

TO: James L. App, City Manager
FROM: Doug Monn, Public Works Director
SUBJECT: Award Contract to Black & Veatch for Final Design of Wastewater Treatment Plant Upgrade
DATE: January 5, 2010

NEEDS: For the City Council to consider awarding a contract to engineering firm Black & Veatch for final design of the City wastewater treatment plant upgrade.

FACTS:

1. The City owns and operates a wastewater treatment plant at 3200 Sulphur Springs Road. Most of the plant is over 37 years old and treatment performance is declining. Equipment has degraded and the plant has become difficult and expensive to maintain.
2. The California Regional Water Quality Control Board requires the City to reduce its discharge of toxic pollutants such as ammonia and disinfection byproducts to the Salinas River. Major upgrade of the plant is required to effectively treat these pollutants.
3. The Water Board periodically fines the City for violations of its wastewater discharge permit. If the City does not make progress on a wastewater treatment plant upgrade, the Water Board could fine the City up to \$10,000 per day.
4. In 2008, after an exhaustive selection process, the City awarded a \$1,100,000 contract to the engineering firm Black & Veatch to plan and prepare a preliminary wastewater treatment plant design. The City split preliminary and final design into phases, so that cost estimates for final design services may be based on actual data, rather than a projected cost that must provide for conditions/requirements not known at the time of the initial contract. Black & Veatch completed a Facility Plan and Preliminary Design (30% complete) in July 2009.
5. Black & Veatch submitted the attached proposal for final design services on December 7, 2009. The scope of services includes all work necessary to complete construction-ready drawings and specifications for the following processes and equipment:
 - New headworks facility, including a septage receiving station;
 - Rehabilitated primary clarifiers;
 - New Biological Nutrient Removal (BNR) process;
 - New electrical/blower building to house BNR blowers and electrical equipment;
 - 3 new secondary clarifiers;
 - New sludge and scum pumping stations;
 - Modified chlorine contact chamber;
 - New dechlorination basin;
 - New chemical feed facilities;
 - New effluent polishing channel;
 - New sludge thickening process and pump station;

- New grease receiving/digestion facility;
 - New co-generation facility to burn digester gas and power the treatment process;
 - Converted belt filter pressate equalization tank;
 - New standby generator facility;
 - New operations building, including laboratory;
 - Relocated storage building; and
 - Instrumentation and programmable control systems.
6. Final design will require approximately 12 months and 18,300 man hours to complete. The not-to-exceed cost is \$2,635,000.

ANALYSIS &

CONCLUSION: Black & Veatch demonstrated good performance and cost-control during facility planning and preliminary design. They have assembled a highly-experienced team of engineers for final design. Proceeding with final design will demonstrate progress to the Water Board and position the City to compete for federal stimulus grants.

POLICY

REFERENCE: Water Board Discharge Permit and Integrated Water Resources Plan.

FISCAL IMPACT: The wastewater treatment plant upgrade is part of the Four Year Capital Improvement Projects Budget. The Sewer Enterprise Fund cash balance is currently \$6,000,000. Allocating \$2,635,000 for final design services will not require an adjustment to sewer rates or connection fees. Templeton Community Services District owns 9% of the treatment plant's capacity and is required to offset 9% of the final design and upgrade cost.

Staff is working with Congressman Kevin McCarthy's office to pursue a possible \$4.7 million federal grant for the project through the Water Resources Development Act.

- OPTIONS:**
- a. Adopt Resolution No. 10-xx appropriating \$2,635,000 from Sewer Enterprise Funds to Budget No. 601.910.5224.683 and authorizing the City Manager to enter into a contract with Black & Veatch in the amount of \$2,635,000 for final design of the Paso Robles Wastewater Treatment Plant upgrade.
 - b. Amend, modify, or reject the above option.

Prepared by: Matt Thompson, PE, Wastewater Manager

Attachments:

- 1. Resolution No. 10-XX
- 2. Black & Veatch Scope of Services for Final Design

RESOLUTION NO. 10-XX

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PASO ROBLES
APPROPRIATING FUNDS AND AWARDED A CONTRACT
TO BLACK & VEATCH FOR PROFESSIONAL ENGINEERING SERVICES ASSOCIATED WITH FINAL
DESIGN OF A WASTEWATER TREATMENT PLANT UPGRADE

WHEREAS, the City of Paso Robles owns and operates a wastewater treatment plant (WWTP) at 3200 Sulphur Springs Road. Most of the WWTP is over 37 years old and treatment performance is declining. Equipment has degraded and the WWTP has become difficult and expensive to maintain; and

WHEREAS, the California Regional Water Quality Control Board (Water Board) requires the City to reduce its discharge of toxic pollutants such as ammonia and disinfection byproducts to the Salinas River; and

WHEREAS, the Water Board periodically fines the City for violations of its wastewater discharge permit. If the City does not make progress on a WWTP upgrade, the Water Board could fine the City up to \$10,000 per day; and

WHEREAS, the City of Paso Robles has adopted goals and objectives in its Integrated Water Resources Plan which includes recycled water as a valuable and sustainable water resource for the future; and

WHEREAS, the WWTP upgrade design process requires a professional engineering firm to ensure its functionality and completion in a timely manner, and;

WHEREAS, in 2008, after an exhaustive selection process, the City awarded a \$1,100,000 contract to the engineering firm Black & Veatch to plan and prepare a preliminary WWTP upgrade design. Black & Veatch completed a Facility Plan and Preliminary Design (30% complete) in July 2009; and

WHEREAS, Black & Veatch submitted a proposal for final design services on December 7, 2009, that includes all work necessary to complete construction-ready drawings and specifications for a WWTP upgrade. The not-to-exceed cost is \$2,635,000; and

WHEREAS, Black & Veatch demonstrated good performance and cost control during facility planning and preliminary design. Black & Veatch has assembled a highly-experienced team of engineers for final design. It would be in the best interest of the City of Paso Robles and its wastewater system users to retain the service of Black & Veatch for final design of the WWTP upgrade, at a cost not to exceed \$2,635,000.

THEREFORE, BE IT RESOLVED AS FOLLOWS:

SECTION 1. The City Council of the City of Paso Robles does approve a one time supplemental budget appropriation from the Sewer Enterprise Fund in the amount of \$2,635,000 to budget account 601.910.5224.683; and

SECTION 2. The City Council does hereby award a contract to Black & Veatch for Professional Engineering Services associated with the final design of upgrades to the Paso Robles Wastewater Treatment Plant in the amount of \$2,635,000, and authorizes the City Manager to execute the contract.

PASSED AND ADOPTED by the City Council of the City of Paso Robles this 5th day of January 2010 by the following votes:

AYES:
NOES:
ABSTAIN:
ABSENT:

Duane Picanco, Mayor

ATTEST:

Lonnie Dolan, Deputy City Clerk

City of Paso Robles Wastewater Treatment Plant Upgrade

Scope of Services for Final Design

The City of El Paso de Robles (City or City of Paso Robles) owns and operates a 4.9 million gallon per day (MGD) secondary wastewater treatment plant (WWTP or plant) permitted under Waste Discharge Requirements Order No. R3-2004-0031 and National Pollutant Discharge Elimination System Permit No. CA0047953. The WWTP is located at 3200 Sulphur Springs Road in Paso Robles. Current flows treated at the plant average 3.14 MGD.

The City included in its capital improvement program an upgrade of the WWTP. The purpose of WWTP upgrade project is to bring the plant into compliance with current and anticipated discharge regulations. Additional information on project description and background is included in Attachment A.

The WWTP upgrade is being implemented in three phases:

- ▶ Phase 1 – Facility Plan, Environmental Documentation, Preliminary Design, and Value Engineering
- ▶ Phase 2 – Final Design, Constructability Review, Project Financing, and Permitting
- ▶ Phase 3 – Construction

The scope of final design services required for Phase 2 of the upgrade project will consist of the tasks described hereinafter.

TASK D - PROJECT MANAGEMENT FOR FINAL DESIGN PHASE

D.1 - Project Schedule

An initial project schedule will be prepared based on a 12-month design period shown in the Preliminary Schedule in Attachment B. The project schedule will be updated on monthly basis to reflect current project status, with emphasis given to meeting milestones associated with major deliverables. City staff will be advised in writing on the schedule impact of project technical decisions. Consultant will prepare updated project schedule periodically.

D.2 - Monthly Progress Meetings

Progress meetings will be conducted with City staff on monthly basis. An agenda and meeting summary will be prepared and distributed to all attendees for each meeting. Meeting summary will be prepared and submitted within five working days after the meeting. Some progress meetings will be combined with other project meetings for execution efficiency. Consultant's key project staff will attend up to twelve (12) progress meetings.

D.3 - Monthly Telephone Conference

Telephone conferences will be conducted with City staff on monthly basis. An agenda and telephone conference summary will be prepared and distributed to all attendees for each conference.

Telephone conference summary will be prepared and submitted within five working days after the meeting. Consultant will attend up to twelve (12) telephone conferences.

D.4 - Monthly Progress Reports / Invoicing

Monthly progress reports summarizing the status of the work will be prepared and submitted with the monthly invoices. Progress reports will include the following:

- ▶ A brief summary of each task that is completed, in-progress, or pending during the reporting period
- ▶ An estimate of the percentage complete for each task
- ▶ A listing of milestones achieved
- ▶ Summary of activities of subconsultants during the reporting period
- ▶ Explanation of deviations from the approved scope
- ▶ Progress relative to schedule and corrective action (if necessary) to be taken by Consultant and/or City
- ▶ Explanation of deviations from the approved schedule
- ▶ Summary of costs incurred during the period
- ▶ Summary of activities planned for the next reporting period

D.5 - Project Document Log and File

A record of the project will be established and maintained in the Consultant's office. This record will contain products and calculations, minutes of meetings and/or workshops, correspondence, memorandum, a detailed list of references used, and other pertinent information pertaining to this scope of services. Information that is produced in an electronic format will be maintained electronically. Non-electronic information will be maintained as hard copy.

TASK E - PRE-FINAL DESIGN SERVICES

E.1 - TM 1 - Blower Technology

An investigation will be performed to identify the blower alternatives and evaluation of each alternative will be performed. A technical memorandum will be prepared to document the evaluation and the recommended blower technology.

E.2 - TM 2 - Cogeneration Power, Standby Power and Peak Power Generation

Microturbine technology will be evaluated for cogeneration power, standby power, and peak power generation. A technical memorandum will be prepared to determine performance criteria, ability to share cogeneration unit for standby power generation and use of heat recovery to meet San Luis Obispo County Air Pollution Control District permit requirements.

E.3 - Operations Building Predesign

Consultant will evaluate the footprint and orientation of the operations building. Consultant will visit the site to understand the site background and any special needs. Consultant will prepare a

revised site plan, a revised building floorplan and two renderings. A meeting will be held with City staff to review the new Operations building design.

TASK F - FINAL DESIGN PHASE SERVICES

F.1 - Surveying, Mapping & Utility Engineering

Subconsultant Cornerstone Engineering, Inc. will provide additional ground survey and potholing to determine the actual location of existing underground utilities beyond the level performed in the pre-design. Consultant will define the location of critical existing underground utilities, and City will provide excavation equipment, a supervisor, and an operator to perform the potholing.

Subconsultant will provide potholing using air-vacuum system where potholing by the City is limited. Subconsultant will be present to observe the potholing activity and to record the findings of the field measurements. Survey of the location for critical underground utilities will be performed, as deemed necessary.

