

WWTP Rehabilitation Design Services

Introduction

19 June 2013

To assist the Carmel Area Wastewater District (CAWD) in the expeditious and cost-effective rehabilitation of key wastewater treatment plant (WWTP) systems and processes, Kennedy/Jenks has assembled a team of highly experienced wastewater engineers who have designed dozens of similar WWTP retrofit projects within the past decade. **Kennedy/Jenks has unparalleled knowledge of CAWD and the WWTP, which we will use to develop highly customized and cost-effective solutions to improve the WWTP with the right technologies to increase reliability, minimize energy costs, protect the environment, and transition it into the 21st century.**

Kennedy/Jenks is committed to providing the same project team that successfully developed CAWD's WWTP 15-year capital improvement master plan (CIP) over the past year. This team, consisting of Mike Barnes, Patrick Treanor, and others, has an in-depth knowledge of the WWTP and has a positive working relationship with District staff, which allows us to hit the ground running and work closely with you to develop the right solutions. In addition, John Wyckoff, P.E. (Kennedy/Jenks' Director of Major Projects) provided quality reviews of the CAWD 15-year CIP work and will be Principal-in-Charge of the work contained in this proposal. John has managed many similar rehabilitation projects, and he also lives relatively close to Carmel as a long-time resident of the South Bay.

Our approach to completing this work for you is focused on being highly responsive to your needs and saving you time and money, while eliminating the operational risks associated with the existing facilities as soon as possible. To do this, we will:

Expedite Improvements to Save Money and Reduce Risk: To quickly get these projects underway, our approach is to group the needed improvements into one bid package and begin pre-design and design immediately. Grouping the needed rehabilitation projects into one bid package will be the most cost effective strategy for CAWD, because it will create economies of scale from now through the end of construction. Furthermore, it will be easier for CAWD to manage a single large project rather than multiple smaller projects. By getting this work done as a single project, CAWD will reduce its risk profile expeditiously by way of efficient implementation.

Get Competitive Construction Pricing: The single bid package is designed to be large enough to garner significant contractor interest, resulting in more competitive bids. To further influence competitive construction bidding, the bid package is scheduled to bid in winter, which is typically when construction bids are most competitive. We will also work with CAWD to incorporate (as appropriate) smaller maintenance projects into the bid packages, allowing you to further capitalize on economies of scale in construction pricing and reduce overall contractor mobilization costs.

Improve Financial and Energy Efficiency for the Future: Our team will conduct pre-design studies of key WWTP systems to identify opportunities to increase energy efficiency and optimize system performance. In the pre-design studies, we will identify the right technologies and processes among various alternatives by evaluating several important criteria, including:

- Life cycle costs
- Operations and maintenance (O&M) requirements
- Synergy with existing plant processes
- Flexibility to accommodate process modifications and energy-saving measures.

Protect the Environment: CAWD is interested in being a leader in protecting the environment now and into the future. Our design will align with this goal by providing energy efficient equipment, and environmentally-friendly and sustainable treatment processes.

Contained within our proposal is a detailed plan for the pre-design and design of CIP projects identified for construction within the next four years. Additional engineering design services, which are not included in our base scope, will be required for other near-term major projects, including:

- Influent Pump Station Improvements
- Effluent Pump Station Improvements

At the request of the District, the design of these projects can be added to the scope of services, but are not included in our base scope of services at this time. Similarly, at the request of the District, we can utilize our in-house energy expertise to conduct an energy management study and develop an energy management plan for the District to further enhance energy efficiency.

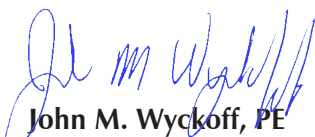
Kennedy/Jenks is eager to continue our long-standing history in serving the District, as evidenced by the following statement from David Kennedy of Kennedy/Jenks who helped lead previous CAWD design projects:

“The Carmel Area Wastewater District and its predecessor, the Carmel Sanitary District, represent an important part of our firm’s legacy. Our engineers served the District over a 50-year period from the 1930s to the 1980s and it is rewarding to have the opportunity to serve you again. Many of the District’s facilities, including much of the existing WWTP, were designed by our engineers, providing us with unique insight into how to design the improvements. As your treatment plant continues into its next era, we too hope to continue as your trusted advisor and partner in designing cost-effective, reliable treatment facilities – for the benefit of the District and the entire Carmel community.” ~David Kennedy, Senior Principal and Former President, Kennedy/Jenks Consultants

We are committed to providing you with responsive, efficient service and are eager to help you maximize the value of this project while positioning the facility for long-term success.

Very truly yours,

Kennedy/Jenks Consultants


John M. Wyckoff, PE
Principal-in-Charge,
Quality Manager, and
Director of Major Projects


Michael J. Barnes, PE
Project Manager


Patrick D. Treanor, PE
Assistant Project Manager

Project Understanding

CAWD, with the assistance of Kennedy/Jenks, recently developed a 15-year WWTP capital improvements master plan (CIP) to establish a road map for implementation of necessary capital improvement projects at the treatment plant. The improvement projects selected were rigorously evaluated, resulting in a capital improvement plan that is focused on reducing the risk of asset failure while positioning you to achieve your strategic goals, which include:

- **Complying with Regulations** for current waste discharge permits and positioning for compliance with probable future regulations.
- **Protect the Environment** through the reliable, efficient, and sustainable treatment of wastewater.
- **Reduce Energy Consumption** to reduce operating costs and reduce the carbon footprint of the WWTP.
- **Maximizing Cost-Effectiveness** in operating and maintaining the WWTP at the lowest cost.
- **Investing in Safety Practices** to reduce the potential for injuries and environmental hazards at the WWTP.
- **Maintaining Reliability** through application of asset preservation and redundancy.
- **Supporting the Reclamation Project** by reliably supplying secondary treated wastewater to the tertiary microfiltration/reverse-osmosis (MF/RO) plant.
- **Enhancing WWTP Flood Protection** by planning and designing mitigation approaches for flood events.

Kennedy/Jenks understands that the efforts expended in the next four years will be critical to complete several high-priority projects as identified in the 15-year CIP Master Plan. To implement these projects, the goals as we understand them are to: 1) expedite improvements to save money and reduce risk; 2) get competitive construction pricing; and 3) improve energy and operational efficiencies, and evaluate new technologies for potential economic benefit.

To help you accomplish these goals, Kennedy/Jenks has developed the following approach. A description of our proposed detailed scope of service begins on page 8, and our implementation schedule is included on page 18.

Project Approach

1. Expedite Improvements to Save Money and Reduce Risk

Meet the District's 4-Year Plan: CAWD plans to implement a significant number of high-priority capital improvements within the next four years, including:

- **Portable RAS Pump Piping:** New portable backup RAS pumping system
- **Thickener Replacement:** New thickener capable of co-thickening sludge from the secondary and recycled water treatment processes
- **Digester Firm Capacity Improvements:** New Digester
- **1-Water Improvements:** New 1-Water pump station
- **3-Water Improvements:** New 3-Water hydropneumatic tank, strainer, and control system
- **Dewatering Improvements:** Repairs to the existing sludge dewatering equipment and upgrades to provide new standby dewatering equipment
- **Power (Main and Standby):** Standby power reliability improvements and standby power and switchgear integration
- **Standby Blower Replacement:** A new standby blower and energy efficiency improvements to the aeration blower system
- **Hypo/SBS Improvements:** A new disinfection and dechlorination chemical feed system
- **Stormwater Improvements:** A stormwater pump station for control of on-site stormwater

To achieve the District's project implementation schedule, Kennedy/Jenks proposes to begin pre-design and design activities immediately.

Efficient Implementation: Kennedy/Jenks has developed a plan that will streamline the District's implementation of these identified projects to meet the time frames established in the CIP. Achieving the time frames established in the CIP for these projects will require that design be started soon and completed within the schedule, illustrated on page 18. We understand your vision for these projects as we helped develop them alongside your staff over the past year, and we know what it will take to meet the implementation schedule.

Implementation of the CIP will increase demands on CAWD's internal resources to manage the design and construction of the improvements. These increased efforts will be in addition to the increase in demands on internal staff for the completion of several other smaller in-house CIP projects and future CIP projects. By leveraging Kennedy/Jenks' assistance where feasible, the District can reduce the demands on internal staff that come with managing multiple contracts.

To reduce demands on internal resources, our project management team will provide consistent, reliable, and responsive service under one roof. The Kennedy/Jenks service team can provide the range of potential expertise that the District may need to implement the identified CIP projects, reduce WWTP energy usage, and assist with potential public outreach efforts.

2. Get Competitive Construction Pricing

Our pre-design and design work will focus on controlling project construction costs. Construction costs will account for approximately 80% of the total project costs for implementation and therefore contain the greatest potential for District savings. While construction costs can vary based on market conditions (which cannot be controlled), our design approach is focused on techniques that we can use to help control end-result construction prices. Examples of this include putting projects to bid during a time of year when construction costs tend to be low (i.e., winter); consideration for project size and complexity; making sure that construction documents are very clear and concise (contractors provide lower bids when uncertainty is lowered—therefore, risk is reduced); and considerations for the project's ease of construction.

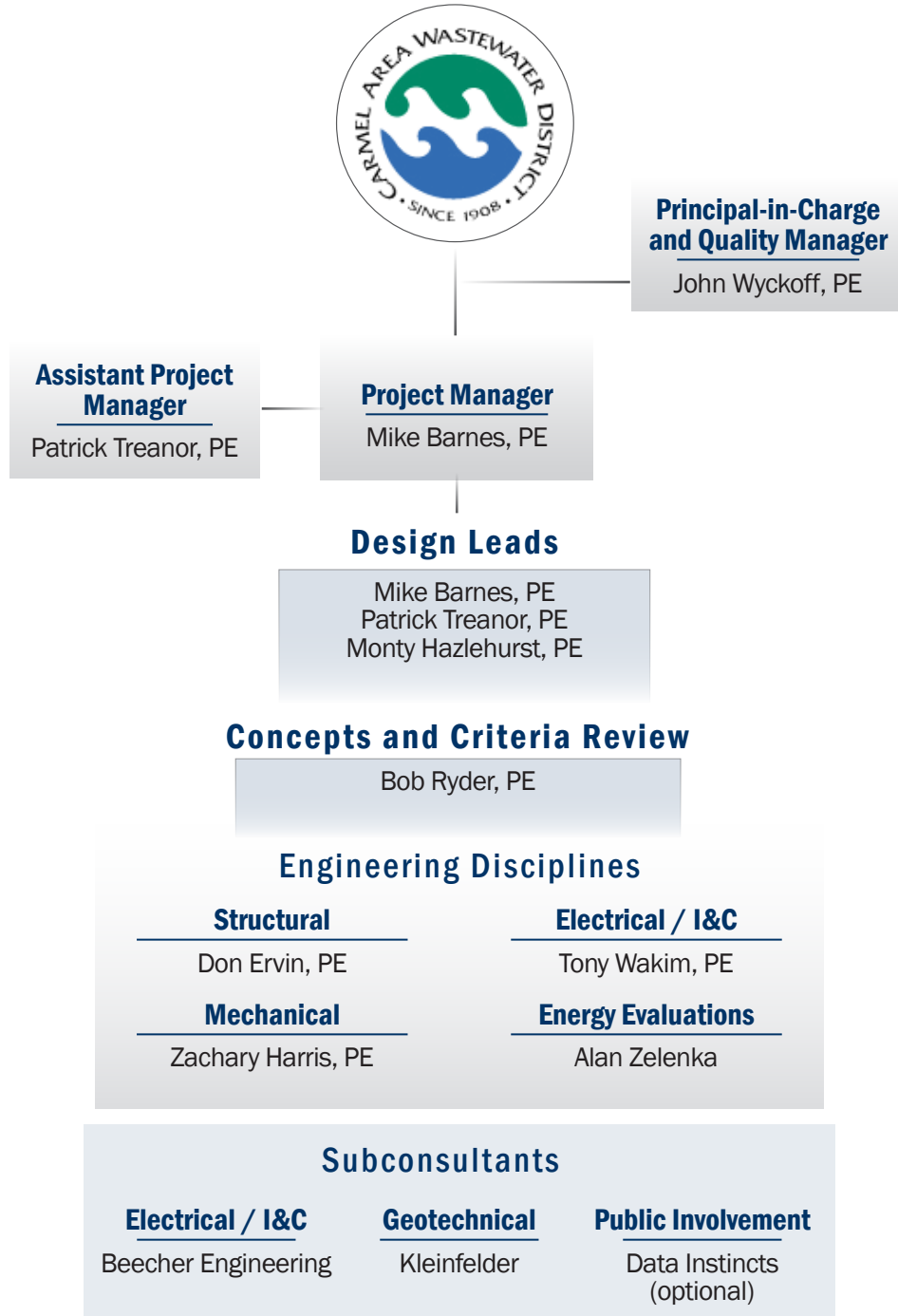
Avoid potential construction cost escalation. In our tracking of the Northern California construction industry, we are observing market conditions which may lead to escalation in construction pricing, likely due to the simultaneous implementation of multi-billion dollar programs in San Francisco, San Jose, Sunnyvale, and Sacramento. For this reason, we believe that getting your WWTP improvements designed and bid as soon as possible will save you significant construction costs.

