

Pacific Gas and Electric Company

RAPIDS Wastewater Optimization Program Implementation Plan

November 25, 2020



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Program Overview

1. Program Name

Risk Assessment, Process Improvement, and Decision Support (RAPIDS) Wastewater Optimization Program

2. Program ID Number

PGE_Pub_010

3. Program Budget Table

Budget Data on CEDARS?: Yes No If No, then show below:

4. Program Gross Impacts Table

Savings Impact Data on CEDARS?: Yes No If No, then show below:

5. Program Cost Effectiveness (TRC)

Effectiveness Data on CEDARS?: Yes No If No, then show below:

6. Program Cost Effectiveness (PAC)

Effectiveness Data on CEDARS?: Yes No If No, then show below:

7. Type of Program Implementer

Third Party

8. Market Sector(s)

Public

9. Program Type

Resource

10. Market Channels and Intervention Strategies

Downstream; Audit, Energy Action Plans, Technical Assistance, Design Assistance, Optional Submetering, Incentives, Financing Support, Performance Monitoring



Implementation Plan Narrative

1. Program Description

Describe the program, its rationale and objectives.

The RAPIDS Wastewater Optimization Program (RAPIDS) is a pay for performance third-party program available to municipal and public agency wastewater customers in PG&E's service area starting in 2021. "RAPIDS" stands for the program's delivery of Risk Assessment, Process Improvement, and Decision Support services to program participants to eliminate energy waste in the treatment process while enhancing operational control and reliability.

RAPIDS is designed to deliver comprehensive, and sustained energy savings through downstream energy, process, and operational savings while building a culture to support energy management excellence within the organization focused on reliability, resilience, and operational efficiency.

The program offers process engineering expertise, strategic energy action planning, energy efficiency measure (EEM) analysis, design assistance, incentives, and financing support. The program engages a wide variety of stakeholders throughout the organization via an "Strategic Energy Management (SEM)-style" approach to understand near-term and long-term customer objectives and risks, site conditions and requirements in order to align program focus with customer priorities and to address opportunities through both capital and operational strategies. RAPIDS provides operators with knowledge and tools to monitor and continuously improve system performance and savings persistence. Savings persistence will be supported by submetering, data tracking, and performance monitoring.

Primary Goals and Objectives

The goal of RAPIDS is to transform the way that wastewater treatment plants (WWTP) consider energy impacts in the design and operation of their treatment and collection systems, and to deliver a cost-effective program with the following benefits over the contracted savings period:

- Engage approximately 17 WWTP over 3 year program cycle
- Deliver first year net savings of 8,322,571 kWh, 1,665 kW and 394,200 therms.
- Deliver lifecycle net savings of 53,743,835 kWh, and 2,545,661 therms.
- Incorporate integrated demand side management (IDSM) strategies in analysis, planning and procurement activities that deliver energy efficiency, load control and resiliency benefits for customers and the grid.



- Improve customer satisfaction and industry engagement through a customer-centric program design that addresses resource management, asset performance reliability and infrastructure planning.
- Help WWTP reduce costs and greenhouse gasses (GHGs) in support of regional and state financial and climate action goals).

2. Program Delivery and Customer Services

Describe how the energy efficiency program will deliver offerings (including program strategies/tactics, market channel, and targeted market/customer group); how it will reach customers, including those in hard-to-reach and/or disadvantaged communities (if applicable), and any services that the program will provide. Describe all services and tools that are provided.

Program Delivery Strategies and Tactics

RAPIDS will be delivered by a team of expert WW professionals, process specialists and energy engineers at AESC, ASK Energy, Dudek and Cascade Energy. This team of wastewater specialists will tailor services to each client based on the observations and findings of the preliminary customer research and kick-off operations and maintenance (O&M) workshop.

RAPIDS will achieve program goals and objectives by focusing on the following key approaches designed to address major challenges such as: lack of resources to explore biochemical process changes while simultaneously evaluating energy efficiency, demand response and distributed generation revenue streams. The RAPIDS program considers opportunities to optimize performance at each treatment plant through the following activities.

Engage key decision-makers such as WWTP managers, planners, and O&M staff to understand current performance objectives, reliability requirements, and infrastructure planning goals. This foundational understanding shapes the scope and boundaries of the subsequent technical support and ties energy projects directly to agency priorities and risk mitigation, increasing the overall likelihood of project implementation and savings.

Deliver Strategic Energy Management-style support (treasure hunts, data logging, performance monitoring, procedures review) to O&M staff and offer financial incentives to incent implementation of behavioral, retro-commissioning, and operational (BRO) savings. This supports early, lower-cost savings “wins” for the WWTP and RAPIDS program while longer-term capital strategies are developed and approved.



Develop EE projects that advance agency priorities and are compliant with CPUC policies and goals.

Offer financial and non-financial incentives, as well as financing support, to help address organizational and financial barriers to EE and system optimization.

Educate WWTP agencies, regulators, energy utilities, service providers, and communities more broadly about the strategies and benefits of the RAPIDS integrated design approach, to engage new plants for future program years, and to transform the way the industry considers energy as an integral part of asset planning and operation. This will be through case studies, training, and presentations at industry associations and conferences.

Market Channels

RAPIDS leverages the AESC, ASK Energy, Dudek and Cascade Energy team’s deep existing industry relationships within PG&E’s territory and throughout California. The RAPIDS team is at the core of a larger “consortium” of individuals and entities (including other design engineering firms, design-build contractors, vendors, manufacturers, equipment distributor representatives, trade associations, energy services companies, and academia) working to improve the efficiency, reliability, and health of the water industry.

Other key channels for outreach include, but are not limited to:

- PG&E’s Customer Account Representatives
- Local Government Partnerships (LGPs)
- Community Choice Aggregators (CCAs)
- California Water Environment Association (CWEA)
- Water Environment Federation (WEF)
- California Association of Sanitation Agencies (CASA)
- Association of California Water Agencies (ACWA).

Participation in and development of whitepapers and case studies to key WW sector associations is a cornerstone of the program’s strategy. These efforts serve to raise program awareness, establish credibility, promote peer to peer marketing, data sharing, and enhance the team’s understanding of the current and future operational challenges faced by the industry.

Targeted Sectors/Segments/Geographies/HTR/DAC

RAPIDS serves municipal and public wastewater treatment systems up to 200¹ MGD throughout PG&E’s territory. They are typically owned and operated by cities, counties, and

¹ Although the program serves sites up to 200 MGD, it targets sites from 5- 100 MGD. This statement is not intended to exclude sites of all sizes that meet program criteria.



special districts. The program excludes net power producers to ensure that all program energy savings are claimable under current CPUC policies.

