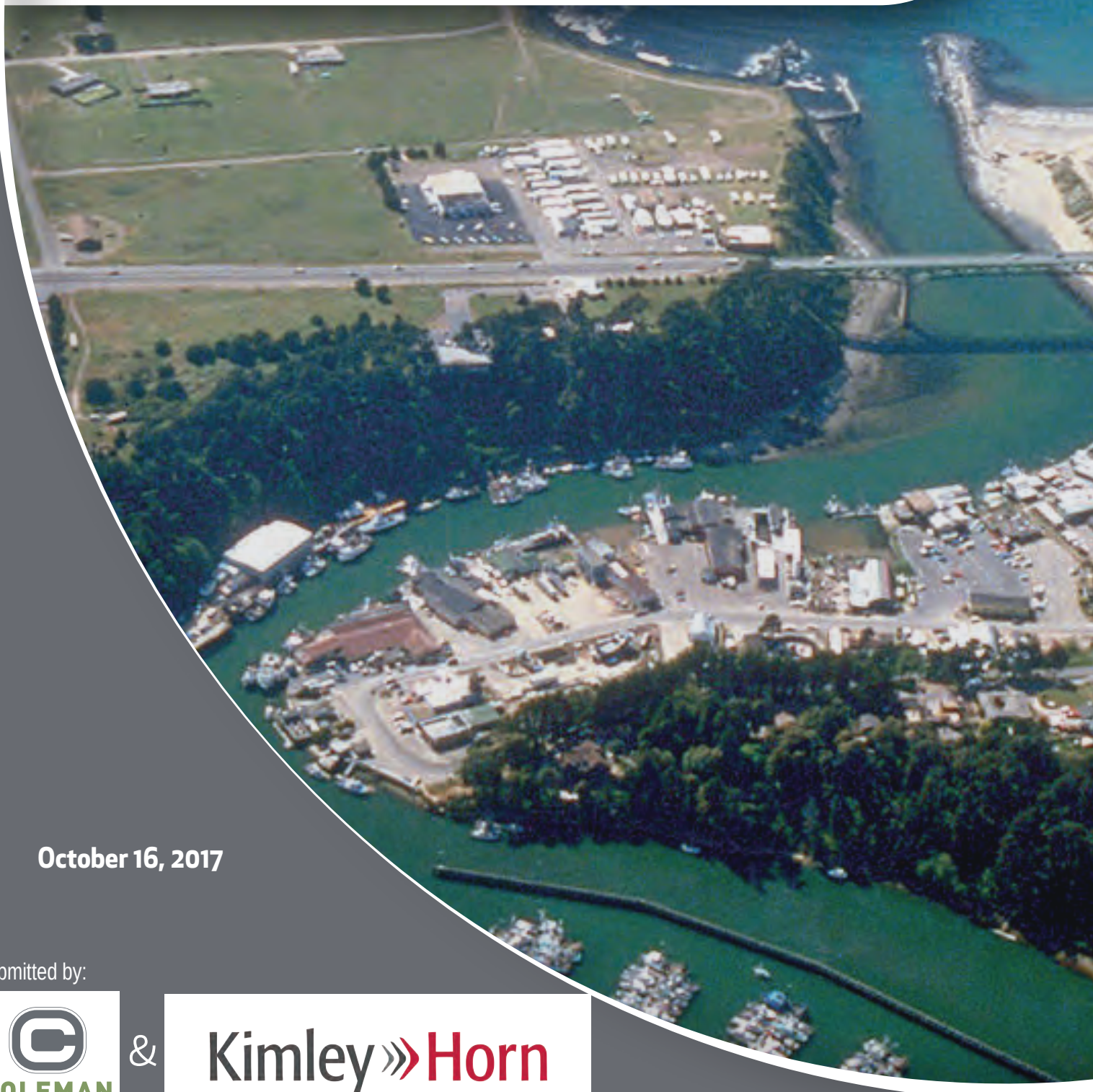
Proposal

City of Fort Bragg

BRACKISH WATER DESALINATION PLANT FEASIBILITY STUDY



October 16, 2017

Submitted by:

COLEMAN ENGINEERING

&

Kimley»Horn

COLEMAN
ENGINEERING

October 16, 2017

City of Fort Bragg
Engineering Department
Attn: Tom Varga
416 North Franklin Street
Fort Bragg, CA 94537

Re: **Proposal to Complete a Brackish Water Desalination Plant Feasibility Study**

Dear Mr. Varga,

The Coleman Engineering team is sincerely looking forward to the opportunity to provide Engineering Services to the City of Fort Bragg for the Brackish Water Desalination Plant Feasibility Study.

Coleman Engineering, Inc. and ***Kimley Horn, Inc.*** are teaming in a collaborative effort to bring the City of Fort Bragg an experienced, specialized team of professional engineers.

The Coleman Engineering team has exceptional experience and insights into the regulatory issues affecting coastal desalination facilities, with team members having conducted engineering feasibility, design and regulatory permitting on over 30 desalination facilities throughout the United States, including more than 20 in California. The initial concept envisioned for the project, as a brackish desalination facility utilizing an existing wastewater treatment plant outfall for commingling the brine discharge, is the desalination approach preferred by state and federal regulatory agencies as well as environmental interest groups. Kevin Thomas of Kimley-Horn and Associates has excellent personal experience working with state and federal regulatory agencies on brackish desalination projects, and he has worked closely with these regulators in developing effective win-win solutions for community-scaled ocean desalination.

Coleman Engineering, Inc. is a local civil engineering firm that has completed successful water projects for the City of Brentwood, City of Crescent City, Sacramento Suburban Water District, Calaveras County Water District, Hamilton City Community Services District, Redding Rancheria, Tuolumne City Sanitary District, Los Molinos Community Services District, Placer County Water Agency, and Nevada Irrigation District.

Kimley-Horn and Associates, Inc. is one of the nation's most comprehensive and respected engineering, environmental, and planning consultants, ranked No. 21 of the Top 500 Design Firms by Engineering-News Record and among the Top 20 Firms for Water Treatment and Desalination. Founded in 1967, Kimley-Horn has grown to more than 3,100 staff members in 84 offices across the United States. Kimley-Horn's multidisciplinary staff is a collaborative partner on water, wastewater, and water resources projects nationwide, providing planning, environmental, engineering, and operations and maintenance support and advice to support large and small systems.

It is our objective to make every client feel like they are our only client.

We look forward to serving The City of Fort Bragg by preparing a feasibility study for a small brackish water reverse osmosis desalination plant.

Sincerely,

Chad R. Coleman, P.E.
Principal in Charge and Project Manager

Table of Contents

Team Description

Coleman Engineering, Inc. is a private consulting engineering firm focused entirely on water and wastewater engineering. We were founded in 2010 and have seven full time staff. Our principal engineer, Chad Coleman, P.E., is also a Certified Water Treatment Plant Operator by the State of California and has over 20 years' experience designing water systems including water treatment processes, wells, pipelines, and tanks. The Coleman Team is unique in that we only focus on Water and Wastewater Projects. Our designs are straight-forward, easy to operate and maintain, and account for long-term operation and maintenance costs.

> ***"Very high technical competency. Design and plans completed well in advance of schedule. Reponses to questions and comments were provided very quickly" – Keith Coggins, City of Oakley***

Kimley Horn, Inc. has a depth of staff resources that include specialists in all aspects of water and wastewater treatment, collection, distribution, reuse, design, and permitting. Our team brings together experts in plant evaluations, master plans, process design, plant expansions, and other projects to improve system operations, meet changing regulatory requirements, and reduce life-cycle costs. Our nationwide water resources team brings together the best practices from multiple regions to provide clients with innovative, cost-effective project alternatives.

Kimley-Horn's environmental staff prepares and processes of all types of environmental documents under CEQA and NEPA, and has extensive knowledge of environmental document and regulatory permitting requirements for major water infrastructure projects. Staff also receives regular training on changes in CEQA and NEPA, as well as applicable case law affecting the interpretation of current statutes.

Key environmental staff from Kimley-Horn each have 15 to 30 or more years' experience in the preparation of environmental documents in compliance with CEQA and NEPA. Their work on local and regional development projects helps them deliver environmental documents and successfully obtain required regulatory permits, with practical insight and solutions regarding feasibility of implementing mitigation measures, being sensitive to cost and schedule impacts to projects. Their team draws on their years of experience of working with public agencies and project stakeholders to develop user-friendly, legally defensible documents.

As requested in the RFP, we have attached our billing rates in Section G: Budget and Schedule charges.

Relevant Experience

The following project examples represent relevant experience by the proposed team preparing desalination water feasibility studies, other municipal water system feasibility studies, and water treatment feasibility and design projects.

Tropical Farms 14.0-MGD Brackish Water Treatment Plant, Stuart, FL

Kimley-Horn provided all phases of design, permitting, construction, and SCADA system integration for the Tropical Farms 14.0-MGD Water Treatment Plant (WTP) expansion. The Tropical Farms WTP was recognized by the Florida Department of Environmental Protection as a winner of the 2012 Water Plant Operations Excellence Award.

