Issues related to the building, as Microbiology shares the same building.

The autoclave should be replaced every five to ten years; spare parts are used between replacements to ensure continuous operation. The Laboratory is transferring funds to purchase a new autoclave, because the current Autoclave fails.

A planned project through the Lab will replace obsolete equipment every ten years

A planned engineering project will construct a new laboratory by 2018.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|----------------------------|--------------------------------------|-----------------------------|
| Metals & Organic Chemistry | 1997 | 2005 |
| Inorganic & Wet Chemistry | 1979 | 2005 |
| Microbiology | 1997 | 2005 |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Agency Headquarters



Figure 7-11: Agency Headquarters – Schematic

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Table 7-12: Agency Headquarters – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|--|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 1 | EN14002 | CIPO Enhancements | Construction Management tracking software upgrades. | EQ | GG | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 150,000 |
| 2 | IS10025 | SAP Public Sector Budget Prep App | SAP Public Sector Budget Prep Application | EQ | GG | 0 | 200,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 200,000 |
| 3 | EN21002 | Chino Creek Wetlands and Educational Park Upgrades | Grant-dependent project to facilitate the education program and increase community involvement, the Park needs three Ramadas with educational signage, a restroom/storage facility and the construction of a previous parking lot with additional signage. | CC | RO | 0 | 0 | 0 | 0 | 0 | 0 | 900,000 | 958,000 | 0 | 0 | 1,858,000 |
| 4 | EN15033 | CIPO Enhancements FY2014/15 | CIPO Enhancements FY2014/15 | EQ | GG | 15,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15,000 |
| 5 | WR15002 | CBWCD Landscape Audit & Monitoring Program | CBWCD Landscape Audit & Monitoring Program | RE | WW | 40,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40,000 |
| 6 | WR15004 | Garden In Every School | Garden In Every School | OM | WW | 45,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45,000 |
| 7 | WR15005 | Residential Landscape Device Retrofit Program | Residential Landscape Device Retrofit Program | RE | WW | 400,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 400,000 |
| 8 | WR15007 | Residential Rebate Incentives | Residential Rebate Incentives | RE | WW | 75,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75,000 |
| 9 | WR15008 | IEUA Regional Education Program | IEUA Regional Education Program | OM | WW | 70,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70,000 |
| 10 | WR15009 | CII Rebate Incentive | CII Rebate Incentives | OM | WW | 75,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75,000 |
| 11 | WR15011 | Freesprinklernozzles.com Program | Freesprinklernozzles.com Program | RE | WW | 243,750 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 243,750 |
| 12 | WR15013 | Sponsorships & Public Outreach | Sponsorships & Public Outreach | OM | WW | 80,500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,500 |
| 13 | WR15015 | Residential Landscape Training Classes | Residential Landscape Training Classes | OM | WW | 15,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15,000 |
| 14 | WR15017 | Landscape Transformation Program | Landscape Transformation Program | RE | WW | 300,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 300,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|---|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 15 | WR15018 | IEUA WUE Model Update & Workshops | IEUA WUE Model Update & Workshops | OM | WW | 7,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,000 |
| 16 | MM15001 | Replace 5 Agency Vehicles | Replace 5 Agency vehicles: 3 Sedans, 1 Passenger Van, and 1 Pickup Truck. | EQ | GG | 130,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 130,000 |
| 17 | EC15001 | Procure & Implement a Web-based GIS Application | Procure & Implement a Web-based GIS Application that Integrates SAP & ArcGIS | EQ | GG | 150,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150,000 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

Asset Management System Summary – HQ Agency Headquarters and Park

1. Asset Profile

Headquarters Structures

Two 33,000-square-foot tilt-up-construction single stores contain office space, conference rooms, a board room, and key information system equipment used for agency business functions. Most of the non-wastewater treatment staff use these two buildings for day-to-day business. The buildings were built to LEED Platinum 2004 certifications by incorporating several eco-friendly sustainable components.

Heating Ventilation and Air Conditioning (HVAC)

The Central Energy Plant serves headquarters buildings A, B, and the RP-5 REEP control room. Each building is air conditioned with a single variable air volume (VAV) air handler with chilled and heated water coils. VAV and VAV with reheat (VAV/R) terminals are pressure independent. Heating is provided by hot water preheat coils in the air handlers and hot water reheat coils in the VAV/R terminals. The REEP control and electrical rooms are air conditioned with constant-volume chilled-water fan coils. There are a total of four chilled water nodes with a connected cooling load of 144.5 tons cooling. Space heating connected load is 590,000 btuh. Hot water is also used for radiant floor heating in the main entrances and locker rooms.

Plumbing

The headquarters facility has traditional plumbing to bathroom fixtures including sinks, showers, toilets, and flushless urinals. Other fixtures include custodian closets and various outdoor hose bibs. Main lines feed hot water from the central plant to the building, where the hot water is used in various heating and cooling aspects of the building. The building is also equipped with a fire suppression system.

Chino Creek Wetlands and Educational Park

The 22-acre park was designed to restore native habitat and natural drainage that feeds into Chino Creek Reach I, showcasing the environmental values of this ecologically rich region of Southern California.

Water Ponds

An aesthetic water feature receives flow from a recycled water service. The ponds hold water and can recirculate for a waterfall feature between the two ponds. The overflow of the ponds flows down a stream to the extended detention basin.

Extended Detention Basin

The detention pond provides initial storage and detention for storm flows. It also serves as a preliminary settling pond for sediments, potentially reducing total suspended solids, and provides the primary storage pool, where flows are conveyed to one of three flow paths: the Surface Flow Wetlands and the Subsurface Flow Wetlands via two stop-log structures. A concrete/rip rap spillway is provided for the 100-year-storm event that would overflow the stop-log structures. The spillway feeds the surface bioswale system.

Surface Wetlands

The Surface Wetlands is a series of several deep water ponds that provide traditional natural system nutrient removal. A combination of emergent vegetation bands and deep and shallow zones provides higher retention time and less hydraulic short-circuiting and supports the microbial processes that result in water quality improvement. The final pond/habitat lake includes dense patches of emergent marsh and open water to provide suitable foraging habitat for water birds. Flow from the habitat lake exits a stop-log structure and flows to the effluent structure.

Subsurface Wetlands

Flow from the detention basin stop-log structure enters three engineered wetland cells. Each cell has a loose pea-gravel soil mixture that supports the root structure of nutrient-removal plant species. The configuration provides high surface area of water flows to the plant root structure for nutrient removal, low potential for hydraulic short-circuiting, and the most

potential for highly efficient nutrient removal. Each cell controls the water level via a stop-log structure.

Bioswale

The bioswale system receives overflow from the extended detention basin and directs flow to the effluent structure. The bioswale has several energy-dissipation and soil-stabilization components, including planted willows, mulefat, geotextile soil fabric, rip rap, and a large stabilized tree root bole.

Intermittent Stream

The intermittent stream on the west side of the site conveys infrequent storm flows, providing preliminary water quality treatment, and consists of drier riparian habitats. Upland woodland and grassland areas provide aesthetically pleasing areas for visitors to walk through and picnic, while demonstrating upland habitats historically common in many hillsides and valleys. The effluent flow from this system flows into the effluent structure.

Effluent Structure

The concrete effluent structure receives surface flow from the intermittent-stream and swale system and bioswale system and receives piped flow from the Habitat Lake. The combined flow then flows south to the RP-5 Santa Ana River Outfall, where it follows the existing waterways.

Education

The purposes of the wetlands are to demonstrate natural-water treatment and upland habitats. The Agency encourages educational awareness through interactive trails with informational signage throughout the park, an information center, scheduled tours, the distribution of educational pamphlets and materials, and presentations to local/regional schools. The education and informational stations focus on different water and wetlands themes. Station examples include water testing, microscopic pond life viewing, and bird watching. Some stations consist of large obsolete wastewater treatment plant equipment that has been modified and placed in the park to serve as an elevated lookout platform; visual volume references; and shade structure. There is appropriate signage for each station.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|-----------------------------------|---|--------|
| <u>Headquarters</u> | 14 acres | |
| Structures | 2 at 33,000 sq ft ea. 194 Office spaces 11 Conference Rooms 7 kitchens | |
| HVAC | 144.5 cooling tons 590,000 btuh space heating | |
| Plumbing | 35 toilets 12 urinals 33 sinks 9 showers | |
| <u>Chino Creek Park</u> | 22 acres | |
| Water Ponds | 2 pumps @ 350 gpm | |
| Extended Detention Basin | 3.1 acre-ft | Volume |
| Surface Wetlands | 7.3 acre-ft | Volume |
| Subsurface Wetlands Pea Gravel | 3 cells Approx. 170 ft by 40 ft 2.5 ft depth | Each |
| Bio swale | 700 LF | |

| System Subsystem(s) | Design Capacity (Dry Weather Average) | Notes |
|------------------------------|---------------------------------------|-------|
| Intermittent Stream | 1300LF | |
| Effluent Structure | 20 ft x 8 ft x 6 ft | Vault |
| Education Stations Trails | 11 stations 1.7 miles | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| <u>Headquarters</u> | | | | |
| Structures | 4 | 3 | 3 | 3 |
| HVAC | 2 | 2 | 3 | 2 |
| Plumbing | 3 | 3 | 3 | 3 |
| <u>Chino Creek Park</u> | | | | |
| Water Ponds | 3 | 3 | 3 | 3 |
| Extended Detention Basin | 4 | 3 | 3 | 4 |
| Surface Wetlands | 3 | 3 | 3 | 3 |
| Subsurface Wetlands | 4 | 3 | 3 | 3 |
| Bioswale | 2 | 3 | 3 | 3 |
| Intermittent Stream | 3 | 3 | 3 | 3 |
| Effluent Structure | 2 | 3 | 3 | 3 |
| Education | 3 | 3 | 4 | 3 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Headquarters Structures

Cracks have been observed on the walls and parking spaces, indicating differential settling of the ground under the headquarters complex. Engineering is currently evaluating the extent of the settling and will develop a project to address its impacts.

Heating Ventilation and Air Conditioning (HVAC)

The Central Energy Plant has limited backup equipment and is undersized for future expected uses, specifically the future Central Lab project. Engineering is working on a project to upgrade controls, add backup equipment and expand process required for future uses.

Plumbing

Last year the fire-suppression-system piping broke, flooding a large portion of the headquarters office space. The failure was caused by excessive corrosion. Maintenance has a project to evaluate the condition of all the piping at the headquarters complex.

Chino Creek Wetlands and Educational Park Extended Detention Basin

Soil erosion has been observed on several slopes of the extended detention basin from storm water runoff. Engineering is working on projects to protect the slopes from further erosion.