3. Improve Energy and Operational Efficiencies and Evaluate New Technologies

Pre-Design and Design: The Kennedy/Jenks approach to WWTP design includes evaluating a range of technologies and alternatives for projects before design begins to select the right alternatives to implement in detailed design. This includes identifying energy-saving measures and evaluating new technologies to improve the efficiency of plant operations. Kennedy/Jenks has already completed pre-design for several of the priority projects, including the disinfection system, dewatering system, and digestion system. Pre-design is incorporated in this proposal as a precursor to design to refine scope and select the right alternatives for projects which are still pending a pre-design evaluation, including the thickener, aeration system, and stormwater improvements.

Proposed Project Team

Our team is composed of highly experienced individuals who have designed dozens of WWTP rehabilitation and optimization projects over the past several decades. Our team's organization is illustrated on this page. Brief team member biographies follow, and full resumes are included at the end of our submittal.





John Wyckoff, PE – Principal-in-Charge, Quality Manager. With over 30 years of experience, John brings a wealth of knowledge in WWTP retrofit projects of various size, type, and complexity. John will provide project oversight in coordination with the project management team to ensure that your project is sufficiently backed with the right resources. He will also provide quality reviews for our team's work products, including review of the project work plan, technical evaluations, sizing criteria and concepts, calculations, cost estimates, and predesign and final design deliverables for accuracy, biddability, and constructability. John was a lead reviewer for CAWD's 15-year CIP Master Plan.



Michael Barnes, PE – Project Manager, Design Lead. Mike has over 35 years of experience in the planning, design, construction management, and operations and maintenance of WWTPs. Mike will coordinate execution of our team's design services and will serve as a lead designer. Mike will also participate in the evaluation and design of process system improvements, including O&M considerations and life-cycle costs. Mike was instrumental during the development of CAWD's 15-year CIP Master Plan.



Patrick Treanor, PE – Assistant Project Manager, Design Lead. Patrick has 10 years of experience in the design of multidisciplinary WWTP retrofit projects. Patrick will work diligently with John and Mike to make sure that this work is completed efficiently, skillfully, and within budget and schedule. In his career, Patrick has managed or served as a discipline lead for 12 WWTP retrofit improvement projects for California municipalities and agencies, and was Project Manager for CAWD's 15-year CIP Master Plan project (which was completed on time and within budget).



Monty Hazlehurst, PE – Design Lead. Monty brings 25 years of experience in managing and designing new and upgraded wastewater facilities. Monty will support Mike and Patrick as an additional lead designer in the preparation of high quality design drawings and specifications. Monty was involved in the 15-year CIP Master Plan and conducted the pre-design evaluation for the dewatering improvements.



Bob Ryder, PE – Wastewater Process Concepts and Criteria Review. Bob has more than 50 years' experience in testing, evaluation, optimization, and operation of WWTPs, including pumping, pretreatment, activated sludge and fixed film processes, filtration, disinfection, corrosion, scale control, land disposal, and river or ocean outfalls. Bob was onsite assisting with the startup of CAWD's secondary treatment plant improvements in the mid 1980s and provided quality control reviews of pre-design reports for CAWD's 15-year CIP Master Plan. Bob will leverage this experience to support QA/QC review of our team's WWTP improvement designs.

Subconsultants

Kennedy/Jenks has selected specialized subconsultants to complement our in-house services. Brief firm profiles follow. All proposed firms have established successful relationships with Kennedy/Jenks.

Beecher Engineering – Electrical, I&C

Beecher Engineering brings over 20 years of experience in the design, analysis, planning and construction of electrical power, control and instrumentation systems for the water and wastewater industry. Todd Beecher, the firm's Principal, recently worked with Patrick Treanor and Mike Barnes on projects for CAWD and the Oro Loma Sanitary District. This successful work history will provide consistency as they support the project's electrical engineering needs. Beecher Engineering also provided similar services for other local wastewater facilities and agencies, including South Bayside System Authority, Union Sanitary District, Fairfield-Suisun Sewer District, and Novato Sanitary District.



Kleinfelder – Geotechnical

Kleinfelder will provide geotechnical services to develop geotechnical design criteria for the project elements to be constructed within the next five years. Located in Salinas, CA, Kleinfelder provides a wide range of geotechnical services and offers a keen eye for potential alternatives that may offer opportunities for construction cost savings. Their services include site investigations, laboratory testing, foundation engineering, and geologic engineering. They have worked with Kennedy/Jenks on more than 70 projects over the past nearly 20 years, strengthening our team's ability to streamline project tasks and cost-efficiently complete the work.



Data Instincts – Public Outreach (Optional)

Data Instincts provides professional Public Information and Public Involvement services for municipalities, counties, and public agencies for public works projects. They also have expertise in public/community relations, media relations, stakeholder and community engagement, mediation, facilitation and public communications. They can assist in being responsive, receptive, and informative to those who may be affected by a project, such as residents, businesses, schools, agricultural interests, environmental interests, and other stakeholders of a community.



Firm Qualifications

Kennedy/Jenks is a full-service, multidisciplinary engineering and environmental sciences consulting firm with a fervent commitment to client service. Our innovative wastewater engineering and environmental services lead the industry. Founded by Clyde C. Kennedy in 1919, Kennedy/Jenks helped pioneer wastewater treatment technology in the western United States, including work for CAWD's predecessor in the late 1930s. Headquartered in San Francisco, the firm now has 25 offices serving clients throughout the United States. This project will be managed and performed out of our San Francisco office, similar to other successful projects completed for CAWD. Our staff of nearly 100 in San Francisco (and over 425 company-wide) blends experienced senior staff in many technical and scientific disciplines, skilled project managers, and well-trained environmental professionals. Kennedy/Jenks has worked over 100 wastewater facilities across California, including nearly 50 in the Bay Area and many more up and down the California coast.

Scope of Services

Task 1: Pre-Design

In the Pre-Design tasks, Kennedy/Jenks will evaluate alternatives and document the evaluations in technical memoranda. As part of the evaluation process, we will meet with CAWD staff to solicit input and discuss the alternatives.

Task 1a: Thickener Replacement Pre-Design

A pre-design study will be performed which will include evaluation of alternatives for: thickener technologies and equipment, energy efficiency, where to locate a new thickener on-site, and thickener loading and redundancy criteria. A technical memorandum (TM) will be prepared to document the review of alternatives and the recommended project design criteria.

Task 1b: Aeration Blower System Pre-Design

A pre-design study will be performed to evaluate alternatives for aeration blower system energy efficiency improvements and sizing criteria for new standby blower improvements. A TM will be prepared to document the review of alternatives and the recommended project design criteria.

Task 1c: Stormwater Improvements Pre-Design

A pre-design study will be performed to establish design criteria for stormwater improvements to improve on-site spill containment and stormwater control. As part of the pre-design study, pumping flowrate design criteria to be used to size new stormwater pumping infrastructure.

Task 2: Design

Kennedy/Jenks will design WWTP CIP improvement component projects as identified below and produce bid documents (drawings and specifications) for these component projects. The individual component projects will be grouped into one construction bid package for bidding by contractors. Kennedy/Jenks will provide a complete biddable set of design documents utilizing our standard construction specification front end documentation and general conditions in addition to specific technical specifications and detailed design drawings. We recommend the District's Legal Council review and provide comments on the front end documents.

Kennedy/Jenks will provide design review submittals to the District at the 30%, 60%, and 95% design stages prior to finalizing the design documents. Review comments received from the District at each stage will be incorporated into the next design stage. If Kennedy/Jenks does not intend to incorporate a District comment we will provide a written response as to why the comment was not incorporated.

The following component projects are included in this proposal for design since they are scheduled in the CIP for construction in the next four years. The budget for each component project is identified separately in the table on page 17 for accounting purposes and cost sharing between CAWD and the Reclamation Project. **The design fee for each project is based on the estimated design drawing lists shown for each project under each task and is based on providing one combined bid packages.**

The component projects included in this proposal are:

- Portable RAS Pump Piping
- Thickener Replacement Installation
- Dewatering Improvements
- 1-Water Improvements
- 3-Water Improvements
- Digester Firm Capacity Improvements
- Standby and Main Power Reliability Improvements
- Standby Blower Replacement and Blower Efficiency Improvements
- Sodium Hypochlorite and Sodium Bisulfite Improvements
- Stormwater Improvements

The bid package will include the following General and Standard Drawings in addition to the specific drawings for each task below:

Bid Package General and Standard Design Drawings:		
General	Mechanical/Process	Electrical
Title Sheet List of Drawings, and Design Criteria General Notes, and Abbreviations Plant Site Plan Piping Schedule and Legend	Standard Pipe Support Details Standard Mechanical Details	Electrical Legend and General Notes Electrical Key Plan
Civil	Structural	Instrumentation
Standard Civil Details Standard Civil Details	Structural Notes and Testing Schedule Standard Structural Details Standard Structural Details Standard Handrail/Guardrail Details	Legend and General Notes

Task 2a: Portable RAS Pump Piping

This task will include the design of modifications to the existing RAS/WAS pump station piping to provide quick connections points in the piping for the connection of portable engine driven RAS pumps in the event of a shutdown of the existing RAS/WAS pumps.

Portable RAS Pump Piping Design Drawings:
Mechanical
Portable RAS Pump Station - Plan Portable RAS Pump Station - Sections and Details

Task 2b: Thickener Replacement Design

This task will include the design of a new thickener to be installed on an elevated concrete structure. The thickener facility will be designed to handle waste activated sludge (WAS) from the secondary process as well as Microfiltration (MF) membrane backwash from the recycled water facility. The installation of underground yard piping will be required to transfer sludge from both sludge sources to the new thickener location and from the thickener to the digesters.

For design estimating purposes, we assume that the thickener will not be enclosed in a building, but will be covered by a shade structure.

Thickener Replacement Design Drawings:		
Civil	Mechanical/Process	Electrical
Civil Demo Plan Civil Grading Plan Thickener - Yard Piping Key Plan Thickener - Yard Piping Plan and Profile Thickener - Yard Piping Plan and Profile Civil Details	Thickener - Mechanical Plan Thickener - Mechanical Sections Thickener - Mechanical Details	Partial Single Line Diagram SWBD and MCC - Front Elevations Schematic Diagrams Circuit Schedule Thickener - Power Plan Thickener - Signal Plan Electrical Details
	Structural	
	Thickener - Foundation Plan Thickener - Floor Plan Thickener - Roof Plan Thickener - Sections Thickener - Architectural Details and Code Requirements	Instrumentation
		P&ID - Thickening System PLC Input/Output List

Task 2c: Digester Firm Capacity Improvements

This project will include construction of a new digester to provide firm digestion capacity along with existing Digester #1. The new digester would replace Digester #2 and Digester #3 which are currently in poor condition. The design will include ancillary systems for the new digester, including sludge heating and recirculation equipment, digester mixing equipment, and gas handling equipment.

Digester Firm Capacity Improvements Design Drawings:		
Civil	Structural	Electrical
Civil Demo Plan Civil Grading Plan Yard Piping Plan Civil Details	Digester - Foundation Plan Digester - Floor Plan Digester - Roof Plan Digester - Sections Digester - Sections Digester - Details Digester - Details Digester - Details	Partial Single Line Diagram SWBD and MCC - Front Elevations Schematic Diagrams Schematic Diagrams Schematic Diagrams Schematic Diagrams Circuit Schedule Digester - Power Plan Digester - Signal Plan Digester - Lighting Plan Digester Control Building - Power Plan Digester Control Building - Signal Plan Electrical Details Electrical Details Electrical Details
	Mechanical/Process	
Digester - Isometric Digester - Top Plan Digester - Intermediate Plan Digester - Bottom Plan Digester - Sections Digester - Sections Digester - Details Digester - Details Digester Control Building - 2nd Floor Plan Digester Control Building - Basement Plan Digester Control Building - Sections Digester Control Building - Details Digester Control Building - Details	Instrumentation PLC Communication Diagram P&ID - Digester Heating System P&ID - Digester Mixing System PLC Input/Output List PLC Input/Output List	

Task 2d: 1-Water Improvements

This task will include the design of a new 1-Water pump station (storage tank, distribution system pressurization pumps, and hydropneumatic tank) outside the existing Operations Building to replace the existing 1-Water pump station.