The project includes an 8.0-MGD reverse osmosis (RO) water treatment facility (WTF) expansion, which is composed of:

- Five Floridan supply wells, each with a capacity of 1,500 GPM at a depth of almost 1,400 feet
- Four 2-MGD RO treatment trains, each equipped with energy recovery turbines, energy saving membranes, and feedwater pumps with variable frequency drives
- Post-treatment system for hydrogen sulfide removal and air stripping towers for odor treatment
- Chemical systems to support the treatment system
- 5 million gallon ground storage tank with high-service pumping capacity to meet the peak hour demands
- 1,500 kW minimum auxiliary power generator with fuel storage
- Supervisory control and data acquisition (SCADA) system which will be integrated into Martin County's wide area network

Other services included consumptive use permitting for Martin County's entire consolidated system, which included decommissioning two smaller treatment facilities and reducing their groundwater allocation. Blending of the existing nanofiltration WTF product water was implemented, including an iron treatment facility which provided finish water stability using treated groundwater. The product water from this modified treatment facility was blended with the RO product water to provide a stable, non-aggressive finish water. Design of the WTF included elements to allow expansion of the facility to a buildout capacity of 14.0 MGD.

Key Staff:
John Potts, Project Manager

Martin County Utilities 5.5-MGD Jensen Beach Brackish Water Reverse Osmosis (RO) Water Treatment Plant, Martin County, FL

The Kimley-Horn team provided years of engineering support to Martin County Utilities for their first brackish water reverse osmosis (RO) membrane treatment plant. Kimley-Horn designed, permitted, and oversaw construction and commissioning of the original 1.5-MGD membrane treatment plant constructed back in 1991 to supplement the old 3.3-MGD lime softening treatment plant. The Kimley-Horn team partnered with MCU over the years to expand the treatment plant to its current rated capacity of 5.5 MGD using three 1.8-MGD rated skids.

The Kimley-Horn team implemented energy recovery improvements to each of the existing RO skids to improve water quality, increase recovery and treatment capacity, and reduce operating costs. The improvements included installation of interstage turbo boosters on the second stage, replacement of the existing membrane elements with newer energy saving polyamide membranes, and upgrading the array to allow increase in capacity---all without any increase in feedwater capacity. The cost of the improvements was $1.2 million, all of which was captured with a return on investment of 5-7 years with the energy savings. The improvements also allowed operation of the membrane system with a degradation in raw water quality which has occurred with one of the Floridan aquifer supply wells. Kimley-Horn provided design, permitting, construction phase services, SCADA programming, and commissioning of these improvements.

Key Staff:
John Potts, Project Engineer

Membrane Water Treatment Plant, Phase I and II, Town of Jupiter, FL

Kimley-Horn designed a 6.0-MGD membrane WTP expandable to 13.5 MGD, to supplement the capacity of an existing 13.5 MGD lime softening water treatment plant that serves the Town of Jupiter. The initial phase of the membrane WTP consisted of four, 1.5 MGD trains.

The $14.4-million WTP was constructed at the same location as the existing 13.5 MGD lime softening plant. A key design element was keeping the existing lime plant on-line during construction activities.

Kimley-Horn's design for the facility employed state-of-the-art computerized control systems for monitoring the process and operating the plant. This system included redundant computers and PLCs, and full manual operating capability of all equipment from the control room. Full control of the existing 13.5-MGD lime softening treatment plant was incorporated into the control and supervisory control systems.

In 1997, construction was completed for a Phase II expansion to the Jupiter Membrane Water Treatment Plant, which increased the facility's capacity from 6.0 MGD to 12.0 MGD. The new plant was constructed at the same location as the existing membrane and lime softening plants.

Our interstage energy recovery system design consisted of a turbine-driven booster pump which uses second-stage concentrate to drive the interstage pump. The 6.0-MGD expansion design also included raw water supply wells, raw water transmission mains, permeate degasification, permeate stabilization, concentrate treatment, and odor abatement.

Key Staff:
John Potts, Project Manager

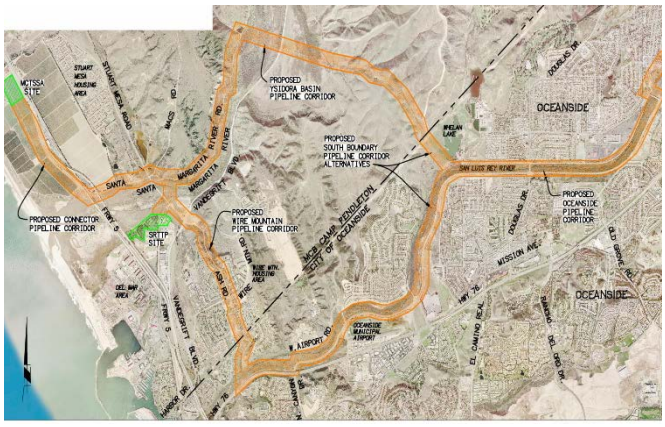
Camp Pendleton Seawater Desalination Project Feasibility Study (Environmental Permitting Task), San Diego County Water Authority, North San Diego County, CA

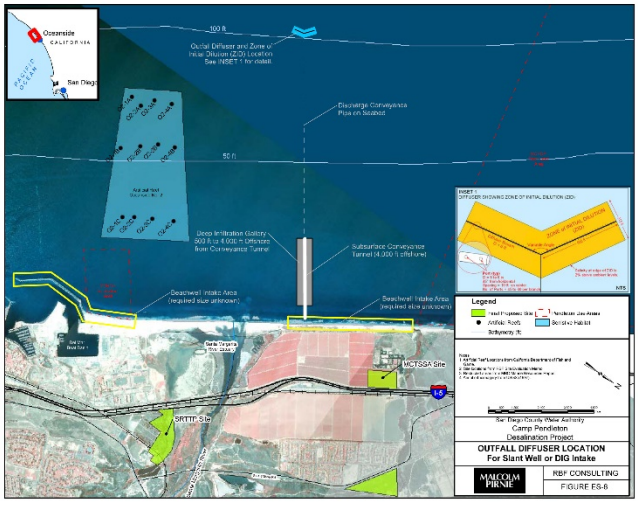
Kimley-Horn staff prepared the Regulatory Permitting Technical Memo as part of a comprehensive Feasibility Study for San Diego County Water Authority (SDCWA), evaluating numerous alternative sites, alternative intake methods, alternative brine discharge options, and alternative pipeline alignments. Key project elements and unique issues associated with this work effort included:

- 50 MGD Desalination Plant, designed for potential future expansion in 50 MGD increments to 150 MGD.
- Project-specific EIR/EIS will tier off of SDCWA's Regional Water Facilities Master Plan Program EIR.
- Numerous Technical Memoranda covering wide range of engineering, site planning, and environmental constraints.
- Facilities are sited at/near highly sensitive biological area including San Luis Rey River, Santa Margarita Estuary, and protected reef area.
- Consistency analysis for California Coastal Act (County and State LCP), as well as Camp Pendleton's Integrated Natural Resources Management Plan.
- Evaluation of over 15 alternative desalination sites.
- Alternative intake analysis included Open Ocean Intake (using passive wedgewire screens), Subsurface Intake Gallery, Deep Infiltration Gallery to limit ocean floor footprint, and Salant Wells.
- Alternative Discharge analysis included dual-use intake/discharge tunnels (pipe-in-pipe), and brine diffuser analysis.

Following the Feasibility Study, Kimley-Horn staff led the initial strategic work plan and agency scoping to obtain CEQA/NEPA clearance and regulatory permitting for desalination field studies at Camp Pendleton.

Key Staff:
Kevin Thomas *(project completed prior to joining Kimley-Horn)*





Coastal Water Project CEQA/NEPA and Regulatory Permitting, Monterey, CA

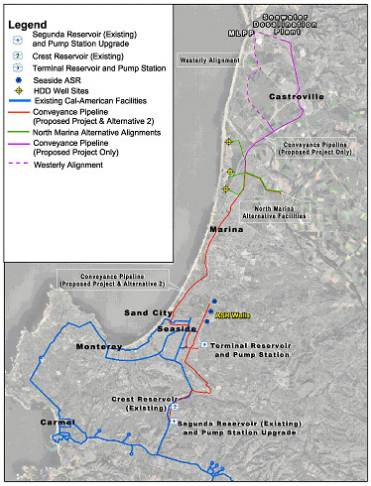
California American Water (CAW) is required to replace 10,730 acre-feet/year pumped from the Carmel Valley Aquifer with a new water supply source as a result of State Water Resources Control Board Order 95-10. To accomplish this, CAW is moving forward in the planning, permitting and engineering of a seawater desalination project called the Coastal Water Project (CWP). Kimley-Horn staff prepared the Proponent's Environmental Assessment (PEA) and provided permitting, EIR support and preliminary engineering for the CWP.

The CWP consists of a 10 million-gallon per day Desalination Plant near the Moss Landing Power Plant, conveyance pipelines, aquifer storage and recovery facilities, and related facilities. This $200 million project will include two booster stations, 24 miles of pipelines, and two reservoirs. A significant portion of the 36-inch diameter conveyance pipeline will be constructed along the former Southern Pacific Railroad alignment that was acquired by the Transportation Agency for Monterey County. The PEA includes a comprehensive range of engineering and technical studies. The preliminary design tasks defined the CWP's processes, systems, facilities, structures and transmission lines to a level that was used to quantify and qualify the information needed for the environmental assessment, cost estimates, and detailed design phase. The CWP included an extensive community involvement process, with over 50 public meetings were held during the initial phase of the project.

Kimley-Horn staff also provided regulatory permitting for the pilot plant, sited at MLPP, which required extensive coordination with the Regional Water Quality Control Board, Monterey County, California Coastal Commission, and California Energy Commission (for AFC Consistency Determination).