Education

The park currently has limited use for school field trips and outreach because of the lack of shaded areas and permanent restroom facilities.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--------------------------|--------------------------------------|-----------------------------|
| <u>Headquarters</u> | | |
| Structures | 2003 | 2013 |
| HVAC | 2003 | |
| Plumbing | 2003 | |
| <u>Chino Creek Park</u> | | |
| Water Ponds | 2003 | |
| Extended Detention Basin | 2007 | |
| Surface Wetlands | 2007 | |
| Subsurface Wetlands | 2007 | |
| Bioswale | 2007 | |
| Intermittent Stream | 2007 | |
| Effluent Structure | 2007 | |
| Education | 2007 | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Business and Process Automation Control Networks

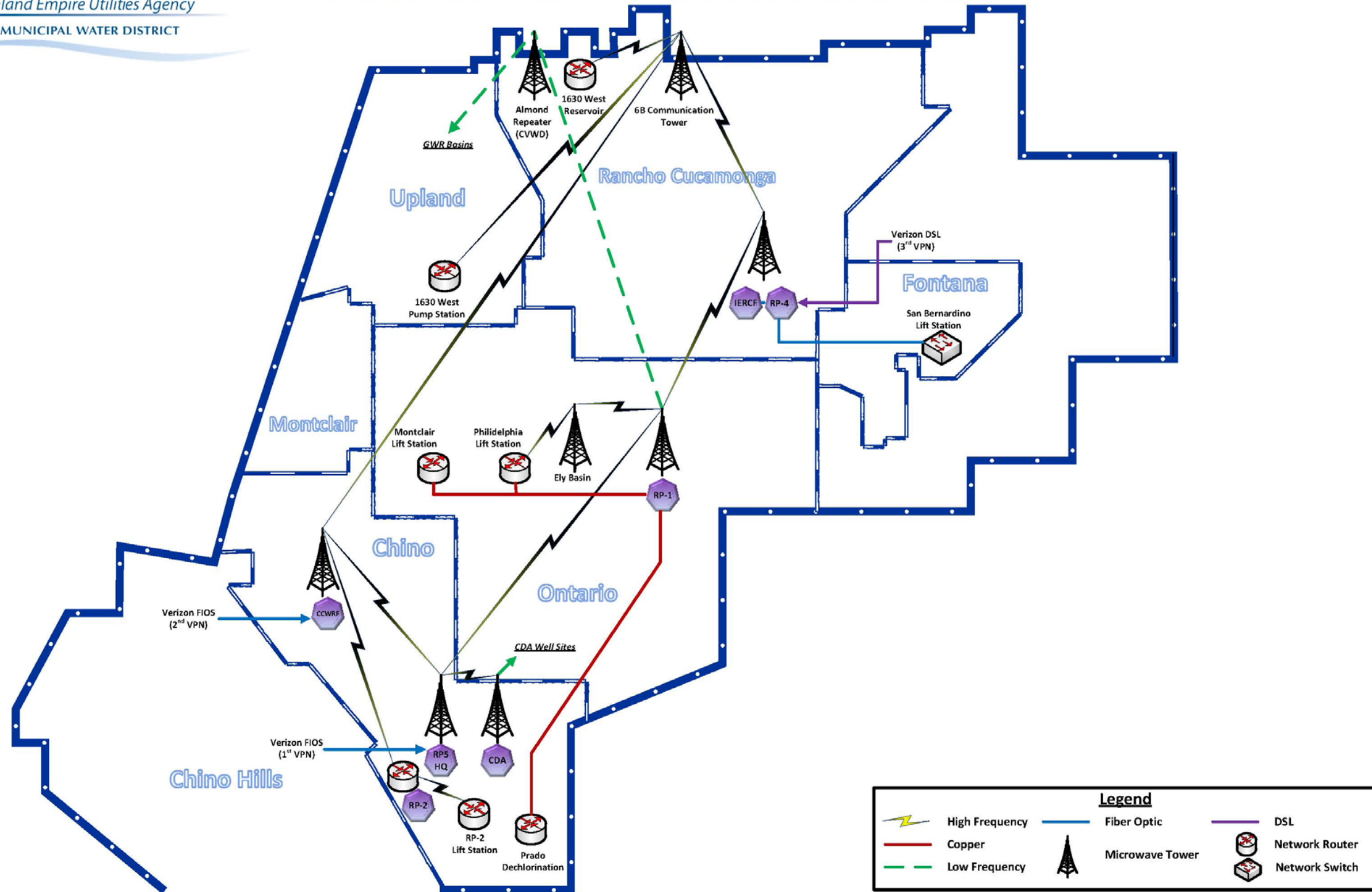


Figure 7-12: Business (BIZ) & Process Automation Control (PAC) Networks – Schematic

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Table 7-13: Business Network and Process Automation Control Network – Project Summary

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | Ten-Year Total |
|----|-----------------------------|--|---|---------------------------|-------------------|------------------------------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | |
| 1 | IS14002 | Records Mgmt Scanner Replacement | Replace failed scanner in Records Mgmt | EQ | GG | 7,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,000 |
| 2 | IS15008 | Telephone System Upgrade | Workstation Replacement for the PAC Network | EQ | GG | 46,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46,000 |
| 3 | IS13030 | Server Replacement - Business Network | Server Replacement - Business Network | RP | GG | 102,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 102,000 |
| 4 | IS15010 | PAC- Veeam Virtual Machine Backup/Recovery Software - GG | PAC- Veeam Virtual Machine Backup/Recovery Software - GG | OM | GG | 17,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17,000 |
| 5 | IS15012 | Business Network IT Improvements | Annual business network improvements (PLACEHOLDER) | RP | GG | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 | 2,000,000 |
| 6 | EN13042 | Philadelphia Pump Station Communication System | Installation of a monopole, radios, microwave dishes, communications panel and other equipment to allow the station to effectively communicate with the rest of the IEUA network. | CC | NC | 150,000 | 15,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165,000 |
| 7 | IS15013 | Philly LS Licensed Radio Upgrade | Replace 5.4 ghz with licensed 18 ghz radio | OM | RO | 10,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,000 |
| 8 | EN13043 | Montclair Lift Station Communication System | Installation of a monopole, radios, microwave dishes, communications panel and other equipment to allow the station to effectively communicate with the rest of the IEUA network. | CC | RC | 165,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 165,000 |
| 9 | EN13016 | SCADA Enterprise System | SCADA Enterprise System. Replacing the DCS. | CC | RO | 1,000,000 | 2,625,000 | 3,000,000 | 3,000,000 | 0 | 0 | 0 | 0 | 0 | 0 | 9,625,000 |
| 10 | EN13040 | Prado Dechlor Communication System | Installation of a monopole, radios, microwave dishes, communications panel and other equipment to allow the station to effectively communicate with the rest of the IEUA network. | CC | WC | 162,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 162,000 |
| 11 | IS15014 | RP-4 Foundation Field Bus Link Device | Replace existing FFLD with current equipment replacement from Rockwell | RP | RO | 42,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42,000 |
| 12 | IS15015 | PAC- L55 Processor Replacement / Redundancy Modules | Replace ethernet (EN2T) North/South (2 year project) | RP | RO | 45,000 | 45,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90,000 |
| 13 | IS15016 | RP-4 ControlNet Replacement | Replace ControlNet with Ethernet | RP | RO | 112,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 112,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | Ten-Year Total |
|----|-----------------------------|--|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | |
| 14 | IS15017 | Replace Remote I/O Scanners at RP-4 - MCC1, RTU1, and RTU2 | Replace remote I/O scanners with Ethernet | RP | RO | 26,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26,000 |
| 15 | IS15018 | Server Replacement - PAC Network | Server Replacement - Process Automation and Controls Network | RP | RO | 10,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,000 |
| 16 | IS15019 | PAC- Veeam Virtual Machine Backup/Recovery Software - RO | PAC- Veeam Virtual Machine Backup/Recovery Software - RO | OM | RO | 17,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17,000 |
| 17 | IS15020 | Process Automation Controls IT Improvements | Annual PAC network improvements. (PLACEHOLDER) | RP | RO | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | 300,000 | 3,000,000 |
| 18 | IS15005 | New GIS Plotter | Replace existing GIS plotter with a new 36-inch plotter with manufacturer's extended warranty. | EQ | GG | 0 | 1,200 | 1,200 | 1,200 | 1,200 | 0 | 0 | 0 | 0 | 0 | 4,800 |
| 19 | IS15006 | SAP Server Hardware and Operation System Upgrade | Secure new server and necessary software licenses. ISS to integrate the new server to the existing virtualized server environment. | EQ | GG | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | IS14025 | Finance Process Analysis & Roadmap | Finance Process Analysis & Roadmap | EQ | GG | 48,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,000 |
| 21 | IS15001 | HCM Phase 2 HR Process & Automation & ESS/MSS Enhancements | HCM Phase 2 HR Process & Automation & ESS/MSS Enhancements | EQ | GG | 0 | 191,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 191,000 |
| 22 | IS15002 | Document Management System - analysis & Roadmap | Document Management System - analysis & Roadmap | EQ | GG | 48,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,000 |
| 23 | IS15003 | Document Management System - Implementation | Document Management System - Implementation | EQ | GG | 250,000 | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 350,000 |
| 24 | IS15004 | Executive Dashboard | Executive Dashboard | EQ | GG | 100,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100,000 |
| 25 | IS16001 | HCM Phase 2 Position Budgeting & Control | HCM Phase 2 Position Budgeting & Control | EQ | GG | 0 | 0 | 206,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 206,000 |
| 26 | IS16002 | Grants Process Analysis & Roadmap | Grants Process Analysis & Roadmap | EQ | GG | 0 | 36,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36,000 |

| # | Project Number ¹ | Project Name | Project Description | Project Type ² | Fund ³ | Fiscal Year Budget (Dollars) | | | | | | | | | | |
|----|-----------------------------|--------------------------------|--|---------------------------|-------------------|------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|
| | | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | 2022/23 | 2023/24 | Ten-Year Total |
| 27 | IS16003 | SAP Archiving | SAP Archiving | EQ | GG | 0 | 0 | 0 | 50,000 | 0 | 0 | 0 | 0 | 0 | 0 | 50,00 |
| 28 | FA15001 | Purchase of two color scanners | Purchase of two color scanners, one to replace the loaner from Accounting & Fiscal Mgmt. that went to the front desk receptionist and one for Financial Planning | EQ | GG | 8,300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,300 |
| 29 | IS12010 | Payroll Replacement Project | Payroll Replacement Project | EQ | GG | 53,600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53,600 |

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

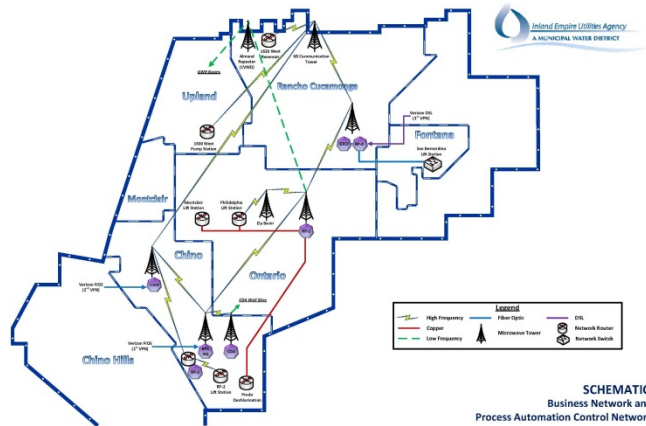
(3) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RCA), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

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Asset Management System Summary –
BIZ/PAC

Business & Process Automation Control Networks

1. Asset Profile



Business Network

The Business Network (BIZ) is an Agency network that connects local area business networks throughout the Agency together through the use of a wireless Wide Area Network (WAN) and provides access to the internet. Communication within the network is transmitted through cable media and wireless media. The wireless media communication supports the BIZ and Process Automation & Control (PAC) systems. BIZ provides the shared use of business-related resources, such as storage servers, printers, email, and interpersonal communications. The BIZ is composed of servers located at the Headquarters Buildings, RP-1, and RP-5. Network switches connect each networked asset to the BIZ network. There are two sets of assets included in the BIZ: productivity tools and fixed assets.