F.2 - Geotechnical Investigations

Under the final design phase of work, Subconsultant Fugro will perform design-level geotechnical services for the Project, including data review, field exploration, laboratory testing, and geotechnical analysis as a basis for preparing the geotechnical reports for the design. The design-level geotechnical services will consist of the following:

- ▶ **Field Exploration**

Perform a field exploration consisting of drilling exploratory bore holes to supplement the CPT sounding obtained during Phase 1 that was performed during the study and preliminary design. Prior to beginning field exploration the locations will be marked, Underground Services Alert will be contacted, well permits will be obtained from the County of San Luis Obispo for borings exceeding 25 feet in depth, and access and a schedule for field exploration will be coordinated with the City.

Borings will be drilled using a truck-mounted drill rig equipped with hollow-stem-augers. The borings will be sampled at approximately 5-foot intervals using standard penetration test (SPT) and modified California split spoon samplers. Closer spaced samples will be obtained from the cuttings retrieved from the auger flights. The borings will be backfilled with the excavated materials upon completion of drilling. The samples will be used to classify the soils encountered, and will be retained for subsequent laboratory testing. A summary of the proposed borings is provided in Table 1 below.

This scope of work specifically excludes the search for, and evaluation of, hazardous materials in soil, water, or air. In the event that hazardous materials are encountered during the field exploration, Subconsultant will be required to report the contamination and to follow protocols required by various agencies. The cost for work performed in association with the discovery of unanticipated hazardous material will be provided on a time and material basis, and is not included in this proposal.

Table 1 - Summary of Proposed Borings

Structure	Tentative Field Exploration
Headworks/Vortex Grit Removal	1 boring to 40 feet
Fog Receiving Station	1 boring to 20 feet
DAF/Ferric Facility	1 boring to 20 feet
Co-Generation System/Standby Generator /Switchgear	1 boring to 20 feet
BNR Basins/Facilities	2 borings to 40 feet
Blower Building	1 boring to 20 feet
Warehouse	1 boring to 20 feet
Secondary Clarifiers 1, 2 and 3	3 borings to 20 feet, 30 feet and 40 feet
RAS/Scum Pump Station	1 boring to 50 feet
Ammonia and CATS Facility	1 boring to 30 feet
Operations Bldg	2 borings to 20 feet
TOTALS	420 feet of Drilling

► **Laboratory Tests**

Perform laboratory tests on selected samples obtained from the field exploration program to assist in the characterization of the geotechnical engineering properties of the materials encountered. The types and numbers of tests will be selected based on the results of the field exploration program. Laboratory testing will include, at a minimum, the following:

- Moisture-density determinations
- Direct shear
- Collapse and consolidation
- Grain size, compaction tests
- pH
- Chloride levels
- Sulfate levels
- Minimum electrical resistivity

► **Reports**

Prepare separate Geotechnical Data Reports (GDR) and Geotechnical Interpretative Reports (GIR) for the wastewater treatment plant site which will summarize the findings of the subsurface explorations and the results of the laboratory testing. The GIRs will provide design and construction recommendations, which will be incorporated into the project documents. The draft copy of the report will be submitted in electronic (PDF) format for review by Consultant and City. Field and laboratory data obtained from the evaluation will

be included in the reports. The reports will provide a summary of the data obtained, and the opinions and recommendations regarding:

- Soil and groundwater conditions encountered
- Geologic and seismic setting
- Potential for liquefaction and seismic settlement
- Site preparation and grading
- Suitability of excavated material for use as fill or backfill material
- Requirements for imported fill materials
- Fill placement and compaction
- Suitable type of foundation support for structures
- Design parameters for structure foundation support (including bearing pressures, foundation widths and depths, and estimated settlement)
- Lateral earth pressures (active and at-rest) for the design of retaining walls or buried structures
- Lateral resistance from passive pressure and friction coefficients
- Resistance to uplift pressures for buried structures
- Ground motion parameters for seismic design including causative fault(s), maximum moment magnitude, ground acceleration, soil profile type, and the fault distance from the site for use 2007 California Building Code (CBC), and including:
 - Earthquake occurrence and the estimated probabilistic peak ground accelerations having a 2 percent probability of being exceeded in a 50-year period
- Earthquake occurrence and the estimated probabilistic peak ground accelerations having a 10 percent probability of being exceeded in a 50-year and 100-year period
 - Considerations for near field (short period) and far field (long period) earthquakes
 - Plotted response spectra (pseudo acceleration, displacement, and velocity) for critical damping of 0.5, 2 and 5 percent, and extrapolated to a period of 10 seconds.
- Expansive soil conditions
- Slab-on-grade
- Pavement recommendations for parking lots and access roads
- Construction considerations regarding groundwater conditions, need for temporary slopes or shoring, and excavation characteristics of the soils encountered
- Site drainage

F.3 - Final Design and Construction Contract Documents

Consultant will perform the final design and prepare construction contract documents consisting of front-end contract documents, technical specifications, and drawings. The design and construction contract documents will address the wastewater treatment plant improvements, and be organized for

a single construction contract. The facilities to be designed will be as detailed in the Preliminary Design Report.:

- ▶ Provide a new headworks facility including one septage receiving station, two fine screens, one vortex grit removal basin, and one Parshall flume.
- ▶ Provide a new concrete diversion box for splitting flow between the two existing primary clarifiers.
- ▶ Rehabilitate the existing primary clarifiers including a new primary scum pump and effluent weir modifications.
- ▶ Convert the existing secondary trickling filter pump station to a primary effluent pump station by replacing the existing pumps.
- ▶ Provide a new concrete diversion box for splitting flow between the three biological nutrient removal (BNR) process trains.
- ▶ Provide three new 3-stage BNR process trains consisting of one anaerobic cell, two anoxic cells, two oxic cells, and one deOX cell.
- ▶ Provide a new concrete diversion box for flow splitting between three secondary clarifiers.
- ▶ Provide three new secondary clarifiers with concrete baffled effluent troughs, including spiral scrapers, energy dissipating inlets, hydraulic flocculating feedwells, full radius ducking scum skimmers, and a rotating pipe weir assembly for scum collection.
- ▶ Provide one new RAS pump station for the clarifiers. The pump station will be a cast in place concrete wet well structure and will be partitioned to house three VFD driven submersible pumps to serve three clarifiers.
- ▶ Provide a new WAS pump station.
- ▶ Provide one secondary scum pump station for the secondary clarifiers. The pump station will consist of two (1 duty +1 standby) submersible pumps to serve three clarifiers.
- ▶ Provide a new disinfection flow splitter.
- ▶ Modify the existing chlorine contact basins to allow basin isolation.
- ▶ Provide a new de-chlorination contact basin.
- ▶ Provide a new effluent polishing channel.
- ▶ Provide one dissolved air floatation thickener (DAFT) unit in partially buried concrete basins for primary and secondary sludge thickening.
- ▶ Provide a new thickened sludge pump station.
- ▶ Provide a new fat, oil, and grease (FOG) digestion facility, including two FOG storage tanks with heating, a truck unloading station with recessed centrifugal pumps, FOG screening, pumped mixing, FOG transfer pumps, monitoring station and truck washing station.
- ▶ Provide a new co-generation facility to clean and use biogas produced on-site to power micro-turbines for on-site electrical power generation. The facility will be outdoors in a canopy area.
- ▶ Convert the existing digester sludge storage tank into a belt filter press pressate equalization tank by modify piping and valving.

- ▶ Provide a new standby generator facility using micro-turbines to power essential facilities during power outage and provide peak power generation.
- ▶ Provide a new operations building. This will be a masonry building with City of Paso Robles' standard architectural treatments and will incorporate sustainable design concepts where applicable. The building will contain offices, an administration and reception area, a training/break room, a laboratory, a control room, a mechanical/electrical room, a janitor room, and men's and women's locker rooms. The building will not be designed to meet LEED certification, but it will incorporate some of the sustainable design principles.
- ▶ Provide a new electrical/blower building to house BNR blowers and electrical equipment.
- ▶ Provide a new chemical feed facility located in a canopy area to house Ferric storage/feed system.
- ▶ Provide a new chemical feed facility located in a canopy area to house ammonia sulfate and Calcium Thiosulfate storage/feed system.
- ▶ Provide a new W3 reclaimed water pump station.
- ▶ Replace the existing digester flare.
- ▶ Provide sitework associated with process piping, storm drainage, paving, plant entrance gate and signage. The existing warehouse, control room, trailer office and maintenance shop and storage building will be either relocated or removed.
- ▶ Provide instrumentation and programmable control system related equipment for the new equipment. New control equipment will be coordinated with the plant wide control system. Software programming and configuration of the system, including programmable logic controllers and human machine interface (HMI) computers are not included.

Drawings including plans, details, and sections for the work will be prepared. A preliminary list of Drawings is included in Attachment C. The drawings will be subject to review by the City at each submittal stage. All drawings will be prepared using AutoCAD 2008. The drawings will be prepared on 22x34-inch sheets and in accordance with City standards. As an example, facility drawings, including P&ID's will be similar in appearance to Consultant's drawings being produced for the City of Paso Robles Water Treatment Plant Project. Project technical specifications, special provisions, and contract bid documents will be prepared using Microsoft Word. The technical specifications Divisions 2 through 16 will be prepared using Consultant's standards. The front-end contract documents will be developed using the City's standard front-end contract documents.

Design packages will be submitted for review at the 60 and 90 percent completion levels as follows:

- ▶ Detailed design – 60% Design Level
 - Deliverables of the 60% Design Level will include the following:
 - Contract front-end documents
 - General construction sequence
 - P&ID drawings (major/secondary processes)
 - Equipment control descriptions
 - Site plan and grading plan drawings

- Yard piping and underground utilities drawings
- Major facility plans and sections including equipment and piping
- Architectural plans, roof plans and wall sections
- Structural plans and sections
- Plumbing and fire protection system plans
- HVAC plans
- Power distribution functional diagram
- Lighting plans
- Control system block diagram
- Process equipment specifications
- Geotechnical investigation report
- Project trend register update
- Decisions that must be made at the 60% Design Workshop to keep the design on schedule will include confirmation and/or acceptance of the following:
 - General construction sequence
 - Site grading plan and process facility elevations
 - Dimensions of floor plans and major sections of all structures and their location on the site
 - Interior dimensions of rooms
 - Architectural design concepts
 - Layout/design for major process areas including location of major process equipment and piping within rooms
 - Process equipment specifications
- ▶ Detailed design – 90% Design Level
 - Deliverables of the 90% Design Level will include the following:
 - Complete CAD plans for process facilities and buildings, including equipment and piping
 - Complete architectural plans and reflected ceiling plans
 - Sections and details showing major process and sub process equipment
 - Structural schedules and details
 - Plumbing and fire protection system layouts and plans
 - Power and lighting plans
 - Electrical fixture schedules
 - Complete major and subprocess equipment specifications
 - Commodity (non-process equipment other than building mechanical, electrical and I&C) specifications

- HVAC system layouts and equipment schedules
- Architectural schedules
- Duct bank and roadway lighting arrangements
- Plumbing schedules
- Complete Instrument Device Schedule
- Complete I/O List
- Complete Equipment Control Descriptions
- Architectural Details
- I&C Installation Details
- Power (Elect) Site Plan
- Complete Specifications
- Project trend register update.
- Decisions that must be made at the 90% Detailed Design Workshop to keep the design on schedule will include confirmation and/or acceptance of the following:
 - Commodity item specifications
 - Level of automation
 - Equipment schedules
 - * HVAC
 - * Electrical
 - * Plumbing

For each submittal, three (3) sets of half size (11x17-inch) drawings, front-end contract documents, and technical specifications will be provided for review and comment by City staff. Each design progress deliverable will be accompanied by evidence of Black & Veatch's internal QA/QC review.