Kimley-Horn staff continued to provide environmental and regulatory permitting support for the CWP through 2015, as the project moved forward through the California PUC regulatory approval process. CPUC coordination included a wide range of desalination technical studies, including subsurface intake analyses, particle dispersion analyses as part of the pilot plant, brine injection modeling, and extensive alternatives analysis.

Key Staff:
Kevin Thomas
(project completed prior to joining Kimley-Horn)



Water and Wastewater Feasibility Study, Redding Rancheria Casino, Redding, CA

Coleman Engineering was retained by Analytical Environmental Services (AES) to prepare a wastewater management and drinking water feasibility study for the Redding Rancheria Casino (Casino) Environmental Impact Statement (EIS). This study includes estimated projections of wastewater flow, drinking water demand, and discussions regarding key wastewater and water facilities and services for the alternatives evaluated in the EIS.

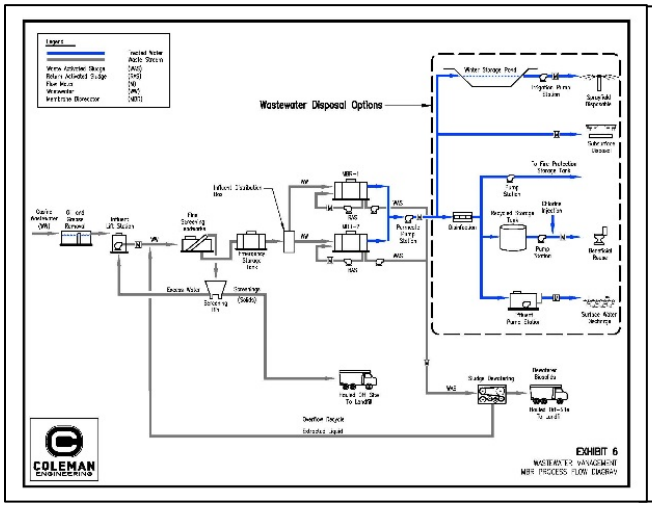
This study is a report on consideration of two sites along Interstate 5: A primary site adjacent to the City of Redding and an alternate site in the City of Anderson. For both sites, wastewater and water options include service from new and independent onsite facilities or from the local municipality (City of Redding for Alternatives A, B, C, and D or the City of Anderson for Alternative E). Alternative F entails the expansion of the existing Redding Rancheria Casino. Exhibit 1 shows the proposed Alternative site locations.

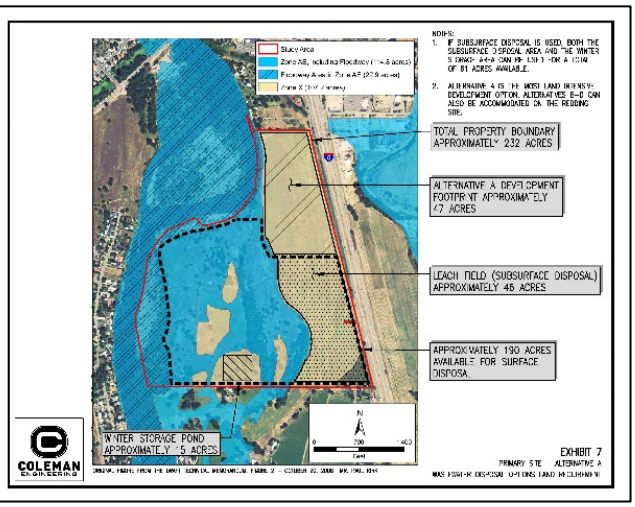
Reference:

Bibiana Alvarez
916-447-3479
balaverez@analyticalcorp.com

Key Staff:

Chad Coleman





Locke Arsenic Compliance, Locke Water Works Company, Locke, CA

Coleman Engineering was retained by the Locke Water Works Company to investigate alternatives that would bring the Locke Water System into Arsenic compliance with drinking water standards. The town of Locke by definition is a community, non-transient, small, rural water system. The project was Proposition 84 state funded and initially involved investigation of conventional coagulation filtration and adsorptive media treatments. A pilot study of 3 different types of adsorptive media was completed and after careful consideration of long term O&M and capital costs the decision was made to consolidate the Locke Water System with neighboring Sacramento County Water Agency (SCWA) in Walnut Grove. A 4,000-foot pipeline is in the process of being designed and constructed to consolidate with SCWA which involves a new force main between Locke and Walnut Grove and horizontal directional drilling under a county drainage canal.

References:

Clarence Chu
Locke Water Works Company
916-776-1684
ckchu52@comcast.net

Pete Stamas
SWRCB - PM
916-552-9983
pete.stamas@waterboards.ca.gov

Key Staff:

Chad Coleman

Water System Regulatory Consulting, Rancho Marina MHP, BWS Municipal Group

Coleman Engineering was retained by BWS Municipal Water Group to provided regulatory consulting to this small water system in need of arsenic treatment. State and County regulators issued Compliance Orders that included requirements for a Technical Report, documenting improvements that would be constructed and added to an existing treatment plant. Coleman Engineering wrote the required Technical Report and communicated effectively with regulators so that improvements were approved for addition to the system.

Reference:

Chris Beebe
BWS Municipal Group
530-722-4555
chris@bwsmunicipal.net

Key Staff:

Chad Coleman

Key Personnel

Chad Coleman, P.E., will be the designated Project Manager for the City of Fort Bragg. Chad R. Coleman, P.E. graduated from Brigham Young University with a Masters in Civil Engineering and has over 20 years' experience planning, designing, and managing construction of water and wastewater infrastructure and facilities, including; municipal wells, water treatment plants, water storage tanks, transmission and distribution piping, and pumping stations; as well as, wastewater collection system rehabilitation and design, wastewater lift stations and wastewater treatment plants. Chad distinguishes himself by providing outstanding client services that are punctuated with excellent and prompt written and verbal communications. He is dedicated to delivering projects, on-time and within budget.

"I appreciate that Chad is flexible - he can always meet the City's schedule. He understands a lot about our system because he's done a lot of work for us so he has institutional knowledge and he produces a quality product." – Chris Ehlers, Asst. Director of Public Works, City of Brentwood

John Potts, P.E., will be designated as the Project Engineer responsible for Reverse Osmosis Technologies. John Potts is recognized as one of the country's leading water experts in the field of advanced water treatment, and served as project director for one of the largest operating brackish water reverse osmosis plants in the country. With more than 40 years of experience of planning, designing, permitting, and overseeing water treatment projects through construction, he has the experience needed to determine the feasibility of treatment solutions and identify alternatives that are more practical and cost-effective.

Kevin Thomas, P.E., has over 30 years' experience in environmental compliance and permitting of major capital improvement and land development projects. He will be designated as the Project Engineer responsible for permitting and regulatory requirements. Mr. Thomas has managed the regulatory permitting program for several major desalination projects, having recently successfully completed the regulatory permitting effort for California American Water's Slant Test Well and Desalination Studies Field Surveys for Camp Pendleton and Montecito. Through active involvement in the industry and a keen understanding of regulatory agency issues and technical requirements, Kevin provides strategic guidance and implements regulatory permitting programs that achieve win-win solutions for desalination stakeholders.

Edward Hohlt, P.E., and ***Bryan Burnitt, P.E.,*** will be designated as project engineering support staff to aid in site and technical data collection. Mr. Hohlt has over 10 years of professional civil engineering experience with an emphasis on water treatment, filtration and media replacement. Bryan Burnitt has over 9 years of experience in water treatment, wastewater treatment, and water resources projects with an emphasis on water treatment and tertiary treatment.

References

Coleman Engineering

Chris Ehlers, Assistant Director of Public Works
City of Brentwood
925-516-6030

Bibiana Alvarez, P.E., Project Manager
Analytical Environmental Services
916-447-3479

Chris Beebe, Owner
BWS Municipal Water
530-722-4555

Pete Stamas, Project Manager
State Water Resources Control Board
916-552-9983

Eric Wier, Public Works Director
City of Crescent City
707-464-9506

Charles Palmer, District Engineer
Calaveras County Water District
209-754-3174

Kimley-Horn

Phil Lauri, PE, Assistant General Manager
Mesa Water District, Costa Mesa, CA
phill@mesawater.org
949-631-1291

Robert Yamada, Water Resources Director
San Diego County Water Authority
ryamada@sdcwa.org
858- 522-6740

Rick Shintaku, PE, Chief Engineer
South Coast Water District
rshintaku@scwd.org
949-499-4555, ext. 3156

Amanda Barnes, Assistant Director of Utilities
Town of Jupiter, FL
561- 741-2537

Shannon LaRocque, Utilities Director
Village of Wellington, FL
561-791-4008

Client Quotes

"Coleman Engineering always acted in the best interest of our District. They took their responsibilities seriously and their designs were effective in meeting the needs of the District." – Brenda Bonillo, District Secretary, Tuolumne City Sanitary District

"Our operations staff like Coleman's group and Chad is always very accommodating and very responsive to our questions. He does a really good job overall." – John Samuelson, Engineering Manager, City of Brentwood

"They're a small firm but really focused on the client, and they put out a quality product." – Gonzalo Rodriguez, Brookfield Residential

Scope of Work

Scope of Services

Client:	City of Fort Bragg
Project:	Brackish Water Desalination Plant Feasibility Study
Project Location:	Fort Bragg, CA
Summary of Services:	Feasibility Study
Utility Systems:	Potable Water

Project Background

The City of Fort Bragg (City, Client) requires a feasibility study for a small brackish water Reverse Osmosis (RO) desalination plant. The City is interested in exploring desalination as an option to supplement the City water supply due to a number of factors that may constrain the City's water supply in the future, including:

- Future development on the Mill Site may increase demand by up to 20%, which is approximately equal to 200,000 gallons per day.
- Climate change may result in a long-term change to the quality and quantity of annual rainfall.
- Climate change may result in sea level rise of up to 2.5-feet by 2050, which could lead to more salt water intrusion into the City's water collector on the Noyo River during periods of high tide and low river water flow. Because the City is currently unable to treat brackish water, this salt water intrusion would constrain the City's ability to use water from the Noyo River.
- Regulatory changes by the Department of Fish and Wildlife may further reduce City diversion rates or pumping periods on one or more of the surface water sources.