Process Automation & Control (PAC)

The Process Automation & Control System (PAC) is an Agency network that connects local area process automation networks together through a wireless Wide Area Network (WAN). The communications within the networks are transmitted through cable media and wireless media. A series of microwave transmitting towers creates a loop of wireless communication linking all the facilities. The primary communication towers are located at RP-1, CCWRF, RP-4, RP-5, and the Northwest 6B Tower. Cucamonga Valley Water District's Almond Street Repeater provides communication and control of the ground water recharge basins. Network switches connect PLCs, operator work stations, and other network devices connected to the PAC network. An operator is able to log on the PAC network to control and monitor a facility using the Supervisory Control and Data Acquisition (SCADA) system or Distributed Control System (DCS) system.

The SCADA systems are composed of Rockwell Automation software and Allen Bradley PLCs. The DCS systems use the Foxboro DCS system from Invensys and a combination of Invensys Control Processors and Allen Bradley PLCs. Field output data is transmitted to either a PLC or a centralized control processor, and the SCADA/DCS systems provide a single platform to monitor all the field data, make set point changes, establish/monitor alarm conditions, and control equipment within an entire facility. Field data is also transmitted to a historian, that is, a storage server, to allow trending or analytical analysis in the future.

There are two sets of assets included in the PAC: productivity tools and other fixed assets.

2. Capacity Profile

Table 1 Capacity by System

| System Subsystem(s) | Design Capacity (Average) | Notes |
|--------------------------|---------------------------|-------|
| BIZ – Productivity Tools | | |
| A/V Equipment | 14 units | |
| Cell Phone | 76 units | |
| Camera | 18 units | |
| Mobile Hot Spot | 55 units | |
| Monitor | 660 units | |
| Printer | 125 units | |
| Scanner | 21 units | |
| Tablet | 23 units | |
| Workstation | 300 units | |
| BIZ – Fixed Assets | | |
| Server | | |
| HyperV | 12 units | |
| Server | 50 units | |
| VMware | 11 units | |
| UPS | 4 units | |
| Network Switch | 90 units | |
| PAC – Productivity Tools | | |
| Tablet | 25 units | |
| Workstation | 50 units | |
| PAC – Fixed Assets | | |
| Microwave | | |
| IEUA | 5 units | |
| CVWD | 1 unit | |
| DCS System | 4 units | |
| SCADA System | 4 units | |
| Server | | |
| HyperV | 3 units | |
| Server | 49 units | |
| VMware | 15 units | |
| UPS | 88 units | |
| Network Switch | 120 units | |
| PLC | 250 units | |
| OIT | 140 units | |

3. Asset Ratings

Table 2 Asset Ratings

| System | Rating Scale* 1 = Excellent; 5 = Poor | | | |
|--------------------------|--|------------|----------|-------------|
| | Condition | Redundancy | Function | Reliability |
| BIZ – Productivity Tools | 3 | 3 | 3 | 3 |
| BIZ – Fixed Assets | 3 | 3 | 3 | 3 |
| PAC – Productivity Tools | 3 | 3 | 3 | 3 |
| PAC – Fixed Assets | 4 | 4 | 3 | 4 |

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

BIZ and PAC Networks

Assets are replaced based on product lifecycle. A technology consultant is evaluating the BIZ and PAC networks to analyze potential hardware and software upgrades.

Equipment replacement lifecycle: PLC (12 years), UPS (10 years), Workstation (4 years), OIT (10 years), server (5 years), I/O (15 years), Printer (10 years), network switches (10 years), and software licenses are typically renewed annually.

BIZ – Productivity Tools

Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

BIZ – Fixed Assets

Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

PAC – Productivity Tools

Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

PAC – Fixed Assets

Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

DCS software and associated hardware need to be updated. Currently the Agency operates two different SCADA systems; it is the Agency's goal to transition to Allen Bradley PLC driven control. Project EN13016 will replace the current DCS system.

Table 3 History of Select Assets

| System | Capital Improvement Project Activity | Condition Assessment Report |
|--------------------------|--------------------------------------|-----------------------------|
| BIZ – Productivity Tools | | |
| BIZ – Fixed Assets | | |
| PAC – Microwave Towers | | |
| PAC – Fixed Assets | | |

Table 4 Potential Projects

| System | Project Name | Project Description |
|--------|--------------|---------------------|
| NA | NA | NA |

End of System Summary

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Appendix A: Asset Ratings

Definitions of the ratings for each of the Failure Modes

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Table A-1 Condition Rating

| Rating | Description |
|--------|--|
| 1 | New or Excellent Condition |
| 2 | Minor Defects Only |
| 3 | Moderate Deterioration (Does not require immediate action) |
| 4 | Significant Deterioration |
| 5 | Virtually Unserviceable |

The rating is intended to show the degree of deterioration to structures and equipment.

Table A-2 Redundancy Rating

| Rating | Description |
|--------|---|
| 1 | High level of redundancy – treatment process is not impacted by multiple units being out of service |
| 2 | Significant level of redundancy – treatment process is not impacted by one unit being out of service for an extended period of time |
| 3 | Adequate level of redundancy – treatment process is not impacted by one unit being out of service |
| 4 | Inadequate level of redundancy – treatment process is negatively impacted by one unit being out of service |
| 5 | No redundancy – intended process function cannot be achieved when asset is out of service |

The rating is intended to show the impact to the treatment process when the asset in question is out of service.

Table A-3 Function Rating

| Rating | Description |
|--------|--------------------------------------|
| 1 | Exceeds all Functional Requirements |
| 2 | Exceeds some Functional Requirements |
| 3 | Meets all Functional Requirements |
| 4 | Fails some Functional Requirements |
| 5 | Fails all Functional Requirements |

The rating is the ability for the asset to meet the functional requirements that allow performance targets to be met.

Table A-4 Reliability Rating

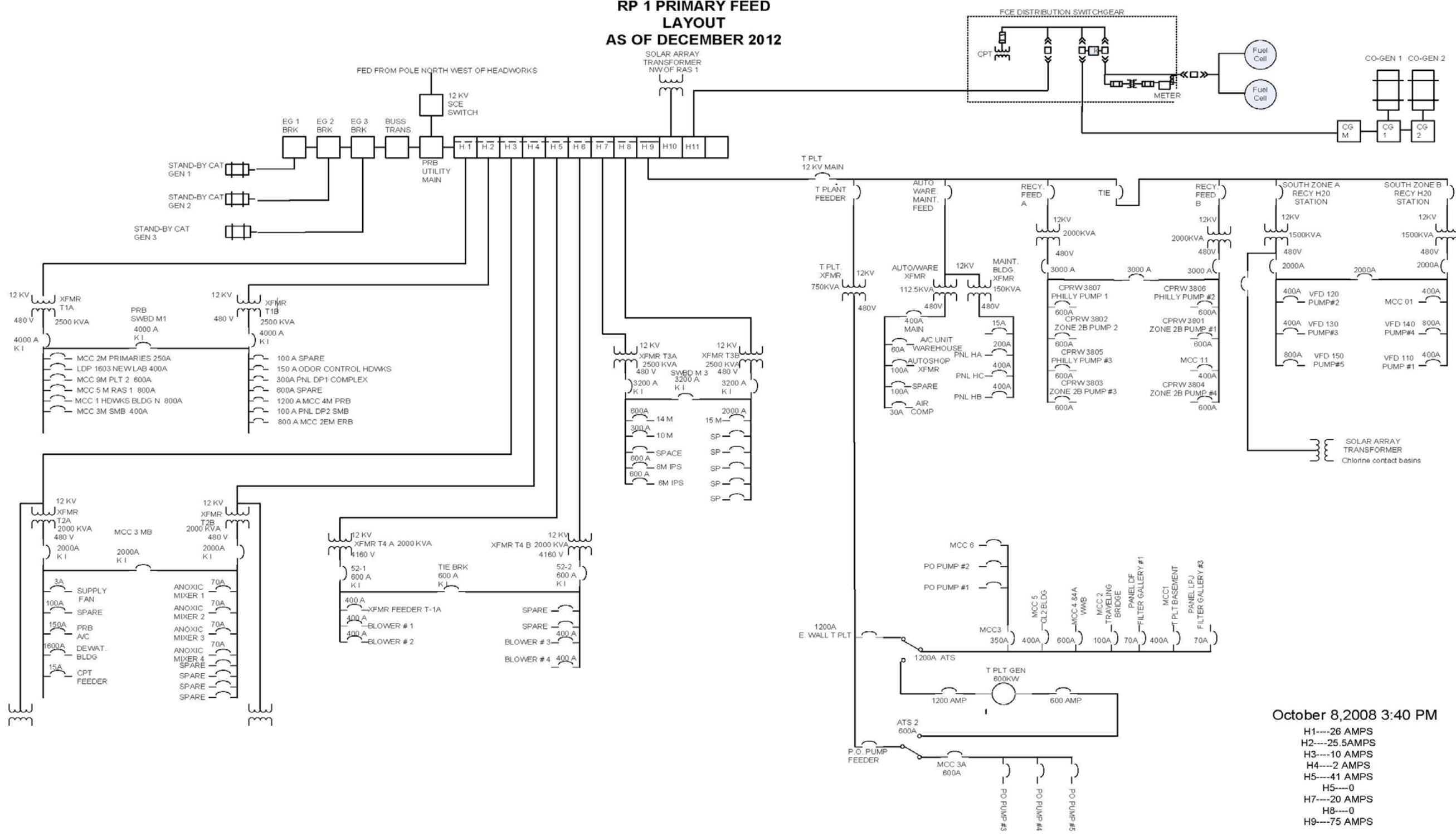
| Rating | Description |
|--------|---|
| 1 | Frequency of failure is significantly lower than expected |
| 2 | Frequency of failure is lower than expected |
| 3 | Frequency of failure is consistent with design expectations |
| 4 | Frequency of failure is higher than expected |
| 5 | Frequency of failure is significantly higher than expected |

The rating is intended to show the tendency for the asset to experience a failure.