1-Water Improvements Design Drawings:		
Civil	Structural	Electrical
Civil Demo and Grading Plan	1-Water Pump Station - Structural Plan and Details	Partial Single Line Diagram Schematic Diagrams Circuit Schedule
Mechanical/Process	Instrumentation	1-Water Pump Station - Power Plan
Existing 1-Water Pump Station - Demo Plan 1-Water Pump Station - Plan, Sections, and Details	Partial P&ID - 1-Water System PLC Input/Output List	1-Water Pump Station - Signal Plan Electrical Details

Task 2e: 3-Water Improvements

This task will include the design of new 3-Water pump station equipment including a new 3-Water hydropneumatic tank, strainer, and new 3-Water system instrumentation and controls.

3-Water Improvements Design Drawings:		
Civil	Structural	Instrumentation
Civil Demo Plan Civil Grading Plan	3-Water Tank Pad - Structural Plan and Details	P&ID - 3-Water System PLC Input/Output List
Mechanical/Process	Electrical	
3-Water Station - Plan 3-Water Station - Sections & Details	3-Water Pump Station - Power Plan 3-Water Pump Station - Signal Plan Electrical Details	

Task 2f: Dewatering Improvements

This task will include the design of improvements to the dewatering building to allow for repair of the existing belt filter press and installation of a new screw press which will provide redundant dewatering capability. For the purposes of this proposal, we have assumed the new screw press will not weigh more than the existing belt press that it would be replacing, which will minimize the structural design effort. Improvements include demolition of abandoned assets in the building, relocation of the polymer feed system to the basement, installation of a new screw press, and electrical improvements to bring the existing electrical room up to current electrical and building code standards.

Dewatering Improvements Design Drawings:	
Mechanical/Process	Electrical
Dewatering Building - Upper Floor Mechanical Demo Dewatering Building - Lower Floor Mechanical Demo Dewatering Building - Upper Floor Mechanical Plan Dewatering Building - Lower Floor Mechanical Plan Dewatering Building - Mechanical Sections Dewatering Building - Mechanical Details	Main Plant Single Line Diagrams Demo Single Line Diagrams Partial Single Line Diagram SWBD and MCC - Front Elevations Schematic Diagrams Circuit Schedule Dewatering Building - Demo Plan Dewatering Building - Power Plan Dewatering Building - Signal Plan Electrical Room Partial Plans Electrical Details
Structural	Instrumentation
Dewatering Building - Structural Plan Dewatering Building - Structural Sections and Details	P&ID - Dewatering System PLC Input/Output List

Task 2g: Standby and Main Power Reliability Improvements

This task will include the design of a new standby switchgear adjacent to the main plant power feed equipment in the Operations Building. The new switchgear will be connected to the main power feed equipment to simplify and improve reliability of the existing standby power system. This task includes additional standby power reliability improvements including installing a new engine-driven generator cooling system.

Standby and Main Power Reliability Improvements Design Drawings:		
Mechanical/Process	Electrical	Instrumentation
Generator Room Plan Engine Cooling System Details	Partial Single Line Diagram SWBD and MCC - Front Elevations Schematic Diagrams Circuit Schedule Panelboard Schedule	PLC Communication Diagram PLC Input/Output List
Structural	Ops Building - Power Plan Ops Building - Signal Plan Influent Building - Power Plan Influent Building - Signal Plan Electrical Details Electrical Details Electrical Details	
Operations Building - Structural Plan Operations Building - Structural Details		

Task 2h: Standby Blower Replacement and Blower Energy Efficiency Improvements

This task will include the design of a new redundant blower and improvements to the current blower system to improve energy efficiency. Improvements may include control changes and installation of variable frequency drives as will be determined during the pre-design task (Task 1b) for this project.

Standby Blower Replacement and Blower Energy Efficiency Improvements Design Drawings:		
Mechanical/Process	Electrical	Instrumentation
Blower Bldg - Demo Plan Blower Bldg - Demo Details Blower Bldg - Plan Blower Bldg - Sections & Details Blower Bldg - Details	Blower Bldg - Power Plan Blower Bldg - Signal Plan Partial Single Line Diagram Electrical Details	P&ID - Aeration Blower System PLC Input/Output List

Task 2i: Hypochlorite and Sodium Bisulfite Improvements

This task will include the design of a new sodium hypochlorite and sodium bisulfite tank storage and spill containment structure and liquid chemical feed systems for the disinfection and de-chlorination systems. The task will also include the design of new electrical, instrumentation, and control systems.

Hypochlorite and Sodium Bisulfite Design Drawings:		
Civil	Electrical	Instrumentation
Civil Demo Plan Civil Grading Plan Yard Piping Plan Civil Details	Partial Single Line Diagram SWBD & MCC - Front Elevations Schematic Diagrams Schematic Diagrams Circuit Schedule	PLC Communication Diagram 1 P&ID - SBS System P&ID - Hypo System PLC Input/Output List PLC Input/Output List
Mechanical/Process	Hypo/SBS Storage - Power Plan Hypo/SBS Storage - Signal Plan Hypo/SBS Storage - Lighting Plan Chlor-Dechlor Bldg - Power Plan Chlor-Dechlor Bldg - Signal Plan Electrical Details Electrical Details Electrical Details	Structural
Hypo/SBS Storage - Mechanical Plan Hypo/SBS Storage - Mechanical Sections Hypo/SBS Storage - Mechanical Details		Hypo/SBS Storage - Floor Plan Hypo/SBS Storage - Foundation Plan Hypo/SBS Storage - Structural Sections Hypo/SBS Storage - Structural Details Hypo/SBS Storage - Architectural Details and Code Requirements

Task 2j: Stormwater Improvements

This task will include the design of a new pump station to handle on-site spills and to control stormwater accumulation on the site.

Stormwater Improvements Design Drawings:	
Civil	Electrical
Civil Demo and Grading Plan Stormwater Pump Station - Yard Piping Stormwater Pump Station - Yard Piping	Single Line Diagrams Schematic Diagrams Stormwater Pump Station - Power Plan Stormwater Pump Station - Signal Plan Electrical Details
Mechanical/Process	Structural
Stormwater Pump Station - Plan, Section, and Details	Stormwater Pump Station - Structural Plan Stormwater Pump Station - Structural Section and Details

Task 3: Geotechnical Investigations for Design

Kleinfelder will develop geotechnical design criteria for the project elements to be constructed in the next four years. They will take soils borings in the approximate locations of the thickener, chemical storage tanks, the hydropneumatic tank, and the digester to develop foundation design criteria. In addition, they will furnish design criteria for pavement and buried piping trench sections. The results of their work will be summarized in a geotechnical report that will be included as an appendix in the biddable contract documents.

Task 4: California Environmental Quality Act (CEQA) Permitting Assistance

The District will need to review the projects included in our proposal for compliance with CEQA and modify the projects as needed to mitigate any identified environmental impacts. Kennedy/Jenks will complete an initial study for these projects that the District can use to demonstrate CEQA compliance. This study will identify the environmental impacts and the general actions that will be taken to mitigate them. Kennedy/Jenks will design the projects so that they account for these mitigation methods.

Task 5: Bid Assistance

Kennedy/Jenks will furnish services to manage the bidding process for the project. This includes managing and developing documentation for pre-bid conference, responding to questions during the bidding process, developing and distributing addenda, reviewing bids, and writing a summary memo of the bid results that would be suitable for the District's use in a Board package for construction contractor selection.

Task 6: Project Management

Kennedy/Jenks will provide project management services to manage project costs, meet the project schedule requirements, collaborate with the District on project development, and maintain effective communication. Kennedy/Jenks will provide detailed monthly invoices to the District that include hourly expenditures separated into each budget task. A project file will be maintained, including copies of correspondence, reports, minutes of meetings, and memoranda.

Workshop review meetings will be conducted with District staff following completion of design deliverables. Kennedy/Jenks will provide monthly updates on project status via email or telephone call check-in.

Optional Additional Services: Energy Management Plan (EMP)

The District spends about \$200,000 per year on electricity and another \$25,000 per year on natural gas. Trimming energy usage by 10% would lower your costs by about \$20,000 to \$25,000 per year – an annual savings that would continue to increase over time as energy costs inevitably increase in the future.

Kennedy/Jenks has helped numerous clients identify and save significant amounts of energy-related O&M costs, thereby reducing their annual operating costs into the foreseeable future. For this reason, we are proposing an optional task to develop an Energy Management Plan. An outline of the tasks involved in this follows, which are customized to fit within your budget and potential service need. These tasks will result in a comprehensive assessment of CAWD's energy usage, including the identification of implementable energy-efficiency measures and renewable resources that can lower your annual operating costs.

EMP Task 1. Energy Efficiency Workshop: Kennedy/Jenks will conduct a 4-hour workshop with key CAWD management and treatment plant staff to identify potential energy efficiency measures (EEMs) that go beyond simply installing new energy-efficient equipment. During this workshop, we will discuss how each of these measures could be implemented as well as each measure's cost and energy-saving implications as a result of implementation. Once identified measures are reviewed, Kennedy/Jenks will lead the group in a process to prioritize the EEMs and create an implementation plan. Following the workshop, we will conduct a more detailed analysis for the short-listed EEMs to calculate their cost-effectiveness and make recommendations.

EMP Task 2. Demand Reduction and Time-of-Use Evaluation: Kennedy/Jenks will evaluate 1-2 years of CAWD bills from PG&E for opportunities to shift load and take advantage of "Time of Use" (TOU) rates to lower energy costs. PG&E offers a Demand Response program that could help provide incentives for CAWD by voluntarily dropping non-critical load during certain peak periods. PG&E would pay the District a stand-by charge and, when necessary, request the District shed load. It would be up to the District to determine if they could comply. If the District does shed the load, they would be further compensated by PG&E. For this task, Kennedy/Jenks will work with plant staff to identify potential load-shedding opportunities, and assess the applicability of the program and its benefits/impacts.

EMP Task 3. Energy Audit: A process energy audit of your WWTP will involve the review and evaluation of WWTP processes and procedures to identify specific potential operational adjustments, modifications, and improvements that could lower costs and save energy. The audit will consist of an off-site review of data, an on-site evaluation of processes/equipment, and a brainstorming workshop with plant staff to identify potential savings in energy, capacity enhancement, chemical use, labor savings, design/limitations versus regulations, and O&M improvements. The audit will exclude the collection system. The brainstorming workshop will be a one-day session with plant staff during which we will discuss the operation and control of each unit process as it relates to process/energy efficiencies. Identified EEMs and process changes will then be described in a TM, along with estimated costs, benefits, and projected savings.

EMP Task 4. Solar PV Evaluation: Kennedy/Jenks will evaluate the potential for solar photovoltaic (PV) at the District's WWTP and administration building. We will provide the District with an estimated amount of potential electricity generation and a purchased power agreement (PPA) price from a third-party solar PV vendor. Both rooftop and ground mounted arrays will be considered. With the dramatic drop in the cost of solar panels in the past couple of years, solar PV projects through PPAs have been able to lower energy costs for many agencies in your area. Kennedy/Jenks will prepare a draft electronic TM describing the evaluation findings as well as the estimated energy capacity of a solar PV array and the associated costs and return on investment. A conceptual drawing will be prepared to describe the potential solar PV array.

EMP Task 5. Energy Management Plan Report: TMs will be produced as part of EMP Tasks 1-4 with each comprising a separate section of the final full-report Energy Management Plan. This Plan will include our recommendation on short-listed projects, an Action Plan for steps involved in implementing the recommended projects, and a project implementation schedule. A Draft Plan will be submitted to the District for review/comment. Kennedy/Jenks will then incorporate the comments from the District, finalize the Energy Management Plan, and provide an electronic version to the District. The Final Energy Management Plan will be stamped and signed by a Professional Engineer registered in the State of California.

Optional Additional Services: Septage Receiving Station Design

Kennedy/Jenks can provide additional design services for construction of a septage receiving station at the WWTP if the District would like to get started on this additional project at this time. The septage receiving station would provide an additional revenue stream and services to the community. It is anticipated that a septage receiving station would provide a payback for investment in about 5 years of operation. The station could remain in service for over 30 years and would be an additional source of income for the District. This task will include the design of a new septage receiving tank, odor control system, and pump system to feed the septic tank waste into the treatment process.