RAPIDS is not hard to reach (HTR) or disadvantaged communities (DAC)-focused program but, because RAPIDS delivers services to WWTPs throughout PG&E's territory, some project sites may be in regions defined as HTR or DAC. For those, RAPIDS offers innovative strategies to enable efficiency in cash-strapped agencies, such as through On-Bill Financing or special third-party financing partners.

3. Program Design and Best Practices

Describe the program strategies/tactics that will be used to reduce the identified market barriers for the targeted customer group and/or market actor(s). Describe why the program approach constitutes “best practices” and/or “lessons learned.” Include descriptions of key software tools that are significant to program strategy and implementation, including audit tools. Provide references where available.

Program Design and Strategies to Address Market Barriers

RAPIDS is designed to overcome the key market barriers that have historically limited energy savings in the WWT sector relative to the technical savings potential. Because agencies are primarily focused on regulatory compliance and service reliability, EE projects can be seen as a distraction or risk to compliance. WWTPs often lack the staff resources and expertise required to analyze and present energy efficiency options, or to incorporate energy related value streams like incentives or future demand response participation revenue. This is especially true for those that are more complex such as those that may involve biochemical process changes.

To address this, RAPIDS engages WWTP managers, planners, and O&M staff to fully understand performance objectives, reliability requirements, and infrastructure planning goals. Supported by the team's water process engineers and experts, and informed by a plant survey, asset registry and nutrient load modeling, RAPIDS can develop strategies that address core needs while also saving energy. These strategies, documented in an Energy Action Plan, forms the basis of further technical and risk analysis for larger capital and infrastructure related projects, based on the opportunities of most interest to the plant. By tying energy projects to existing agency priorities, it also increases the likelihood of energy project implementation in an accelerated timeline to meet program objectives.

To mitigate program savings delay and long capital planning timeframes, RAPIDS engages plant operators to identify operational and retrocommissioning savings through SEM-style support. These strategies can deliver early plant savings and “wins” while longer-term capital strategies are developed, approved, and funded and provides awareness and tools to support continuous improvement and savings persistence.



Because WWTPs often lack system and sub-system energy performance tracking and controls to optimize operations, identify potential performance issues, and participate in programs like demand response, RAPIDS facilitates the deployment of targeted data logging, temporary or permanent submetering, and performance monitoring at the project, system and/or sub-system level. This helps identify operational issues and BRO project opportunities, establish performance baselines to inform capital project analysis, modeling, and approval, support program and project measurement and verification (M&V), and enable savings persistence by providing more granular data visibility.

To address local government capital constraints, further exacerbated by recent COVID-19 related budget impacts, the program offers incentives to improve project economics and support capital planning approval. In addition, the program also facilitates financing solutions, including but not limited to OBF loans, to enable projects that might not otherwise be approved.

Finally, as a component of initial program marketing and ongoing market transformation, RAPIDS educates a broad population of California water agencies and service providers about the benefits of a design approach that considers energy as an integral part of asset planning and operation. This is achieved through sharing of success stories, case studies, encouragement of peer-to-peer sharing, and through delivering training and presentations at industry association meetings and conferences.

Best Practices

The RAPIDS program design is informed by the implementation team's industry expertise with over 50 public sector, wastewater and industrial end users, and program experience deploying custom and Strategic Energy Management programs in California and nationally. In the last five years the team has identified more than 28 GWh at 30 WWTPs and are actively working with 15 agencies to implement suggestions

Program design best practices include:

- 1) **Early and Ongoing Stakeholder Collaboration:** RAPIDS partners with WWTP Customer Relations Managers and Energy Efficiency Specialists to inform the customer engagement strategy and engages PG&E's program engineering team early in project development with review to ensure regulatory compliance and manage customer expectations.
- 2) **Customer Alignment:** RAPIDS is aligned with customer priorities.
- 3) **One Stop Support:** RAPIDS delivers end-to-end customer support and a single point of contact to coordinate activities, from strategic planning through M&V.
- 4) **Clear Influence:** The high-touch program design includes well documented points of influence throughout the entire process including audits and strategic energy planning, EEM option and risk analysis, rebates and incentives, financing and operational staff engagement.
- 5) **Minimizes Program Overlap:** RAPIDS was designed to minimize overlap and enable coordination with future statewide water programs and initiatives.



Program Management best practices include use of standardized tools and templates, integrated program platforms to support project documentation and management, internal QA/QC on all client deliverables and regular management review of performance to ensure compliance and support continuous improvement.

Program implementation best practices include:

- 1) **Alignment with SEM and ISO 50001:** While RAPIDS is not yet classified as a CPUC-approved SEM program in California, it is designed to deliver long term continuous energy improvement through impacting many areas of energy management as defined in international energy management best practice standards like ISO 50001. For example RAPIDS focuses on engaging customers with organizational readiness and management commitment, evaluating and addressing risks to success, establishing baselines and energy goals, developing energy action plans, supporting staff engagement and awareness, incorporating energy as a consideration in design, monitoring performance over time, and putting processes into place to achieve continuous improvement.
- 2) **Tracking customer satisfaction with the participation process:** Customer satisfaction is monitored at key milestones. Data from these efforts helps optimize delivery mid-stream to fulfill customer satisfaction within the program parameters.
- 3) **Custom WWTP Site Assessment Tool:** Site conditions are assessed by a tool developed by a team with a collective 70 years of experience in WWTP operations and engineering.

4. Innovation

Describe how the program is innovative and will increase the uptake of cost-effective energy efficiency and minimizes lost opportunities for promoting other demand side energy reduction efforts by advancing a technology, marketing strategy, or delivery approach in a manner different from previous efforts. See Appendix D for the update innovation definition and requirements.

The RAPIDS program introduces significant innovations over historical approaches to the WW sector that are designed to lead to more comprehensive savings, increased implementation rates, and program spillover.

Delivery Approaches

- Program design focuses on facility strategies that mitigate key areas of customer risk, such as compliance and reliability thus aligning with customer priorities and increasing EE implementation rates. The program offers WWT operators risk mitigation and decision support tools such as plant surveys, asset registries and nutrient load modeling to optimize performance and achieve environmental compliance requirements. This program addresses the more complex issues including but not limited to biochemical processes.
- Program alignment with best practices in energy management (ISO 50001, Strategic Energy Management Programs) including strategic energy action planning, data tracking and



performance monitoring, benchmarking and baselining, and treasure hunts with operational staff increase BRO savings, organizational awareness and savings persistence.