A three-week review period is allocated for City review of each submittal.

Design review workshops will be conducted to present, discuss, and review the contract documents at each of the design stage submittals. Each workshop will be conducted with City staff to present the information and findings of the design team and to summarize the work. Input from City staff will be obtained and incorporated into the contract documents. Certain decisions must be made and features shall be fixed at the workshops for each of the project submittal. Changes made after fixing features will be considered Supplemental Services.

For the 90% submittal, the City will provide a building plan check and a fire protection review for code compliance. It is assumed that the building plan check will be limited to Operations building and Blower building. Consultant will provide structure calculations, electrical calculations, and other necessary information to support this review. A five-week review period is allocated for plan check and City review.

F.4 - Quality Assurance/Quality Control (QA/QC)

A project-specific Quality Assurance/Quality Control (QA/QC) plan will be prepared. The QA/QC plan will define the procedures to be followed. The QA/QC plan will identify the schedule and level of effort planned for internal quality review and call for evidence of QA/QC review with each design deliverable. QA/QC will be provided for each final design deliverable prior to submission to the City.

F.5 - 100% Camera Ready Design Document

The review comments from City review, building plan check, and fire protection review will be addressed and appropriate changes made to the design and construction contract documents. Upon completion, the original final drawings will be submitted to the City together with one set of camera ready project specifications and all other bid documents. The final construction contract documents will be signed and sealed by the Engineer of Record who is a registered professional engineer licensed in the state of California. The electronic files of the final drawings (in pdf format), front end documents (in pdf format), and technical specifications (in Microsoft Word and pdf format) will be provided to the City on CD/DVD. The City will be responsible for reproduction and distribution of the construction contract documents and addenda during the bid phase.

F.6 - City Presentations

Consultant will provide support to the City for two presentations to either the City Council or other committees.

F.7 - Opinion of Probable Construction Costs

The opinion of probable construction cost in the preliminary design report (PDR) will be updated at the 60 and 90 percent completion levels and for 100% final design submittal. Contact will be made with equipment suppliers and manufacturers to obtain budget pricing for major equipment items. The take-off quantities used to compile the opinion of probable construction cost will form the basis for the bid tab items and quantities.

F.8 - Permitting Support

City will be responsible for acquiring the following permits for the Project.

- ▶ General Waste Discharge Requirements (WDR) / NPDES Permit
- ▶ APCD Authority to Construct (ATC) / Permit to Operate (PTO)
- ▶ Notice of Intent for Construction Stormwater Permit

Consultant's responsibilities will be limited to providing design documents and project information to support City's permitting activities within the allocation of time and budget set forth herein. As the level of effort approaches the set allocation, the City will be notified in writing. Upon approval from the City, efforts beyond allocated levels will continue as required and will be monitored as trend of services outside the scope of services to be invoiced in accordance with the rate schedule set forth within this Agreement.

F.9 - State Revolving Fund (SRF) Loan Support

City is in process of applying for SRF loan to finance the Project. Consultant's responsibilities will be limited to providing design documents and project information to support City's SRF activities within the allocation of time and budget set forth herein. As the level of effort approaches the defined budget allocation, the City will be notified in writing. Upon approval from the City, efforts beyond allocated levels will continue as required and will be monitored as trend of services outside the scope of services to be invoiced in accordance with the rate schedule set forth within this Agreement.

F.10 - Constructability Review

The City intends to select a Constructability Review panel to review the 90% final design and opinion of probable construction cost.

Consultant will participate in a two-day review workshop. On the first day of review workshop, Consultant will make a one-hour presentation to the panel. Purpose of the presentation is to provide an overview on the design approach. On the second day of workshop, the panel will make a presentation to the City. Purpose of the presentation is to discuss the preliminary findings and recommendations. Consultant will attend the panel's presentation.

Consultant will review findings and comments of the constructability review. Upon reaching agreement with the City, Consultant will incorporate selected findings and comments of the constructability review within the allocation of time set forth. As the level of effort approaches the set allocation, the City will be notified in writing. Upon approval from the City, efforts beyond allocated levels will continue as required and will be monitored as trend of services outside the scope of services to be invoiced in accordance with the rate schedule set forth within this Agreement.

F.11 - Contractor Outreach

Consultant will conduct a contractor outreach program for the project. The task budget includes conducting one interactive workshop. Workshop will include a presentation and question and answer session.

In preparation for the workshop, Consultants will contact contractors to raise awareness of the Project and prepare announcements.

TASK G - SUPPLEMENTAL SERVICES

Supplemental services are not included in this scope of services. These services will be performed at City's request with compensation adjustments. Supplemental services that City might choose to add to the scope of services include, but are not limited to, the following items.

- ▶ Security Assessments.
- ▶ LEED certified design.
- ▶ Additional renderings or photo realistic drawings.
- ▶ Prequalification of contractors or vendors.
- ▶ Additional meetings with local, State, or Federal agencies to discuss the project.

- ▶ Additional appearances at public hearings or before special boards.
- ▶ Supplemental engineering work required to meet the requirements of regulatory or funding agencies that become effective subsequent to the date of this agreement.
- ▶ Additions to an engineering report or other document to update or revise original recommendations.
- ▶ Bid phase services:
 - Conduct a pre-bid conference at a date, time, and location selected by the City to:
 - Instruct prospective bidders and suppliers as to the types of information required by the contract documents and the format in which the bids should be presented.
 - Review special project requirements and contract documents in general.
 - Receive requests for interpretations that will be issued by addendum.
 - Conduct a site visit.
 - Prepare notes of the conference and issue to all attendees by addendum.
 - Prepare final Invitation to Bid.
 - Interpret construction contract documents and provide written responses to questions from bidders requiring clarification during the bidding period.
 - Prepare addenda to the contract documents as required.
 - Assist City during bid opening.
 - Review and evaluate the qualifications of the apparent successful bidder and the proposed major or specialty subcontractors. The review and evaluation will include such factors as past experience on similar work, equipment that is available for the work, financial resources, and technical experience.
 - Prepare and distribute formal bid tabulation sheets, evaluate bids, and make written recommendations to City concerning contract award.
 - Prepare a set of conformed contract documents at the conclusion of the bidding period.
- ▶ Assistance with bid protests and rebidding.
- ▶ Preparation for litigation, arbitration, or other legal or administrative proceedings; and appearances in court or at arbitration sessions in connection with bid protests, change orders, or construction incidents.

COMPENSATION

The not-to-exceed ceiling cost of the scope of services is \$2,635,000. The basis for this cost include the following:

- ▶ Project Schedule in Attachment B
- ▶ List of Drawings in Attachment C
- ▶ Estimated Level of Effort in Attachment D
- ▶ Billing Rate Schedule in Attachment E

PROJECT TEAM

Our project team is graphically presented in the organization chart in Attachment F. Resumes of key team members are also included.

Attachment A

Project Description and Background

PROJECT DESCRIPTION AND BACKGROUND

Existing Wastewater Treatment Process

The City WWTP has been in operation for 55 years. It has been added to (digesters and trickling filters) but has never undergone a comprehensive upgrade. The current treatment process includes preliminary treatment with ferric chloride for odor control, two primary clarifiers, secondary treatment with two plastic media and two rock media trickling filters, four secondary clarifiers, and chlorination. Treated effluent is conveyed to a series of six ponds adjacent to the Salinas River, from which overflow is discharged to the river. Primary and secondary sludge is belt-pressed on site before disposal at the City-owned landfill.

Regulatory Compliance Issues

Compliance concerns center on the California Toxics Rule parameters, chronic and acute toxicity limits, and salts. The Regional Water Quality Control Board (RWQCB) sets forth expectations that measures will be taken to ensure reliable compliance in these areas. Both source control pollutant minimization and treatment improvements have been emphasized as components in the upcoming permit revision. Further, population projections for the treatment plant service area suggest that average dry weather flows may increase to 4.9 MGD by the year 2025.

Economic, Social and Environmental Sustainability

One of the City Council Adopted Goals for 2008-2011 is to preserve energy resources. The specific objectives for this goal are to implement the Integrated Water Resources Plan, investigate alternatives to generate electricity, implement “green” building standards (LEED), and encourage energy efficiency.

The WWTP upgrade project provides opportunities for the City to achieve the said objectives. The opportunities will include generating electricity with biogas and solar power, incorporating “green” building standards in the new administration building, and using energy efficient equipment. Furthermore, the high quality treated effluent to be produced by the WWTP, following the upgrade, will likely be suitable for irrigation and other uses, and thus become an integral element in the City’s future water supply.

The City’s ongoing effort in managing the water supply and sewer discharge such as the delivery of Nacimiento water, voluntary and mandated reduced use of water softeners, implementation of water conservation best management practices and implementation of source control programs for the industrial discharges will change the characteristics of the sewage entering the WWTP. It is essential that the WWTP upgrade project incorporate the impacts of these changes. Recommended improvements may include upgrades outside of the WWTP.

Attachment B
Project Schedule

Attachment C
List of Drawings

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
GENERAL		350	12	20
1	G-000 Cover Sheet			
2	G-001 Index of Drawings			
3	G-002 Legend			
4	G-003 Abbreviations			
5	G-004 Process Flow Diagram Liquid			
6	G-005 Process Flow Diagram Solids			
7	G-006 Liquid Stream Hydraulic Profile			
8	G-007 Residuals Stream Hydraulic Profile			
CIVIL		1887	76	430
9	CY001 Demolition Plan - Phase I			
10	CY002 Key Map			
11	CY003 Overall Site Plan and General Notes			
12	CY004 Demolition Plan and Overall Site Plan - Phase II			
13	CY101 Grading and Paving Plan - Area 1			
14	CY102 Grading and Paving Plan - Area 2			
15	CY103 Grading and Paving Plan - Area 3			
16	CY104 Grading and Paving Plan - Area 4			
17	CY105 Grading and Paving Plan - Area 5			
18	CY106 Grading and Paving Plan - Area 6			
19	CY109 Grading and Paving Plan - Area 8			
20	CY109 Grading and Paving Plan - Area 9			
21	CY110 Effluent Polishing Channel			
22	CY111 Effluent Polishing Channel Details			
23	CY112 Site Piping - Area 1			
24	CY113 Site Piping - Area 2			