The purpose of the Scope of Services described below is for the Coleman Engineering team to assist the City by analyzing options, making calculations and projections, and summarizing findings in a Feasibility Study that may be used to guide City policy and planning for future capital improvements.

Services and Data to be Provided to Coleman Engineering by City

Prior to commencing pre-design services, the City will provide the following services and data to Coleman Engineering.

- Confirm all design assumptions listed above are valid and approved for inclusion in the study
- Confirm City Water Appropriations published in the RFP are correct and available for use in the study
- Confirm the current City WWTP Discharge Permit
- Provide detailed raw water quality information that should be considered for desalination
- Provide input on facility siting criteria, including knowledge of any specific available parcels, existing City domestic water transmission lines
- Provide available information on facility siting constraints, such as known/mapped sensitive resources or known groundwater pumping restriction zones
- Provide contacts for existing local, state and federal regulatory agency staff that the City has been working with on water supply or other issues (no third-party contacts would be made without prior City authorization and discussion)
- Existing WTP Site Plan showing available space and constraints to co-locating the RO Facility at this site

Scope of Services

TASK 1 – System Sizing

The Coleman Engineering team will work with the City of Fort Bragg to develop a "right sized" definition of a desalination package that offers the technical capability to meet the City's future water needs, given: 1) the anticipated water demand for existing and future development; 2) potential changes to current water supply that result from climate change; and 3) potential regulatory changes that may further restrict available water supplies.

This task will include a Kick-Off Meeting at the City with the Coleman Engineering project manager. The purpose of the meeting will be to transfer as much information and data as possible from the City to the team. In addition, site visits to the wet well, the existing water treatment plant, and the Noyo River locations will be made.

Based on telephone discussions with City staff and based on the site visit above, the Coleman Engineering team will develop the conceptual definition of the target desalination package that includes the following basic criteria:

- Flow

- Influent raw water quality assumptions
- Effluent treated water quality assumptions
- Waste stream water quality assumptions
- Site requirements

Task 1 Deliverables:

- *System Sizing Technical Memo*

Task 1 Information to be Provided by the Client, if available:

- *Influent raw water quality data*
- *Effluent water quality requirements*
- *Information on any potential RO-WTP sites that the City would like considered in the analysis*

TASK 2 – Regulatory Issues

The Coleman Engineering team will prepare an overview of the regulatory process, challenges, and ROM permitting costs for a small brackish water desalination facility located within the California Coastal Zone. The focus of this task will be to provide an understanding of the agencies which would have authority over the project, what permits would be required, what studies would need to be completed, a general timeline for the permitting process, and an overview of the primary regulatory issues.

Key agencies anticipated to be referenced for this task include the California Coastal Commission, State Lands Commission, Regional Water Quality Control Board, State Water Resources Control Board, California Department of Water Resources Division of Drinking Water, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers.

This task will identify potential regulatory constraints and issues to be further defined, as well as environmental resource benefits of the project which should facilitate the regulatory approval process. In addition to providing water security for the City of Fort Bragg by developing a hydrologically independent and locally controlled water supply that avoids many of the reliability and regulatory constraints associated with current surface water supplies, the project's potential environmental benefits include reducing pressure on existing surface water supplies (these limited surface water supplies are often constrained by setting aside minimum flows for wildlife resources) and ensuring a safe, reliable water supply for local agriculture, businesses and residences.

The Coleman Engineering team will identify agencies that require consultation and coordination together with permits that are anticipated to be required. This permitting information will be coupled with anticipated timelines for project design and

development to create an integrated project development schedule. This task will include recommended strategies to minimize regulatory permitting risk, and optimize the overall project development process, including identification of critical path and interdependent tasks where multiple agencies are involved.

Task 2 Deliverables:

- *Regulatory Issues Technical Memo*

TASK 3 – Wet Well Analysis

The Coleman Engineering team will analyze the feasibility of utilizing and existing wet well as the water source for the brackish water desalination plant. The wet well provides 800 gallons per minute, or 1.1 million gallons per day. The Coleman Engineering team will assess and describe physical challenges to using this water source.

Much of the analysis will be based on the site visit described above in Task 1. Because the target flow rate for the RO plant is 200,000 gpd, the size and capacity of the wet well is not in question. This analysis will focus on other issues such as:

- Site opportunities and constraints
- Location relative to other potential infrastructure that is likely to be required
- Other sites that may be more advantageous
- Stability of water quality
- Durability of structure in salt water environment

Task 3 Deliverables:

- *Wet Well Analysis Technical Memo*

TASK 4 – Schematic Design

The Coleman Engineering team will prepare a schematic design for the facility that emphasizes flexibility, and possibility a modular system so that the system can be increased in size as demand warrants and/or operated at below maximum capacity to reduce costs associated with desalinized water when it is not needed.

The schematic design will be depicted using the following two conceptual level drawings:

- Conceptual Process Flow Diagram
- Conceptual Site Plan

The purpose of these conceptual drawings will be to provide a very basic understanding of the anticipated facility that should be planned. This level of design will aid in the determination of the likely costs of the planned facility as well as site planning goals that should be considered in the future.

Task 4 Deliverables:

- *Conceptual Process Flow Diagram*
- *Conceptual Site Plan*

TASK 5 – Technical Issues

The Coleman Engineering team will identify and analyze technical issues associated with the conceptual desalination project including consideration of the following topics:

- Brackish raw water intake and conveyance to the RO Facility
- Power requirements and sources
- Alternative power supply options (such as solar PV, fuel cells, natural gas fired turbines)
- Plant siting analysis (anticipated to consist of an initial preliminary screening of up to 5 sites based on siting criteria to be developed in coordination with the City)
- Connecting the plant with the existing City water collection storage and treatment system
- Brine waste discharge, treatment and/or disposal (including adequacy of the existing WWTP ocean outfall both in terms of capacity and diffuser capability to meet Ocean Plan salinity requirements)
- Product water quality and blending considerations, including potential effects on the existing WWTP NPDES permit

Technical issues will be non-site specific since site selection is not a part of this study. Instead, the analysis and discussion for this task will be conceptual only and will address characteristics that may be critical to the success of a future RO Facility but will not address how those characteristics apply to a specific site.

Task 5 Deliverables:

- *Technical Issues Technical Memo*

Task 5 Information to be Provided by the Client, if available:

- *Identification of the location and sizing of existing wastewater treatment and disposal infrastructure*
- *Identification of the location and sizing of existing water supply, treatment, and transmission infrastructure*
- *Identification of any City owned properties that should be considered as potential plant locations*

TASK 6 – Construction Cost Estimate

The Coleman Engineering team will prepare a conceptual level opinion of probable construction cost (OPCC) for the construction and installation of the plant.

This OPCC will be suitable for use in setting budgets for future studies and planning but will not include sufficient detail to set actual construction budgets. The purpose of this OPCC will be to help City Officials to understand order of magnitude level costs so that future planning and design activities can be reasonably considered.

This task will also include a brief discussion of available funding and project delivery methods, including potential for state or federal grants or low interest loans, as well as public/private partnerships or design/build.

Task 6 Deliverables:

- *Conceptual Level Opinion of Probable Construction Cost*

TASK 7 – Operating Cost Estimate

The Coleman Engineering team will prepare a conceptual level opinion of annual operating cost that provides a detailed understanding of how the facility will impact maintenance and operations costs in terms of labor, maintenance and power costs for the City's Water Enterprise.

This conceptual level opinion of annual operating cost will be suitable for use in setting budgets for future studies and planning but will not include sufficient detail to set actual operating budgets. The purpose of this conceptual level opinion of annual operating cost will be to help City Officials to understand order of magnitude level costs so that future planning and design activities can be reasonably considered.

Task 7 Deliverables:

- *Conceptual Level Opinion of Annual Operating Cost*

Task 7 Information to be Provided by the Client, if available:

- *Unit costs for City staff that should be used in the analysis*
- *Staffing level*
- *Administration costs included in water production costs*
- *Any remaining capital repayment burden in water production costs*

TASK 8 – Compile Final Feasibility Study and Presentation

The Coleman Engineering team will compile the deliverables described in the tasks above into a single report. The report will not include any unique or reformatted text

but will be an assembly of the memos, and deliverables produced in the tasks above. It is anticipated that the report will be organized using the memos above in the following order:

- System Sizing Technical Memo
- Regulatory Issues Technical Memo
- Wet Well Technical Memo
- Conceptual Site Plan
- Conceptual Process Flow Diagram
- Technical Issues Technical Memo
- Conceptual Opinion of Probable Construction Cost
- Conceptual Opinion of Annual Operating Cost

Following preparation of the Final Feasibility Study, Coleman Engineering will attend one City Council Meeting to assist City Staff in making a presentation to the Council to summarize the findings of the study.