- By looking at whole system incorporating Integrated EE, DR, and DG in analysis, planning and procurement to optimize customer and grid benefits, **rather than individual measure strategies.**

Market Strategies

- WWTP process expertise, design assistance and compliance risk analysis give agencies the confidence to address process-related efficiency opportunities.
- RAPIDS offers the market unprecedented technical process expertise to analyze options, such as the consequence of failure analysis (COFA) and design assistance, to increase strategy adoption.
- Enabling incentives like submetering, conceptual design assistance, and project management support help overcome capital and organizational barriers. These incentives streamline the agency procurement process and address resourcing concerns.
- Facilitates innovative financing strategies for capital-constrained agencies.

Technology

- Biochemical optimization design strategies lead to larger, system-wide efficiencies while delivering enhanced performance.
- Customer AMI data, submeter data, and project parameters are tracked to demonstrate real-time performance. AESC's cloud-based software platform, Praxis, is used to monitor submeter data and track savings, which facilitates energy performance feedback to participants, allowing them to view incremental savings and promotes persistence.

How the Proposed Program Yields Increase Savings or Participation

The combined proposed approaches increase sector awareness, engagement, and energy savings delivered per site. The most significant impact results from the deeper savings possible as a result of our early engagement, risk analysis, and design assistance to support customer decisions.

The potential savings per site over three to five years increases from the range of 3-8% from the simple pump overhauls, VFDs and lighting projects, to 20-30% from a focus on BRO, capital and biochemical process optimization. Savings are scalable and our methods are replicable across sectors and segments. The program also promotes new technologies adapted from industries with similar processes (such as industrial WW and food manufacturing) leading to incremental savings opportunities while maintaining compliance. This integrated approach promotes increased savings and participation.



5. Metrics

Provide metrics that will be used to track program progress. For programs design and implemented by third parties, include the required performance metric for innovation. Metrics can include non-energy metrics if applicable.

[A] KPI ID	[C] KPI DEFINITION	[E] KPI TARGET/MILESTONE	Frequency
Program Data Quality	Provided program data must be complete, accurate, and timely.	KPI Measurement method: Total corrections/adjustments requested by PG&E ----- Total number of submissions into IE or program Units: Individual record level for submission into EI (e.g., custom project records) and program reports and administrative and operational deliverables.	Quarterly
Engineering Documentation Quality	The change in energy savings calculations required after review by PG&E engineering staff	KPI Measurement method: $\frac{ABS [Est Sav] - [Approved Sav] }{[Est Sav]}$ Est Sav = Pre-Committed Net Savings (Above Code vs Above Existing, based on Measure Application Type); where Pre-Install Tech Review Date is in the quarter Approved Sav = Committed Net Savings (Above Code vs Above Existing, based on Measure Application Type); where Pre-Install Tech Review Date (Post-Install Tech Review Date for Custom Lite ONLY) is in the quarter	Quarterly



[A] KPI ID	[C] KPI DEFINITION	[E] KPI TARGET/MILESTONE	Frequency
Savings Forecast Accuracy	A comparison of paid (and approved for payment) adjusted net energy savings achieved (kW, kWh, Therm where applicable) within the quarter by a subprogram, to the energy savings that was in the quarterly forecast or re-forecast.	KPI Measurement method: $\frac{\text{ABS (Actual net adjusted paid savings achieved quarterly by subprogram - Forecast energy quarterly adjusted savings)}}{\text{Forecast energy quarterly net adjusted savings}}$ $\text{ABS} \frac{[\text{Act Savings}] - [\text{Fcst Savings}]}{[\text{Fcst Savings}]}$ Act Net Adj Savings = Total Savings; where Payment Date occurs within quarter Fcst Savings = Submitted by Implementer Units: Net kWh, kW and Therms	Quarterly

6. For Programs claiming to-code savings

Describe how the program complies with Applicable Laws and: a. Identify where to-code savings potential resides; b. Specify which equipment types, building types, geographical locations, and/or customer segments promise cost-effective to-code savings; c. Describe the barriers that prevent code-compliant equipment replacements; d. Explain why natural turnover is not occurring within certain markets or for certain technologies; and e. Detail the program interventions that would effectively accelerate equipment turnover.

Not Applicable. Wastewater treatment plants in the public sector are minimally impacted by Title 24 code and RAPIDS was designed to target complex measures that exceed industry standard practice. As such, program savings goals do not account for any to-code savings.

7. Pilots

Describe if any pilot projects are part of this program and explain the innovative characteristics to these pilots. The inclusion of this description should not replace the Ideation Process requirements currently agreed by CPUC staff and the IOUs. This process is still undergoing refinements and will be further discussed as part of Phase III of this proceeding (R.13-11-005).10

No pilots are part of the RAPIDS program design. In many cases, RAPIDS program engagements lead customers to explore the adoption of new and novel technologies, proof of concept tests, bench tests, and pilot studies. However, such pilot tests are not coordinated through the RAPIDS program directly or funded by the program administrator.



8. Workforce Education and Training

Describe how the program will support workforce, education, and training to:

1. Expand/initiate partnerships with entities that do job training and placement;
2. Require placement experience for any new partners in the workforce, education, and training programs and new solicitations;
3. Require “first source” hiring from a pool of qualified candidates, before looking more broadly, beginning with self-certification; and
4. Facilitate job connections, by working with implementers and contractor partners, and utilizing energy training centers.

Not Applicable. The program did not propose a workforce education and training component.

9. Workforce Standards

Identify all relevant workforce standards that the Implementer deems applicable to the Program, including any specific skills certification and/or broader occupational training and experience for the following:

a. HVAC Measures

- i. Installation, modification, or maintenance of non-residential HVAC measures with an incentive of \$3,000 or more are required to be installed by workers or technicians that meet one of the following criteria:
 1. Enrolled in and/or completed an accredited HVAC apprenticeship
 2. Completed more than five years of work experience at the journey level per California Department of Industrial Relations definition, passed competency tests, and received specific credentialed training
 3. Has a C-20 HVAC contractor license issued by the California Contractor’s State Licensing Board?

b. Advanced Lighting Control Measures

- i. Installation of non-residential lighting control measures with an incentive of \$2,000 are required to be installed by installation technicians who have completed the California Advanced Lighting Controls Training Program (CALCTP).