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours			
		Task F.3	Task F.4	Task F.5	
25	CY114	Site Piping - Area 3			
26	CY115	Site Piping - Area 4			
27	CY116	Site Piping - Area 5			
28	CY117	Site Piping - Area 7			
29	CY118	Site Piping - Area 8			
30	CY119	Site Piping - Area 9			
31	CY301	Grading Coordinates			
32	CY302	Yard Piping Coordinates			
33	CY303	Chemical Feed Duct Bank and Pull Box Section			
34	CY501	Miscellaneous Yard Details			
35	CY502	Miscellaneous Yard Details			
36	CY503	Miscellaneous Yard Details			
37	CY504	Miscellaneous Yard Structures - Dechlorination Channel Plan and Sections			
38	CY504	Entry Monument			
	ARCHITECTURAL		1041	42	180
39	AG000	Title 24			
40	AG001	Schedules and Details			
41	AG002	Details			
42	AM101	Blower/Electrical Building Floor Plan			
43	AM102	Blower/Electrical Building Roof Plan			
44	AM201	Blower/Electrical Building Canopy Elevations			
45	AM202	Blower/Electrical Building Canopy Elevations			
46	AM301	Blower/Electrical Building Sections			
47	AO101	Operations Building Floor Plan			
48	AO102	Operations Building General Arrangement Floor Plan			
49	AO103	Operations Building Roof Plan			
50	AO104	Operations Building Reflected Ceiling Plan			

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
51	AO200	Operations Building Elevations - North and South		
52	AO202	Operations Building Elevations - West and East		
53	AO301	Operations Building Section		
54	AO501	Operations Building Interior Details		
55	AO503	Operations Building Interior Elevations		
56	AO504	Operations Building Interior Details		
STRUCTURAL		2778	114	465
57	SG001	Structural Notes		
58	SG002	Std Concrete Joint Details		
59	SG003	Std Concrete Reinf Details		
60	SG004	Typ Masonry Wall Reinf Details		
61	SG005	Typ Masonry Lintel & Jamb Details		
62	SG006	Guardrail & Handrailing Details		
63	SG007	Typical Stair Details		
64	SH101	Headworks Lower and Operating Level Plans		
65	SH301	Headworks Sections		
66	SH303	Headworks Sections and Details		
67	SP301	Primary Influent Flow Splitter Plan and Sections		
68	SP101	Primary Effluent Pump Station Plans, Sections and Details		
69	SB101	BNR Influent Flow Splitter Plan and Sections		
70	SB101	BNR Basin Foundation Plan		
71	SB102	BNR Basin Foundation Plan		
72	SB104	BNR Basin Operating Floor Plan		
73	SB105	BNR Basin Operating Floor Plan		
74	SB301	BNR Basin Sections		
75	SB302	BNR Basin Sections		
76	SB303	BNR Basin Sections		

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
77	SS101	Secondary Clarifiers No. 1 Foundation and Top Plans		
78	SS102	Secondary Clarifiers No. 2 Foundation and Top Plans		
79	SS103	Secondary Clarifiers No. 3 Foundation and Top Plans		
80	SS301	Secondary Clarifier Sections		
81	SS301	Secondary Clarifier Sections		
82	SS302	Secondary Clarifier Sections and Details		
83	SS302	Secondary Clarifier Sections and Details		
84	SR101	RAS Pump Station Plan and Sections		
85	SR102	WAS Pump Station Plan and Sections		
86	SR103	Primary Scum Pump Station Plan and Section		
87	SR104	Secondary Scum Pump Station Plans and Section		
88	SR105	FOG Receiving Station - Plan and Section		
89	SD101	DAFT System - Plan		
90	SD301	DAFT System - Sections		
91	SD102	Thickened Sludge Pump Station - Plan and Sections		
92	SO101	Operations Building Floor Plan		
93	SO102	Operations Building Roof Plan		
94	SO301	Operations Building Sections & Details		
95	SO302	Operations Building Sections & Details		
96	SL101	Chlorine Contact Basin Plans, Sections and Details		
97	SL102	Dechlorination Contact Channel		
98	SC101	Chemical Feed Area Plans, Sections and Details -Ferric		
99	SC102	Chemical Feed Foundation Plan - CATS & Ammonia		
100	SC103	Chemical Feed Sectional Plan		
101	SM101	Blower/Electrical Building Plan		
102	SM301	Blower/Electrical Building Details		
103	SE101	Cogen and Standby Generator Foundation Plan		

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
104 SE102	W3 Foundation Plan			
	MECHANICAL	2866	122	345
105 MG001	Miscellaneous Pipe Support Details			
106 MG002	Miscellaneous Piping Details			
107 MG003	Miscellaneous Details			
108 MG004	General Notes and Details			
109 MG006	Miscellaneous Mechanical Details			
110 MH101	Headworks Lower and Operating Level Plans			
111 MH301	Headworks Section			
112 MH303	Headworks Details (Septage Receiving Station)			
113 MP101	Primary Influent Flow Splitter			
114 MP102	Primary Effluent Pump Station (Retrofit)			
115 MB101	BNR Influent Flow Splitter			
116 MB102	BNR Basins Sectional Plan @ El XX			
117 MB103	BNR Basins Sectional Plan @ El XX			
118 MB104	BNR Basins Operating Level Plan			
119 MB105	BNR Basins Operating Level Plan			
120 MB106	BNR Basins Enlarged Plans			
121 MB107	BNR Basins Enlarged Plans			
122 MB301	BNR Basins Sections			
123 MB302	BNR Basins Sections			
124 MS101	Secondary Clarifiers Plan			
125 MS101	Secondary Clarifiers Plan			
126 MS101	Secondary Clarifiers Plan			
127 MS301	Secondary Clarifiers - Sections and Detail			
128 MS301	Secondary Clarifiers - Sections and Detail			

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours			
		Task F.3	Task F.4	Task F.5	
129	MS501	Secondary Clarifier - Details			
130	MR101	RAS Pump Station Plan and Sections			
131	MR102	WAS Pump Station Plan and Sections			
132	MR103	Primary Scum Pump Station Plan and Section			
133	MR104	Secondary Scum Pump Station Plans and Section			
134	MR105	FOG Receiving Station - Plan			
135	MR301	RAS Pump Station Sections			
136	MR301	RAS Pump Station Sections			
137	MR302	FOG Receiving Station - Section and Details			
138	MD101	DAFT System - Plan			
139	MD301	DAFT System - Sections			
140	MD102	Thickened Sludge Pump Station - Plan and Section			
141	MC101	Chemical Feed Area Plan - Ferric and Sections			
142	MC101	Chemical Feed Area Plan - Ammonium Sulfate & Cat			
143	MC301	Chemical Feed Area Sections			
144	MC302	CATS Area Plan and Sections			
145	ML101	Chlorine Contact Basin Plans, Sections and Details			
146	MM106	Blower Bldg - Plan and Section			
147	ME101	Standby Engine Generator			
148	ME102	Engine Generator (Co-Gen)			
149	ME103	Engine Generator (Co-Gen)			
150	ME104	Engine Generator (Co-Gen)			
151	ME105	Engine Generator (Co-Gen)			
152	ME106	Digestor Flare			
153	ME107	W-3 Water Pump Station Plan and Section			
	HVAC		340	20	80

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
154	HG001	Legend, Abbreviations, and General Notes		
155	HG002	Title 24 Compliance Forms		
156	HG003	Title 24 Compliance Forms		
157	HG004	Schedules and Sequence of Operations		
158	HG005	Details		
159	HB101	Blower/Electrical Building Floor Plan		
160	HO101	Operations Building Floor Plan		
PLUMBING		226	14	65
161	PG001	Water Schematics and Riser Diagrams		
162	PG002	Schedules and Details		
163	PO101	Blower/Electrical Building - Floor Plan		
164	PR101	FOG and Chemical Feed Areas		
165	PO101	Operations Building Floor Plan		
ELECTRICAL		2450	128	464
166	EG001	Legend and Abbreviations		
167	EY101	Power Distribution Functional Diagram		
168	EY102	Overall Electrical Site Plan		
169	EY103	Partial Electrical Site Plan 1		
170	EY104	Partial Electrical Site Plan 2		
171	EY105	Service Entrance Switchboard One Line		
172	EY106	Headworks & Thickened Sludge PS Power One Lines		
173	EY107	Primary Effluent Pump Station Power One Lines		
174	EG601	RAS & Secondary Scum Pump Station 1 Power One Lines		
175	EG603	Blower Building MCC One Line		
176	EG604	Blower Building MCC One Line		
177	EG605	Blower Building MCC One Line		
178	EG606	FOG Power One Line		

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
179	EG611	Operations Building MCC One Line		
180	EG612	Operations Building MCC One Line		
181	EG613	Relocated Warehouse Power One Lines		
182	EG615	Chemical Feed One Lines		
183	EG617	PLC One Lines		
184	EG631	PLC One Lines		
185	EG618	PLC One Lines		
186	EG632	Blower System Control One Lines		
187	EG701	Misc One Lines		
188	EG701	Misc One Lines		
189	EG703	Schematics		
190	EG703	Schematics		
191	EG704	Schematics		
192	EG802	Panelboard Schedules		
193	EG803	Panelboard Schedules & Lighting Fixture Schedule		
194	EH101	Duct Bank Sections		
195	EB101	Duct Bank Sections & Schedule		
196	EB102	Details		
197	EI101	Headworks Area Power & Lighting Plan		
198	EF101	Thickened Sludge PS & DAF Area Power & Lighting Plan		
199	ES103	Electrical Building Power Plan		
200	ES104	Electrical Building Lighting Plan		
201	ES107	W3 Power and Lighting Plan		
202	ES108	BNR Basin Power Plan 1		
203	ES109	BNR Basin Power Plan 2		
204	ES111	BNR Basin Lighting Plan		
205	ES112	RAS & Secondary Scum Pump Station 1 Power & Lighting Plan		

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours		
		Task F.3	Task F.4	Task F.5
206	ES113	RAS & Secondary Scum Pump Station 2 Power & Lighting Plan		
207	ES114	Secondary Clarifiers Power & Lighting Plan		
208	ES115	Chemical Feed Area Power and Lighting Plan		
209	ES116	Operations Building Power Plan		
210	ES117	Operations Building Lighting Plan		
211	ES118	Relocated Warehouse Power & Lighting plan		
212	ES119	FOG Area Power and Lighting Plan		
213	ES120	Standby Generator Power & Lighting Plan		
214	ES121	Title 24 Forms Plan		
215	ES122	CATS Area Power Plan		
216	ES123	Dechlorination Area Lighting Plan		
INSTRUMENTATION		1360	68	142
217	I001	P&ID Legend and Abbreviations (1 of 3)		
218	I002	P&ID Legend and Abbreviations (1 of 3)		
219	I003	P&ID Legend and Abbreviations (1 of 3)		
220	I004	P&ID Influent Bar Screens		
221	I006	P&ID Vortex Grit Basin and Primary Influent Flow Splitter		
222	I007	P&ID Primary Clarifiers Sludge Pump Station		
223	I008	P&ID Primary Clarifiers Scum Pump Station		
224	I009	P&ID Aeration Blowers System		
225	I010	P&ID BNR Basin No. 1		
226	I011	P&ID BNR Basin No. 2		
227	I012	P&ID BNR Basin No. 3		
228	I013	P&ID Secondary Clarifiers		
229	I014	P&ID Secondary Clarifiers		
230	I015	P&ID RAS Pump Station		
231	I016	P&ID WAS Pump Station		