Appendix B: Electrical Single Line Diagrams

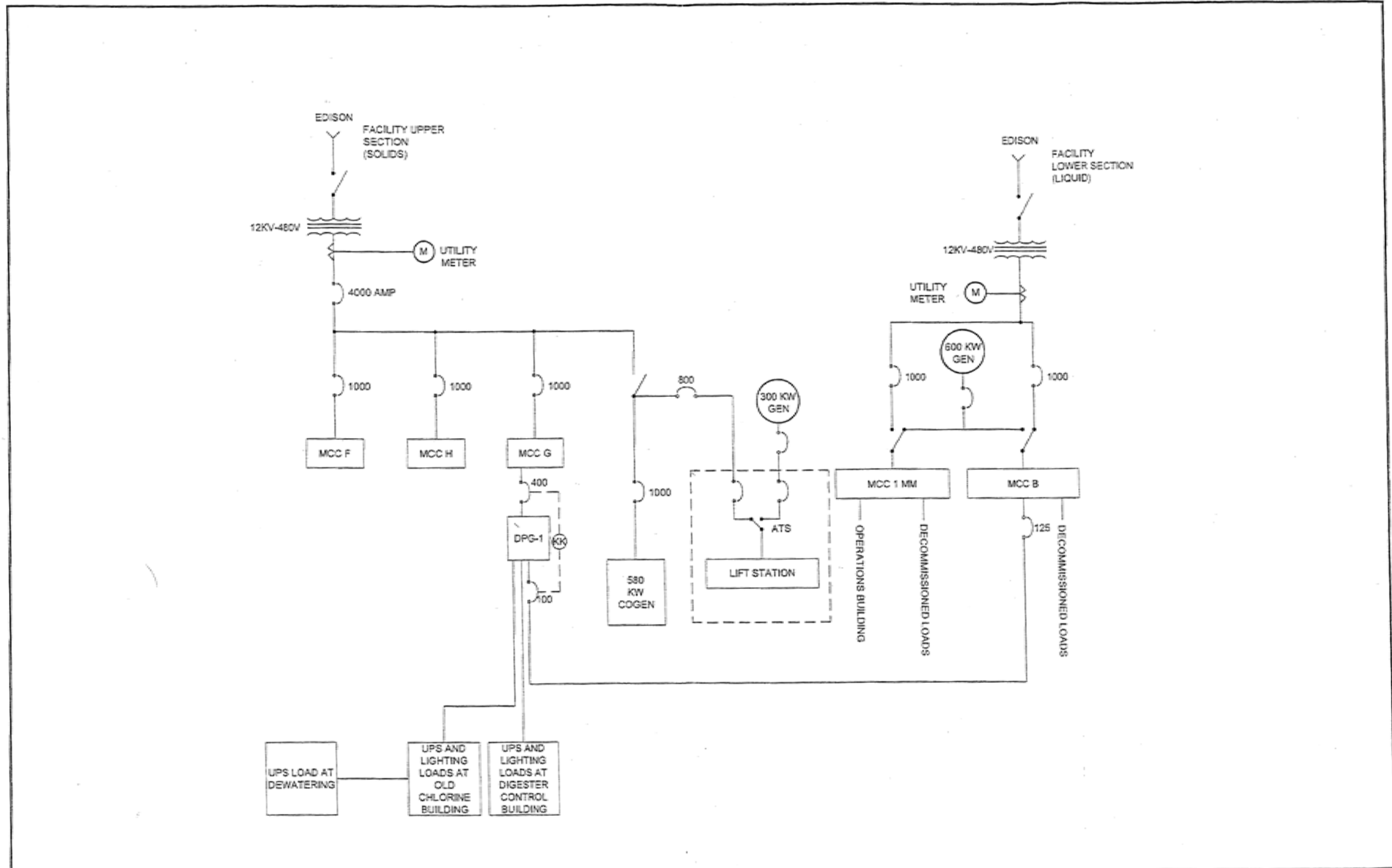
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**RP 1 PRIMARY FEED LAYOUT
AS OF DECEMBER 2012**



October 8, 2008 3:40 PM
 H1---26 AMPS
 H2---25.5 AMPS
 H3---10 AMPS
 H4---2 AMPS
 H5---41 AMPS
 H5---0
 H7---20 AMPS
 H8---0
 H9---75 AMPS
 Revised drawing 12/8/12 JAA

C:\Users\jagular\Documents\Electrical Diagrams\RP-2 Single Line Diagram\RP-2 Single Line Diagram.dwg 12/22/2009 7:00:28 AM



| REV | DATE | BY | DESCRIPTION |
|-----|------|----|-------------|
| | | | |
| | | | |
| | | | |

Designed: J. AGUILAR 11/06/09
 Drawn: M. KARIM 11/06/09
 Checked: M. KARIM 11/06/09
 Date:

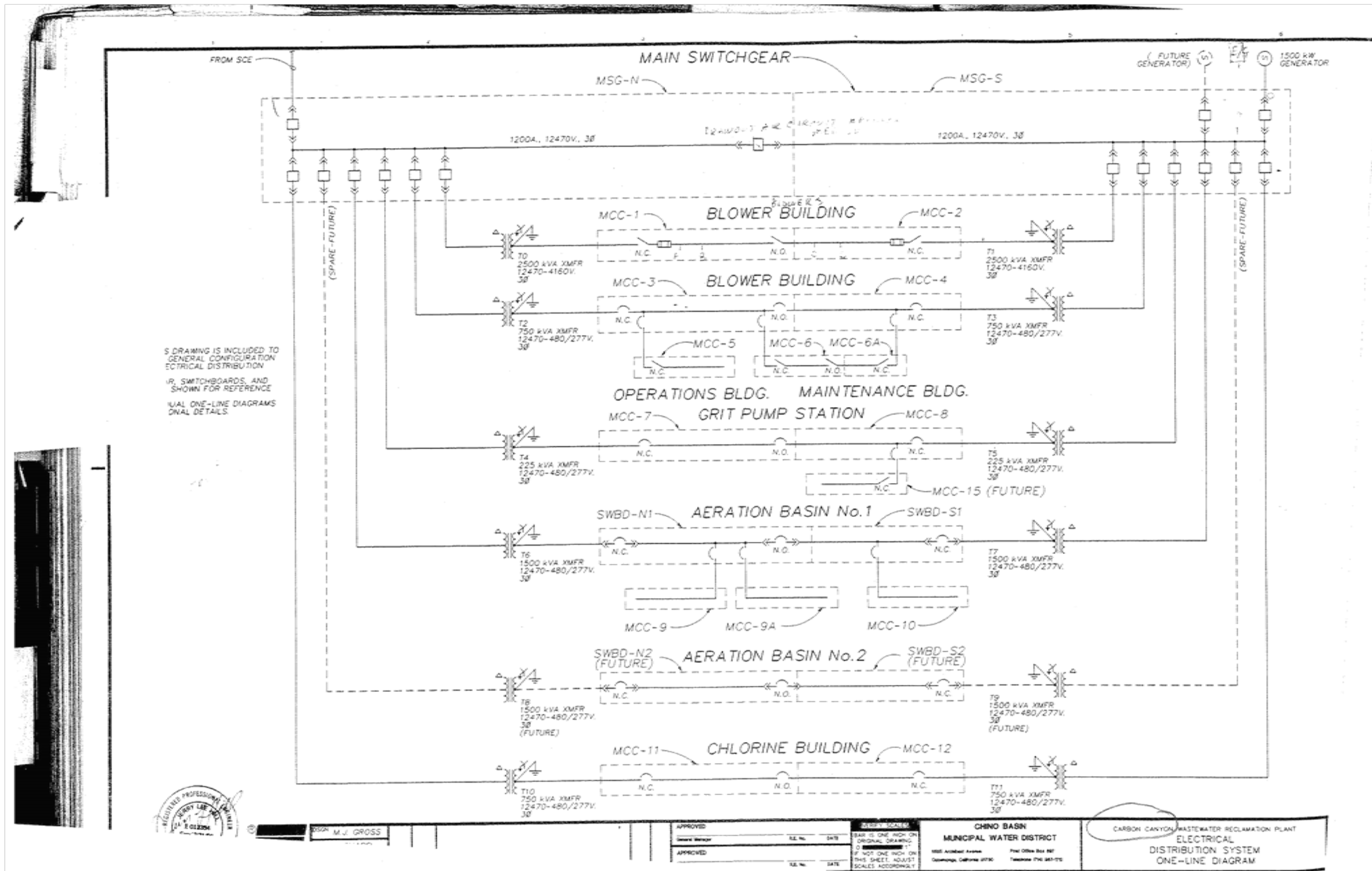
APPROVED BY: _____
 Date: _____
 Project Manager: _____

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 1" = 100'

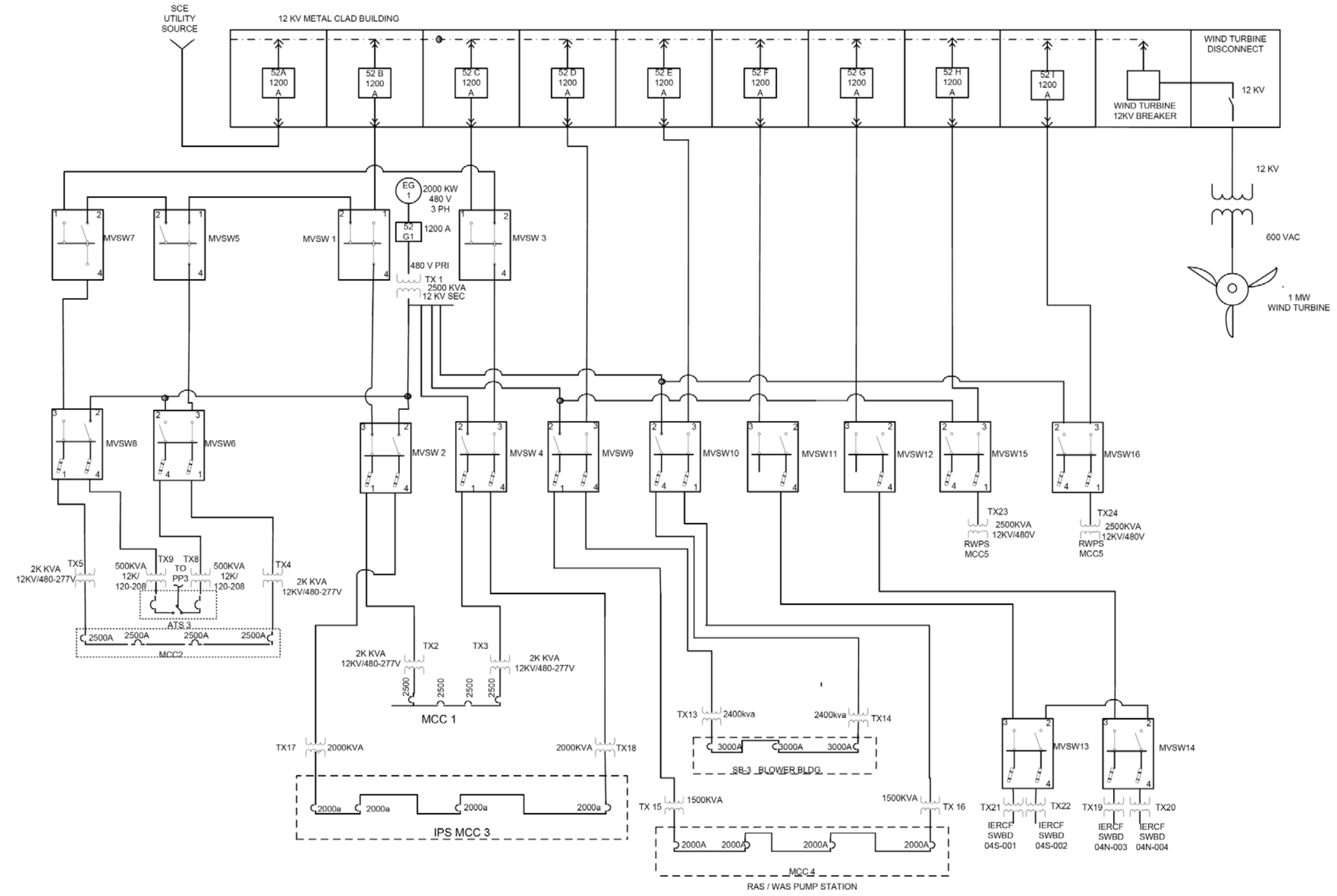
INLAND EMPIRE UTILITIES AGENCY
 A Municipal Water District
 1575 Central Expressway
 Chico, California 95720
 Telephone (925) 962-1000