RAPIDS sometimes leads to significant changes in operational strategies and physical configurations of wastewater treatment. In some cases, our team recommends changes to sampling protocols and laboratory testing practices, physical activities performed in the normal course of treatment, and to the physical characteristics of the treated wastewater effluent or reclaimed water supply. Whether these changes impact the workplace or the workforce, or both, the RAPIDS program works with customer staff to ensure consistency with all required laws, regulations, permit requirements, and health and safety standards that are or may be potentially impacted by recommendations of the program.



The applicable workplace standards include, but are not limited to:

- CA State Water Resources Control Board (SWRCB) Plant Classification
- SWRCB Discharge Permit
 - Waste Discharge Requirements (WDR)
 - National Pollutant Discharge Elimination System (NPDES)
 - Recycled Water Permit and Management Plan
 - Stormwater Management and Discharge Permit
 - Industrial Waste Discharge Permit Plan (IPP)
 - Sanitary Sewer Management Plan (SSMP)
 - Bio-Solids Management Plan
 - Sampling and Monitoring Plan (SMP)
- Air Emissions Permits
- Cal OSHA Health & Safety Plan
- Emergency Evacuation Plan
- Electrical Safety Program and ARC Flash Testing Plan
- Injury & Illness Prevention Plan (IIPP)
- ELAP Laboratory Certification and Chain-of-Custody Plan
- Visitor Logs

The applicable workforce standards include, but are not limited to:

- SWRCB Operator Certification
- Water Treatment & Distribution Certification (for reuse systems)
- 40-Hour HAZWOPER Training and certification
- CWEA Voluntary Certifications (required by some employers); Grades I-IV
 - Industrial Waste Treatment
 - Mechanical Maintenance Technician
 - Electrical Technician
 - Instrumentation and Controls Technician
 - Collection System Maintenance Technician
 - Laboratory Technician
- IIPP Training and Certification

10. Disadvantaged Worker Plan

Describe how the program will provide Disadvantaged Workers with improved access to career opportunities in the energy efficiency industry for programs that directly involve the installation, modification, repair, or maintenance of Energy Efficiency equipment. Also describe the method that will be used for tracking this population in order to satisfy metric reporting requirements.

Not applicable. The RAPIDS program does not directly involve the installation, modification, repair, or maintenance of EE equipment. When possible, RAPIDS team will work with



customers to select contractors for project implementation that meet the needs of the community. When a disadvantaged community (DAC+) is being served by the wastewater customer, RAPIDS will make every reasonable effort to support local labor in the construction force to maximize benefits to the community.

11. Additional information

Include here additional information as required by CPUC decision or ruling, as applicable. Indicate decision or ruling and page numbers.

CPUC does not require additional information for this program beyond what is included in this document.

Supporting Documents

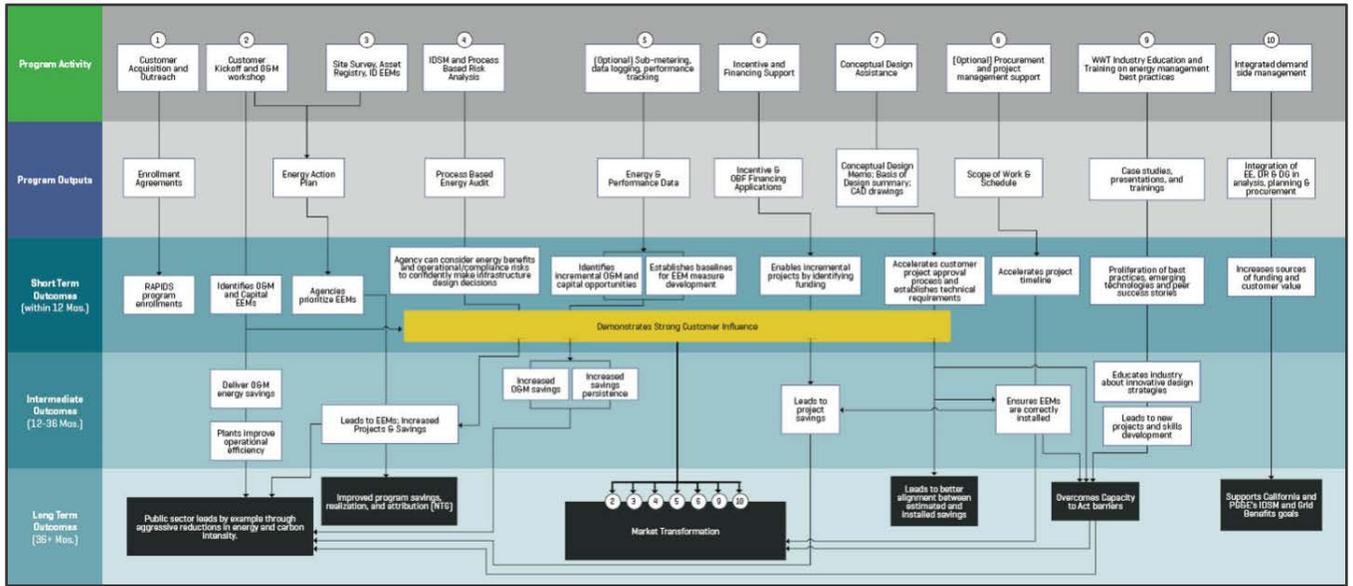
1. Program Manuals and Program Rules

2. Program Theory and Program Logic Model

Program Theory and Logic Models should visually explain underlying program theory supporting the sub-program intervention approach, referring as needed to the relevant literature (e.g., past evaluations, best practices documents, journal articles, books, etc.).

The RAPIDS logic model explains the underlying theory of the program. It draws a correlation between program activity, program outputs and program outcomes. All RAPIDS program activities tie to the desired long-term outcome of market transformation.