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

Drawing Number	Drawing Title	Budget Hours			
		Task F.3	Task F.4	Task F.5	
232	I017	P&ID Secondary Scum Pumps			
233	I018	P&ID Primary Effluent Pump Station			
234	I019	P&ID DAFT System			
235	I021	P&ID Effluent Disinfection and Polishing			
236	I022	P&ID Thickened Sludge Pump Station			
237	I023	P&ID FOG Receiving Station			
238	I024	P&ID FOG Storage and Recirculation			
239	I025	P&ID FOG Delivery			
240	I026	P&ID Standby Engine Generator			
241	I027	P&ID Engine Generator (Co-Gen)			
242	I028	P&ID DG Gas Cleanup			
243	I029	P&ID DG Gas Compression			
244	I030	P&ID DG EG Heat Recovery			
245	I031	P&ID W3 System			
246	IC001	P&ID Ferric Storage and Feed System			
247	IC002	P&ID Ferric Storage and Feed System			
248	IC003	P&ID Ammonium Sulphate Storage and Feed System			
249	IC004	P&ID Ammonium Sulphate Storage and Feed System			
250	IC005	P&ID Dechlorination Storage and Feed System			
251	IC006	P&ID Dechlorination Storage and Feed System			
252	I501	Instrument Installation Details Page 1 of 3			
253	I502	Instrument Installation Details Page 2 of 3			
254	I503	Instrument Installation Details Page 3 of 3			
255	I601	Plant Control System Network Diagram			
		Total	13298	594	2191

Attachment D

Estimated Level of Effort

City of Paso Robles
Wastewater Treatment Plant Upgrade
Scope of Services for Final Design

City of Paso Robles Wastewater Treatment Plant Final Design Estimated Level of Effort																		
Task No.	Task Description	Classification		Project Director	Project Manager	Eng Mgr	Project Egrs	QA/QC	Sr Egrs	Staff Egrs	CAD	Admin	Total Hours	Labor Cost	Direct Expenses	Sub-Cons	Total Cost	
		Avg Rate																
D	PROJECT MANAGEMENT																	
D.1	Project Schedule (Initial + Monthly Updates)			0	20	30	0	0	0	0	0	0	50	\$9,050	\$980	0	\$10,030	
D.2	Monthly Progress Meetings (12)			60	100	160	40	0	0	0	0	22	382	\$67,580	\$10,540	0	\$78,120	
D.3	Monthly Telephone Conference (12)			12	24	30	30	0	0	0	0	20	116	\$18,930	\$1,540	0	\$20,470	
D.4	Monthly Progress Reports (12) / Invoicing			4	28	30	0	0	0	0	0	60	122	\$16,910	\$1,080	0	\$17,990	
D.5	Project Document Log and File (12 Months)				0	10	0	0	0	0	0	120	130	\$12,450	\$1,340	0	\$13,790	
	SUBTOTAL - TASK D PROJECT MANAGEMENT			76	172	260	70	0	0	0	0	222	800	\$ 124,920	\$ 15,480	\$ -	\$ 140,400	
E	PRE-FINAL DESIGN PHASE SERVICES																	
E.1	Blower Technology Evaluation			2	4	6	8	2	12	20	0	4	58	\$8,430	\$1,260	0	\$ 9,690	
E.2	Cogeneration, On-Site Generation and Standby Generator Evaluation			2	6	14	20	4	22	58	0	12	138	\$19,330	\$1,810	0	\$ 21,140	
E.3	Operations Building			0	4	8	10	2	22	34	34	10	124	\$15,810	\$2,060	0	\$ 17,870	
	SUBTOTAL - TASK E PRE-FINAL DESIGN PHASE			4	14	28	38	8	56	112	34	26	320	\$ 43,570	\$ 5,130	\$ -	\$ 48,700	
F	FINAL DESIGN PHASE SERVICES																	
F.1	Surveying, Mapping & Utility Engineering			0	12	15	0	0	5	0	20	0	52	\$7,660	\$2,940	\$19,600	\$30,200	
F.2	Geotechnical Investigations			0	12	20	0	8	20	0	0	0	60	\$9,980	\$6,500	\$56,430	\$72,910	
F.3	Final Design and Construction Contract Documents (60%, 90%)			0	500	949	932	0	2,034	3,291	5,142	450	13,298	\$1,669,210	\$126,210	0	\$1,795,420	
F.4	Quality Assurance/Quality Control			0	0	0	0	594	0	0	0	0	594	\$98,010	\$4,530	0	\$102,540	
F.5	100% Camera-Ready Design Documents			0	40	80	136	0	255	765	850	65	2,191	\$266,610	\$25,145	0	\$291,755	
F.6	City Presentations (2)			0	48	16	0	0	0	24	16	16	120	\$18,520	\$6,020	0	\$24,540	
F.7	Opinion of Probable Construction Costs (60%, 90%, 100%)			0	16	20	34	40	68	184	0	13	375	\$52,650	\$2,640	0	\$55,290	
F.8	Permitting Support			0	4	16	16	0	12	12	8	14	82	\$11,320	\$150	0	\$11,470	
F.9	SRF Support			0	4	16	16	0	12	12	8	4	72	\$10,420	\$60	0	\$10,480	
F.10	Constructibility Review			0	20	24	24	0	24	60	24	24	200	\$27,440	\$3,490	0	\$30,930	
F.11	Contractor Outreach			0	16	16	16	0	24	40	8	16	136	\$19,200	\$1,165	0	\$20,365	
	SUBTOTAL - TASK F FINAL DESIGN PHASE			0	672	1,172	1,174	642	2,454	4,388	6,076	602	17,180	\$ 2,191,020	\$ 178,850	\$ 76,030	\$ 2,445,900	
	TOTAL =			80	858	1,460	1,282	650	2,510	4,500	6,110	850	18,300	\$ 2,359,510	\$ 199,460	\$ 76,030	\$ 2,635,000	

Attachment E
Billing Rate Schedule

Black & Veatch Corporation
Billing Rate Schedule
For
City of Paso Robles Wastewater Plant Upgrade Project
(Effective January 1, 2008 through December 31, 2010)

Classification	Typical Title	Hourly Rate
Vice President / PM 14	Project Director	205
Vice President / PM 13	Specialist / Senior Manager	195
PM 12	Senior Project Manager	190
PM 11	Project Manager	190
Engineer 9	Senior Specialist / Department Manager	195
Engineer 9	Senior Specialist / Department Manager	180
Engineer 8	Specialist / Department Manager	180
Engineer 7	Senior Design Manager	175
Engineer 6	Design Manager	175
Engineer 5	Engineering Manager	170
Engineer 5	Project Engineer	155
Engineer 4	Project Engineer	150
Engineer 4	Senior Engineer	145
Engineer 3	Staff Engineer	130
Engineer 2	Staff Engineer	125
Engineer 1	Staff Engineer	115
Technical 8*	Senior Technician	125
Technical 7*	Senior Technician	120
Technical 6*	Senior Technician	115
Technical 5*	Adv. Technician	110
Technical 4*	Adv. Technician	105
Technical 3*	Technician	100
Technical 2*	Technician	95
Technical 1*	Technician	85
Contract Administrator*	Contract Administrator	95
Project Assistant*	Project Assistant	90
Clerical*	Clerical	70

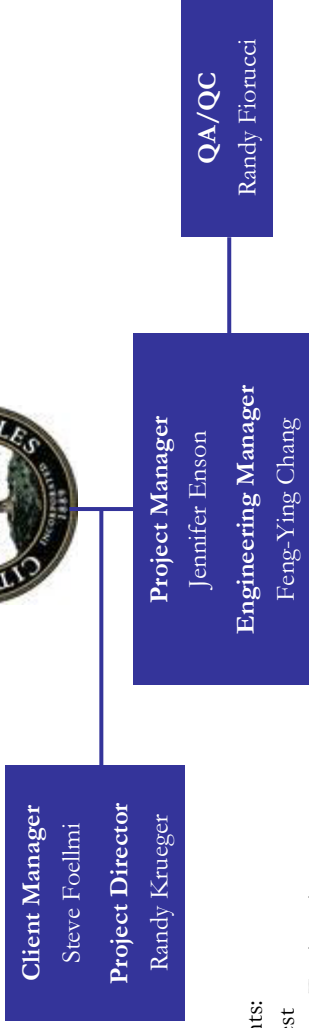
Notes:

1. Office expenses shall be reimbursed on a basis of \$8.75 per labor hour billed to cover in-house reproduction & printing, telephone, computer, postage, local travel (within 50 miles of site) and other general office expenses.
2. Mileage shall be reimbursed at a rate of \$0.55 per mile.
3. Subconsultants and other direct costs, including outside reproduction charges and long distance travel (beyond 50 miles to site) will be reimbursed at cost plus 10%.
4. The fee schedule may be adjusted periodically to reflect salary increases for professional staff. The annual adjustment may not exceed 5 percent. This schedule will be held unchanged for year 2010.
5. Professionals noted with an (*) are non-exempt classifications.

Attachment F

Project Team Organization Chart and Resumes

Wastewater Plant Upgrade Final Design Project Team



- Subconsultants:
1. Fugro West
 2. Cornerstone Engineering

ENGINEERING DISCIPLINE LEADS			
Architectural Tim Devine	Instrumentation & Controls Kevin Vandiver	Treatment Process Ken Abraham	Chemical Feed Ed Vogt
Electrical John Pudota	Building Mechanical Michele Roth	Structural S.U. Park	Process Mechanical Dave Long
TECHNICAL SPECIALISTS AND DESIGN SUPPORT			
Electrical Scott Cutting Chris Kindle	Structural Ben Yolo	I&C Kim Ogle	Treatment Process Peter Schauer
Geotechnical Jon Blanchard ⁽¹⁾	Process Mech Julia Gass Enrique Mejia	Survey Derrill Whitten ⁽²⁾	Civil Kevin Jim Erin Brosnan
CAD DESIGN SPECIALISTS			
	Jerry Martins – Manager	Norman Custado – Structural	
	John Parker – Electrical	Tony Schwank – Process Mechanical	
	Binh Pho – Site Layout	Gerardo Tijero – Structural/Process Mechanical	



Project Title:

Client Manager

Specialty / Discipline:

Civil Engineer

Total Years Experience:

37

Years with Black & Veatch:

37

Special Attributes:

- ✓ Project Manager of more than 30 WTPs
- ✓ Project Manager of Nacimiento Water Project
- ✓ “Triple Threat” Combination of Technical, Project Management, and People Skills

Professional Registration:

California, Arizona, Wisconsin, Michigan, Nevada

Education:

B.S., Civil Engineering, University of Wisconsin, 1972
M.S., Civil Engineering, University of Missouri, 1981

Professional Associations:

AWWA, ASCE

Publications / Presentations:

Author of more than 100 articles or presentations, including Intake Facilities Chapter AWWA Manual of Practice

Awards / Recognition:

Voting Member, AWWA Steel Pipe Committee

Summary of Recent Project Experience / Role:

Wastewater Treatment Plant Upgrade Project, Paso Robles, California.

Client Manager. For preparation of Facilities Plan and preliminary design for the upgrade of City of Paso Robles Wastewater Treatment Plant. The identified major improvements include converting tricking filters to activated sludge to facilitate nitrogen and phosphorus removal, installation of cogeneration facilities to utilize digester gas for power generation, and renewal and replacement of other major equipment to extend their useful life. Estimated construction cost of the identified improvements is \$40 million.

Water Treatment Plant Project, Paso Robles, California.

Project Director. For new 6 mgd water treatment plant, expandable to 12 mgd, to treat future Nacimiento raw water supply. Project includes new treatment process, clearwell, treated water pump station, and distribution pipelines.

Nacimiento Water Project, San Luis Obispo County Flood Control and Water Conservation District, San Luis Obispo, California.