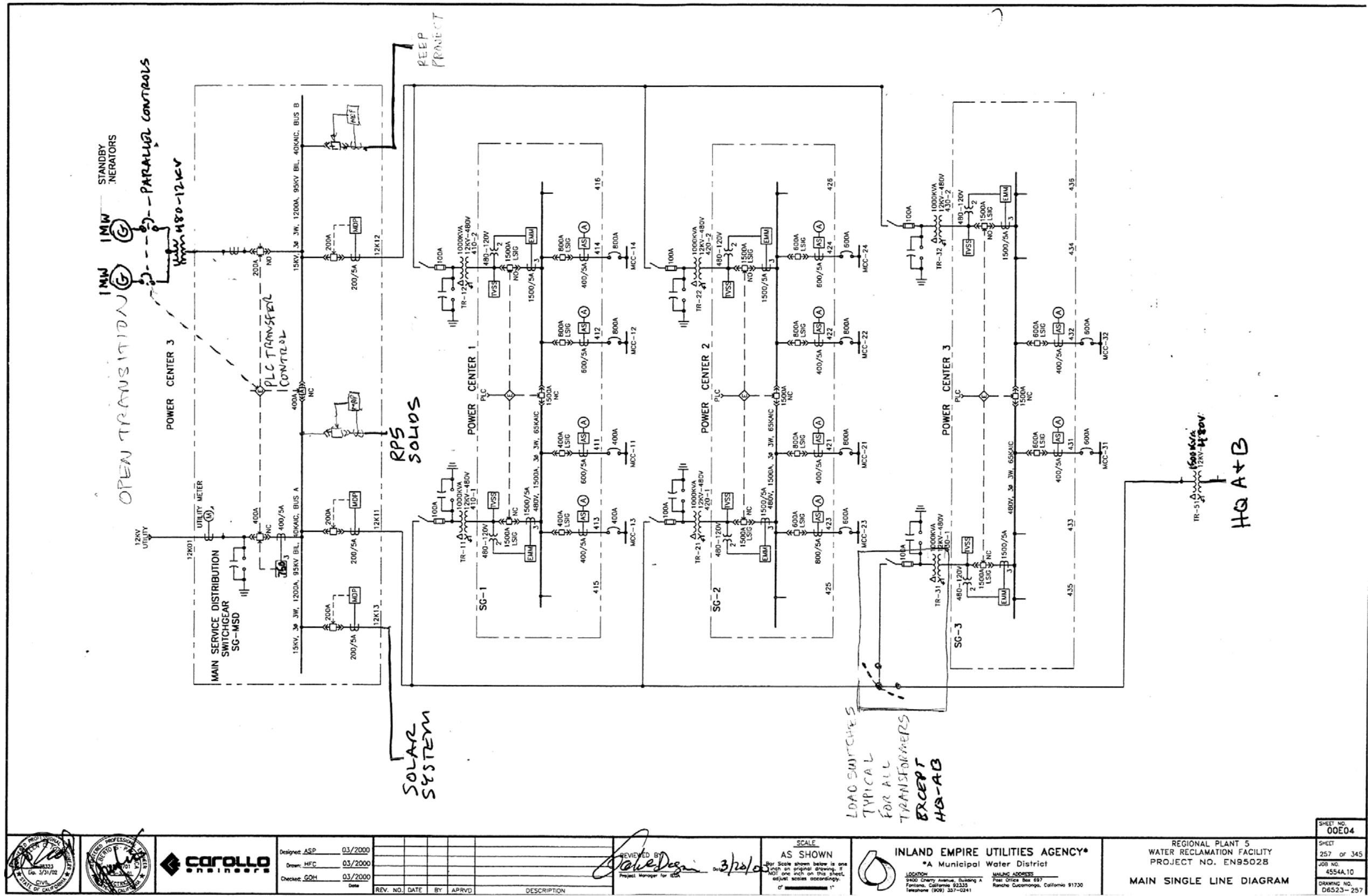
INLAND EMPIRE UTILITIES AGENCY
 RP-2 SINGLE-LINE DIAGRAM

SHEET
 OF 001
 DRAWING NO.



RP 4 12 KV
SINGLE LINE





Designed: ASP 03/2000
 Drawn: HFC 03/2000
 Checked: GOH 03/2000

| REV. NO. | DATE | BY | APRVD | DESCRIPTION |
|----------|------|----|-------|-------------|
| | | | | |

REVIEWED BY: *[Signature]* 3/20/00
 Project Manager for E&C

SCALE AS SHOWN
 For Scale shown below is one inch on original drawing. If not one inch on this sheet, adjust scales accordingly.

INLAND EMPIRE UTILITIES AGENCY*
 *A Municipal Water District
 LOCATION: 1900 Cherry Avenue, Building A, Fontana, California 92335
 MAILING ADDRESS: Post Office Box 497, Rancho Cucamonga, California 91730
 Telephone (909) 357-0241

REGIONAL PLANT 5
 WATER RECLAMATION FACILITY
 PROJECT NO. EN95028
MAIN SINGLE LINE DIAGRAM

SHEET NO. 00E04
 SHEET 257 OF 345
 JOB NO. 4554A.10
 DRAWING NO. D6523-257

LOAD SWITCHES
 TYPICAL FOR ALL
 TRANSFORMERS
 EXCEPT
 HQ-A+B

OPEN TRANSITION
 PARALLEL CONTROLS
 IMW 1MW STANDBY GENERATORS
 15KV 1200A 95KV BIL 40KAC BUS B
 15KV 3Ø JW 1200A 95KV BIL 40KAC BUS A

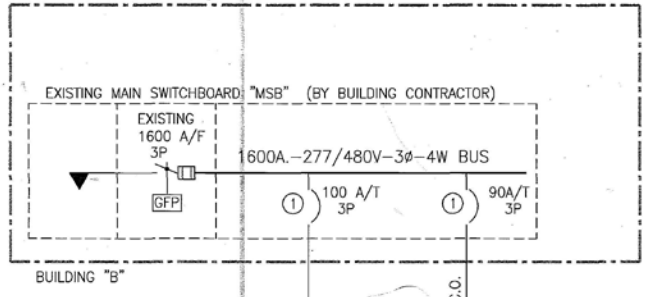
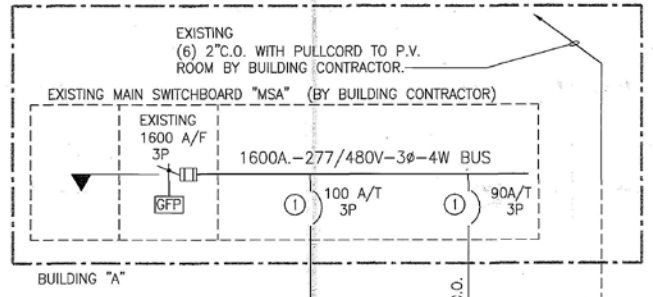
RPS SOLIDS

SOLAR SYSTEM

KEEP PROTECT

HQ A+B
 1500KVA 12KV-480V

DRAWINGS SERVICES, TEL: 618



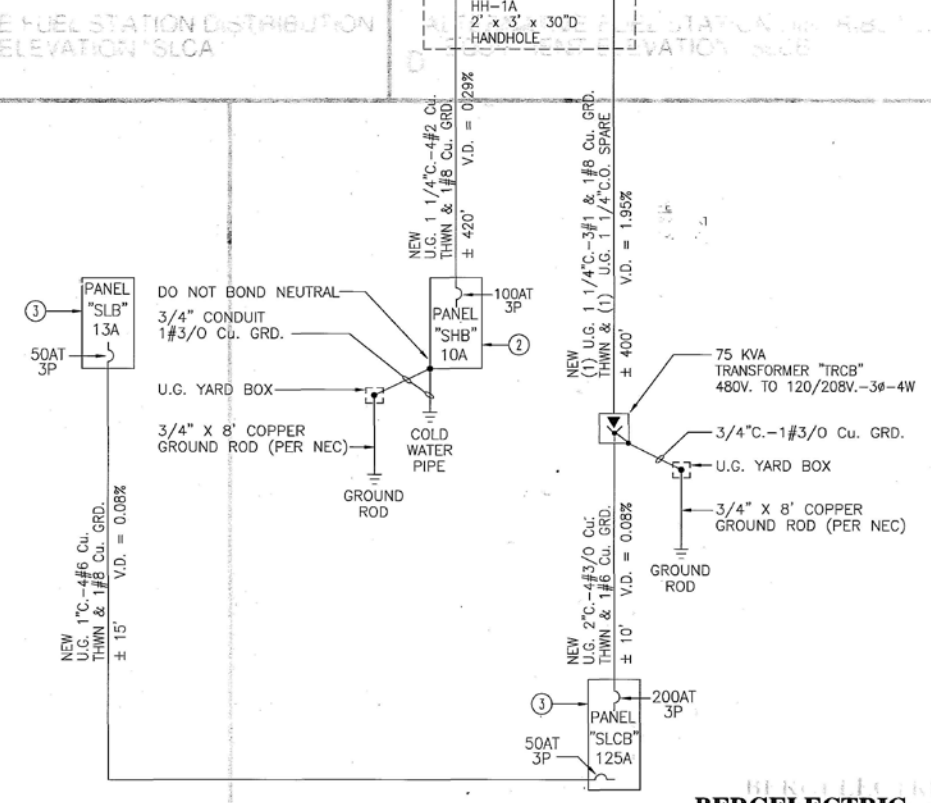
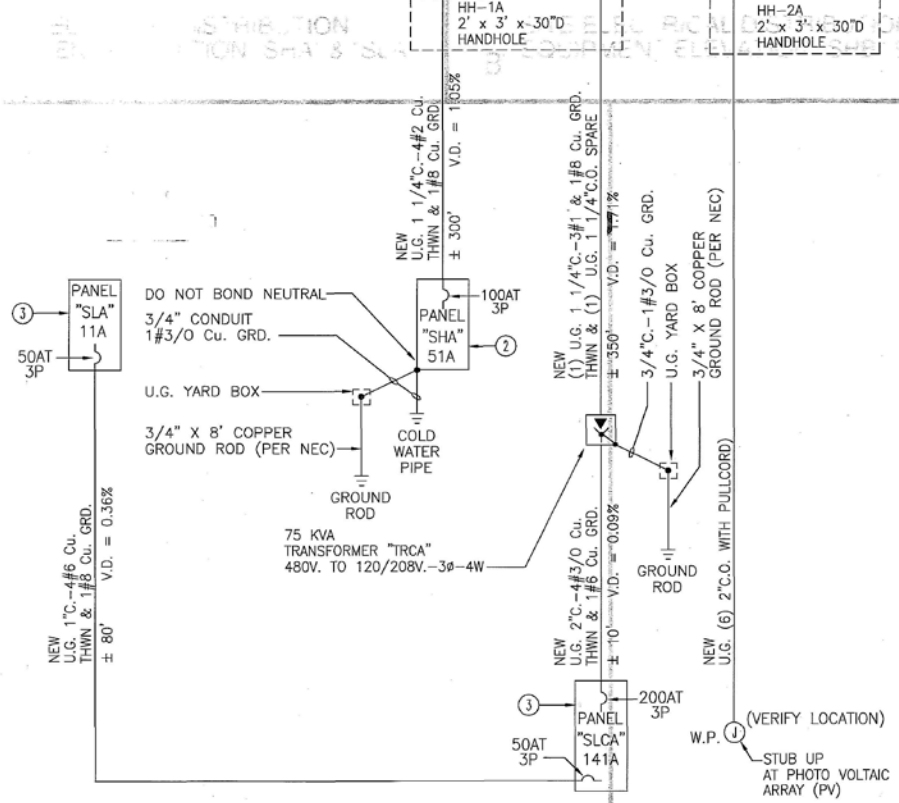
- ① EXTEND NEW CABLE TO BUILDING SWITCHBOARD. TERMINATE SITE FEEDER CABLES ON BREAKERS IN MAIN SWITCHBOARD "MSA" AND "MSB" BREAKERS PROVIDED AND INSTALLED BY T.G. CONSTRUCTION. CABLES BY PHASE-1 CONTRACTOR.
- ② ALL CIRCUIT BREAKERS IN PANEL SHALL BE FULLY RATED FOR MINIMUM OF 14,000 AIC.
- ③ ALL CIRCUIT BREAKERS IN PANEL SHALL BE FULLY RATED FOR MINIMUM OF 10,000 AIC.