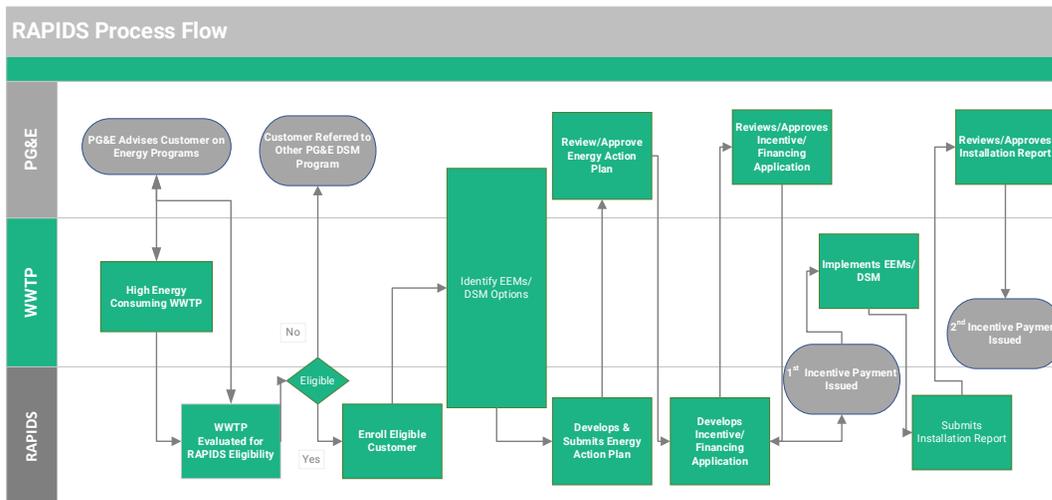




3. Process Flow Chart

Provide a program or, if applicable, a sub-program process flow chart that describes the administrative and procedural components of the sub-program. For example, the flow chart might describe a how a customer submits an application, how the implementer screens the application, the application approval/disapproval process, verification of purchase or installation, incentive processing and payment, and any quality control activities.

The RAPIDS process flow chart provides an illustration of the coordination among project stakeholders, roles and responsibilities, and steps in the project completion process.



4. Incentive Tables, Workpapers, Software Tools

Provide a summary table of measures and incentive levels, along with links to the associated workpapers.

RAPIDS offers downstream financial and non-financial incentives. Incentives can be issued to participating customers in three ways, as described in detail below:

1. Cash incentive to offset project cost upon project completion
2. Optional enhanced incentive for design assistance
3. Optional enhanced incentive for submetering equipment and deployment.

Financial Incentives

Financial incentives are available to customers based on verified energy savings at the completion of project implementation.

Category	\$/kWh	\$/kW	\$/Therm
Behavioral, Retro-Commissioning and Operational (BRO)	\$0.04	\$50.00	\$1.00
Custom Retrofit (\leq 5 year EUL and AR to-code)	\$0.04	\$50.00	\$1.00
Custom Retrofit (\geq 5 year EUL and AR to-code)	\$0.12	\$150.00	\$1.00

Enabling Incentives

Based on customer size (MGD) and capped based on total estimated savings potential identified (kWh, kW, and therms) in measures for implementation as documented in the Energy Action Plan, customers may elect to leverage enabling incentives. There are two enabling incentives available through the program:

1. Sub-metering
2. Design Assistance Services and/or Reimbursement

Submetering Incentives

Submetering incentives are available to offset the costs of a submetering assessment and/or equipment. Submetering supports visibility of equipment, system and sub-system energy performance, as well as project M&V, long-term savings persistence, and future energy project identification.



Optional Enhanced Direct Implementation Services	Value of Service
Submetering	\$10,000 to \$25,000 per customer

Design Assistance Services and/or Reimbursement

RAPIDS provides specialized conceptual design engineering services for recommended EEMs with which the customer would like to move forward and implement. Through design assistance, customers receive technical memorandums that include the Basis of Design and up to three design drawings provided by the program’s engineering design firm. The study describes the objectives, project benefits, alternatives analysis, risk minimization strategies, design parameters of each project to support customer implementation, including a phased-implementation schedule, as needed. For customers who choose design assistance reimbursement but would prefer to use a different design engineering firm, RAPIDS screens proposed alternative providers to ensure that program objectives can be satisfactorily met and reimburses fees up to the incentive caps upon proof of customer EEM project initiation.

Optional Enhanced Direct Implementation Services	Value of Service
Design Assistance Services and/or Reimbursement	\$12,500 to \$30,000 per customer

Workpapers

Not applicable. The RAPIDS program does not anticipate any workpaper reference, as the measures are not encompassed by a deemed approach.

Software Tools

AESC’s cloud-based software platform, Praxis, is used to monitor data at the meter and submetered level and to track savings. This platform facilitates energy performance feedback to participants. Customer AMI data, submeter data, and project parameters are tracked to demonstrate real time performance of the energy interventions. PRAXIS may be leveraged as the data warehouse for the program and utilized alongside Smartsheet to round out the program administration functions. Other software tools to facilitate CRM may also be introduced.



5. Quantitative Program Targets

Provide estimated quantitative information on number of projects, companies, non-incentive customer services and/or incentives that program aims to deliver and/or complete annually. Provide references where available.

Program Year	Metric	Total
Program Total	Total RAPIDS Energy Savings (kWh)	13,870,952
	Total RAPIDS Gas Savings (Therms)	657,000
	Total RAPIDS Engagement Target (Number of WWTPs)	17
Year 1	Total RAPIDS Energy Savings (kWh)	693,548
	Total RAPIDS Gas Savings (Therms)	0
	Total RAPIDS Engagement Target (Number of WWTPs)	10
Year 2	Total RAPIDS Energy Savings (kWh)	4,854,833
	Total RAPIDS Gas Savings (Therms)	197,100
	Total RAPIDS Engagement Target (Number of WWTPs)	7
Year 3	Total RAPIDS Energy Savings (kWh)	8,322,571
	Total RAPIDS Gas Savings (Therms)	459,900

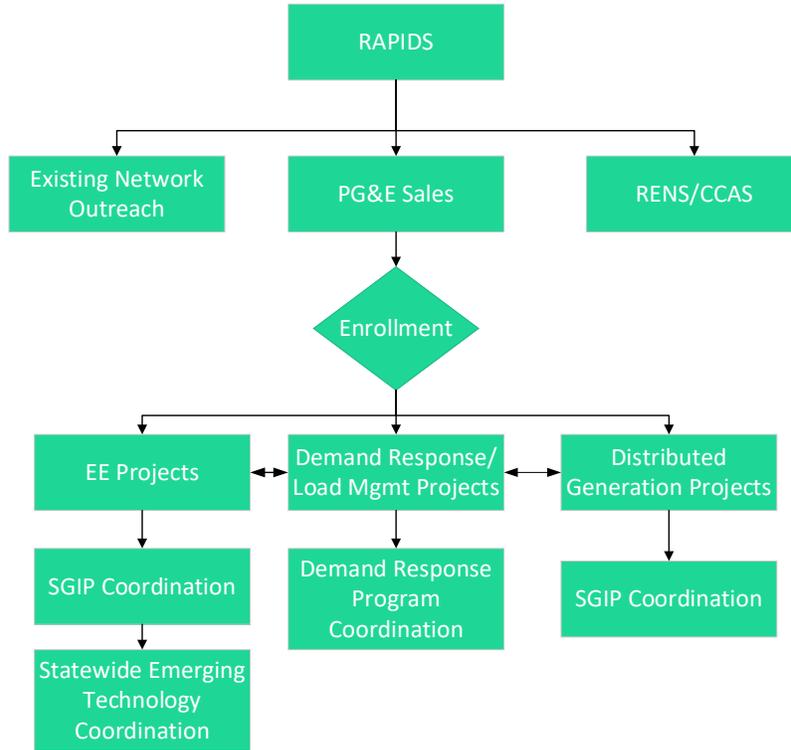
6. Diagram of Program

Provide a one-page diagram of the program including subprograms. This should visually illustrate the program/sub-program linkages to areas such as:

- a. Statewide and individual IOU marketing and outreach
- b. Workforce Education & Training programs
- c. Emerging Technologies and Codes and Standards
- d. Integrated efforts across demand-side management programs

RAPIDS leverages various market channels to produce program enrollments. Participants are then evaluated for energy efficiency, load management and distributed generation opportunities. In parallel, RAPIDS promotes new technologies in coordination with SW Emerging Technology efforts.





7. Evaluation, Measurement & Verification (EM&V)

Describe any process evaluation or other evaluation efforts that the program administrator (PA) or program implementor (PI) will undertake to identify the evaluation needs that must be built into the program, clearly identifying who will be responsible for which evaluation activity. These might include:

- a. Data collection strategies embedded in the design of the program or intervention to ensure ease of reporting and near-term feedback, and
- b. Internal performance analysis during deployment
- c. Performance metrics
- d. All PAs should indicate what coordination support and funding, if any, they will provide to support program evaluation.

Data Collection Strategies

RAPIDS relies heavily on data collection via three methods: 1) PG&E customer & energy data via Energy Insight, 2) WWTP site assessment/audit data and 3) data logging. Program data is stored in PRAXIS to enable analytics and performance monitoring.



Through the site assessment, the Program collects key operational data for all WWTP process systems on-site. This includes but is not limited to baseline information, existing conditions, influence information, equipment make/model, hours of operation, run-times, current WWTP processes etc.

Cost tracking, labor and direct expense management, invoicing and financial reporting is tracked in AESC's Deltek Ajera platform, an integrated accounting and project management software. Team members will record their expenses and labor and the team will monitor expenses against plans. Cost information automatically populates a monthly invoice by billing category. The invoice will be paired with a monthly narrative summarizing the work and results reflected in the invoice.

Internal Performance Analysis During Deployment

For RAPIDS projects, IPMVP Option B: Retrofit Isolation/ All Parameter Measurement is used wherein savings are determined by field measurement of energy use as a comparison of baseline versus post-intervention observation. The data gathered during the baseline period is used to establish the existing conditions baseline for AR/AOE/BRO measures, as well as to determine the duty cycles used in Code/ISP baselines for NR measures. For all measures, weather conditions as well as hydraulic and organic loading conditions observed during post-installation data is used to normalize the energy savings estimations.

Basis for Adjustments

Seasonality: The pre-and post-implementation M&V tasks may occur during varying seasonal and weather conditions. Ambient weather data and plant loading conditions is collected pre-and post-implementation.

Non-Routine Adjustments: Non-routine events (NREs), both positive and negative, are identified using a statistical approach for determining outliers present in data sets acquired both pre-and post-implementation. Clear identification of NREs and energy savings (or penalties) associated with the NREs are removed from the scope of the final measure determinations.

System Boundary

For each measure, the appropriate system boundary is established prior to deployment of any power monitoring equipment.

Measure Monitoring Period

The baseline and proposed monitoring periods shall each last at least one month to cover a range of hydraulic and organic loading conditions. Power measurements are logged every 15 minutes or less using either a DENT ElitePro XC logger or an equivalent equipment. Spot measurements of voltage, current, and power factor are recorded.

Power measurements are taken at the local disconnect, when accessible, or at the main distribution panel localized to the specific sub-system. Hydraulic loading rates (MGD)



and organic loading concentrations (mg/L) are provided by onsite SCADA trending systems at the various points of interest throughout the plant as gathered by onsite laboratory technicians. For most process-based measures, normalization to organic loading is expected, while others may require normalization to hydraulic, or ambient conditions.

Performance Metrics

The table below outlines quarterly and monthly metric data critical to evaluating program efforts and success provided. The data will be provided by the RAPIDS team.

Quarterly Metric	Frequency	Monthly Metric	Frequency
Marketing	Quarterly	Target Participant Data	Monthly
Forecast and Actual Program Participants	Quarterly	Enrolled Participant Data	Monthly
Forecast and Actual Program Spend by Quarter	Quarterly	Participant Activity Tracking	Monthly
Forecast and Actual Savings by Quarter	Quarterly	Influence Documentation	Monthly
Active Project Summary	Quarterly	Project Specific Data	Monthly
Program Integration Tracking	Quarterly	Active Project Summary Report	Monthly
		Aggregated Project Savings	Monthly
		Project Milestone Report	Monthly

Program Evaluation Support

RAPIDS supports CPUC and PG&E program evaluation efforts as required by the contract and CPUC guidelines. The Program will make all program resources available to assist in coordination of evaluation efforts, data analysis and data queries. RAPIDS will coordinate with PG&E to finalize data reporting requirements.



8. Normalized Metered Energy Consumption (NMEC)

If NMEC is applicable please include a detailed Program-level M&V plan, as called for in the most recently updated NMEC Rulebook. The revised Rulebook includes requirements for Program-level M&V plans to be submitted as part of the Implementation Plan.

Not applicable. Per CPUC guidelines, industrial projects are not able to use NMEC as an approved savings verification method.

9. Bid M&V Plans

Implementers must develop and submit an M&V Plan as part of their bid. The Bid M&V Plan in bid packages must include at least the following:

- a. A description of the program target population and participant eligibility criteria;**
- b. Documentation of the expected costs, energy savings and effective useful life (EUL) of planned measures and intervention strategies;**
- c. Identification of the method(s) and calculation software that will be used to calculate savings, including required information as outlined elsewhere in this rulebook.**

Not applicable. Per CPUC guidelines, industrial projects are not able to use NMEC as an approved savings verification method.