Task 8 Deliverables:

- *No independent deliverables to be produced in Task 8. Task 8 will only include assembly of previously prepared deliverables.*

<u>Tasks Not Included in this Scope of Services</u>

This Scope of Services is intended to outline the services offered to the Client by Coleman Engineering. The list below is offered as a clarification of the services that are not included, not anticipated, or that will be completed by others.

1. No detailed design is included in this phase of the services. No plans or specifications will be prepared during this phase.
2. Coleman Engineering CAD standards to be used.
3. The only coordination for approvals that will be made are with the City of Fort Bragg. No other agencies will be consulted, coordinated with, or sought out for approvals.
4. Neighborhood meetings and public relations activities are not included in the scope of services.
5. Pipeline modeling, including surge analysis, is not anticipated to be required and is not provided.
6. CEQA/NEPA review or other environmental consulting including environmental technical studies or field surveys (may be coordinated under a separate contract).
7. Permit applications and necessary services to prepare, process or obtain permits, including meetings and fees, are not included in this scope of services. This includes CEQA, NEPA and CA-DDW approvals for the project.

Supporting Materials

Project Approaches

In order to successfully and economically accomplish the engineering services described above and to produce a study that accomplishes the purposes of the City, the Coleman Engineering team has anticipated a number of specific approaches to the project. We plan to carefully implement the following project elements for the benefit of the City.

Raw and Treated Water Considerations

According to information we discussed with the City in preparation for the project, we understand the brackish water supply to be relatively lightly concentrated. This means that brackish water treatment should be relatively economical when compared with treating more concentrated brackish water or seawater.

Given the light concentration of salts, we anticipate that a recovery rate of up to 87% should be possible which would result in a 6x concentration of inorganics in the waste stream. Using these assumptions and the raw water quantity and quality data provided by the City, we have calculated the following influent, effluent, and waste stream characteristics for the RO Facility.

Constituent	MCL	Raw Water Measurements	Treated Water Calculations	Waste Stream Calculations
Flow (gpm)	n/a	160	139	21
Iron (mg/L)	0.3	0.18	0.05	1.08
Manganese (mg/L)	0.05	0.18	0.05	1.08
Odor (TON)	3	ND	ND	ND
Silver (mg/L)	0.1	ND	ND	ND
Sulfate (mg/L)	250	98	25	588
Zinc (mg/L)	5	0.021	0.01	0.126
TDS (mg/L)	500	838	212	5,028
pH	6.5-7.5	7.5	7.5	7.5

There are a number of conclusions and related benefits that can be deduced from a brief analysis of this data. Most notable is the economy of treating this brackish water. Because the TDS is measured at only 838 mg/L, the treatment level and associated power demand will be relatively low.

An RO plant to produce this amount of permeate can be installed in an area approximately 750 square feet (excluding employee parking and nominal appurtenances). Our team has ample experience in siting, layout, and configuration of RO units and will try to locate the RO unit at an existing City-owned property, ideally in close proximity to or at the existing WWTP, to provide better control of the blending operation as well as reduce operating requirements by co-using existing disinfection, control and maintenance facilities.

Ocean Outfall Considerations are also likely to be significantly influenced by the information summarized in the table above. None of the constituents listed in the table above are regulated in the WWTP WDR's (ORDER NO. R1-2015-0024, NPDES NO. CA0023078). Given the very small projected flow rate of 21 gpm, it is likely that there will be no adverse technical issues associated with using the existing outfall pipe as a means of disposal for the RO Facility waste stream. Certainly, it is likely that there will be permitting implications and other non-technical issues associated with use of the existing ocean outfall, but given the preliminary assessment of the technical issues, we anticipate that use of the existing ocean outfall is likely to be advantageous and consistent with regulatory agency preferred discharge method.

The 2015 **California Ocean Plan** (Desalination Amendment) will guide many of the permitting and regulatory approaches that the City will be required to pursue in the development of any RO Facility resulting in a waste stream that reaches the ocean. Compliance with plan requirements may not be difficult given the low flow and low concentrations of contaminants, and given the lack of biological constituents that could have the potential to affect the discharge of treated domestic waste already in the outfall pipeline.

A quantitative assessment of the outfall's ability to meet NPDES and Ocean Plan requirements could be prepared under separate scope, which will be an important component of any future project permitting and CEQA review process.

Budget and Schedule of Charges

Coleman Engineering will provide the services outlined in the scope of work on a Time & Materials basis, not to exceed $35,000, according to the terms of payment outlined in the Agreement. The current billing rates of key team members likely to participate on this project are itemized in the table below.

Classification	Billing Rates
Senior Professional I	$325
Senior Professional II	$275
Principal Engineer	$196
Project Manager	$184
Senior Planner	$180
Project Engineer	$155
Staff Engineer	$130
Planning Support Staff	$100
CAD Drafter/Designer	$114
Administration/Graphics	$105
Project Technician	$104
Project Assistant	$83
Engineering Intern	$80

- Billing rates and expense charges are subject to annual update.
- Hourly rates include Indirect Costs such as general computers, telephone, fax, routine in-house reproductions, first class letter postage, miscellaneous supplies, and other incidental general expenses.
- Direct Costs of services and materials such as vendor reproductions/prints, shipping, major in-house Coleman Engineering reproduction efforts, travel expenses, special engineering supplies, etc. will be billed at actual cost plus 10%.
- Sub-Consultants will be billed at actual cost plus 10%.
- Mileage will be billed at the current Federal Rate ($0.535/mile as of Jan. 1, 2017)
- Computer charges are included in the Standard Hourly Rates for those employees and contract personnel assigned to use such specialty hardware and software.
- Billing rates apply to all computers and equipment, whether owned or rented by Coleman Engineering, and to all employment categories including regular full-time, part-time, limited term and contract personnel, etc.
- A finance charge of 1.5% per month (an annual rate of 18%) on the unpaid balance will be added to invoice amounts if not paid within 45 days from the date of the invoice.

Work Schedule

It is understood that the City expects execution of a contract by November 2017 and will then immediately authorize Feasibility Study services. We anticipate the following milestone schedule will be followed to achieve project goals.

Milestone	Projected Date
Execution of Agreement	November 2017
Site Visit and Kick-Off	December 2017
Complete Drafts of Technical Memos and Deliverables	January 2018
Internal Review and Quality Control of Deliverables	February 2018
Submit Final Feasibility Study	March 2018
Presentation to the City Council	March 2018

This schedule is based on information from City Staff that indicates no urgency or deadlines. In the event that the City determines a specific need to meet a milestone, or a desire to speed up the schedule, Coleman Engineering will be glad to work with the City to move up the milestone dates and meet the City's desires.

Insurance

The following certificates of insurance have been provided in accordance with the agreement and request for qualifications and shall be maintained for the duration of the anticipated contract.

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/10/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Randy Gardner
Gardner Insurance & Financial Services 8035 Madison Ave #D2 Citrus Heights CA 95610	PHONE (A/C, No, Ext): 916-965-4690 FAX (A/C, No): 916.965.5068 E-MAIL ADDRESS: rgardner@farmersagent.com

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
COLEMAN ENGINEERING INC 1358 BLUE OAKS BLVD, STE 200 ROSEVILLE CA 95678	INSURER A: Truck Insurance Exchange	21709
	INSURER B: Farmers Insurance Exchange	21652
	INSURER C: Mid Century Insurance Company	21687
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
B	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC			604791716	01/18/2017	01/18/2018	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 2,000,000 $ 75,000 $ 5,000 $ 2,000,000 $ 4,000,000 $ 2,000,000
B	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS HIRED AUTOS X SCHEDULED AUTOS X NON-OWNED AUTOS			604791716	01/18/2017	01/18/2018	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 2,000,000 $ $ $
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			605122863	01/18/2017	01/18/2018	EACH OCCURRENCE AGGREGATE	$ 1,000,000 $
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: Y N/A If yes, describe under DESCRIPTION OF OPERATIONS below			A09327740	07/01/2017	07/01/2018	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

1358 BLUE OAKS BLVD, STE 200, ROSEVILLE, CA 95678

CERTIFICATE HOLDER	CANCELLATION
City of Fort Bragg its officials, officers, employees, agents, and vo 416 N. Franklin Street Fort Bragg CA 95437	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE Randy Gardner

ACORD 25 (2010/05)

POLICY NUMBER: 604791716

BUSINESSOWNERS
BP 04 48 01 97

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

BUSINESSOWNERS POLICY

SCHEDULE*

Name Of Person Or Organization: CITY OF FORT BRAGG ITS OFFICIALS, OFFICERS, EMPLOYEES

* Information required to complete this Schedule, if not shown on this endorsement, will be shown in the Declarations.

The following is added to Paragraph **C. Who Is An Insured** in the Businessowners Liability Coverage Form:

4. Any person or organization shown in the Schedule is also an insured, but only with respect to liability arising out of your ongoing operations or premises owned by or rented to you.