Septage Receiving Station Design Drawings:	
Civil	Electrical
Septage Station - Civil Demo Plan Septage Station - Civil Plan Septage Station - Yard Piping	Single Line Diagrams Schematic Diagrams Stormwater Pump Station - Power Plan Stormwater Pump Station - Signal Plan Electrical Details
Mechanical/Process	Structural
Septage Station - Plan Septage Station - Section and Details	Septage Station - Structural Plan Septage Station - Structural Section and Details

Optional Additional Services: Public Outreach

Data Instincts can be available on an “as needed” basis if public outreach is needed during the projects. In our experience, the strategic advice and tactical support that Data Instincts provides can be highly beneficial for agencies implementing projects that may impact the surrounding community during construction or could have policy and/or rate implications. Having them “on-call” or using them to help design a public communications plan for the eventual construction period may be of value to District staff.

Proposed Budget

Kennedy/Jenks' budget estimate is based on a dollar amount per drawing based on our experience of retrofit projects similar to the current CAWD WWTP improvements. Design fees for this type of treatment plant retrofit project typically average between \$7,000 to \$10,000 per drawing sheet. For the bid packages in this proposal, the design budget (Task 2) is based on an average drawing cost of less than \$7,000 per drawing. This also equates to a design budget (Task 2) which is about 11% of the current estimated construction cost. The construction cost for the projects included in this proposal is estimated to be approximately \$12 million.

We thoroughly understand the projects in the CIP and so we have developed an estimated budget which is well-informed by our understanding of the demands and complexities of the projects. The following is a task-by-task breakdown of the proposed budget:

Project Budget Breakdown	
Task 1 Pre-Design	
Task 1a: Thickener Replacement Pre-Design	\$25,000
Task 1b: Aeration Blower System Pre-Design	\$25,000
Task 1c: Storm Water Improvements Pre-Design	\$15,000
Pre-Design Subtotal	\$65,000
Task 2 Design	
Task 2a: Portable RAS Pump Piping	\$15,000
Task 2b: Thickener Replacement	\$188,000
Task 2c: Digester Firm Capacity Improvements	\$320,000
Task 2d: 1-Water Improvements	\$77,000
Task 2e: 3-Water Improvements	\$76,000
Task 2f: Dewatering Improvements	\$145,000
Task 2g: Standby and Main Power Reliability Improvements	\$121,000
Task 2h: Standby Blower Replacement and Blower Energy Efficiency Improvements	\$100,000
Task 2i: Hypochlorite and Sodium Bisulfite Improvements	\$225,000
Task 2j: Storm Water Improvements	\$69,000
Design Subtotal	\$1,336,000
Task 3 Geotechnical Investigations	\$20,000
Task 4 Permitting Assistance	\$30,000
Task 5 Bid Assistance	\$25,000
Task 6 Project Management	\$50,000
Total	\$1,526,000

Optional Additional Services

Optional Additional Services	
Energy Management Plan	\$66,000
Septage Receiving Station	\$80,000
Public Outreach	N/A

Schedule

We have developed a detailed schedule for implementation of the CIP to show that construction within the time frames established in the CIP is feasible. Where possible, project construction bidding should be targeted for the winter season when contractors are more likely to provide favorable bids due to the lull in construction during the winter.

Proposed Schedule for Long-Term CIP Project Implementation	2013						2014						2015								
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Project Management & Quality Control	<i>Ongoing</i>																				
Studies																					
Optional Task: Energy Management Plan																					
Pre-Design																					
Thickener Replacement																					
Standby Blower Replacement																					
Stormwater Improvements																					
Design																					
Portable RAS Pump Piping																					
Thickener Replacement																					
1-Water Improvements																					
3-Water Improvements																					
Dewatering Improvements																					
Power (Main & Standby)																					
Standby Blower Replacement																					
Hypo/SBS Improvements																					
Stormwater Improvements																					
Digester Firm Capacity																					
Bidding, Bonding, Mobilization & Permitting																					
Bidding, Bonding, Mobilization & Permitting																					★

★ = Construction Bid Date

Resumes

John M. Wyckoff, P.E.

Principal-in-Charge, Quality Manager

Education

M.S., Environmental Engineering, University of California at Davis
B.S., Civil Engineering, University of California at Davis

Registrations

Professional Engineer: California, Alabama, Kansas, Kentucky, South Dakota, and Guam

Professional Summary

John Wyckoff has over 30 years of experience and brings to this project a wealth of experience in managing wastewater treatment plant retrofit projects of various size and complexity. His experience with equipment procurement spans a wide range of equipment type and he has worked and led many design teams through selection, various types of procurement methods, vendor and contractor negotiations, review of submittal packages, and field support during construction. This experience also includes experience with design-build-operate project delivery which requires a very high level of coordination and responsiveness throughout all phases of equipment procurement and installation

John served as Chief Technical Officer for several years. In this position he had the overall responsibility for overseeing the Quality Assurance and Quality Control (QA/QC) program within Kennedy/Jenks. John's duties included developing quality control procedures and overseeing their implementation. The QA/QC procedures begin with initial project planning and include concept and criteria reviews, monitoring project team and project manager performance, technical reviews, interdisciplinary review of plans and specifications for biddability and constructability, and detailed reading of project reports and studies.

Relevant Project Experience

Water Pollution Control Facility Headworks Improvements Project for City of Hayward, Alameda County, CA. Project Manager and Lead Designer for design of a new headworks/pump station. New headworks consisted of a wet pit/dry pit type pumping facility with a average dry weather pumping capacity of 10 MGD and peak wet weather pumping capacity of 40 MGD. Included at the headworks was grinding of influent solids and metering of individual pump discharges with magnetic flow meters. The project included modification of an existing Barminutor Chamber and the construction of tow diversion structures. The new Headworks was constructed and the existing facilities modified while the Water Pollution Control Facility was kept in operation with minimum and only planned disruptions to the flow through the facility.

Waste Recycling Facility Project for City of Fillmore, Ventura County, CA. This project is a design/build/operate project for the construction of a new 1.8-MGD water recycling facility at the City of Fillmore, CA. Teamed with American Water as the operator and W.M. Lyles Company as the contractor, Kennedy/Jenks, under the direction of John as Project Manager provided the design of the new facility along with support during construction and startup assistance. The project included a mile of influent interceptor, influent pumping and screening, flow equalization, grit removal, the membrane bioreactor (MBR) process, UV disinfection, onsite effluent storage, recycled water pumping, a mile of recycled water forcemain, odor scrubbing, onsite operations and maintenance buildings and onsite wetlands.

City of Millbrae Water Pollution Control Plant Renovations Project, San Mateo County, CA. Served as Project Manager and Client Manger for the design phase of the rehabilitation project for the City of Millbrae Water Pollution Control Plant. The project included the design of flow equalization tanks, a new influent pump station, primary sedimentation tank rehabilitation, a new aeration system for the activated sludge tanks along with new aeration blowers, new sludge thickening facilities, rehabilitation of the existing secondary clarifiers, a new effluent pump station and a new operations building. On the Construction Support project for the renovations John is serving as Principal-in-Charge for Kennedy/Jenks. The Construction Support efforts include, submittal review, responding to RFIs, Start-up assistance, preparation of O&M manuals and SCADA programming.

South BaySide System Authority, Coatings Replacement and Secondary Clarifier Retrofit, Redwood City, CA. Provided quality control review for the condition assessment and design of coatings replacement in a primary effluent channel, fixed film reactor wet pit, and scum pit along with the replacement of a secondary clarifier drive unit. The project included condition assessment and the development of critical construction sequencing criteria to maintain continuous operation of primary sedimentation tanks, fixed film reactors, and scum and activated sludge systems. Project also included design of gravity-flow bypass piping installed within the primary effluent channel that allowed coating replacement and design of a flow control and work platform scheme that allowed coating of the fixed film reactor wet pit while the wet pit remained in operation.

Secondary Clarifier Rehabilitation Design/Build Project, City of Palo Alto Regional Water Quality Control Plant, Palo Alto, CA. This project was a design/build effort for the rehabilitation of four existing secondary clarifiers. John was Project Engineer on the first stages of this project and Project Manager on later stages of this project that included complete rehabilitation of the clarifier mechanisms including beef up supports of center column sludge launders, a new launder seal between the stationary and rotating sections of the sludge launders and new corner sweep mechanisms. The existing clarifier drives were rebuilt providing a low cost solution with a longer life that replacing the drives with new mechanisms.

Wastewater Treatment Plant Improvements and Modifications Design Project for Avila Beach Wastewater Treatment Plant, San Luis Obispo County, CA. Project manager for the design of an expansion project including the addition of secondary biological treatment, secondary clarification, disinfection, dechlorination and standby power at the existing primary treatment plant. Addressed project challenges included a limited plant site, existing facilities which had to remain in operation during construction, and a very low average plant flow. Project included construction support services.

Design Improvements Project for City of Scotts Valley Wastewater Treatment Plant, Santa Cruz County, CA. This project included a new influent pump station, flow equalization, grit removal, aeration tank improvements, a new secondary clarifier, waste-activated sludge conditioning and chlorine contact tanks improvements. One responsibility on this project included the development of constraints and construction sequencing that the contractor had to meet to keep the treatment facility in operation during construction. Participated in the design of the new influent pumping facility, flow equalization facility, process piping, improvements to the aeration system at existing activated sludge process, new secondary clarifier, modification to the chlorine contact facility, improvement to sludge pumping facilities, and operations building modifications.

Michael J. Barnes, P.E.

Project Manager, Design Lead

Education

MBA, Business, St. Mary's College, 1986
BS, Civil Engineering, Lafayette College, 1976

Registrations

Professional Engineer in California, Colorado

Memberships/Affiliations

Rocky Mountain Water Environment Association
Water Environment Federation
RMWEA Biosolids Committee

Professional Summary

Michael (Mike) Barnes has 35 years' experience in both the public and private sectors. Mike's experience includes managing the design and construction of wastewater, water, and recycled water facilities; management and implementation of wastewater capital improvement programs; and management of wastewater infrastructure facilities. He is familiar with all different stages of a project including: planning, design, construction management, and O&M of wastewater and water system; capital improvement program management; wastewater infrastructure management; development and administration of specialized contract documents for projects such as O&M, SCADA, contract operations, design build; and O&M efficiency analyses.

Relevant Project Experience

Asset Condition Assessment and CIP Development, Carmel Area Wastewater District, Carmel, CA - *Process Engineering* - Completed an on-site condition assessment of the assets of the wastewater treatment plant. In addition, to the condition assessment, we reviewed the general ability of the key processes to operate reliably. The second phase of the project consists of development of a CIP for the WWTP based on the condition assessment and the predesign of key processes. The key processes include the plant service water system and hydropneumatic tank, the effluent pumping system, the chlorination system, the aeration blowers, the digestion system, and the sludge dewatering system. The sludge dewatering analysis consists of reviewing alternatives to replace the existing belt press.

Design of Digester Improvements and FOG/Food Waste Facility, Central Marin Sanitation Agency, San Rafael, CA - *Project Manager/Engineer* - Design of digester improvements consisting of new digester covers and mixing systems, and appurtenant system improvements. The improvements will replace aging equipment, in addition to upgrading digester performance to handle the anticipated FOG and food waste loading. The project also includes the development of a facility to receive and feed FOG and food waste to the digesters to increase digester gas production to increase electricity production using the cogeneration system.

Digester Facilities Improvements, Oro Loma Sanitary District, San Lorenzo, CA - *Project Manager* - Design of two new anaerobic digesters; each with a capacity of one million gallons. Design components included two concrete digesters with concrete covers, pumped mixing system, digester heating system, digested sludge withdrawal system, replacement of digester gas piping system, interconnection with existing piping systems, development of a construction sequence plan to keep the plant operational during construction, and the electrical, instrumentation, and control systems.

Rehabilitation of Digesters 1 and 2, City of Sunnyvale, Sunnyvale, CA - *Technical Engineering* - Providing technical engineering for the design of the rehabilitation of Digesters 1 and 2 at the Sunnyvale WWTP. Overall project consists of replacing the digester mixing, heating, feeding, and

withdrawal systems as well as installing new digester covers, and installation of a FOG and food waste receiving and feeding facility. Mr. Barnes role is the lead engineer for the modifications to the digester gas system as well as the FOG and/or food waste receiving and feeding facility.

Master Planning Assistance, Central Marin Sanitation Agency, San Rafael, CA - *Project Engineer* - Worked collaboratively with the Central Marin Sanitation Agency (CMSA) team to assist with evaluating and revising its capital improvement program (CIP) to protect and preserve its assets in a cost-effective manner. Specific tasks included analysis of sludge thickening alternatives, Class-A Biosolids alternatives, odor control systems, assessment of the condition and risk management of the wastewater treatment plant assets, seismic vulnerability, and development of alternatives to blending. Using the results of the analyses, we recommended modifications to the CMSA CIP.