NOTES TO CONTRACTOR:

1. THE FEEDER LENGTHS SHOWN ARE APPROXIMATE AND ARE FOR VOLTAGE DROP CALCULATIONS ONLY. THEY SHALL NOT BE USED FOR BID PURPOSES OR MATERIAL TAKE-OFF.

EXISTING CONDUIT STUBS LOCATED OUTSIDE BUILDING BY T.G. CONSTRUCTION. PHASE-1 CONTRACTOR TO LOCATE AND EXTEND (TYPICAL)

EXISTING CONDUIT STUBS LOCATED OUTSIDE BUILDING BY T.G. CONSTRUCTION. PHASE-1 CONTRACTOR TO LOCATE AND EXTEND (TYPICAL)



PARTIAL SINGLE LINE DIAGRAM "MSA"

PARTIAL SINGLE LINE DIAGRAM "MSB"

BERGELECTRIC RECORD SET
02/19/04

DALAN ENGINEERING, INC.
ELECTRICAL ENGINEERS
DALAN JOB NO. 04-001
8638 DARBY AVENUE (714) 771-4221
NORTHridge, CA 91325 (885) 684-4944
(818) 772-2228 FAX (818) 772-2239

| | | | | | |
|----------|----|----------|----------|------|-------------|
| Designed | MM | 12/19/02 | | | |
| Drawn | FC | 12/19/02 | | | |
| Checked | MM | 12/19/02 | | | |
| | | Date | REV. NO. | DATE | BY |
| | | | | | APRVD |
| | | | | | DESCRIPTION |

| | |
|--------------------------|------|
| REVIEWED BY: | Date |
| Project Manager for IEUA | |

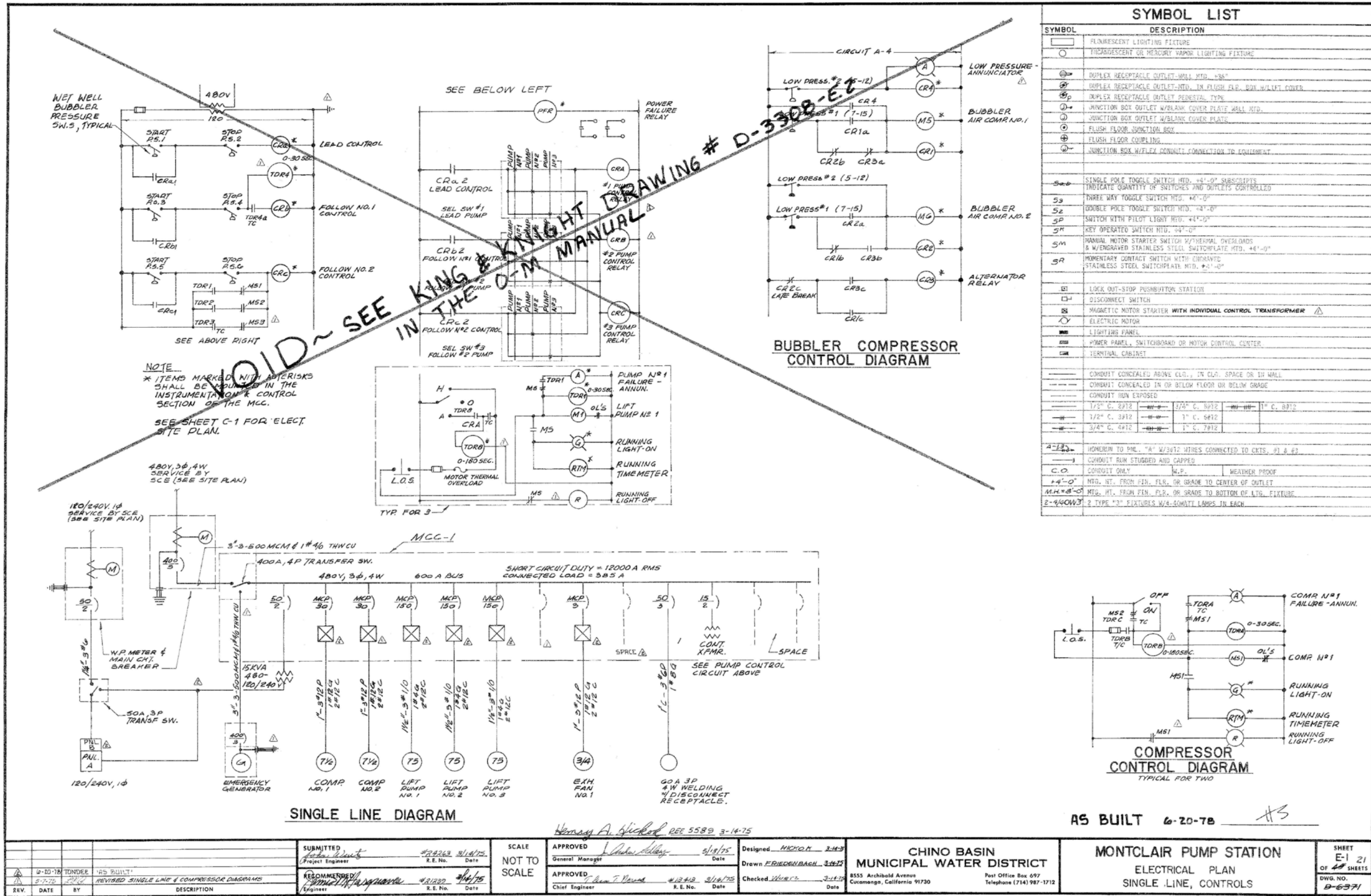
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INLAND EMPIRE UTILITIES AGENCY
A Municipal Water District
3400 Chevy Avenue, Building A First Office Bldg 617
Fountain, California 92335 Rancho Cucamonga, California 91730
Telephone (909) 387-0261

I.E.U.A. HEADQUARTERS PHASE 1
SINGLE LINE DIAGRAM

| | |
|-------------|----------|
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| JOB NO. | 01139.02 |
| DRAWING NO. | E-300 |

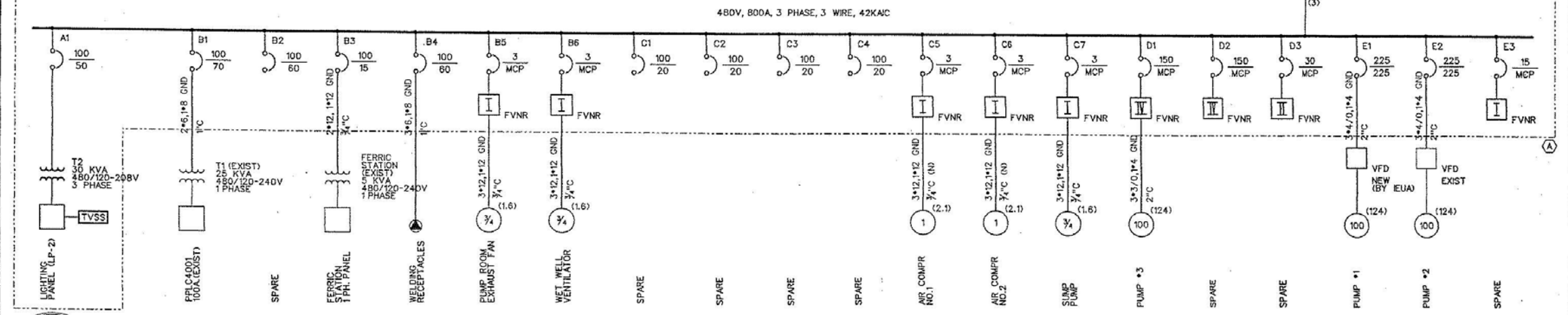
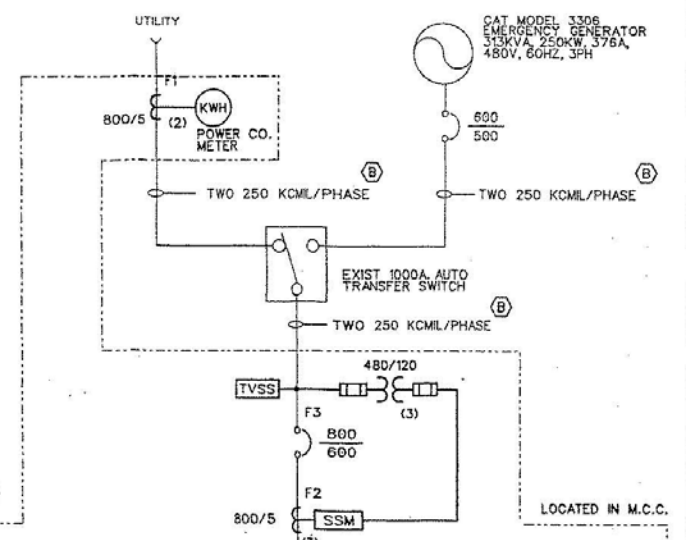
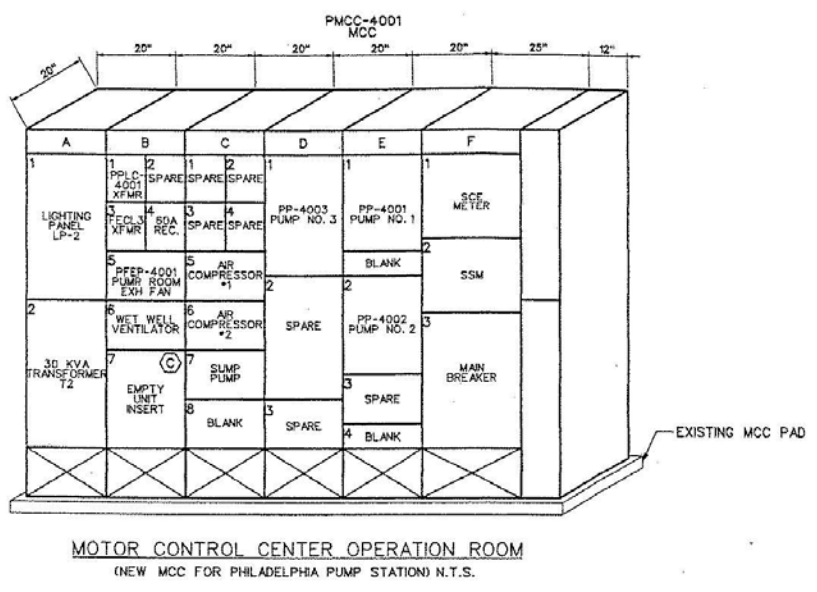
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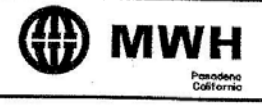
AS BUILT 6-20-78 #5