Project Manager. Directing preliminary and final design of a regional raw water transmission facility that will deliver water from Lake Nacimiento to communities in San Luis Obispo County. Major facilities include an intake and pump station at Lake Nacimiento, approximately 45 miles of transmission pipeline ranging in size from 30 to 12-inches in diameter, four storage tanks, two intermediate pump stations, and turnouts to divert water to project participants. Provided technical oversight on PDR development, 16 TMs, and various technical investigations. Significant liaison with project stakeholders.

Canyon Filtration Plant Membrane Treatment Upgrade and Expansion, Azusa Light and Water, Azusa, California.

Project Manager. Directed preliminary and final design of a 16 mgd capacity membrane treatment upgrade and expansion of an existing 7.5 mgd Canyon Filtration Plant.

Earl Schmidt Filtration Plant Improvements, Castaic Lake Water Agency, Santa Clarita, California.

Project Manager. Directed the study, design and construction management of the plant expansion from 28 to 56 mgd as well as improvements to meet current and future regulations. The plant treats West Branch SWP water from Castaic Lake and is the largest contact adsorption clarification plant in North America.

Oliver P. Roemer Water Filtration Facilities Expansion, West Valley Water District, Rialto, California.

Project Manager. Directed preliminary and final design of facilities expansion (from 9.6 mgd to 14.4 mgd) incorporating design for both local water and SWP East Branch water in all combinations.



Sandhill Water Treatment Plant, San Gabriel Valley Water Company, El Monte, California.

Project Manager. Directed preliminary and final design for a new 20-mgd surface water treatment plant that would operate in conjunction with an existing Diatomaceous Earth filtration facility.

Lloyd W. Michael Water Treatment Plant Audit, Cucamonga Valley Water District, Rancho Cucamonga, California.

Project Manager. Directed an audit of existing facilities at the Lloyd W. Michael Water Treatment Plant. Directed preparation of a report recommending modifications to allow the plant to operate at 30 mgd. Participated in meeting with DHS to receive regulatory approvals.

Water Treatment Improvements, City of Redlands, California.

Project Manager. Directed a series of projects designed to allow the City of Redlands to continue to provide a safe, reliable water supply. Projects include development of treatment process modifications to the Henry Tate Water Treatment Plant (20 mgd), alternative operational procedures to increase hydraulic capacity at the Horace Hinckley Water Treatment Plant (30 mgd), and a blending plan for the Highland Avenue Water Complex and two adjacent wells. As part of the Emergency Response Plan, several testing protocols were established for DHS review and approval.

Fontana Surface Water Treatment Plant, San Gabriel Valley Water Company, El Monte, California.

Project Manager. Directed the preliminary design of a new 15 mgd (expandable to 45 mgd) water treatment to treat East Branch SWP water. Alternative analyses included evaluation of plant capacity and phasing, site selection and acquisition assistance, and treatment process and disinfection approach selection.

Lenain Filtration Plant Modifications, City of Anaheim, California.

Project Manager. Directed preliminary and final design and construct phase services for improvements to the existing 15-mgd water treatment plant. The project work included a new conventional water treatment plant with inclined plate settlers, ozonation for primary disinfection and deep bed filtration using monomedium anthracite. The project included DOHS and EPA regulatory compliance. An important aspect was the extremely constrained site in the Anaheim Hills.

Expansion of the Rio Vista WTP, Castaic Lake Water Agency, Santa Clarita, California.

Project Manager. Directed expansion of the existing Rio Vista WTP from 30 to 60 mgd. Plant includes intake pump station, ozone primary disinfection, contact clarifiers, filtration and washwater treatment facilities. Also directed feasibility study of including sidestream ozone injection.



Project Title:

Project Director

Specialty / Discipline:

Civil Engineer

Total Years Experience:

36

Years with Black & Veatch:

36

Special Attributes:

- ✓ Water and wastewater management and engineering

Professional Registration:

Oregon, Colorado, Washington

Education:

B.S., Civil Engineering, University of Colorado, 1971

Professional Associations:

WEF, AWWA

Summary of Recent Project Experience / Role:

Wastewater Treatment Plant Upgrade Project, Paso Robles, California.

Project Director. For preparation of Facilities Plan and preliminary design for the upgrade of City of Paso Robles Wastewater Treatment Plant. The identified major improvements include converting tricking filters to activated sludge to facilitate nitrogen and phosphorus removal, installation of cogeneration facilities to utilize digester gas for power generation, and renewal and replacement of other major equipment to extend their useful life. Estimated construction cost of the identified improvements is \$40 million.

Wastewater Treatment Plant Upgrade and Expansion, City of Soledad, California.

Project Director. Design and construction management services for expansion and rebuild of City Treatment Plant. Plant capacity is 5.5 mgd and includes BNR process and Title 22 improvements. Project includes design of 1.3 mgd Scalping MBR facility located within City Collection System. Facility will supply reuse water to new and existing City developments. Provided advisory for 5.5 mgd upgrade and expansion to the existing Soledad Wastewater Treatment Plant. Plant includes new headworks, aeration basins, secondary clarifiers, tertiary treatment, solids handling, and UV treatment trains.

Master Plan and Facilities Plan, City of Soledad, California.

Project Director. Master Plan and detailed Facilities Plan for City’s wastewater collection, treatment and reuse facilities. Planned improvements included major upgrade to existing treatment plant and proposed new scalping MBR treatment facility. Treatment improvements emphasis on the reuse of water.

Schematic Design (Preliminary Design) of Wastewater Treatment Improvements, City of Salem, Oregon.

Project Manager. Managed schematic design (Preliminary Design) of \$300 million improvements and upgrades to City’s wastewater treatment facilities. Improvements include substantial upgrades to City’s Willow Lake Water Pollution Control Facility plus a new Satellite High Rate Treatment Facility (Actiflo Process) at the City’s River Road Park.

Facilities Plan, City of Salem, Oregon.

Project Director. Facilities Plan to correct Sanitary Sewer Overflows (SSO’s) and treatment plant improvements to provide for Salem’s growth. Plan developed a 400 million dollar plan to be implemented over an approximate 15 year period.

Wastewater Regionalization Study, County of Clackamas, Oregon.

Project Manager. Feasibility level study for regionalization of four wastewater treatment facilities in Clackamas County.



Columbia Boulevard Wastewater Treatment Plant, City of Portland, Oregon.

Project Manager. Design and construction of solids handling improvements at wastewater treatment facility.

Air Treatment Facilities, City of Los Angeles, California.

Deputy Project Manager. Design and Construction phase services for 7 air treatment facilities that treat foul air (primary H₂S) from City’s wastewater conveyance system. Treatment process includes multiple trains of biotrickling filters followed by carbon contactors. Construction value is \$105 million.

Dechlorination Facility, South Adams County Water and Sanitation District, Commerce City, Colorado.

Project Manager. Managed design and construction of sulfur dioxide dechlorination facility at wastewater treatment plant.

Roger Road Wastewater Treatment Plant Expansion, City of Tucson, Arizona.

Design Engineer. Designed improvements and plant capacity expansion to wastewater treatment plant.

Wastewater Treatment Plant Modifications, City of Boulder, Colorado.

Design Engineer. Designed digester complex at 75th Street wastewater treatment plant.

Wastewater Treatment Plant No. 2, City of Fort Collins, Colorado.

Design Engineer. Designed 12 mgd headworks facility that included three 72-inch diameter screw pumps.

Emergency Interceptor Sewer Repair, City of Longview, Washington.

Project Manager. Emergency assistance to the City for repair of failed (collapsed) interceptor sewer. Work included advisement of repair options, design services, and assistance during actual repair. Site conditions included high groundwater and “running sands”.

Peak Excess Flow Treatment Facility (PEFTF), City of Salem, Oregon.

Project Manager. Facility planning and schematic design for 50 mgd PEFTF that will treat SSO’s prior to release to Willamette River. Treatment system is expandable to 160 mgd. Treatment process includes screening, high rate clarification (Actiflo process), and UV disinfection. Project also includes SSO pumping into treatment facility.

CSO Wetlands Treatment System, City of Portland, Oregon.

Project Manager. Managed feasibility study of wetlands treatment system for combined sewer overflows. Project included pretreatment facilities, pumping stations, and conveyance pipelines up to 72-inches in diameter.



Project Title:

Project Manager

Specialty / Discipline:

Civil Engineer

Total Years Experience:

15

Years with Black & Veatch:

8

Special Attributes:

- ✓ Specializes in design and management of large and complex multi-disciplined projects
- ✓ Managed numerous projects with leading technology components. Involved in over 200 mgd of membrane filtration design
- ✓ Hand-on project manager with strong technical background

Professional Registration:

California

Education:

B.S., Environmental Engineering,
Humboldt State University, 1994
M.S.E., Environmental
Engineering, University of Texas
at Austin, 2000

Professional Associations:

AWWA, BAWWA, PMI

Other Languages:

Spanish - Proficient

Summary of Recent Project Experience / Role:

Groundwater Replenishment System Initial Expansion Project; Orange County Water District; Orange County, CA

Micofiltration and Reverse Osmosis Task Leader responsible for managing the design of a 30 mgd expansion of a groundwater replenishment project. The Groundwater Replenishment System (GWRS) consists of three major components: the Advanced Water Purification Facility (AWPF) and pumping stations, a pipeline connecting the facility to the recharge basins, and an existing seawater intrusion barrier. The Expansion Project will add 30 mgd to the production capacity of the AWPF, bringing the facility up to 100 mgd of product water. The GWRS supplements existing water supplies by providing a reliable, high-quality source of water to recharge the Orange County groundwater basin and protect the basin from further degradation due to seawater intrusion.

Altamont Water Treatment Plant; Zone 7 Water Agency; Livermore, CA

Project Manager responsible for design of the 24-mgd water treatment plant. Zone 7 Water Agency is expanding their supply with the construction of the new Altamont Water Treatment Plant. Project included an extensive pre-design effort including a two-phase pilot study. Selected major processes include submerged membrane filtration, ozone for disinfection and taste and odor control, biologically active carbon contactors, and centrifuge dewatering.

Desaladora Project (Seawater Desalination Project-Definition Phase); Minera Escondida Limitada and BHP Billiton; Santiago, Chile

Package 1 Engineering Lead responsible for managing the design of a 3,200 L/s (approximately 75 mgd) Seawater Reverse Osmosis Plant. BHP Billiton (BHPB), through Minera Escondida Limitada (MEL), operates the Escondida Copper Mine in Antofagasta, Chile. As a result of expansion of mining activities and reduction of available water supplies, a new desalination plant is required. B&V was retained to prepare the Definition Phase Study (DPS) for the Desaladora (Desalination Plant) Project. The Project will consist of a seawater reverse osmosis-based desalination plant (Package 1), a water transportation system consisting of pipeline and pump stations (Package 2), a high voltage transmission system expansion (Package 3), and a 7-day storage reservoir (Package 4). Recommendations developed during the DPS form the basis for the Execution Phase of the Project. Package 1 consists of a seawater reverse osmosis plant with major processes including seawater intake and pipeline, screening facility, intake pump station, in-filter dissolved air flotation, second stage gravity media filters, filtrate pump station, cartridge filters, reverse osmosis system, and post treatment stabilization and storage.



Ophir Water Treatment Plant, Placer County Water Agency, CA

Project Manager responsible for siting study, preliminary design memorandum, and final design of this new water treatment plant. The membrane filtration plant is designed for an initial phase of 30 mgd, with many facilities in the ground to accommodate a near-term expansion to 60 mgd and an ultimate expansion to 120 mgd.