Belt Filter Press Planning, Pre-Purchase, and Design, Oro Loma Sanitary District, San Lorenzo, CA - *Project Manager* - Assist the District with the development of documents to pre-purchase two new belt filter presses to replace an aging belt filter press. In addition to the technical specifications, the documents include a detailed construction sequencing plan to allow the District to dewater solids throughout the procurement and installation phase. Finally, we developed biddable contract documents to install the pre-purchased belt presses, install polymer feed systems, modify sludge piping, and install conveyor to direct the dewatered sludge to dewatered sludge trucks. The project included installation and operation of one of the pre-purchased belt presses in a temporary location while the second belt press was installed in the permanent location.

Digester 3 Rehabilitation Review, Oro Loma Sanitary District, San Lorenzo, CA - *Project Manager/Engineer* - Review of whether existing Digester 3 can be improved to extend its useful life without incurring excessive structural modifications and costs, and to summarize the major improvements needed for rehabilitation. The major improvements needed include upgrades to reduce seismic risk, a new digester cover, and a new mixing system; all of which require structural modifications. This information will be used to assist the District in prioritizing whether Digester 3 should be improved or whether a new digester should be constructed.

Operations Specialist Consulting Services, Bay Area Clean Water Association, Oakland, CA - *Project Engineer* - Retained by the Bay Area Clean Water Association (BACWA) to facilitate meetings for the operation, maintenance, and engineering managers of the member agencies. The operations managers meet quarterly and share information related to operations management issues. Typical issues include staffing, organizational structure, succession planning, energy management, security, union negotiations, and permitting. The maintenance managers also meet quarterly, and typically discuss staffing, performance indicators, maintenance planning, technical education, equipment maintenance problems and solutions, and CMMS. The engineering managers meet quarterly and typically discuss CIP implementation and management, alternative energy projects, new equipment and processes, and regulatory impacts on plant processes.

Sludge Dewatering System Design, Sausalito-Marín City Sanitary District (SMCSD), Sausalito, CA Project Manager/Engineer for the planning and pre-design, design, and engineering services during construction of new sludge dewatering facilities at the SMCSD plant. The project consists of a screw press, sludge piping modifications to deliver the sludge from the digesters to the screw press, polymer feed and storage equipment, sludge storage and hauling equipment, odor control facilities, structural modifications to existing structures, and electrical, instrumentation, and control modifications. In addition to the biddable contract documents, developed customized documents for direct purchasing of the screw press and negotiated the pre-purchase on behalf of the District.

Patrick D. Treanor, P.E.

Assistant Project Manager, Design Lead

Education

BS, Civil Engineering, Loyola Marymount University, 2003

MS, Environmental Engineering, University of California, Berkeley, 2004

Registrations

Professional Civil Engineer, California (70895)

Professional Summary

Patrick Treanor is a civil engineer with experience in wastewater treatment plant planning, design, and construction. With 9 years of experience at Kennedy/Jenks, Patrick has worked extensively on wastewater retrofit projects as a multidisciplinary design leader handling projects from pre-design, to design, through construction, and start-up.

Relevant Project Experience

15-Year Capital Improvements Projects Master Plan and Asset Management Planning, Carmel Area Wastewater District, Carmel, CA - *Project Manager* - Developed the District's first asset registry for the WWTP assets and developed asset management data for the assets. Each asset was evaluated for condition, probability of failure, and consequence of failure. Strategic levels of service were established for each process area and asset class to determine if assets were meeting their level of service. Financial inefficiencies were identified for various assets. A business risk evaluation was conducted for each asset to develop a sound basis for CIP planning. \$30 million in CIP Projects were developed to address high risk areas to improve the reliability of the WWTP. Maintenance budgets were also projected based on the asset data for assets established with maintenance based risk management strategies.

Digester Heating System Improvements, Carmel Area Wastewater District, Carmel, CA - *Project Engineer/Lead Designer* - Design of sludge heating system improvements including a new dual fuel boiler, new spiral heat exchangers and new sludge recirculation piping and hot water loop piping. Utilized 3D design to develop design drawings.

Digester Improvements and FOG/Food Waste Facility Engineering Services During Construction, Central Marin Sanitation Agency, San Rafael, CA - *Project Engineer* - Engineering services during construction for FOG/Food Waste to Energy project. Project is currently in construction and includes modifications to the existing digesters to facilitate digestion of food waste and increase energy generated by the digestion process. Existing digesters are being retrofit with Kennedy/Jenks designed mixing system.

Primary Effluent Conveyance Rehabilitation, Sausalito-Marín City Sanitary District, Sausalito, CA - *Project Manager* - Designed temporary pump station to pump primary clarifier effluent to the Fixed Film Reactors while the Primary Effluent Conveyance piping and structures were rehabilitated. Designed rehabilitation of concrete Primary Effluent Box and

Belt Filter Press Replacement, Oro Loma Sanitary District, San Lorenzo, CA - *Project Engineer* - Engineer of Record for improvements to the existing solids dewatering building to accommodate two new belt filter presses, conveyor belt conveyance system, and other associated equipment.

Digester Facilities Improvement, Oro Loma Sanitary District, San Lorenzo, CA - *Project Engineer* - Provided multidisciplinary coordination for design of two new 1 million gallon digesters, and ancillary systems for sludge feed and withdrawal, gas piping, pumping systems, and civil design. Project utilized 3D design to develop design drawings.

Onsite Engineering Services, Oro Loma Sanitary District, San Lorenzo, CA - *Construction Manager* - Worked daily in the District's offices reporting to the District Engineer. Successfully lead several concurrent construction projects at the WWTP while the District was short staffed. Worked side by side with District operations, maintenance, and engineering staff and gained valuable insight as to the daily work environment and work flow at a WWTP.

Plant Maintenance Project, Oro Loma Sanitary District, San Lorenzo, CA - *Project Engineer* - Conducted design and interdisciplinary coordination for project involving improvements to plant water system, sludge pumping, and disinfection system. Digester improvements included new heat exchangers, and Digester new sludge withdrawal pumping.

Paradise WWTP Outfall, Sanitary District No. 5 of Marin County, Tiburon, CA - *Civil Engineer* - Engineer of record for design of a San Francisco Bay outfall (6-inch-diameter treated effluent outfall) extending 400 feet into the San Francisco Bay. The outfall was designed to be constructed by horizontal directional drilling from the shore to reduce potential environmental impacts of construction to the bay ecology in the tidal zone and along the bay floor.

Primary Treatment Pipe Emergency Repair, Sausalito-Marin City Sanitary District, Sausalito, CA - *Resident Engineer* - Emergency repair of broken live 24-inch welded steel sewage pipeline on the shore of the San Francisco Bay. Provided construction insight during design/build of repair which consisted of tapping and plugging live pipeline, cutting pipe and installing new valves, and placing concrete encasement over existing pipe. Conducted field condition assessment of existing pipeline after repair.

WWTP Improvements, Sausalito-Marin City Sanitary District, Sausalito, CA - *Project Engineer* - Designed pump systems for transfer and withdrawal of sludge into and out of the Primary Digester. Designed piping for the Primary Digester Mixing System (Rota-mix system). Designed sludge heater recirculation piping, and sludge macerator equipment for transfer pumps. The SMCS D primary digester is a 75-foot diameter tank with interior columns supporting a concrete roof.

Sodium Bisulfite Building (SBS) Expansion, Sausalito-Marin City Sanitary District, Sausalito, CA - *Project Engineer* - Engineer of Record for project involving the design of plant improvements including a chemical storage building, chemical feed equipment and piping, repair of existing elevated walkways for safety, and a new server room and fiber optic cable.

Chemical Storage Improvements, Sausalito-Marin City Sanitary District, Sausalito, CA - *Project Engineer* - Engineer of record for project involving design of improvements to an existing chemical storage building which included secondary containment storage in the building, two 3,000 gallon ferric chloride tanks, feed pumps and piping and replacement of two existing 4,000 gallon sodium hypochlorite tanks. Particular care was taken in designing the secondary containment in the building to provide water tight separation and a fire wall to separate these two incompatible chemicals. Sequenced construction was planned to keep sodium hypochlorite continuously feeding and disinfecting the plant effluent throughout construction.

Monty Hazlehurst, P.E.

Design Lead

Education

BS, Civil Engineering, University of Arizona, 1987

BS, Forest Management, Northern Arizona University, 1982

MS, Hydrology, University of Arizona, 1988

Registrations

Professional Engineer, Washington (41315)

Professional Civil Engineer, Oregon (16627)

Professional Environmental Engineer, Oregon (16627)

Professional Summary

Monty Hazlehurst has professional experience including studies and designs for water and wastewater treatment plants, wastewater collection systems, water distribution systems, pumping stations, sludge handling facilities, stormwater management systems, and solid waste facilities.

Relevant Project Experience

Wastewater Treatment Plant Improvements, Final Design Services, City of Tillamook, Tillamook, OR - *Project Engineer* - Responsibilities included the design of the solids handling facility including an anaerobic digester utilizing pumped mixing.

Wastewater System Improvements, City of Vernonia, Vernonia, OR - *Project Engineer* - Provided QA/QC review of the project through the design period. Project was for the design of improvements to an existing WWTP to expand capacity and upgrade treatment technology.

Cowlitz Water Pollution Control Plant Biosolids Processing Improvements, Eugene, OR - *Project Engineer* - Developed plans and specifications for a new biosolids facility processing raw primary and secondary sludge with a lime pasteurization system to produce Class A biosolids. Project was completed as a subconsultant to the Prime.

Wastewater Collection System Rehabilitation, Service Lateral Replacement, City of Reedsport, Reedsport, OR - *Project Engineer* - Responsibilities included developing plans and specifications for the headworks, aeration basins and blowers, secondary clarifiers, chlorine disinfection and dechlorination system, aerobic digester and biosolids storage modifications, paving and grading, and outside piping. Developed the hydraulic profile for the project.

Crescent City Water Pollution Control Facilities Upgrade, Crescent City, CA - *Project Engineer* - Responsibilities included developing plans and specifications for improvements to the headworks, primary clarifiers, sludge thickening, digesters, outfall, paving and grading, and outside piping. Developed the hydraulic profile and solids mass balance for the project. Project was completed as a subconsultant to the Prime.

Indian Springs Wastewater Treatment System Upgrades, Clark County Water Reclamation District, Las Vegas, NV - *Project Engineer* - Responsibilities included developing plans and specifications for the influent pumping station, influent forcemains, headworks, aeration basins and blowers, secondary clarifiers, effluent distribution system, percolation basins, facultative sludge lagoons, grading, and outside piping. Developed the hydraulic profile for the project.

Brookings WWTP Biosolids Dewatering Facility Design, City of Brookings, Brookings, OR - *Project Engineer* - Design of a Class A Biosolids Treatment facility utilizing the FKC process including a lime feed system, lime/sludge mixing tank, polymer feed system, rotary drum thickener, screw press

with steam heating, and a boiler system. The project includes sludge transfer pumping, a new building to house equipment, odor control and site improvements.

Wastewater Treatment Plant Upgrade and Expansion, City of La Center, La Center, WA - *Project Engineer* - Provided QA/QC review of the project through the design period. Project was for the design of improvements to an existing WWTP to expand capacity and upgrade treatment technology. Kennedy/Jenks provided comprehensive project services, from planning through construction management and operator training.

Wastewater Treatment Plant Facility Upgrades, City of Pendleton, Public Works Department, Pendleton, OR - *Project Engineer* - Provided quality assurance/quality control review of the project through the design period.

Wastewater Treatment Plant Planning, Design, and Construction, City of Coburg, Coburg, OR - *Project Engineer* - Developed a predesign report including a technical memorandum addressing biosolids treatment. Developed a construction cost estimate for the project.

Wastewater Treatment Liquid Stream Improvements, City of Riddle, Riddle, OR - *Project Engineer* - Developed a predesign report including technical memorandums addressing the influent pumping station, headworks, disinfection, and biosolids treatment and disposal. Developed a construction cost estimate for the project.

Bisbee Wastewater Improvements Project, City of Bisbee, AZ - *Project Engineer* - Responsibilities included developing plans and specifications for the headworks, aeration basins and blowers, secondary clarifiers, UV disinfection system, paving and grading, and outside piping. Developed the hydraulic profile for the project.

Budd Inlet Treatment Plant Digester Gas Compressor and Piping Replacement, LOTT Clean Water Alliance, Olympia, WA - *Project Engineer* - Developed plans and specifications for replacing five rotary sliding vane gas compressors and all digester gas piping for four existing digesters.

Design of Facilities Improvements, Forest Grove and Hillsboro WWTPs, Clean Water Services, Washington County, OR - *Project Engineer* - Responsibilities included preparation of plans and specifications for a return activated sludge pumping station, effluent pumping station, tank drain pumping station, paving and grading, and odor control.