Client#: 42909 COLEENGI

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/10/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Nicole Larsen	
Greyling Ins. Brokerage/EPIC 3780 Mansell Road, Suite 370 Alpharetta, GA 30022	PHONE (A/C, No, Ext): 770-552-4225	FAX (A/C, No): 866-550-4082
	E-MAIL ADDRESS: Nicole.Larsen@greyling.com	
	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A : Atlantic Specialty Insurance Co	27154
INSURED Coleman Engineering, Inc 1358 Blue Oaks Blvd., Ste 200 Roseville, CA 95678	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER: 17-18** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	☐ UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	☐ EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ PER STATUTE ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ N / A						E.L. EACH ACCIDENT	$
	(Mandatory in NH)						E.L. DISEASE - EA EMPLOYEE	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - POLICY LIMIT	$
A	Professional Liability			DPL613117	01/18/2017	01/18/2018	Per Claim $1,000,000 Aggregate $2,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

City of Fort Bragg
its officials, officers, employees, agents
& volunteers
416 N. Franklin Street
Fort Bragg, CA 95437

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

NLAR1

Consultant Agreement

We appreciate the opportunity to review the City's Professional Services Agreement. Our primary concern with all contract considerations is that we execute a document that maintains full compliance with the terms of our Professional Liability Insurance so that in the unlikely event that there is a need for the City to seek recovery for negligent services by Coleman Engineering, the City will have the full benefit of our insurance. Likewise, the insurance will protect Coleman Engineering by providing the financial remedy without bankrupting the company.

In that spirit, we asked our Professional Liability Insurance carrier to review the City's Professional Services Agreement and note any parts that require edits to maintain consistency with the coverage terms. We will look forward to discussing edits to the following sections prior to execution of the agreement.

Section	Purpose
Section 5	Add "Force Majeure" language making clear that the Consultant is not liable for delays caused by factors out of the Consultants control.
Section 9a	Add minor wording to clarify the Consultant is liable for *negligent* failure to comply with laws, regulations, etc.
Section 12	There are a few edits required to the first paragraph in order to bring it into compliance with California State Law and with the terms of Professional Liability Insurance. The main principles that need to be addressed include: • Removal of the requirement to defend the City • Modifying attorneys' fees to be *reasonable* • Adding comparative liability • Tying the Consultants liability and indemnity to *negligent acts, errors and omissions* • Removing the limitation that the City is only liable for its "sole" negligence so that comparative liability is consistent
Section 13a	Modify the language to make it clear that "occurrence coverage" is not applicable to Professional Liability insurance which shall be on a "claims made" basis.
Section 13h	Make clear that the insurance requirement is $1M per claim and $2M annual aggregate and that professional liability insurance is only applicable to *negligent* errors and omissions.

Appendix A – Resumes

Chad Coleman	Project Manager
John Potts	Project Engineer
Kevin Thomas	Project Engineer
Edward Hohlt	Project Engineer
Bryan Burnitt	Project Engineer

Chad R. Coleman, P.E.

Principal Engineer

Education

M.S., Civil Engineering
Brigham Young University

B.S., Civil Engineering
Brigham Young University

Registrations

Professional Engineer # 56490, CA

Professional Engineer # 8964, ID

Professional Engineer # 188915, UT

Professional Engineer # 16990, NV

Water Treatment Plant Operator, CA, Grade 3

Professional Affiliations

American Public Works Association

American Water Works Association

Water Environment Federation

Sacramento Area Water Works Association

Mountain Counties Water Resources Association

California Water Environment Association

Special Certifications

Completed Risk Assessment Methodology for Water Utilities (RAM-W™) Training Course sponsored by AWWA

Certified Grant Administrator, Idaho

Chad has over twenty years of experience planning, designing, and managing construction of water and wastewater infrastructure and facilities. He is experienced with the planning, design, and construction management of municipal wells, water treatment plants, water storage tanks, transmission and distribution piping, and pumping stations; as well as wastewater collection system rehabilitation and design, wastewater lift stations and wastewater treatment plants.

Chad distinguishes himself by providing outstanding client service that is punctuated with attention to excellent written and verbal communications.

Selected Project Experience

Experience Detail - Water Projects

Water System Regulatory Consulting, Rancho Marina Mobile Home Park, Isleton, CA: Project Manager responsible for a Technical Report documenting improvements that would be constructed and added to an existing treatment plant under s Sacramento County Compliance order. Coleman Engineering wrote the required Technical Report and communicated effectively with regulators so that improvements were approved for addition to the system.

Water and Wastewater Feasibility Study, Redding Rancheria Casino, Redding, CA: Project Manager responsible to prepare a wastewater management and drinking water feasibility study for the Redding Rancheria Casino Environmental Impact Statement. Study included estimated projections of wastewater flow, drinking water demand, based on several different casino build out options.

Arsenic Treatment, Funding, Planning and Design, Locke Water Works Company: Principal in Charge responsible to provide planning, secure SRF funding, design, and manage construction of a wellhead arsenic treatment plant. Preliminary engineering included management of a pilot study that met the requirements of the State of California funding guidelines. Following the pilot study, the Client chose to connect to a neighboring water system.

Sunset Water Treatment Plan Filter Media Replacement, Placer County Water Agency, Auburn, CA: Project Manager responsible to provide technical assistance to PCWA on the replacement of filter media in an existing water treatment plant. Specialty services

included a site visit and discussion with operations staff, an assessment of current conditions, and recommendations and technical specification writing required to assist the Agency in obtaining the new filter media they needed.

Alta Water Treatment Plant Improvements, Placer County Water Agency, Auburn, CA: Project Manager for the pre-design and design of multiple improvements to an existing water treatment plant located in Alta, CA. Improvements that required assessment and design to increase maximum plant flow rate included: new raw water pumps and MCC with VFD's, influent strainer, static mixer, influent raw water meter and rate of flow control valve, new pressure filters with air scour systems, backwash pump, in-plant water system and new genset with ATS.

Casino Wastewater Treatment and Disposal Feasibility Study and Preliminary Design, Yuba County, CA: Principal in Charge for the preliminary design of a wastewater treatment and disposal system to serve a casino in Yuba County, CA. The project was preliminary designed to include a 0.6 MGD onsite MBR wastewater treatment plant and a recycled water storage tank and booster pump station. Title 22 tertiary treated and disinfected effluent was planned to be used for toilet and urinal flushing, plant water, construction water, and landscape irrigation.

Airpark 599 Wastewater Feasibility Study for **Treatment and Disposal Planning, San Joaquin County, CA:** Principal in Charge retained by San Joaquin County to prepare a preliminary design report for the construction of a 90,000 gpd packaged onsite MBR wastewater treatment plant, a 5-acre seasonal storage pond, and 40 acres of spray field.

Well 8 Replacement and Site Improvements, City of Brentwood, CA: Project Manager responsible for two phases of this project: management including permitting, management of subconsultants, and coordination with other City staff improvements as an extension of City staff; followed by design of well and site piping improvements.

Well 15, City of Brentwood, CA: Project Manager responsible for civil and mechanical design of a new well site for the City. The new well facility is capable of 1,000 gpm. Ancillary facilities include an emergency generator and chlor-amination equipment.

Water System Improvements, Harrah's Rincon – San Diego County, CA: Project Manager responsible for the pre-design and preparation of design-build bid documents for water system improvements that included: a new 650 gpm well and well pump, a 200,000 gallon water storage tank, a new booster pump station, relocation of an existing filter system, and associated yard piping. The well included sodium hypochlorite disinfection design.

Kimley»Horn

Professional Credentials

- Bachelors of Science, Mechanical Engineering, University of South Alabama
- Professional Engineer, Florida No. 22881
- Professional Engineer, Louisiana No. 18625

Professional Affiliations

- American Membrane Technology Association
- American Water Works Association (AWWA))

John Potts, P.E.

Technical Issues Task Manager

John Potts is recognized as one of the country's leading water experts in the field of advanced water treatment, and served as project director for one of the largest operating brackish water reverse osmosis plants in the country. With more than 40 years of experience of planning, designing, permitting, and overseeing water treatment projects through construction, he has the experience needed to determine the feasibility of treatment solutions and identify alternatives that are more practical and cost-effective.

John is particularly recognized for his expertise in membrane technology for reverse osmosis and desalination. He served for 17 years on the Board of Directors for the American Membrane Technology Association, was Chairman of the American Water Works Association Desalting Committee, and a board member and founding member of the Southeast Desalting Association. He as the recipient of a 2015 Special Recognition Award from the Southeast Desalting Association, and was the recipient of the Hall of Fame Award from the American Membrane Technology Association.

Relevant Experience

Palm Beach County Water Utility- Water Treatment Plant No. 3 Membrane Replacement and Train Modifications, Palm Beach County, FL — Project Manager for a project that included pilot testing replacement membranes, recommending replacement membranes, and developing modifications to the existing reverse osmosis (RO) train, support facilities, and configurations. The study found that there would be substantial reduction in operating costs if the membranes were replaced and the RO train array/configuration changed to produce more drinking water. The study also found that the water plant support components could produce the additional water with very little cost in capital improvements.

Indian River County Utilities Membrane Replacement and Water Treatment Plant Improvements, Fort Pierce, FL - QA/QC Reviewer for a project to provide technical support and oversight of membrane replacement and improvements to improve efficiency and water quality. Kimley-Horn is reviewing membrane replacement options which will reduce fouling potential, improve water quality, and increase recovery while lowering overall operating costs. A significant amount of raw water bypass is used, which contributed to an increase in disinfection byproducts. Through better membrane selection, overall finish water quality should be improved without requiring major equipment changes and an increase in overall operating costs.