Lopez Water Treatment Plant Upgrade, San Luis Obispo County; San Luis Obispo, CA

Project Manager responsible for membrane procurement process, design of the upgrade project for a 6-mgd water treatment plant, and support during the construction phase. The project constituted an upgrade to the existing conventional treatment plant. All work was planned and sequenced to ensure minimal impact to the existing plant operations during construction and turnover.

South County Water Supply Program, South San Joaquin Irrigation District, Oakdale, CA

Project Engineer responsible for pre-design and design of the 40-mgd water treatment plant. Co-authored membrane filtration system procurement specifications, evaluated suppliers' bids for conformance to specifications and recommended the system that provided the best value to the owner. Facilitated coordination between multiple design disciplines and specifically focused on design of membrane filtration system mechanical piping and high-rate AquaDAF™ pretreatment system. As the project moved into construction, Ms. Enson participated as the Project Engineer responsible for coordination with contractors, review of shop drawings, and response to requests for clarification.

Phase 2 Recycled Water Project; City of Petaluma; Petaluma, CA

Project Manager responsible for design and management of the Phase 2 Recycled Water Project. The City of Petaluma was expanding their recycled water system to include a separate distribution system for secondary and tertiary recycled water. Project included design of a new 2.2 mg pre-stressed concrete reservoir and approximately 12,000 linear feet of 20-inch diameter recycled water piping. Pipeline alignment passes through several City and County streets as well as unimproved areas. Includes a jack and bore crossing under California Highway 120.

West Campus Water Treatment Plant; University of California Davis Campus; Davis, CA

Project Manager responsible for feasibility study for a new surface water treatment plant utilizing membrane filtration. Currently, the University utilizes deep aquifer wells for water supply. Due to concern over decreasing aquifer levels and availability of residual irrigation supply, a study was initiated to determine the feasibility of constructing a surface water treatment plant. The study analyzed water quality data, reviewed pertinent regulations, and evaluated conventional and membrane technologies. Study recommended an encased membrane system, based on a life cycle cost analysis and ranking of project objectives.



Project Title:

Engineering Manager

Specialty / Discipline:

Civil Engineer

Total Years Experience:

12

Years with Black & Veatch:

8

Special Attributes:

- ✓ Pilot study, design, plant start-up and optimization of Actiflo® system

Professional Registration:

California, North Carolina

Education:

B.S., Environmental Engineering,
Chen-Kung University, Taiwan,
1991

M.S., Environmental Engineering,
University of Florida, 1996

M.S., Bioinformatics, North
Carolina State University, 2002

Summary of Recent Project Experience / Role:

Wastewater Treatment Plant Upgrade Project, Paso Robles, California.

Engineering Manager. For preparation of preliminary design for the upgrade of City of Paso Robles Wastewater Treatment Plant. The identified major improvements include converting tricking filters to activated sludge to facilitate nitrogen and phosphorus removal, installation of cogeneration facilities to utilize digester gas for power generation, and renewal and replacement of other major equipment to extend their useful life.

Water Treatment Plant Project, Paso Robles, California.

Engineering Manager. Engineering manager for the final design of \$12 million new water treatment plant that will treat surface water from Lake Nacimiento. The primary project components includes raw water facility, raw water storage tank, pressure membrane filtration system, membrane building, chemical feed and Storage facilities and treated water storage and conveyance.

City of Soledad Wastewater Treatment Plant, Soledad, California.

Project Engineer. Led engineering team in designing a 5.5 mgd tertiary wastewater treatment plant producing reclaimed water meeting CA DHS Title 22 requirements. Major components included headworks, BNR basins, secondary clarifiers, direct filtration and UV disinfection. Procured filtration system and screw press system with State Revolving Fund.

City of Antioch Water Treatment Plant Solids Handling Facility and Plant Expansion - Antioch, CA

Project Engineer. Responsible for overall design of the solids handling facility and 10-mgd conventional treatment plant, which is an addition to an existing 16-mgd plant. The solids handling facility consists of a Deskins® dewatering system, Actiflo® treatment, a solids handling pump station, and an equalization tank.

Wastewater Pretreatment, New Century Beverage Company/Pepsi, Hayward, California.

Process Engineer. Preliminary design for anaerobic biological treatment system to achieve 95 percent BOD removal prior to discharge to the POTW.

City of Titusville Wastewater Treatment Plant, FL

Process Engineer. Responsible for evaluation of a modified A2O biological nitrogen removal system. This study included both bench-scale and full-scale evaluations to determine denitrification rates and total nitrogen removal using the modified system.

Midhill Reservoir II, Contra Costa Water District, CA

Project engineer. Responsible for preliminary study, final design, and construction support services for the 1.5-million-gallon, cast-in-place, rectangular, concrete reservoir.



Efficiency Enhancement Project - Stockton East Water Project, Stockton, CA

Project Engineer. Responsible for development, planning, coordination, design, and direction of engineering work for a 27.6 mgd pretreatment complex (coagulation, flocculation, and sedimentation).

Ophir Water Treatment Plant, Placer County Water Agency, Placerville, California.

Process Engineer. Responsible for process design for 40 mgd Actiflo[®] system to replace existing 27 mgd conventional plant. Raw source turbidity was 2 NTU and spiked to 1,200 NTU during winter storm events.

City of San Luis Obispo Water Treatment Plant, California.

Process Engineer. Participated in modifications for 16 mgd water treatment plant, including new clearwells, new pump station and evaluation of Actiflo[®] system retrofit to flocculation basins. Prepared a ballasted flocculation system evaluation report, including conceptual design and a present worth analysis of Actiflo system as compared to two other potential treatment options. Preparing Actiflo pilot study protocol and assisting implementation of a 5-week Actiflo pilot testing.

City of Clovis Water Treatment Plant, Clovis, California.

Process Engineer. Participated in pre-design and design for new 15 mgd water treatment plant and specifically focused on design of high rate Actiflo[®] pretreatment system. Authored ballasted flocculation system procurement specification, evaluated suppliers' bids for conformance to specifications and conducted a life-cycle cost analysis.

East Bay Municipal Utility District, Walnut Creek, California.

Actiflo Process Engineer. Responsible for pilot testing of recycling of filter backwash water for 90 mgd water treatment plant.

North Table Mountain WSD, Golden, Colorado.

Actiflo Process Engineer. Responsible for process design, start-up, process optimization, and trouble-shooting for an 11 mgd Actiflo[®] system, which replaced a conventional coagulation/flocculation and sedimentation process. Actiflo[®] was designed to treat low-particle density, low temperature, and extremely low alkalinity snowmelt water. This Actiflo[®] system is the first US Actiflo[®] installation.

Central Wyoming Regional Water Treatment Plant, Casper, Wyoming.

Actiflo Process Engineer. Responsible for pilot testing, process design, start-up, and operator training of a 27 mgd Actiflo[®] system retrofitting into the existing coagulation/flocculation basin. Raw water was from the North Plate River with turbidity ranging from an average of 10-20 NTU to 500-1,000 NTU during storms, or up to 4,000 NTU during spring run-off.



Project Title:

QA/QC

Specialty / Discipline:

Civil Engineer

Total Years Experience:

34

Years with Black & Veatch:

34

Special Attributes:

- ✓ Study, design and construction management of wastewater collection and treatment facilities

Professional Registration:

California, Kansas, Oregon, Washington

Education:

B.S., Civil Engineering, Kansas State University
M.S., Environmental Health Engineering, University of Kansas

Professional Associations:

WEF, ASCE, BAWWA, CWEA

Summary of Recent Project Experience / Role:

Wastewater Treatment Plant Upgrade Project, Paso Robles, California.

QA/QC. For preparation of Facilities Plan and preliminary design for the upgrade of City of Paso Robles Wastewater Treatment Plant. The identified major improvements include converting tricking filters to activated sludge to facilitate nitrogen and phosphorus removal, installation of cogeneration facilities to utilize digester gas for power generation, and renewal and replacement of other major equipment to extend their useful life. Estimated construction cost of the identified improvements is \$40 million.

Water Treatment Plant Project, Paso Robles, California.

QA/QC. For new 6 mgd water treatment plant, expandable to 12 mgd, to treat future Nacimiento raw water supply. Project includes new treatment process, clearwell, treated water pump station, and distribution pipelines.

Wastewater Treatment Plant Upgrade and Expansion, City of Soledad, California.

Senior Technical Advisor. Provided advisory services for 5.5 mgd upgrade and expansion to the existing Soledad Wastewater Treatment Plant. Plant includes new headworks, aeration basins, secondary clarifiers, tertiary treatment, solids handling, and UV treatment trains.

Wastewater Facility Plan Update, Yakima Regional Wastewater Treatment Plant, Yakima, Washington.

Senior Engineer. Provided technical input and review for the update of the Yakima Facility Plan, which encompasses regulatory requirements, analysis of existing 12-mgd wastewater treatment plant, and recommendations for future treatment modifications and expansions to meet projected future (2019) capacity and regulatory effluent quality requirements. The Facility Plan was submitted as part of National Pollutant Discharge Elimination System (NPDES) permitting requirements to the Washington Department of Ecology.

Secondary Activated Sludge Facility 2 – Plant No. 1, Orange County Sanitation District, Fountain Valley, California.

Senior Engineer. Provided technical guidance, review, and oversight for Technical Memorandum 2 - Facilities Operation and Maintenance for the 80-mgd secondary treatment facilities for Plant No. 1.

Clarifier Analysis and Review, Soscol Wastewater Treatment Plant, Napa Sanitation District, Napa, California.

Senior Technical Advisor. Led investigation of the existing 80-foot-diameter algae flocculating clarifiers and provided recommendations to optimize removal performance and to convert two existing 100-foot-diameter activated sludge final clarifiers to algae flocculating clarifiers. Proposed improvements for both facilities will include peripheral launders, scum skimming, baffling, and piping modifications.



Equipment Repair and Replacement Expenditure Benchmarking, Central Contra Costa Sanitary District, Martinez, California.

Project Manager. Led investigation of the existence of databases in order to establish guidelines for repair/replacement spending for the Central Contra Costa Sanitary District Wastewater Treatment Plant. Developed recommendations for estimating annual equipment replacement expenditures.

Northern San Joaquin Valley Water Recycled Water Study, City of Modesto, California.

Project Manager. Conducted a feasibility study identifying opportunities in the recycled water market and determining economic feasibility of expanding the secondary wastewater facilities to provide adequate recycled water to meet potential demand surrounding Modesto.

Main Wastewater Treatment Plant Odor Control (Phase 1) Project, East Bay Municipal Utility District, Oakland, California.

Project Manager. Evaluated 12 odor abatement strategies to treat odors from the 300-mgd headworks facilities. Developed equipment pre-purchase specifications and designed regenerative carbon systems to treat odors from the headworks facilities.

Leachate Management for the West County Landfill Closure Plan, East Bay Municipal Utility District, Oakland, California.

Project Manager. Evaluated landfill leachate impacts on existing wastewater treatment plant process trains. Assessed the feasibility and options for implementing a reliable flow pacing program to manage chloride discharges into the wastewater treatment plant utilizing conductivity as the control mechanism.

Water Pollution Control Plant, San Jose Environmental Services Department, San Jose, California.