Bainbridge Island WWTP Improvements Design, City of Bainbridge Island, WA - *Project Engineer* - Responsibilities included preparation of plans and specifications for headworks, new secondary clarifier, chlorine disinfection system, and sludge pumping stations.

Design of Improvements, Bandon Wastewater Treatment Plant, City of Bandon, OR - *Project Engineer* - Project included improvements to an influent pumping station, secondary clarifiers, return activated sludge pumping station, disinfection system, sludge handling facility, and administration building. The pumping station modification involved installation of vertical turbine solids handling (VTSH) pumps. Prepared plans and specifications, and provided office engineering during construction.

Robert A. Ryder, P.E.

Concepts and Criteria Review

Education

BS, Civil Engineering, Purdue University
MS, Sanitary Engineering, Massachusetts Institute of Technology
Graduate Studies in Chemistry and Chemical Engineering, University of California - Berkeley

Registrations

Professional Civil Engineer, California (11501)
Professional Chemical Engineer, California (2695)

Professional Summary

Robert (Bob) Ryder has more than 50 years' experience in investigations, planning, design and operation of water and wastewater facilities, as well as specialized experience in laboratory analyses and testing, corrosion protection, water reclamation, energy efficiency and conservation, odor control, and process control. While with Kennedy/Jenks Consultants, he has served in a variety of capacities, including project manager, design engineer, reviewer, value engineer, pilot plant tester, expert witness, and director of the firm's environmental laboratory.

While director of the laboratory division, he conducted many special testing and pilot plant programs on municipal and industrial wastes and processes, including biological treatability, disinfection, toxicity, corrosion, and odor control investigations. His university post-graduate research, thesis and lifelong interest have been in optimization of the activated sludge wastewater treatment process.

He has considerable experience in testing, evaluation, optimization, and operation of WWTPs, including pumping, pretreatment, activated sludge and fixed film processes, filtration, disinfection, aerated and facultative ponds, corrosion, scale control, land disposal, and river or ocean outfalls.

An abbreviated summary of his experience with wastewater treatment and disinfection follows.

Relevant Project Experience

Wastewater Systems Planning

Master planning of long-term wastewater collection and treatment facilities for Ukiah Valley. I/I and reclamation evaluation.

Facilities planning for Greater Eureka Area. Bay dispersion modeling, infiltration-inflow (I/I) evaluation and cost-effective analyses of alternative wastewater processes.

Long-range planning for wastewater management for Town of Paradise. Establishment of an On-site Wastewater Management Plan, analysis of STEP system wastewater collection, treatment process and reclamation evaluation.

Facilities planning for wastewater collection of Waikiki-South Honolulu Area. Video inspection of existing sewers for conducting I/I analysis, overflow analysis and major pump stations.

Wastewater Treatment System Process Design

Process design of 30-MGD tertiary wastewater treatment facilities for Reno-Sparks. Activated sludge secondary treatment, anaerobic sludge digestion and dewatering.

Process and control system design of 38-MGD Oro Loma Sanitary District activated sludge secondary WWTP, including dissolved oxygen-controlled activated sludge secondary treatment, chlorination and dechlorination, anaerobic sludge digestion, vacuum filtration and incineration.

Process and control system design of 30-MGD activated sludge secondary treatment plant for Richmond, CA. Bay outfall location, dechlorination, sludge elutriation-filtration and incineration.

Process design of 2 MGD San Francisco International Airport Domestic WWTP. Laboratory analyses and testing, chemical toilet wastewater treatability evaluation, grease removal, activated sludge secondary treatment, sludge digestion and filter dewatering process selection and sizing.

Process design of 2-MGD oxidation ditch WWTP, Susanville, CA.

Process design of 2-MGD extended aeration activated sludge WWTP, Willows, CA.

Rehabilitation of secondary clarifiers, City of Santa Rosa, Laguna WWTP.

Process design and modifications of 10-MGD Central Marin Sanitation Agency Wastewater Treatment Plant, San Rafael, CA.

Process design of 5-MGD WWTP upgrades, Sausalito-Marín City Community Services District.

Struvite and Vivianite Control at Oro Loma Sanitary District, Central Marin Sanitation Agency, Cities of San Mateo, Reno-Sparks, Las Vegas, and Eugene.

Wastewater Treatment Pond Systems

Bob has developed, designed, and optimized aerated and facultative wastewater treatment pond systems for many municipal and food processing producers in the western United States.

Municipal activated sludge and wastewater pond optimization evaluations have been conducted at El Centro, Niland, Blythe, Temecula, Fortuna, Firebaugh, Santa Nella, Soledad, Gonzales, King City, Manteca, Copperopolis, Bridgeport, Bieber, Alturas, Modesto, Pleasanton, Yountville, Yosemite National Park, Calistoga, Windsor, Ukiah, Willits, Oroville, Marysville, Yuba City and Davis, CA; South Truckee Meadows, Laughlin, Elko, Ely, Hawthorne, Reno-Stead, and Winnemucca, NV; Hermiston, Pendleton, and Camp Rilea, OR; and Snohomish, Kelso and Port Orchard, WA; Grand Canyon National Park, Rainbow Bridge, and Tucson, AZ, among others.

Disinfection

Bob has evaluated and designed numerous disinfection systems including chlorination, chloramination, ultraviolet irradiation, ozonation, peracetic acid and ultrasonics. He has extensive experience in chemical handling systems. Safety issues, risk evaluation and code compliance for risk reduction; also wastewater handling, neutralization, brine disposal and water recycling. He has also served numerous times as an expert witness or consultant in litigation on water and wastewater treatment and corrosion issues.

Chlorination and Dechlorination Richmond WWTP, chlorine and sulfur dioxide, Oro Loma WWTP, chlorine and sulfur dioxide Pleasanton-Sunol WWTP, chlorine Calistoga WWTP, chlorine and sulfur dioxide Yountville Veterans' Home WWTP, chlorine and sulfur dioxide Carmel WWTP, chlorine and sodium metabisulfite Las Gallinas WRP, hypochlorite Ukiah WWTP, chlorine and sodium metabisulfite Sausalito-Marín City WWTP, hypochlorite and sodium metabisulfite - McClellan AFB WWTP.

Tony I. Wakim, P.E.

Electrical / I&C Quality Review

Education

BS in Electrical Engineering, California State University, Sacramento
Graduate Work in Electrical Engineering, San Jose State University

Registrations

Electrical Engineer in California, Nevada, Oregon, Washington, Hawaii, Arizona and Indiana
Control Systems Engineer in California and Oregon

Professional Summary

Tony Wakim is experienced in the design of electrical and instrumentation and control systems for water and wastewater treatment plants pumping stations and wells. He has organized the work effort and prepared plans and specifications for such projects. He also has written the control systems section of O&M manuals and has been involved in construction start-up.

Tony is particularly expert in the design of process control systems for a number of projects that have involved the use of programmable controllers and computer systems including distributed control systems, SCADA, operator-interface software and telemetry.

His responsibilities on past projects have included review of contractor's proposals and related shop drawings, extensive field inspection of the systems, and assistance with system startup. His attention to these functions ensures that electrical, instrumentation, and control systems will comply with specifications.

Relevant Project Experience

Various Projects, Central Marin Sanitation Agency, San Rafael, CA - *Electrical Engineer* - Prepared evaluation report for condition assessment of electrical and instrumentation equipment as part of Kennedy/Jenks team. The work included site visit and area by area evaluation of motor control centers, switchboards, instruments and PLCs. Also provided quality control checking of construction documents for miscellaneous projects including receiving station, chemical additions.

Water Pollution Control Plan Upgrade and Expansion, City of Millbrae, Millbrae, CA - *Electrical Engineer* - Designed electrical and control system for wastewater treatment plant expansion which included secondary treatment, sludge thickener and rotary drum thickener. Provided SCADA integration for a PLC-based control system for a treatment plant. This system is a PLC based control system with a redundant fiber optical network using Wonderware System Platform V10.1.

Water SCADA System, City Woodland, Woodland, CA - *Electrical Engineer* - Prepared a SCADA telemetry system master plan for 20 wells and proceeded to design contact documents to implement the master plan. The work included wells improvements, instrumentation upgrades, 900 MHZ radio telemetry system, well control strategies and Intellution SCADA system. System was completed in 2012.

Water Reclamation Facility, City of Fillmore, Fillmore, CA - *Electrical Engineer* - Designed electrical, instrumentation and SCADA system for the 16 MGD membrane recycled water treatment plant. The project included new 3000A, 480 volt service, 900 kW standby power generator, Variable frequency drives, lighting systems, power distribution, motor control centers, PLC distributed control

system, Computer based SCADA system and fiber optical network. Implemented the SCADA programming for the treatment plant and included startup and training.

Water Distribution SCADA, City of Ventura, Ventura, CA - *Electrical Engineer* - Designed and managed the programming of a SCADA system utilizing rack mounted servers and Wonderware HMI software for 40 remote reservoirs and pump station supplying water to 13 zones. The SCADA system was also linked to the Avenue Water Treatment Plant and Satcoy Water Treatment Plant's SCADA systems on a wide area network.

Rio Vista Water Treatment Plant, Castaic Lake Water Agency, Santa Clarita, CA - *Electrical Engineer* – 30 MGD water treatment plant includes distributed control PLC control system with 10 operator workstations and a telemetry systems. Plant included ozonation, chemical feed system and chlorination.

40 MGD Water Treatment Plant, Castaic Lake Water Agency, Santa Clarita, CA - *Control Systems Engineer* - 40-MGD water treatment plant includes distributed control PLC control system with eight operator workstations and telemetry system.

Conditioning Facility, City of Santa Paula, Santa Paula, CA - *Electrical Engineer* - Water treatment facility using pressure conditioning filters with Allen Bradley PLC and 500 hp adjustable frequency drives.

30 MGD Water Treatment Plant SCADA Upgrade, Kern County Water Agency, Kern County, CA - *Electrical Engineer* - 30 MGD water treatment plant with SCADA upgrade using Modicon PLC's and Intellution FIX 32 software.

Donald L. Ervin, P.E.

Structural Quality Review

Education

BS, Civil Engineering, Oregon State University,
1985

Memberships/Affiliations

American Concrete Institute of Northern California
American Society of Civil Engineers

Registrations

Professional Civil Engineer, California (50633)

Professional Summary

Don Ervin has over 25 years of engineering experience. Don specializes in the condition assessment and upgrade of existing wastewater and water treatment facilities. This work has included the assessment and upgrade of several wastewater facilities including the repair and replacement of digester covers, the replacement of digester mixing and gas management systems, the seismic evaluation and structural upgrade of existing structures and equipment, and the application of protective coatings and digester insulation systems. Don's work has also included the repair of leaking joints on wastewater force mains, the structural design of new facilities, the conversion of existing facilities to perform new functions, the selection of utility alignments, the design of site grading and drainage improvements, and the demolition of existing equipment.

Relevant Project Experience

Water Pollution Control Facility Sedimentation Basin Renovation, City of Sunnyvale, Sunnyvale, CA - *Project Engineer* - Project engineer for the condition assessment of and recommendation of improvements for a series of ten primary sedimentation tanks and associated equipment at the Water Pollution Control Facility.

Regional Water Quality Control Plant Facilities Condition Assessment, City of Palo Alto, Palo Alto, CA - *Project Manager* - Provided a multi-year condition and seismic capacity assessment of nearly all of the structures at a large water quality control plant.

Secondary Clarifier Rehabilitation Design/Build Project, Regional Water Quality Control Plant, Confidential Client, Palo Alto, CA - *Construction Coordinator* - As part of a design/build project, provided on-site observation and contractor coordination during the rehabilitation of four wastewater secondary clarifiers.

South Bayside System Authority, Digester No. 3 Rehabilitation & Upgrade, Redwood City, CA. Project Manager for condition assessment of a 30-year old digester and appurtenant facilities and design of improvements to address deficiencies. Project includes replacement of axial flow mixing pumps with screw centrifugal mixing pumps, construction of a 24-inch pipeline through the digester concrete wall to replace a deteriorated mixing pipeline, replacement of existing bio-gas piping and equipment, and replacement of high-performance coatings and cover insulation.

South Bayside System Authority, Seismic Improvements Program, Redwood City, CA. Project Manager and Project Engineer for various phases of a program to evaluate seismic risks at a WWTP and associated pump stations. The program included the identification of seismic loading criteria and development of post-earthquake performance criteria, an evaluation and retrofit prioritization methodology, and a financing plan. Work included coordinating workshops, conducting walkthrough

screenings, inventorying facilities, assigning performance goals to specific facilities, developing implementation plans, conducting facility evaluations, and designing seismic retrofits.