Town of Jupiter Island Brackish Water Reverse Osmosis Water Treatment Plant Design/Build, Jupiter, FL — Project Manager and Project Director for a program that involved preliminary planning, water withdrawal permitting, well construction, concentrate discharge permitting, water plant basis of design documents, construction of an ocean outfall for concentrate disposal, water plant construction, and water plant start-up. This program encompassed approximately five years and resulted in a reverse osmosis water treatment facility with a production capacity of 2.0 MGD (million gallons per day), expandable to 4.0 MGD.

Tropical Farms Reverse Osmosis/Water and Wastewater Treatment Plant Expansion, Stuart, FL — Quality Assurance/Quality Control Officer for the expansion of Tropical Farms Water Treatment Plant. As part of a team for expansion of Martin County's 6.8 MGD reverse osmosis (RO) treatment plant. Kimley-Horn is providing all phases of design, permitting, construction, and SCADA system integration for the RO water treatment expansion.

City of Fort Myers Membrane Water Treatment Plant, Fort Myers, FL — Project Manager for investigation of operational and construction issues for the conversion of a three stage 12.0 MGD nanofiltration plant to a brackish water two-stage 12.0 MGD Reverse Osmosis process. Replacement and reconfiguration of the membranes included using ultra low-pressure RO membranes. Also, several additional engineering tasks essential in the WTP conversion included construction of an 80,000-gallon clearwell, the relocation of the existing degasifiers, installation and implementation of a new automated brackish raw water supply system, and integration of independent concentrate control valves on each of the three process trains; all while maintaining operation of the facility.

Okeelanta Membrane Water Treatment Plant, South Bay, FL — Project Director in charge of design, permitting, and construction of a 750,000 GPD membrane treatment facility. The water plant produces boiler feed, process quality, and potable water simultaneously. The fast-track design included groundwater wells, pretreatment, membrane treatment, degasification of membrane product water, ion-exchange units for final polishing, and treatment and disposal of membrane concentrate to a percolation pond.

Dixon Water Treatment Plant Reverse Osmosis Improvements, Jacksonville, NC - Project Engineer for an expansion to Onslow Water and Sewer Authority's (ONWASA) Dixon WTP to improve water quality and process reliability. This expansion added 3.0-MGD of treatment using the reverse osmosis (RO) process to remove silica and iron and reduce and total organic carbon. The RO expansion included three 1.0-MGD trains and the permeate produced by these trains will be blended with water treated by the existing iron removal process on a 3-to-1 ratio. The existing raw water delivery pumps are being kept in service; the concentrate stream is being treated for iron oxidation/settlement and then being discharged with the existing backwash, and the RO trains are being installed in the existing building. To prove that the iron and silica would not scale or foul the membranes, Kimley-Horn designed a pilot unit and then operated the unit for 16 weeks using raw water without pretreatment for iron removal. The plant is under construction with Kimley-Horn providing water treatment design, National Pollutant Discharge Elimination System (NPDES) permitting, and pilot testing.

Harbor Branch Reverse Osmosis Water Treatment Plant, Fort Pierce, FL – Project Manager for the planning, design, permitting, and construction phase services for the Harbor Branch Oceanographic Institute's (HBOI) expansion of its existing reverse osmosis water treatment plant (ROWTP) from a capacity of 33,780 GPD to 66,000 GPD. HBOI owns and operates a ROWTP that converts surficial aquifer water to drinking water to serve their main campus. HBOI intended to increase capacity to meet the growing demands of the facility. Kimley-Horn performed a due diligence review of the existing ROWTP and was able to identify and recommend improvements that would both increase the plant's capacity and make the operations of the plant more cost effective. The proposed improvements have been designed in phases in order to immediately increase the capacity of the existing facility while planning and designing for the complete expansion of the facility. Kimley-Horn was also responsible for modifying the plant's existing water use and industrial wastewater permits to reflect the increase in the plant's capacity.

Kimley»Horn

Professional Credentials

- Bachelors of Arts, Environmental Engineering, University of California, Los Angeles, CA
- Certified Environmental Professional, 99040383
- ENVISION Sustainability Professional (ENV SP)

Professional Affiliations

- California Association of Environmental Professionals (AEP), AEP 2018 Conference Planning Committee
- National Association of Environmental Professionals (NAEP)
- ARTBA Environmental Committee, Co-Chair Environmental Committee, Chair NEPA Subcommittee (Federal Issues Oversight)
- American Consulting Engineers Council (ACEC), California Chapter, Land Use, Environmental, and Sustainability Committee
- CalDesal, Chair, Regulatory Working Group
- American Water Works Association (AWWA), California and Nevada, Desalination Committee

Kevin Thomas, CEP, ENV SP

Environmental Permitting Task Manager

Kevin Thomas has over 30 years of experience in the environmental compliance and permitting of major capital improvement and land development projects, specializing in the strategic guidance, preparation, and peer review of California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents and regulatory permitting programs. Kevin has managed the regulatory permitting program for several major desalination projects, having recently successfully completed the regulatory permitting effort for California American Water's Slant Test Well and Desalination Studies Field Surveys for Camp Pendleton and Montecito (see discussion below). Through active involvement in the industry and a keen understanding of regulatory agency issues and technical requirements, Kevin provides strategic guidance and implements regulatory permitting programs that achieve win-win solutions for desalination stakeholders.

Industry Involvement

Kevin has unique insight into the desalination industry and CEQA/NEPA practice through taking an active leadership involvement in the professional organizations noted above. On behalf of desalination clients and through industry involvement, Kevin has provided input, strategic guidance, peer review and policy recommendations on such key desalination topics as the Ocean Protection Council's previously proposed Once-through Cooling Resolution, proposed amendments to the Marine Life Protection Act, various Ocean Plan amendment provisions, desalination sections for the California Water Plan, regulatory efforts such as current federal legislation to amend the Clean Water Act and Clean Air Act, and proposed legislative efforts such as SB-42. As a founding member of CalDesal (the State's only ocean desalination advocacy group) and conference chair of two ocean desalination conferences, Kevin truly has exceptional insight into California's desalination CEQA/NEPA compliance and regulatory permitting.

Relevant Experience *(* = prior to joining Kimley-Horn)*

Montecito Desalination Facility Feasibility Study and Permitting, Montecito, CA - Project Manager and CEQA/Permitting Task Manager to evaluate various potential desalination facility alternatives for the Montecito Water District. The work program has included a Desalination Feasibility Study, community meetings, and an extensive analysis of various alternative subsurface intake sites, design and technology options. The District was considering a subsurface intake facility producing from 1 to 3 MGD. Kevin Thomas led the regulatory permitting process for processing geophysical survey permits and initiated full-scale facility stakeholder outreach and regulatory permitting.

Doheny Desalination Project, Dana Point, CA - CEQA and Regulatory Permitting Manager for preparation of an EIR for South Coast Water District, addressing a proposed 5-15 MGD desalination facility for the purposes of developing a reliable water supply portfolio. The project proposes state-of-the-art subsurface intakes, brine diffusers and on-site renewable energy to minimize environmental impacts. Current efforts include facilitating a multi-agency regulatory permitting briefing and pre-application program running concurrently with the CEQA process, assisting the District in obtaining State funding for the project, and initiating regulatory permitting to

expedite overall project approval. Prior to the current EIR task, Kevin served as Regulatory Permitting Task Manager for one of the project's earlier Feasibility Studies.

Morro Bay Desalination Facility Regulatory Permitting Support, Morro Bay, CA –Assisted the City in processing a revised Coastal Development Permit with respect to existing and future operations of its existing desalination facility, which includes vertical beach wells and brackish water wells. The facility primarily operates as an emergency water supply source, capable of delivering approximately 1,226 acre-feet per year of potable water.

***Monterey Peninsula Water Supply Project, California American Water Company, Monterey, CA** - Following earlier work on the "Coastal Water Project" (see below), Kevin Thomas provided CalAm with strategic regulatory permitting and CEQA/NEPA support for this project. The work efforts include coordination with the CPUC's EIR consultant on the full-scale project, full-scale regulatory permitting strategy, and providing various CEQA/NEPA and regulatory permitting support services for nearshore geotechnical borings, a Test Slant Well at Cemex, a Test Slant Well at Potrero, and construction monitoring support for the Cemex Slant Test Well. Kevin served as CEQA/NEPA compliance and regulatory permitting lead for the initial desalination pilot facility at Moss Landing, and the initial Test Slant Well which was successfully permitting and constructed in Marina, CA.

***Emergency Water Supply Project, Cambria Community Services District, Cambria, CA** - Provided periodic strategic support for current regulatory permitting and CEQA compliance work for an emergency water supply project, which includes brackish water desalination. The permitting included a CEQA Exemption under the Governor's 2014 drought proclamation, expedited emergency permit application processing, and concurrent preparation and processing of an EIR and "regular" permits post construction. Previous to the Emergency Water Supply Project, Kevin helped provide CEQA/permitting support for the District's full-scale desalination project EIR and Water Master Plan Program EIR.

West Basin Municipal Water District Ocean Desalination Project EIR, El Segundo, CA - CEQA/NEPA and Regulatory Permitting Task Manager to provide CEQA and regulatory permitting guidance for a 20-60 MGD ocean desalination facility. The project is being developed for the primary purpose of ensuring a locally controlled, drought-proof water supply. Kevin previously managed the EIR for the District prior to joining Kimley-Horn.