| | | | | | | | |
|--|---|-----------------------|--|---|--|--|---|
| SUBMITTED <i>[Signature]</i> Project Engineer 5/18/75 R.E. No. | | SCALE NOT TO SCALE | APPROVED <i>[Signature]</i> General Manager 5/18/75 Date | Designed <i>[Signature]</i> 3-14-75 Drawn <i>[Signature]</i> 3-14-75 Checked <i>[Signature]</i> 3-14-75 Date | CHINO BASIN MUNICIPAL WATER DISTRICT 8555 Archibald Avenue Cucamonga, California 91730 Post Office Box 697 Telephone (714) 987-1712 | MONTCLAIR PUMP STATION ELECTRICAL PLAN SINGLE LINE, CONTROLS | SHEET E-1 21 OF 44 SHEETS DWG. NO. D-6371 |
| RECOMMENDED <i>[Signature]</i> Engineer 5/18/75 R.E. No. | APPROVED <i>[Signature]</i> Chief Engineer 5/18/75 R.E. No. | | | | | | |

- SHEET KEYNOTES
- A. ALL POWER AND CONTROL WIRING FROM THE MCC TO EXISTING LOADS WILL BE REPLACED. EXTEND EXISTING CONDUITS TO NEW MCC AS NECESSARY.
 - B. REUSE EXISTING CONDUIT AND WIRING.
 - C. RE-LOCATE EXISTING ACOPIAN POWER SUPPLY TO THIS LOCATION FROM EXISTING MCC.
 - D. MCC AND EQUIPMENT INTERNAL TO MCC ARE NEW. ALL OTHER EQUIPMENT IS EXISTING.



03/08/07



| | | | | | |
|----------|------|-------|---------|-------------|--|
| Designed | DAK | 02/07 | | | |
| Drawn | DAK | 02/07 | | | |
| Checked | DBM | 02/07 | | | |
| REV. NO. | DATE | BY | APPROV. | DESCRIPTION | |

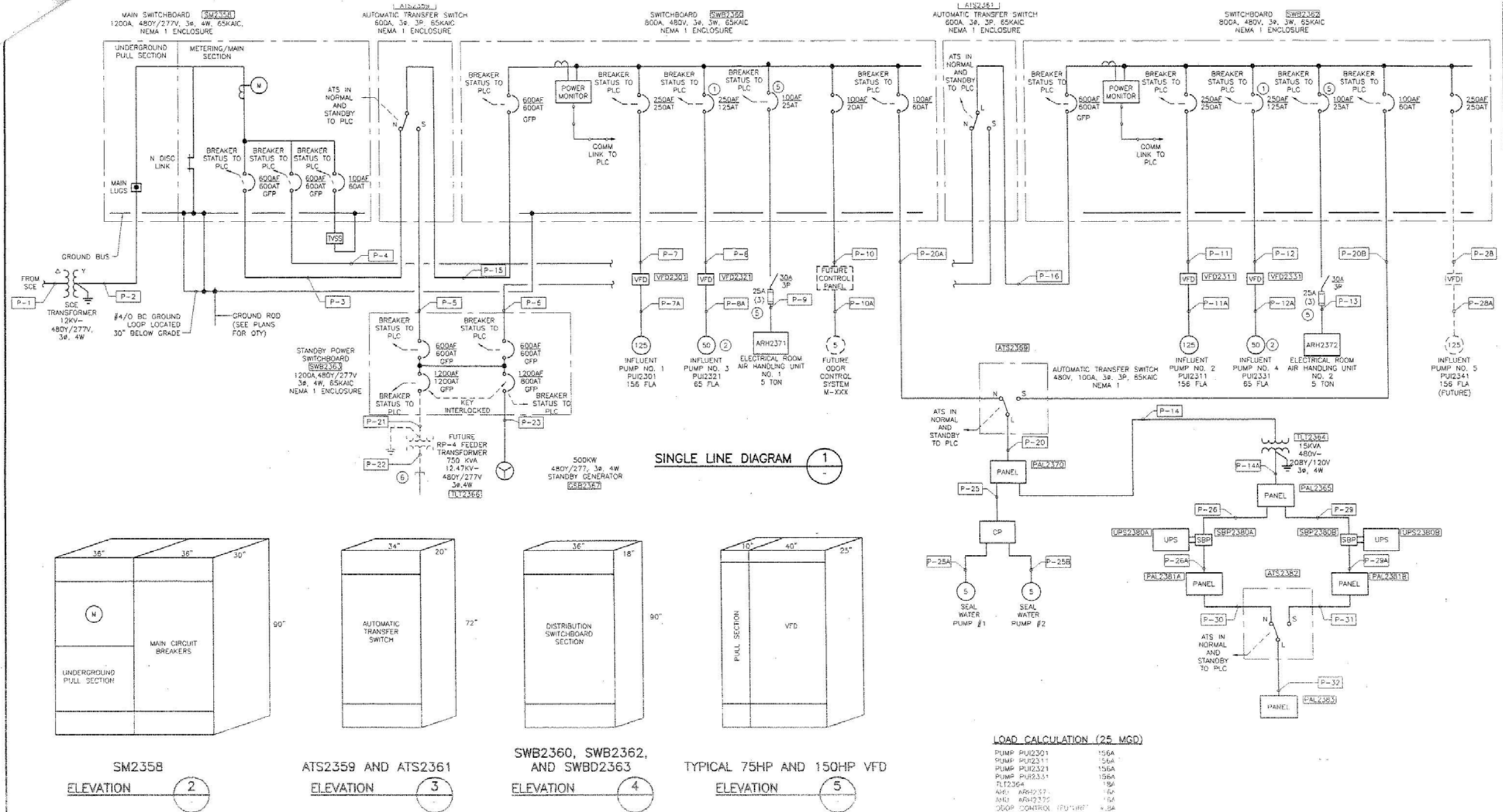
REVIEWED BY: *[Signature]* Date: 3/12/07
Project Manager for *[Signature]*

SCALE AS SHOWN
For Scale shown below is one inch on original drawing, if not one inch on this sheet, adjust scales accordingly.

INLAND EMPIRE UTILITIES AGENCY*
*A Municipal Water District
2575 Central Express
Chico, California 95710
Telephone (909) 963-1600
Total Office Box 9022
Chico Hills, California 91709

NRWS PHILADELPHIA PUMP SYSTEM UPGRADES
EQUIPMENT ELEVATIONS & SINGLE LINE DIAGRAMS

| | |
|-------------|-----------|
| SHEET | E-2 |
| SHEET NO. | 22 OF 33 |
| JOB NO. | 13425998 |
| DRAWING NO. | D5634-022 |



LOAD CALCULATION (25 MGD)

| | |
|-----------------------|------|
| PUMP PUI2301 | 156A |
| PUMP PUI2311 | 56A |
| PUMP PUI2321 | 156A |
| PUMP PUI2331 | 156A |
| FLT2364 | 18A |
| AHU: ARH2371 | 16A |
| AHU: ARH2372 | 16A |
| ODOR CONTROL (FUTURE) | 4.5A |
| CONTROL PANELS | 15A |
| SUBTOTAL | 717A |
| SHARE (20%) | 143A |
| TOTAL | 860A |

- NOTES:**
- PROVIDE CIRCUIT BREAKER WITH REPLACEABLE TRIP PLUG
 - MOTOR WILL BE REPLACED WITH A 75-HP MOTOR IN THE FUTURE TO ACCOMMODATE 25 MGD.
 - SEE DWG E-6 FOR CONDUIT SCHEDULE.
 - ALL INSTRUMENT AND EQUIPMENT TAGS HAVE AN AREA PREFIX. SEE DWG E-2 FOR TAG FORMATTING.
 - COORDINATE CIRCUIT BREAKER RATING, FUSE RATING, AND CONDUCTOR SIZE WITH AIR HANDLING UNIT MANUFACTURER.
 - INTERCEPT EXISTING RP-4 4" CONDUIT PROVIDED BY OTHERS AND EXTEND TO TRANSFORMER (ELEVATION).

CDM Camp Dresser & McKee Inc.
 8220 Cleveland Avenue, Suite 100
 Rancho Cucamonga, California 91730
 Tel: (909) 578-3500
 Fax: (909) 980-5185

DIGALERT
 DIAL BEFORE YOU DIG
 TWO WORKING DAYS BEFORE YOU DIG
 TOLL FREE 1-800-227-2660
 A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

| REV | REVISION DESCRIPTION | DATE | ENR | QTY | DATE |
|-----|----------------------|------|-----|-----|------|
| | | | | | |
| | | | | | |
| | | | | | |

SHOULD CONSTRUCTION OF THE REQUIRED IMPROVEMENTS NOT COMMENCE WITHIN TWO YEARS OF THE DATE OF APPROVAL SHOWN HEREON AND CARRIED FORTH IN A DILIGENT MANNER, THE CITY ENGINEER MAY REQUIRE REVISIONS TO THE PLANS TO BRING THEM INTO CONFORMANCE WITH CONDITIONS AND STANDARDS IN EFFECT.