South Bayside System Authority, Digester Dome Coating and Walkway Replacement, Redwood City, CA. Project Manager and Project Engineer of two projects for the condition assessment and upgrade of two digesters. Design improvements included the cost-effective repair rather than replacement of the deteriorated steel covers. Improvements also included the replacement of deteriorated coatings, the installation of new insulation with integral walkways on the exteriors of the covers, and the replacement of deteriorated piping.

City of Millbrae, Secondary Digester Rehabilitation, Millbrae, CA. Project Engineer for the rehabilitation of a 30-year old concrete wastewater digester. Design improvements included the repair of a deteriorated concrete column supporting the digester cover, the replacement of piping and equipment, and the installation of high-performance coatings. In addition, provided construction management and observation services during construction.

North San Mateo County Sanitation District, Digester Rehabilitation, San Mateo County, CA. Lead Engineer for the structural analysis and upgrade of an existing digester. Conducted a seismic analysis of the existing concrete digester, developed a design to replace an existing floating steel cover with a stationary steel cover, and designed penetrations through the digester concrete wall for installation of piping for an external pumped mixing system.

City of West Lafayette, Digester Renovation with Alternate Power Sources Project, West Lafayette, IN. Lead Engineer for the structural analysis and upgrade of two existing 50-year old concrete digesters. Improvements included strengthening of the digester walls to accommodate an increase in digester operating depth and gas pressure, the installation piping through the digester walls for external pumped mixing systems, the replacement of floating covers with fixed covers, and the application of high-performance coatings and cover insulation.

City of San Leandro, Digester Improvements Project, San Leandro, CA. Project Engineer for the evaluation and rehabilitation of an existing wastewater digester with a deteriorated steel dome. Improvements included repair of deteriorated portions of the cover and the application of high-performance coatings and cover insulation.

South Bayside System Authority, Coatings Replacement and Secondary Clarifier Retrofit, Redwood City, CA. Project Manager for the condition assessment and design of coatings replacement in a primary effluent channel, fixed film reactor wet pit, and scum pit along with the replacement of a secondary clarifier drive unit. Conducted condition assessment and developed critical construction sequencing criteria to maintain continuous operation of primary sedimentation tanks, fixed film reactors, and scum and activated sludge systems. Project included design of gravity-flow bypass piping installed within the primary effluent channel that allowed coating replacement and design of a flow control and work platform scheme that allowed coating of the fixed film reactor wet pit while the wet pit remained in operation.

Zachary D. Harris, P.E., LEED® AP

Mechanical Engineering

Education

BS, Mechanical Engineering, Stanford University,
1989

Registrations

Professional Mechanical Engineer, California

Certifications

Leadership in Energy and Environmental Design
(LEED), Green Building Institute

Memberships/Affiliations

American Society of Mechanical Engineers
National Fire Protection Association

Professional Summary

Zachary Harris has a mechanical engineering background with experience in the design of water and wastewater facilities. Zachary has additional design experience in the development and design of building mechanical systems, including plumbing, HVAC, odor control, fire protection, natural gas, and compressed air systems. This experience has been garnered through professional study in the areas of HVAC and Fire Protection Engineering and the application of these practices.

Relevant Project Experience

Wastewater Treatment Plant Disinfection Facility, Linda County Water District, Marysville, CA - *Mechanical Engineer* - Designed ventilation and fire protection systems for gaseous chemical feed facilities (chlorine, sulfur dioxide). Ventilation system included design for (dry) gas scrubber system. Designed HVAC systems for separate 1,000 square foot office facility.

Wastewater Treatment Plant Upgrade and Expansion, Linda County Water District, Marysville, CA - *Mechanical Engineer* - Provided Code review of compliance of ventilation and fire protection systems with NFPA 820 for process facilities including Chemical Storage and Rotary Thickener systems. Designed aeration blower systems, and plumbing, HVAC systems for Lab/Office facility. Sludge Pumping Systems, and Mechanical (Rotary) Thickener. Assisted in design of blower system For Soil Bed Scrubber odor control system for Headworks and Thickener systems.

Water Pollution Control Plant, City of Millbrae, Millbrae, CA - *Mechanical Engineer* - Designed ventilation and fire protection systems for process facilities including Headworks/Flow Equalization, Aeration Blower and Sludge Pumping Systems, and Mechanical (Rotary) Thickener. Odor control system for Rotary Thickener incorporated air ionization unit.

Belt Filter Press Replacement, Oro Loma Sanitary District, San Lorenzo, CA - *Mechanical Engineer* - Analyzed presence of excessive ammonia vapor at enclosed belt filter press facility. Designed improvements to ventilation and exhaust systems to divert vapor away from inhabited spaces

Expansion of Meadowlark Water Reclamation Facility (MWRF), Vallecitos Water District, San Marcos, CA - *Mechanical Engineer* - Designed plumbing, HVAC, and fire protection systems for facility upgrades for plant expansion from 2.0-mgd to 5.5-mgd (peak dry weather). Specific responsibilities included design of gas chlorination system design and dry-pellet emergency scrubber system, and design of building for 3,000 square foot office/lab facility.

Lake of the Pines Wastewater Treatment Plant Expansion and Design, Nevada County, Nevada City, CA - *Mechanical Engineer* - Designed plumbing and HVAC systems for facility upgrades for plant expansion from 0.7-mgd to 3.7-mgd (peak wet weather). Specific responsibilities involved design of building systems for a 1,500 square foot office/locker room facility.

Santa Rosa Water Reclamation Facility (SRWRF) Interim Facilities Improvement Project, Rancho California Water District, Temecula, CA - *Mechanical Engineer* - Designed replacement heating, ventilation and odor control systems for enclosed Sequencing Batch Reactor and Aerobic Digester Tanks, gallery areas, and for Solids Handling (Belt Thickening) Facility. Odor control systems utilized carbon absorber vessels ranging in capacity between 4,000 and 12,000 cfm

Wastewater Treatment Plant Upgrades, Construction Period Services, Susanville Consolidated Sanitary District, Susanville, CA - *Mechanical Engineer* - Designed plumbing (water, sewer, natural gas), heating and ventilating systems for various process facilities developed during the Treatment Plant expansion. Design responsibilities included specification and layout of standby generator set and diesel fuel system.

Digester Improvements and FOG/Food-to-Energy Facility, Central Marin Sanitation Agency, San Rafael, CA - *Mechanical Engineer* - Assessed building ventilation system and provided recommendations for improving reliability of ventilation system at the sewage intake facility and improving air circulation within the electrical and mechanical equipment room.

Vail Waste Water Treatment Plant, Eagle River Water and Sanitation District, Vail, CO - *Mechanical Engineer* - Designed heating and ventilation system improvements for process facilities including Headworks, Aeration Basins, Nitrification Basins and gallery areas. Due to harsh weather conditions, all process facilities were located indoors. Process exhaust was ducted to adsorber units and blower units to segregate process odors from regularly occupied spaces within plant.

Miscellaneous Improvements, South Bayside System Authority, Redwood City, CA - *Mechanical Engineer* - Design odor scrubber systems to clean ventilation intake systems at sensitive plant areas (operator kiosks, motor control centers, Warehouseman's Office).

Alan J. Zelenka

Energy Evaluations

Education

BA, Political Economy, University of California, Berkeley, 1982

MS, Interdisciplinary Studies: Individualized Program in energy policy and planning, University of Oregon, 1990

Executive Management Institute, University of Wisconsin, Madison, 1998

Memberships/Affiliations

Oregon Global Warming Commission, appointed by Governor Kitzhaber

Eugene City Councilor, Past President

City of Eugene Sustainability Commission

Central Lane Metropolitan Planning Organization, Past Chair

Previous Affiliations

Oregon GHG Task Force on Transportation and Land-Use, appointed by Governor Kulongoski

The Climate Trust, Past Chair

EPUD, Power Manager, Conservation Manager, Legislative Affairs Manager, and IT Manager
Renewable Northwest Project, Co-founder and Past-Treasurer

Northwest Power and Conservation Council, Conservation Resources Advisory Committee Member

Northwest Energy Coalition, Board Member

Public Power Council, Executive Committee

Solar Energy Association of Oregon, President

Eugene Budget Committee, Chair and member for 10 years

City Club of Eugene, President and member since 1991

Human Service Commission of Lane County, Chair
Safe and Sound Project, Eugene, Co-Founder

Professional Summary

Alan Zelenka is the Director of Energy Services for Kennedy/Jenks Consultants where he works with clients to do climate change mitigation, energy efficiency, renewables, and sustainability. Alan brings over 28 years of diversified experience in these fields.

Alan has expertise in the planning, evaluation, development, permitting, and construction of energy efficiency and power generation projects. Alan has evaluated the feasibility of numerous renewable resource projects, including: solar PV, FOG & food-waste-to-energy, landfill-gas-to-electricity, hydroelectric, wind, geothermal, fuel cells, microturbines and natural gas combustion turbines as the Power Manager for Emerald PUD (EPUD). His experience includes extensive work in the energy regulatory and policy arena at the national, regional, and local levels. He also co-founded the Renewable Northwest Project (RNP) to promote renewable resources, he was elected to the Executive Committee of the Public Power Council, and appointed to the Northwest Power and Conservation Council's Conservation Resources Advisory Committee to help evaluate and plan regional conservation programs. He was the project manager for the Oregon ACWA Energy Independence Project that was named the 2009 Oregon ACEC Project of the Year, and also received the 2009 AAEE National Grand Award for Planning. He was also recently asked to provide expert testimony to the U.S. Congressional Subcommittee on Water Resources and Environment on energy efficiency and renewable resources at water and wastewater treatment plants.

Alan was appointed by Governor Kitzhaber to the Oregon Global Warming Commission to help guide state policies and efforts to reduce GHGs. He was also appointed by Governor Kulongoski to serve on the Oregon GHG Task Force on Transportation and Land-Use, and was appointed to the

Kennedy/Jenks Consultants

Oregon Land Conservation and Development Commission Scenario Planning and GHG Reduction Target Rulemaking Advisory Committee for SB 1059 (similar to California's SB 375). Alan was also the Past Chair of The Climate Trust, a national organization dedicated to providing solutions to climate change through the acquisition of quality carbon reduction projects and offsets. Alan was the primary author for the first Climate Action Plan to go through the regulatory process in California for Poseidon's Carlsbad Desalination Plant. That plan won a 2009 California ACEC Excellence in Engineering Award. Alan is currently leading the team to develop the GHG plan for the proposed Bay Area Regional Desalination Project. Alan is currently on the Eugene City Council is the Council Past President, and is the Council representative to the Eugene Sustainability Commission.

Relevant Energy Experience and Projects

Expert Testimony to the U.S. Congressional Subcommittee on Water Resources and Environment, 2009. Provided testimony regarding energy efficiency in water and wastewater treatment plants.

Energy Efficiency. Developed and managed Emerald PUD's energy efficiency programs with a \$1.3 million budget for 6 years. Appointed to the Northwest Power and Conservation Council's Conservation Resources Advisory Committee to help evaluate and plan regional conservation programs. Appointed to the Board of Directors of the Northwest Energy Coalition, the premier organization advocating for more conservation programs in the Pacific Northwest. Member of the Public Power Council Conservation Committee.

Resource Assessments. Performed sophisticated assessments on dozens of resources as Power Manager for Emerald PUD, including: FOG and food waste to energy, solar PV, wind, geothermal, fuel cells, microturbines, natural gas combustion turbines, landfill gas, waste-to-energy, and cogeneration. Conducted technical assessments, including feasibility studies, environmental impacts (air, land, and water), greenhouse gas impacts, social impacts, financial and economic analysis, funding and incentive option analysis, and political and regulatory assessments.

Power Management and Resource Development. Responsible for evaluating and making recommendations on numerous resource projects and acquisitions. Managed a \$14 million power budget. Lead the effort to develop the first direct access energy contracts in Oregon for two large industrial customers. Project Manager for the development of the 3.2 MW Short Mountain landfill-gas-to-electricity plant which was the first of its kind in the Pacific Northwest. Conducted feasibility studies, financing, permitting, and regulatory compliance. Lead Negotiator for Emerald PUD to become the first utility in the Pacific Northwest to sign a contract with BPA for wind power. Developed a solar PV project at the Aprovecho Sustainability Center. Helped two of Oregon's largest industrial loads to become the first market purchasers of electricity and facilitated their power management and power delivery. Contracted for the purchase of power from numerous electricity brokers.

Policy Development and Regulatory Compliance. Over two decades of experience dealing with complex energy policy and regulations as a member of the Executive Committees of the Public Power Council and as co-founder of the RNP. Lobbied for legislative and regulatory changes at the federal and state levels. Involved in the creation and negotiations for Oregon's electric utility industry deregulation bill, Net Metering law, and solar tax credits, as well as Bonneville Power Administration's (BPA) Conservation and Renewables Discount Program.