West Basin Municipal Water District Desalination Program Full-Scale Feasibility Study, Redondo Beach, CA - Project Manager for a comprehensive planning and engineering feasibility study for the District's full-scale ocean water desalination program. The desalination plant would provide a minimum 25 MGD for the District's member agencies. The work effort includes preparing multiple conceptual site plans, evaluating site constraints, investigating alternative sites, developing regulatory permitting strategies, and preparing conceptual visual impact studies.

***West Basin Municipal Water District Desalination Program Demonstration Facility, Redondo Beach, CA** - As subconsultant, Kevin Thomas provided regulatory permitting and CEQA compliance support for a temporary desalination demonstration facility. This work effort included preparation of a detailed regulatory permitting Technical Memorandum as part of the original feasibility study. The TM evaluates alternative sites and alternative intake options, as well as recommends strategic CEQA compliance and regulatory permitting strategies. This unique project is proposed as a 580,000 GPD demonstration facility co-located at the AES power plant in Redondo Beach (King Harbor), within the footprint of the existing SEALab (Science, Education and Adventure Lab, owned and operated by the L.A. Conservation Corps). The project also includes a subsurface intake pilot to test marine life effects and pre-treatment requirements for drawing ocean water through the seafloor, and proposes an extensive evaluation of a passive wedgewire screen system. Kevin has coordinated several key regulatory agency meetings, developed project Fact Sheets and presentation materials, created a Project Permitting Binder with key information for regulatory permits, developed the work program for environmental technical studies and reviewed draft studies, and has advised the District on integrating the project design process with the CEQA compliance process

and the District's legal and public relations advisors. *The Final EIR was completed in five business days to make a Board hearing deadline*. Kevin oversaw the regulatory permit application preparation and processing (Coastal Development Permit, NPDES/WDR Permit, and ACOE Letter of Permission). *The CDP was successfully obtained less than four months following initial application submittal*.

***Camp Pendleton Desalination Facility Feasibility Study and Technical Studies, San Diego County Water Authority, Oceanside, CA** - CEQA/NEPA and Regulatory Permitting Task Manager for this comprehensive offshore and onshore desalination technical study program. The Project consists of various offshore geotechnical investigations, offshore marine biology and water quality sampling, and subsurface borings in an existing jetty and onshore location. The work effort includes strategic regulatory permitting through the U.S. Navy (land owner and Coastal Zone Management Act conformity determination), City of Oceanside (landowner and Coastal Act compliance through the City's Local Coastal Program), U.S. Army Corps of Engineers, Regional Water Quality Control Board, and State Lands Commission. In addition to technical study management and obtaining required regulatory permits to carry out the program, Kevin directed the CEQA/NEPA compliance program for the respective local, state and federal agencies. The study previously evaluated co-located facilities at SONGS (San Onofre Nuclear Generating Station). In addition, Kevin prepared the CEQA/Permitting Technical Memo for the full-scale desalination feasibility study (50-150 MGD), as well as the CEQA/Permitting compliance strategy for a proposed pilot plant.

***Coastal Water Project, California America Water Company, Monterey, CA** - Project Manager for this Proponent's Environmental Assessment (PEA), a NEPA-like document evaluating several alternatives at equivalent level of detail. The Project includes a 10 MGD seawater desalination facility at LS Power's Moss Landing Power Plant, as well as over 20 miles of conveyance pipelines, ASR facilities (Aquifer Storage and Recovery), pump stations and storage tanks. The PEA process included design and permitting for a pilot plant (which is under construction, after surviving multiple appeals and challenges through the Coastal Commission process), detailed evaluation of alternative intake options, extensive hydrodynamic modeling, a public outreach program involving more than 40 town hall meetings and presentations, an extensive analysis of project alternatives (including various non-desal options, and various intake and discharge alternatives), and a series of Permit Coordination Center meetings involving more than 20 agencies. The PEA required extensive coordination with LS Power (Duke Energy), as well as formulating a water quality sampling program. Kevin provided oversight of regulatory permitting issues for this highly controversial seawater desalination facility in the Monterey Bay National Marine Sanctuary, assisted in the regulatory permitting for the pilot plant, and participated in forming a "Blue Ribbon Panel" to review the environmental study approach. Following PEA submittal to the California Public Utilities Commission (CPUC), Kevin provided the CAW with strategic environmental and regulatory guidance, including detailed review of the CPUC's Environmental Impact Report, periodic policy input on issues, such as SB-42 and greenhouse gas issues, and regulatory permitting strategy. The EIR review effort, led by Kevin, included innovative use of web-driven file sharing systems to allow multiple technical experts and other team members to review EIR sections, post comments, view EIR reference materials in a common online library, view all team member comments in real-time, and consolidate EIR review comments (this effort resulted in condensing over 1,000 individual comments into a concise, substantive Draft EIR comment letter drafted on behalf of CAW and submitted to CPUC). The project also required separate NEPA clearance through DOD for right of way.

***Seawater Desalination Facility EIR, Huntington Beach, CA** - Project Manage for this EIR, addressing a 50 MGD seawater desalination facility at the AES Generating Station, as well as associated pipelines, pump stations and storage tanks. The EIR includes detailed evaluation of impingement/entrainment and brine discharge issues, as well as growth-inducing effects of a private desalination facility. The EIR survived an aggressive legal challenge by Surfrider.

H. Edward Hohlt Jr., P.E.

Project Engineer

Education

B.S., Environmental Engineering, Old Dominion University

B.S., Physics, Longwood College

Registrations

Civil Engineer # 83593, CA

Professional Affiliations

American Public Works Association

Society of American Military Engineers

Water for People

Edward Hohlt is a professional engineer with 10 years of civil engineering experience that includes engineering with an emphasis in planning, design and construction support services for various infrastructure focused projects. These projects include site, as well as, municipal infrastructure that includes grading, land development, roadway design, water, wastewater and storm drainage utilities.

Selected Project Experience

CMC Water Treatment Plant Raw Water Pre-Treatment Upgrades, CDCR, San Luis Obispo, CA: Project Engineer for the design and construction of a new high-rate clarifier for the 3 MGD water treatment plant at California Men's Colony (CMC). During periods of rainfall runoff, Chorro Reservoir raw water turbidity will spike from 10 NTU to a high in excess of 60 NTU in a few hours. The new ballasted clarification process unit reduces plant feed water turbidity levels to acceptable levels.

CMC Water Treatment Plant Filter Rehabilitation, CDCR, San Luis Obispo, CA: Project Engineer for the design and construction of the gravity filter rehabilitation at the 3 MGD water treatment plant at California Men's Colony (CMC). New Leopold underdrains were installed with new dual-media (sand and anthracite) totaling 2.5 feet in bed depth. Piping and fittings were also installed with the new underdrains to allow future use of air scour during backwash cycles.

Well 6 Water Treatment System, City of Sebastopol, CA:

Project Engineer responsible for layout of new filter treatment units, associated piping, site improvements, as well as relocating existing treatment units onsite. The project repaired the existing well casing to prevent collapse and provide continued water supply for the next 10 years, and to construct an arsenic treatment system to meet current public health standards for arsenic in drinking water.

Total Trihalomethane (TTHM) Reduction Project, CDCR, Centinela, CA: Project Engineer responsible for design and construction support service for a treatment based option to reduce the trihalomethane levels to an acceptable level by California Department of Health standards.

Bryan Burnitt, P.E.

Project Engineer

Education

B.S., Civil Engineering
North Carolina State University - Raleigh

Registrations

Professional Engineer # C83046, CA

Professional Affiliations

Water Environmental Federation

Special Certifications

Certified Levee Inspector Training

OSHA HAZWOPER Training

REVIT Process Pipe Modeling

Bryan is a Registered Professional Engineer with over 9 years of experience in water treatment, wastewater treatment, and water resources projects. Mr. Burnitt has a wide range of water-related experience. From multi-site federal infrastructure projects to public treatment plant upgrades to small, private water quality projects, Mr. Burnitt executes each with the attention to detail and clear communication required to meet the client's needs and expectations.

Selected Project Experience

Tertiary Treatment Facilities Design, Sacramento Regional County Sanitation District, Elk Grove, CA: Project Engineer responsible for design tertiary treatment facilities for upgrade of 330-mgd wastewater treatment plant to qualify the tertiary effluent for unrestricted Title 22 reuse. Responsible for design of the sodium hypochlorite and sodium bisulfite storage, pumping and injection systems; process control narratives and P&ID development for chemical injection systems; coordination with disinfection contact basin and granular media filter design teams to ensure chemical injection systems provide required dosage at over a dozen different locations. [2015 - 2017]

Recycled Water Design, Paradise Irrigation District, Magalia, CA: Project Engineer responsible for design upgrades to an existing 19-mgd water treatment plant to completely eliminate discharge of residual water generated from plant processes. System design includes inclined plate settlers, flow equalization facilities, dewatering and solids handling facilities, and chemical injection and chlorination facilities. Regulatory coordination with the CA Division of Drinking Water and Regional Water Control Board to achieve NPDES and drinking water standards compliance. Challenges included integration with an existing and operational treatment plant on a small site with shallow underlying rock and steep slopes. [2015 - 2017]

EchoWater Project – Nitrifying Sidestream Treatment Project ESDC, Sacramento County Regional County Sanitation District, Elk Grove, CA: Staff Engineer, provided project and construction management assistance. Receiving, organizing, and tasking RFIs and submittals for the nitrifying sidestream project construction. Producing proposed construction modifications based on experience from parallel Echo Water projects. [2017]

Kimley»Horn