Program Manual

All programs must have manuals uploaded in CEDARS to clarify the eligibility requirements and rules of the program for implementers and customers. Program rules must comply with CPUC policies and rules. Table templates are available at CEDARS. At minimum, manuals should include:

1. Eligible Measures or measure eligibility, if applicable

Provide requirements for measure eligibility or a list of eligible measures.

The RAPIDS program accepts a wide variety of wastewater energy-savings projects. A list of example measures and operational strategies are included in Appendix A. Measure eligibility will be made at the discretion of the Program on a per site basis, however all measures must meet the following criteria:

- **Must Exceed Baseline Energy Performance:** Incentives are paid on the energy savings and demand reduction above and beyond baseline energy performance, which include state-mandated codes, federal-mandated codes, industry-accepted performance standards, existing baselines, or other baseline energy performance standards as determined by PG&E.



- **Must Operate at Least Five Years:** Measures that do not provide the Program with 100% of the related energy benefits for at least five (5) years from receipt of incentive are generally ineligible. PG&E may allow selected measures with less than five years of operation at their sole discretion.
- **Must Be Permanently Installed:** Measures that are not permanently installed or can be easily removed as determined by the Program, are generally ineligible for incentives.
- **Cannot Overlap with Other Incentive Programs:** Customer may not apply to more than one California energy efficiency incentive or rebate program for the same measure or receive incentives from more than one such program for any measure. Gas and Electric components of a measure should be considered separately. Other California end-user energy efficiency programs include but are not limited to: any program offered by or through PG&E, SCE, SCG, SDG&E; the California Energy Commission (CEC); and CPUC, including PPP funded local programs, third-party programs, or local government partnerships. This includes both upstream and midstream programs, which provide incentives to manufacturers and distributors.
- **Existing Equipment Must Be Decommissioned and Removed:** Existing equipment must be decommissioned and removed from site prior to Installation Review approval. Decommissioned equipment cannot be reused, resold, or retained for backup purposes without Program pre-approval. In those cases, additional documentation or verification may be required.

2. Customer Eligibility Requirements

Provide requirements for program participation (e.g., annual energy use, peak kW demand)

The RAPIDS program is open to wastewater customers who (1) receive natural gas and/or electric services from PG&E, (2) are not net energy or gas producers, (3) purchase at least 70% of total energy, or 1 MWh/yr, from PG&E at the discretion of the Program, and (4) pay the Public Purpose Program (PPP) surcharge on the gas or electric meter on which the energy efficient equipment is proposed. Customers are screened to verify organizational readiness to act, and for energy savings potential over the program period.

3. Contractor Eligibility Requirements

List any contractor (and/or developer, manufacturer, retailer or other “participant”) or sub-contractor eligibility requirements (e.g. specific required trainings; specific contractor accreditations; and/or, specific technician certifications required).

The RAPIDS team works with any customer-selected contractor or subcontractor to ensure all incentive eligibility requirements are addressed and met and to verify the contractor’s understanding of all incentive eligibility requirements.



For customers who choose design assistance reimbursement to apply to a different design engineering firm, the program screens proposed alternative providers to ensure that program objectives can be satisfactorily met and reimburses fees up to the incentive caps upon proof of customer EEM project initiation.

The RAPIDS team will ensure that the contractor screening process matches adequately the complexity of the project. For example, comprehensive construction projects will require a different level of eligibility screening than will a controls and instrumentation project.

4. Participating Contractors, Manufacturers, Retailers, Distributors, and Partners

For upstream or midstream incentives and/or buy down programs indicate, if applicable.

Not applicable.

5. Additional Services:

Briefly describe any additional sub-program delivery and measure installation and/or marketing & outreach, training and/or other services provided, if not yet described above

No additional services beyond what is described are provided.

6. Audits

Indicate whether pre and post audits are required, if there is funding or incentive levels set for audits, eligibility requirements for audit incentives, which demand side resources will be included within the audit's scope and who will perform the audit.

Pre-installation process-based energy audits are conducted in a manner that aligns with PG&E incentive eligibility requirements for energy efficiency, demand response, and other IDSM opportunities at the customer site. A combination of AESC, Cascade, and Dudek engineers conduct the audits in collaboration with customer staff. Upon completion of project construction, post-intervention M&V activities are conducted by ASK Energy to verify estimated savings in order to finalize savings values and incentive payments. For all efforts, equivalent measurement points are used both pre- and post-implementation to determine the actual energy savings normalized to any identified varying conditions. Any governing equations or statistical analysis used during the baseline simulation development are used in the post-implementation savings confirmation. For most process-based measures, normalization to organic loading are used, while others may require hydraulic, or ambient normalization that are determined prior to implementation of the measure.



7. Sub-Program Quality Assurance Provisions

Please list quality assurance, quality control, including accreditations/certification or other credentials

Quality assurance is embedded throughout the project process with Senior Managers and Senior Engineers overseeing and signing off on all milestone deliverables generated by team members. Acceptance criteria guide these senior level employees with quality assurance oversight. The acceptance criteria are geared towards ensuring compliance, data accuracy and customer satisfaction. As the program team does not directly install energy efficiency equipment or system optimization measures, RAPIDS quality assurance (QA) and quality control (QC) mechanisms for measure implementation is in the forms of project/construction management support and M&V.

Quality Assurance

The RAPIDS team implements comprehensive QA strategies that address each stage of the custom project lifecycle – from initial customer outreach through measurement and verification. In addition, through RAPIDS partner AESC, the team brings the experience of creating and maintaining program policy documents (including the Statewide Customized Offering Procedures Manual) and the role of statewide IOU coordinator. The strategies addressing the custom platform are part of the overall program QA plan. The key examples of QA efforts include the following:

- Publish and Socialize Implementation Plan (PIP)
- Facilitate onboarding practices and training for all program staff and positions
- Develop program forms and documentation
- Standardize all custom project forms and socialize to users, as appropriate.
- Establish a process for intermittent quality control checks (including a technical review checklist)
- Engage early with selected contractors to ensure provided solutions align with the proposed engineering objectives and anticipated measure savings

Quality Control

As laid out in the QA Plan, there are several QC checkpoints along the lifecycle of a custom project. The team has more than two decades of IOU custom technical review QC experience. AESC alone has reviewed thousands of custom applications and calculation assistance projects and has firsthand knowledge of the ever-increasing complexity and stringency of custom process requirements. The team approaches our own projects with the same rigor that we use during review of others' work.