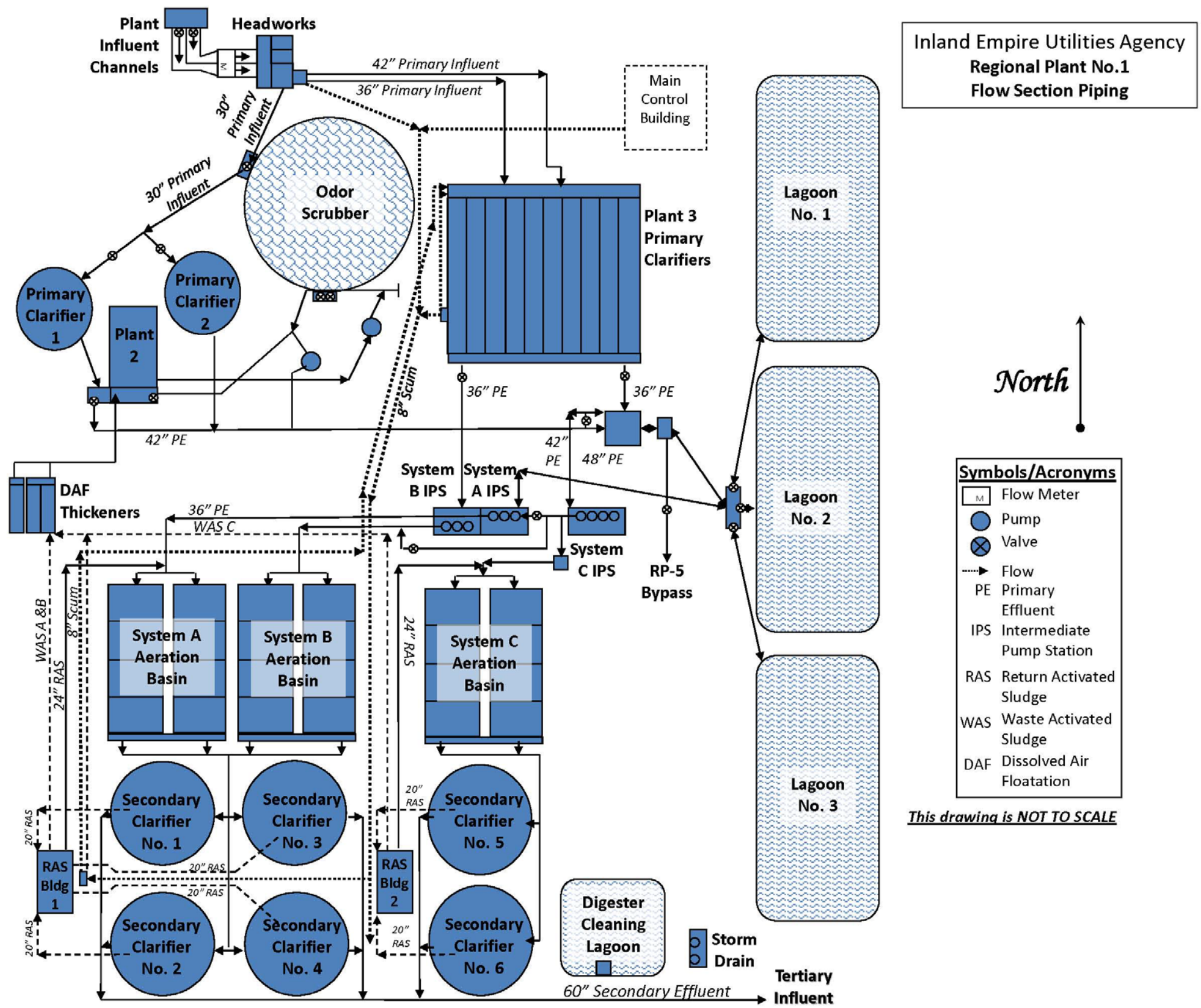
Prepared Under the Supervision Of:
 Date: _____

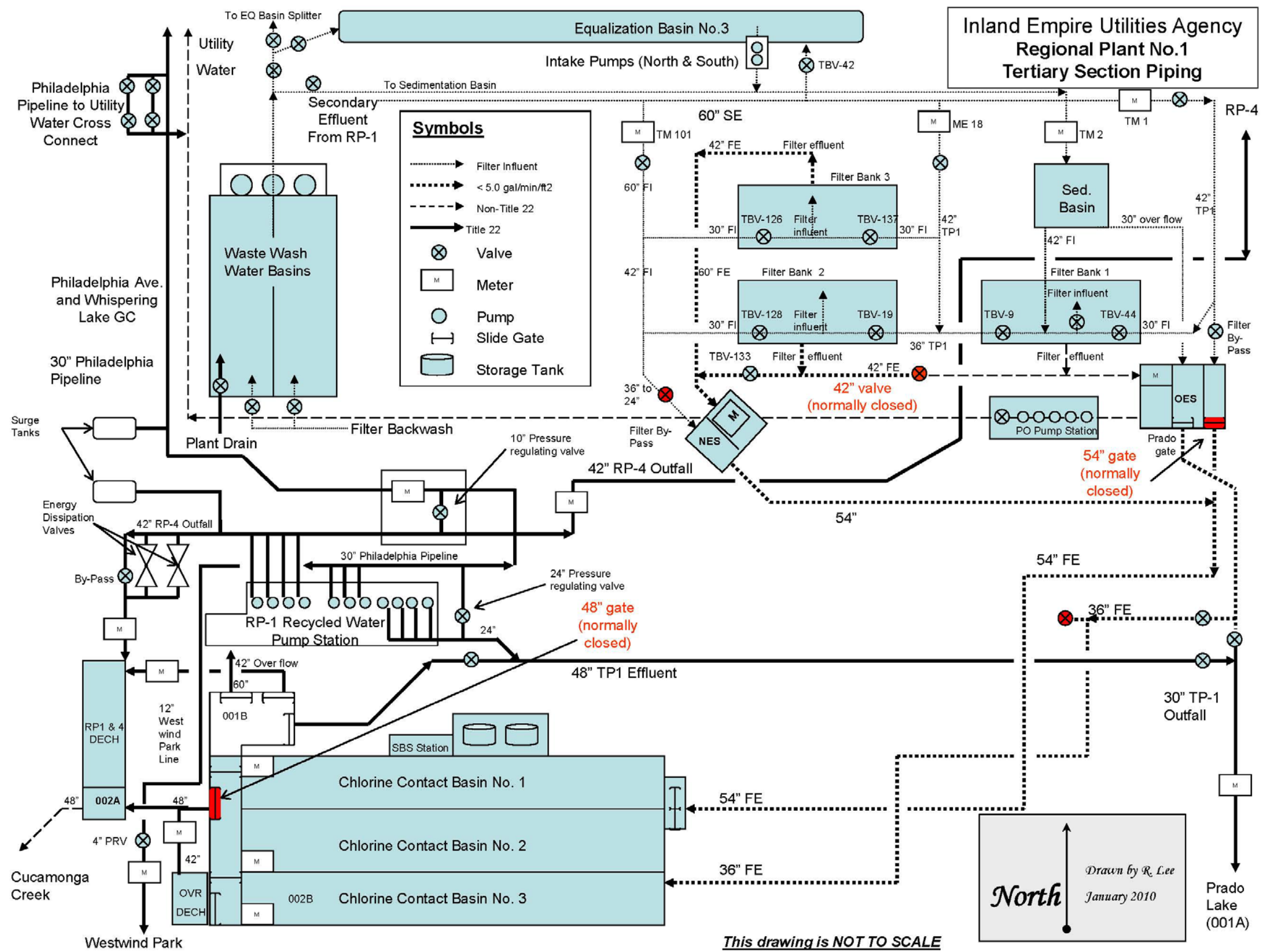
CITY OF FONTANA, CALIFORNIA
 SAN BERNARDINO AVENUE LIFT STATION
SINGLE LINE DIAGRAM AND EQUIPMENT ELEVATIONS
 DRAWN BY: MD
 DESIGNED BY: MD
 CHECKED BY: _____
 APPROVED BY: _____
 DATE: FEBRUARY 2007
 SCALE: NTS
 SHEET NO. E-2

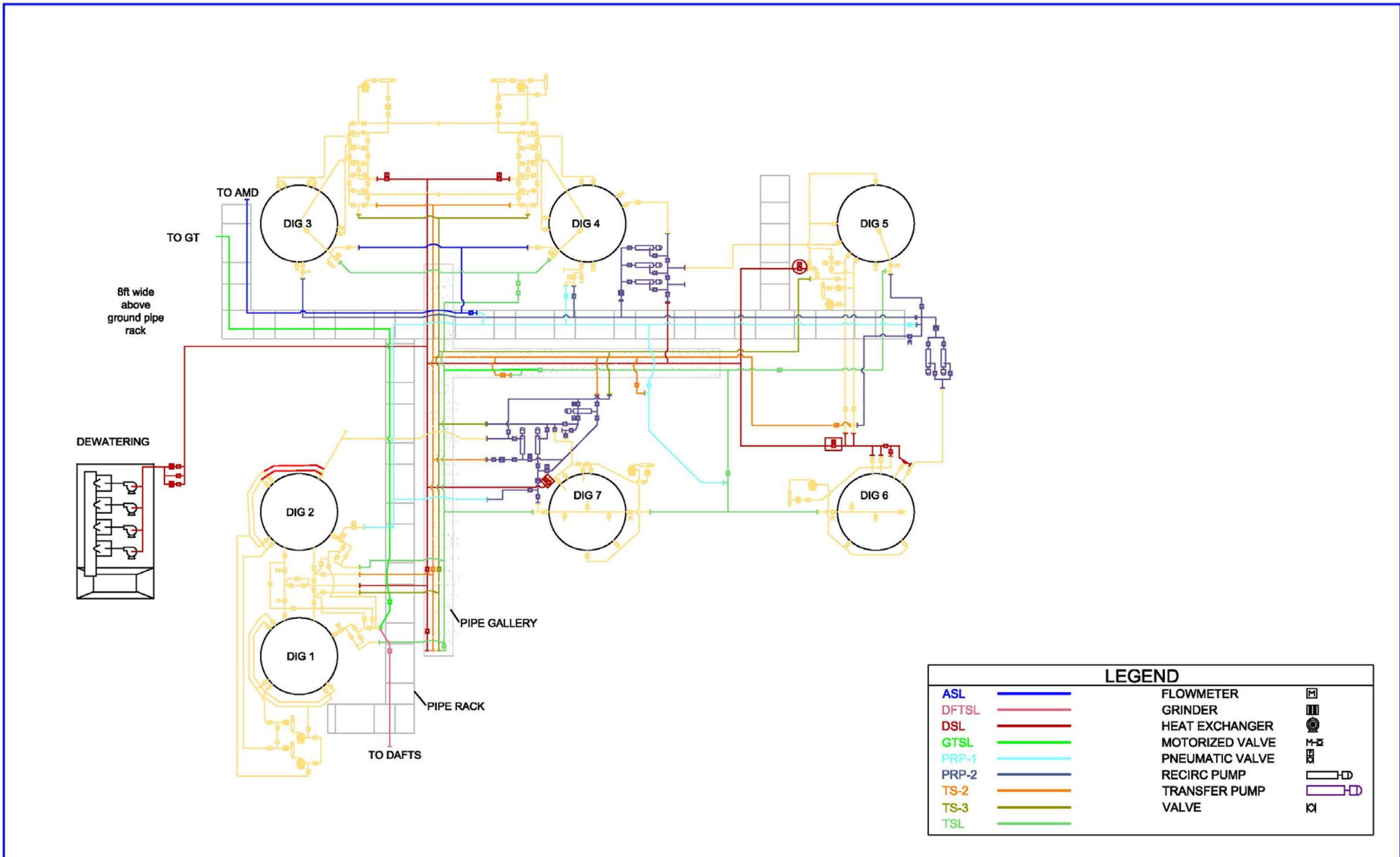
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Appendix C: Yard Piping

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| REV. | DATE | BY | DESCRIPTION |
|------|------|----|-------------|
| | | | |
| | | | |
| | | | |

Designed _____
 Drawn _____
 Checked _____
 Title _____

APPROVED BY: _____
 Project Manager _____ Date _____

SCALE
AS SHOWN
 1" = 100'

INLAND EMPIRE UTILITIES AGENCY*
 #A Municipal Water District

AGRON **SEWER SERVICE**
 140000 140000
 140000 140000
 140000 140000

INLAND EMPIRE UTILITIES AGENCY
 Regional Plant No. 1
 Solids Section Sludge Piping

SHEET
 1
 OF 1 SHEETS
 DRAWING NO.

C:\Users\jason\Documents\140000\140000_Schematic_Solids_Sludge_Piping.dwg 10/14/2014 10:23:18 AM

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