Energy and GHG Master Plan for the Irvine Ranch Water District, Irvine, CA - *Project Manager*
The Master Plan created a set of distinct items in an Action Plan ready for implementation by IRWD.

The process is based on the innovative award-winning methodology of the Oregon ACWA Energy Independence Project. The process created an energy and GHG profile of the District, and investigated regulatory constraints and opportunities. Identify the savings and cost of all energy efficiency and process energy opportunities by performing energy audits and process audits. We worked with IRWD to assess energy and GHG project options for consideration. Using evaluation criteria and weighting factors created by IRWD, the options were scored and ranked to create a short-list of projects. We conducted a workshop with IRWD senior management to narrow 61 possible project ideas down to 20. Using a common template, these project ideas were analyzed in detail. The 20 Project Assessments were scored using evaluation criteria and weighting factors created by IRWD. With the projects scored they were ranked to create a short-list of projects. Preliminary results of the Plan show a cumulative total savings through the year 2030 of nearly \$24 million. Scenario analyses were performed to show the impacts of different regulatory changes on the final portfolio of projects. The cumulative total of estimated GHG emission reduction is nearly 53,000 metric tons of CO₂ by 2030.

Energy Master Plan Update, Encina Water Authority (EWA) – *Technical Expert*- Provided a complete review of current and future energy use, and investigation into future technology options, and the development of an Action Plan specifically identifying the energy opportunities EWA should pursue. The process is based on the innovative award winning methodology of the ACWA Energy Independence Project. Facilitated and led the process by conducting a series of in-person workshops and on-line live meetings. Identified the savings and cost of all energy efficiency and process optimization opportunities by performing energy audits and process audits. An energy profile of current energy use, a forecast of future energy use was performed, and a calculation of the KWh needed to meet their goal of 95% self generation by 2020. Using a common template Option Assessments were created on numerous technology options selected by EWA, including: biogas production enhancements, internal combustion engines, fuel cells, microturbines, solar PV, small wind turbines, gasification of biosolids and options to use their waste heat. Using evaluation criteria and weighting factors created by EWA the options were scored and ranked; and a top tier of ranked options was selected. These options were analyzed and compared using KJ's Scenario Manager Model that allowed EWA to assess the cost & benefits of different packages of options or scenarios. A net present value was calculated for each scenario, the scenarios were ranked, and final scenario was selected. The final recommendations included: energy-efficiency measures, liquid waste to energy facility, IC engine gas treatments and catalyst, and new IC engines, and replacing the Admin building chiller. The adopted Plan will enable the EWA to meet its 95% electrical energy self generation goal by 2020. Compared to the "business as usual" scenario, EWA will be avoiding \$2.1 million in purchased energy costs by 2020 by implementing the adopted energy management plan. O&M costs will decrease from an anticipated \$3.2 million a year in 2020 under the "business as usual" scenario to \$2.5.

Energy Independence Project, Oregon Association of Clean Water Agencies - *Project Manager*- 2009 National Grand Award for planning from the American Academy of Environmental Engineers and the 2009 Project of the Year Award honors from the Oregon America Council of Engineering Companies. Investigated what it would take for wastewater treatment plants to optimize energy efficiency and become energy independent through the use of renewable resources. Completed energy audits at the two pilot sites which identified all cost-effective energy efficiency measures. The operational, environmental, and greenhouse gas impacts of seven renewable resources were assessed, and their cost and cost-effectiveness was determined. All of the renewable options were evaluated and scored against common criteria from which recommendations for the best way to

become energy independent were made. The methodology and data is broadly applicable and can be used by any wastewater treatment plant in the country.

Energy Management Plan, City of Riverside, CA – *Project Manager*- Kennedy/Jenks is currently developing the Plan for the City of Riverside’s Water Department. The project will provide a baseline and forecast of energy use and costs; analyze and make recommendations regarding the use of natural gas engine or electric motors; look at the feasibility and cost of alternative renewable energy sources (wind, solar PV, microturbines and fuel cells); investigate and select the best and most cost-effective ways to save energy in Riverside’s water system; and investigate efficiencies to be gained from improving the existing SCADA system or using another real time energy management system. Grant and funding opportunities will be investigated and narrowed down to the most applicable programs. The analyses will be compiled into a concise Master Plan Report that will provide a road map for future actions for the Water Division.

Energy Management Plan, Eastern Municipal Water District, Perris, CA – *Project Manager*- Kennedy/Jenks is currently developing this Energy Management Plan. As with all previous energy master plans we will create a baseline and forecast of energy use and costs. We will perform energy audits on their WWTP and buildings; assess cogeneration options including their 59 existing IC engines, microturbines and fuel cells; assess the suitability of numerous sites for solar PV projects; evaluate a FWTE project; and assess grant and funding opportunities for short-listed projects. In addition, we will do an operational audit of their existing Derceto water system optimization software, recommend a strategy for surplus WWTP capacity, evaluate proposals for a biosolids and a biodiesel project, and evaluate small hydro opportunities in their system. Grant and funding opportunities will be investigated and narrowed down to the most applicable programs. All of the projects will be evaluated using a common template so they can be scored and ranked to create a shortlist of projects. The analyses will be compiled into a concise Energy Management Plan Final Report that will provide a road map for future actions for Eastern.

Renewable Energy Development Alternatives, National Park Service, Pacific West Region - *Project Manager* - Conduct an evaluation of alternatives for implementing renewable energy projects. The question this study was trying to answer was: “What is the preferred approach for the National Park Service to deploy renewable energy resources – at the meter, park, or utility level?” To answer the question, this study took a systematic four-step approach to analyze the relevant data and policies for the renewables development at the eight national parks in the Southern California Edison’s (SCE) service territory, and in a separate study the fourteen parks in the Pacific Gas & Electric (PG&E) service territory. The four steps these studies followed were: 1) review the electrical usage data to create an energy profile; 2) determine the potential size for renewables at the three development level; 3) using solar PV as an example renewable, analyze the relevant resource development policies, incentives, costs, impacts, construction time frames, and benefits; and 4) develop recommendations for the National Park Service.

Co-Founded the Renewable Northwest Project (RNP). Part of a small team of people who founded the RNP to promote wind, solar, and geothermal renewable resource development. RNP has become the premier renewable resources policy and advocate group in Oregon and the PNW.

Resource Planning. Managed three comprehensive least cost plans, or integrated resource plans, for Emerald PUD; comparing and evaluating energy efficiency programs and generation resources, and creating action plans. Conducted “how to” workshops for the Western Area Power Administration and acted as guest lecturer at the University of Oregon and Lane Community College.

Other Relevant Experience and Projects - Climate Change

Oregon Global Warming Commission - Appointment by Governor Kitzhaber. The OGWC recommends ways to coordinate state and local efforts to reduce Oregon's greenhouse gas emissions consistent with Oregon's goals and to recommend efforts to help the Governor, the state, local governments, businesses and residents prepare for the effects of global warming.

San Francisco Bay Area Integrated Regional Water Management Plan Update - Climate Change Section, Marin Municipal Water District, Corte Madera, CA. - Climate Change Section Team Leader. This project will update the existing IRWMP, and specifically integrate climate change into the overall Master Plan Update. Leading the team that is performing a comprehensive climate change vulnerability assessment for the Bay Area IRWMP; developing potential adaptation and mitigation strategies to respond to changes in water supply, demand and quality, sea level rise, flooding, and ecosystem habitat; and developing a comprehensive list of next steps.

Santa Cruz Desalination Plant Energy Minimization & GHG Reduction Plan, City of Santa Cruz and Soquel Water District (scwd2) – Senior Advisor. Currently providing expert technical assistance to the City of Santa Cruz and the Sequel Water District for development of their new 2.5 MGD desalination plant, guiding the scwd2 project through every phase of the complex process. Using the innovative award-winning methodology of the Oregon ACWA Energy Independence Project, a detailed Action Plan to meet the energy and GHG goals of the scwd2 project was developed. An Energy White Paper to help educate the public, created an energy profiles and forecast of energy use and GH emissions for the scwd2 project was also developed. Led a 21 person workshop to narrow down a list of 48 project ideas. The results were consensus on 15 project ideas to more fully analyze using a common template. These project ideas were scored and ranked using evaluation criteria and weightings developed by the City and District. Using the Scenario Manager Model an Action Plan was developed with specific projects the City and District will use to meet their energy and GHG goals.

Climate Action Plan for Carlsbad Desalination Project, Poseidon Resources, Carlsbad, CA - Project Manager. This project received a 2009 Engineering Excellence Award from the California chapter of the American Council for Engineering Companies. Primary author for the first greenhouse gas inventory and climate action plan (CAP) to go through the regulatory process in California. The Plan makes the 50 mgd project carbon neutral and mitigates nearly 100,000 metric tons of CO₂ per year. Part of the team that guided the project through the regulatory permit process where the CAP became a condition of their state permits.

Climate Action Plan for the Huntington Beach Desalination Project, Poseidon Resources, Huntington Beach, CA - Project Manager. Using the template developed for the Carlsbad project, wrote the greenhouse gas inventory and CAP for the project which is currently making its way through the approval process.

Bay Area Regional Desalination Project GHG Analysis - GHG Analysis Leader. Five agencies cooperatively are creating the BARD project to improve long-term water supply reliability and provide 20 MGD of new local, reliable, drought-proof water supply. The agencies are: Contra Costa Water District (CCWD), East Bay Municipal Water District (EBMUD), San Francisco Public Utilities Commission (SFPUC), Santa Clara Valley Water District (SCVWD), and Zone 7 Water Agency (Zone 7). The analysis will create a GHG & energy baseline and forecast for the BARD project, assist in the development of outreach materials, evaluate and rank potential GHG reduction projects, and create a plan to make the project net-carbon neutral.

Upper Santa Clara River Integrated Regional Water Management Plan Update - Climate Change Section, Castaic Lake Water Agency, Santa Clarita, CA – Team Member. This project will update the existing IRWMP, and specifically integrate climate change into the overall Master Plan Update.

Oregon Governor’s Greenhouse Gas Task Force on Transportation and Land-Use – Committee Member. Task Force Member. Appointed by Governor Kulongoski to this task force which was co-chaired by the OTC Chair and LCDC Chair. The purpose of the task force is to propose legislation that establishes greenhouse gas reduction targets for local MPOs and creates a toolkit for the development of local MPO greenhouse gas reduction plans. The toolkit will include a list of best practices, public involvement opportunities, and modeling and scenario planning guidelines and tools. The final report was presented to the legislature on 13 January 2010. As a result SB 1059, which embodied the recommendations of the Task Force, became law in 2010.

Oregon Global Warming Commission Transportation and Land-Use Committee and Technical Subcommittee - Member of the Committee and Co-Chair of the Subcommittee in 2010.

Investigate ways to reduce GHG emissions, help develop measurement tools and craft a plan to meet the statewide GHG reduction targets in these two sectors.

Oregon Land Conservation and Development Commission SB 1059 Target Rulemaking Advisory Committee – Committee Member. Appointed to the Committee to develop a recommendation to LCDC on targets for reducing GHG emissions from light vehicle travel in the state’s six metropolitan areas.

The Climate Trust, Portland, OR - Past-chair. Helped create one of the largest portfolios of carbon offset projects. Well-versed in climate change regulation, certification and reporting protocols, mitigation strategies, emerging markets, and advising clients on marketplace positioning. Member of the Board of Directors 2004-2010.

Delta Wetlands Carbon Sequestration Project, Renewable Resources Group - Project Manager. Assisted the client in assessing the amount of the CO2 reduction, the best protocol to use to certify the offset project, and the market. Advised the client on positioning this project in the marketplace.

Expert/Peer Reviewer for Voluntary Carbon Standard (VCS) Peatland Rewetting and Conservation Protocol, Renewable Resources Group - Project Manager. Selected by VCS to be a peer reviewer of the draft document, prior to finalization and publication, that establishes the rules for the development of peatland carbon offset projects.

Kennedy/Jenks Greenhouse Gas Inventory and CAP – Project Manager. Helped manage the development of the internal corporate greenhouse gas inventory and CAP that will make Kennedy/Jenks climate neutral by the centennial anniversary in 2019.

Central Lane MPO – Appointed by the Mayor, Committee Member and Past Chair. Authored a unanimously passing amendment to the Unified Planning Work Program (UPWP) that requires the MPO to conduct a greenhouse gas inventory of area transportation emissions, and identify and evaluate greenhouse gas reduction and adaptation strategies suitable for the MPO area. Chaired the Scenario Development Committee.

Eugene Sustainability Commission – Appointed by the Mayor, Committee Member and City Council Liaison since the inception of the commission. Guided the commission to craft two relevant goals: 1) have the City operations become climate neutral by 2020, and 2) reduce fossil fuel consumption community wide by 50 percent by 2030.