Based on customer feedback, a subset of measures identified in the Energy Action Plan and more fully evaluated in the Audit Report are then converted to incentive applications, which undergo both a technical and program level QC review prior to submittal to PG&E. A technical review checklist is



developed that addresses the nuances of each measure type (NR, AOE, AR, etc.) to ensure that calculations, methodologies, and assumptions are documented and free of errors. The QC checklist reflects current policy and technical requirements contained in PG&E's Rulebook and Statewide Customized Calculation Savings Guidelines, as appropriate. The technical QC review is then routed to PM staff for policy-level QC review.

For each measure the energy, process, failure modes, and operational impacts are evaluated through the entirety of the treatment process. This may be facilitated by permanently installed data loggers wirelessly transmitting energy consumption data throughout the year, or by temporary monitoring equipment installed for specified durations. Post-installation data is collected to confirm process-based operation, normalization of simulations, and realization of energy savings. Any deviations from the original scope of work are documented and accounted for in a final installation report which includes calculations demonstrating verified energy savings based on M&V data.

Documenting Influence

RAPIDS' end-to-end agency approach is laden with points of influence, which are documented in all phases of project development. To promote consistency and adherence to CPUC requirements, RAPIDS incorporates and abides by a standardized influence matrix that is tiered in complexity based on the level of savings expected. RAPIDS captures both program and measure level influence. Customer interactions are detailed through emails, phone call summaries and discussion notes from in-person meetings. Our team utilizes communication templates and document customer exchanges, for IOU submission with the project application package, in our SQL program tracking database. Example information includes origin of measure identification, the customer's internal financial criteria, and proposed measure information, all of which is highlighted within the technical support documentation provided to the customer during the decision-making process. Alternate measure options and process leading to the customer's implementation decision are also captured within the RAPIDS application documentation.

Screening for Free Ridership

To screen for and thus minimize free ridership, RAPIDS:

- Administers a brief standardized free ridership survey at the onset of customer interaction based on Chapter 5.2 of the EE ISP Guidance 2.0 (forthcoming), which is tracked in the program database.
- Administers survey that reveals EE is pursued regardless of IOU assistance and is flagged and the team either stops the project or identify, document and implement a level of efficiency beyond what would have been done without intervention.
- Discusses and documents the status of current and future projects during the kickoff meeting and O&M workshop.
- Conducts customer interviews and analyzes all available budget plan documents (e.g. Master Plan, annual capital improvements budget and annual O&M budget) to



- screen for free ridership associated with planned measures prior to measure development.
- Works with PG&E to automate the data upload for documentation.

Documenting Accelerated Replacement Measures

Accelerated replacement (AR) measures are supported through the provision of equipment age, condition, maintenance records, invoices, and remaining useful life (RUL), all documented within the energy audit report. These records are used to determine that either 1) the project is replacing equipment within the RUL, or 2) the equipment can be repaired indefinitely, without significant increase in costs, resulting in no economic need for replacement (and thus AR). PG&E's Accelerated Replacement Scorecard Tool helps weigh whether a measure is AR or NR by quantifying program influence and viable operation through the equipment effective useful life (EUL).

Documenting Industry Standard Practice

Industry standard practices (ISP) relevant for applicable measures are researched, explained, and reflected within the standard baseline calculations included in the energy audit report. RAPIDS leverage PG&E's "A study on technology options and energy efficiency standard practices for municipal wastewater treatment plants" as the primary resource for all ISP measure development. If not applicable, our team relies on engineering expertise in industry, contacting plant operators and system designers to understand the current design and purchasing trends for new, similar applications.

8. Other Program Metrics

List all documentation and data used to calculate Program Metrics. This includes but is not limited to data in support of sector-level and portfolio-level metrics.



To support future reporting efforts, the following metrics are gathered for all RAPIDS projects:

Project Metric	Metric Definition	Metric Units
Measure Energy Savings	For each measure the baseline (in-situ) conditions, code/ISP-compliant baseline (if applicable), and installed conditions are measured and documented. These are used as the basis for 1 st and 2 nd baseline energy impacts.	Energy Usage: kWh/yr Power Demand: kW Gas Usage: Therms/yr
Measure Details	For each measure, all Program inputs are provided to facilitate tracking, cost effectiveness, and third-party verification.	Measure Description Solution Code Measure Installation Type (NR, AOE, AR, BRO, NC) Estimated Useful Life Remaining Useful Life (if applicable)
Measure Costs	For each measure, appropriate installation costs, standard measure costs (if applicable), incremental measure cost (if applicable), and accelerated replacement cost (if applicable) are provided. All costs are in accordance with Statewide Custom Program requirements.	Installation Cost Standard Measure Cost (if applicable) Incremental Measure Cost (if applicable) Accelerated Replacement Cost (if applicable)
Program Costs	All RAPIDS program costs associated with measure implementation are provided.	Measure Incentive Administrative Cost Subcontractor Cost Sub-Metering Cost (if applicable) Design Assistance Cost (if applicable) OBF Application Cost (if applicable)
Supporting Documentation	Justification for all of the above metrics are provided in sufficient detail to facilitate Program or third-party verification.	Examples include, but are not limited to: Raw Measurement Data Open Source Calculation Files Project Feasibility Study Installation Report Project Correspondence Specification Sheets Invoices Cost References Process and Instrumentation Diagrams Accelerated Replacement Justification (if applicable)



Appendix A: List of Example Eligible Measures

- Digester Mixing Optimization
- Large-Bubble Mixing
- Secondary Treatment Aeration Optimization
- Chemical Addition and Optimization
- Ammonia-Based Aeration Controls
- Tertiary Filter Turbidity/Head Loss Controls
- Return Activated Sludge Pump Total Suspended Solids Controls
- Chemical Oxygen Demand Controls
- Dissolved Oxygen Controls
- Sludge Blanket Controls
- Simultaneous Nitrification-Denitrification Controls
- Increase Wet-Well Operations
- Reduced Air Scour Frequency
- Adjust Utility Water Pressure
- Control of MLR Pumps
- Addition of Mechanical Baffles in Primary Sedimentation
- Trickling Filter Optimization
- Aeration Blower Replacement
- High-Efficiency Blower Air Filtration
- Dewatering Optimization
- High-Efficiency Dewatering
- Modular Stacked Grit Separators
- Membrane Diffusers
- Granular Activated Sludge
- Reflective UV Chambers
- Thermal Vacuum Desiccation
- Non-Buoyant Pure Oxygen Infusion Technology
- Pump Sequencing Optimization
- Variable Frequency Drives
- Equalization Strategies