Project Manager. Designed 1998-1999 Capital Improvement Program components including filter building roof replacement; rehabilitation of digesters; evaluation of existing gas holder; east primaries coating system evaluation; handrail replacement; cathodic protection system; and nitrification aerator pipe gallery repairs.

Evaluation of Grit System Upgrade and Odor Control at IPS, East Bay Municipal Utility District, Oakland, California.

Project Manager. Evaluated grit system upgrade to replace existing aerated grit chambers with vortex grit removal systems to treat average dry weather flow of 120 mgd. Odor control facilities for the influent pump station and associated grit removal facilities were evaluated.

Water Pollution Control Plant, San Jose Environmental Services Department, San Jose, California.

Deputy Project Manager. Responsible for providing technical guidance and quality control for tertiary filter upgrade project, digester cover evaluation, equalization basin study, and recycle water pipeline project.



Project Title:

Treatment Processes Task Lead

Specialty / Discipline:

Environmental Engineer

Total Years Experience:

23

Years with Black & Veatch:

5

Special Attributes:

- ✓ Process design of wastewater facilities

Professional Registration:

British Columbia (Canada)

Education:

B.S., Chemical Engineering,
University of Natal, Durban,
South Africa, 1982

B.S., Commerce, Business
Economics and Information
Systems, University of South
Africa, Pretoria, South Africa,
1986

Professional Associations:

WEF, PEO, APEGBC

Summary of Recent Project Experience / Role:

Wastewater Treatment Plant Upgrade Project, Paso Robles, California.

Process Engineer. For preparation of Facilities Plan and preliminary design for the upgrade of City of Paso Robles Wastewater Treatment Plant. The identified major improvements include converting tricking filters to activated sludge to facilitate nitrogen and phosphorus removal, installation of cogeneration facilities to utilize digester gas for power generation, and renewal and replacement of other major equipment to extend their useful life. Estimated construction cost of the identified improvements is \$40 million.

Wastewater Treatment Plant, Inland Empire Utilities Agency, Chino, California.

Process Engineer. Process analysis, recommendations and revised operations and maintenance procedures for a complex digester heating facility including biogas fueled cogeneration engine, two boilers and 4 heat exchangers attempting to operate in phased Acid/Thermophilic/Mesophilic configuration.

East Bay Municipal Utilities District, Oakland, California.

Process Engineer. Installation of a Pilot Facility, development of Pilot Test protocol and troubleshooting support to client for a ultra-filtration, reverse osmosis pilot facility to manufacture high purity high pressure boiler feed water from reclaimed wastewater. Provide process and detailed design direction to project engineers in the development of the design drawings and specifications.

Altamont Water Treatment Plant, Zone 7 Water Agency, Livermore, California.

Manager of Construction of Pilot Facility. Development of Pilot Test protocol and manager of operations for a head to head comparison of two submerged membrane filter technologies. Provided process and detailed design direction to project engineers in the development of the design drawings and specifications. Coordination and development of process related specifications including process control for CIP neutralization systems, backwash treatment systems and membrane integration.

Modesto Water Treatment Plant, Modesto Irrigation District, Modesto, California.

Manager of Pilot Operations. For a head to head comparison of two submerged membrane filter technologies. Provided process and detailed design direction to project engineers in the development of the design drawings and specifications. Coordination and development of process related specifications including process control for CIP neutralization systems, backwash treatment systems and membrane integration.



Ophir Water Treatment Plant, Placer County Water Agency, Placerville, California.

Manager of Construction of a Pilot Facility. Development of Pilot Test protocol and manager of operations for a head to head comparison of two submerged membrane filter technologies. Provided process and detailed design direction to project engineers in the development of the design drawings and specifications. Coordination and development of process related specifications including process control for CIP neutralization systems, backwash treatment systems and membrane integration.

Wastewater Treatment Plant, Stockton, California.

Process Engineer. Design build process engineering development for Stockton Wastewater Treatment Plant in association with US Filter.

BNR Wastewater Treatment Plant Upgrade and Expansion, City of Hagerstown, Maryland.

Process Engineer. Pre-design and detailed design input for the BNR wastewater treatment plant upgrade and expansion.

BNR Wastewater Treatment Plant, Missoula, Montana.

Process Engineer. Process design and review of the Missoula Montana, BNR wastewater treatment plant. Process piloting and design of a wastewater treatment plant for removal of hydrocarbons and surfactants with total reuse in Fire fighting.

Wastewater Treatment Plant, City of Bridgeport, Connecticut.

Process Engineer. Nitrogen removal modelling for the City of Bridgeport’s wastewater treatment plant.

Little Patuxent Wastewater Treatment Plant, Howard County, Maryland.

Process Engineer. Process Analysis and Troubleshooting of the 18 mgd wastewater treatment plant. Process design for the retrofit expansion of wastewater treatment plant.

South County Water Supply Program, South San Joaquin Irrigation District, California.

Process Engineer. Development of Performance Test Protocol for confirming vendor contractual guarantees. Managed commissioning and optimization of the 36 mgd Zenon ZW1000 plant startup. Coordination and development of process related activities including developing a novel process control method for citric acid recycle.

Biological Nutrient Removal Plant, Kalispell, Montana.

Process Engineer. Process commissioning, training, start-up and optimization of the Kalispell, Montana, biological nutrient removal plant.

Wastewater Treatment Plant, Stockton, California.

Process Engineer. Design build process engineering development for Stockton, CA WWTP in association with US Filter.



Project Title:

Lead Architectural

Specialty / Discipline:

Architect

Total Years Experience:

23

Years with Black & Veatch:

10

Special Attributes:

- ✓ Knowledge of client preferences and design standards through involvement with WWTP Facility Plan and new Water Treatment Plant

Professional Registration:

Missouri

Education:

Bachelor of Architecture,
University of Kansas

Professional Associations:

AIA

Summary of Recent Project Experience / Role:

Wastewater Treatment Plant Upgrade, City of Paso Robles, California.

Lead Architect: Responsible for architectural services on a facility improvements project for 4.9 million gallons per day (mgd) secondary WWTP located in Paso Robles. The WWTP was built in 1954 and was upgraded or expanded in 1972, 1987, and 2002, but has not been comprehensively upgraded since 1954. A new sodium hypochlorite facility is concurrently in construction to replace the existing chlorine gas disinfection system. The WWTP upgrade is intended to bring the plant into compliance with current and anticipated discharge regulations, as well as local regulatory requirements and City goals and policies. In addition, the City anticipates water recycling will be required and thus plans to add tertiary treatment in the future upgrade such that plant effluent can be used for irrigation and other recycle uses. The phasing approach is to “phase-in” the improvements over time, such that the initial WWTP capacity is adequate to meet the current customer demands, and subsequent capacity expansions are timed to keep pace with population growth.

Water Treatment Plant, City of Paso Robles, California.

Lead Architect: Responsible for architectural services on the facility. The City of Paso Robles is a project stakeholder in the Nacimiento Water Project currently being implemented by the San Luis Obispo County Flood Control and Water Conservation District. The Nacimiento Water Project is a regional water supply system that will convey raw water from Lake Nacimiento to communities in San Luis Obispo County, including the City of Paso Robles. The City will construct a water treatment plant to treat surface water received from Lake Nacimiento. The project is designed as a 6 million gallon per day (mgd) facility for initial operation in Year 2010, expandable to 12 mgd to meet ultimate future demand. The project components include raw water facilities, treatment process, chemical facilities and treated water blending facilities.

South Bakersfield Water Treatment Plant, California Water Services Company, Bakersfield, California.

Lead Architect: Responsible for architectural services on the Facility. Due to increasing potable water demand in the south Bakersfield service area, California Water Service Company (Cal Water) plans to construct a new water treatment plant (WTP) at their existing Station 146 groundwater well site. The WTP will supply both the Cal Water and City of Bakersfield water distribution systems. This project is being performed in partnership with the City of Bakersfield and the Kern Delta Water District. The project site is located in Bakersfield on the south side of Pacheco Road and a short distance east of Stine Road. The South Bakersfield WTP will be an immersed microfiltration membrane treatment plant, designed for 20 million gallons per day (mgd) initial production capacity, with the ability to be expanded to 40 mgd production capacity in the future. The new plant will be constructed on the western portion of the Station 146 site, with project facilities located on each side of Farmers Canal.



Mill Creek Wastewater Treatment Plant for the Greater Metropolitan Sewer District of Cincinnati, Ohio

Lead Architect: Responsible for architectural services on a new Grit Facility and Improvements to the existing Mill Creek Wastewater Treatment Plant for the Greater Metropolitan Sewer District of Cincinnati, Ohio, as well as modifications to the handling of primary settling tanks' thickened skimmings. The scope of the project includes operation of the facility during phased construction with demolition of the existing Grit building, tanks and equipment, construct six new grit tanks and new Grit building and installing new grit equipment; thickened skimmings handling building and tanks, demolition of existing building and equipment, and new building addition, new tanks and installation of new equipment.

Facility Improvements for the Airlite Waste Water Treatment Plant for the City of Elgin, Illinois

Lead Architect: Responsible for architectural services on the facility improvements at the Airlite Waste Water Treatment Plant. The improvements include operation of the Airlite booster pumps throughout a phased construction while demolition of the existing aeration basin, odor control building, rapid mix basin, two softening basins, recarbonation basin, valve vault A and B, and associated site piping; and new construction and installation for H₂S removal system, odor control system, 55 ft diameter upflow solids contact clarifiers, recarbonation basin and associated site piping; as well as electrical upgrades to add a new backup power generator and new 5 mgd booster pump.



Project Title:

Process Mechanical Lead

Specialty / Discipline:

Process Mechanical design for water and wastewater treatment facilities

Total Years Experience:

30

Years with Black & Veatch:

30

Professional Registration:

Kansas, Arizona, South Dakota, Missouri

Education:

B.S., Mathematics, Emporia State University
B.S., Mechanical Engineering, Kansas State University

Professional Associations:

WEF

Summary of Recent Project Experience / Role:

Energy Master Plan, Orange County Sanitation District.

Team Leader/Mechanical Engineer – Responsible for the evaluation of the existing cogeneration facility, including developing future power generation alternatives, future digester gas production and heating requirements, future electrical power requirements, and future siloxane removal systems. This information was used as input in a heat balance model to evaluate selected power generation alternatives.

Wastewater Treatment Plant Improvements, Yankton, South Dakota.

Process Mechanical Engineer – Designed the rehabbing of existing digester facility including replacing digester covers, digester heating systems, digester mixing systems, and digester gas system.

Phase I, II, and III Improvements, McDowell Creek Wastewater Treatment Plant, Charlotte-Mecklenburg Utilities, Charlotte, North Carolina.

Process Mechanical Engineer – Designed new process blower for Phase I Improvements. Designed new digester gas collection system and digester heating system, and digester mixing system for four existing primary digesters for Phase II Improvements. Designed new process blower system for Phase III Improvements

Advanced Wastewater Treatment Capacity Improvements, City of Dayton, Ohio.

Process Mechanical Engineer – Evaluated existing heating water system including engine heat recovery and boilers systems to determine improvements to meet future heating requirements. Designed boiler replacement facility and heating water improvements.

10th Addition to the Nine Springs Wastewater Treatment Plant, Madison Metropolitan Sewerage District, Madison, Wisconsin.

Process Mechanical Engineer – Designed of support systems for the converting of existing conventional digestion system to Temperature Phased Digestion (TPAD). Design included new and expanded digester and building heating systems, digester mixing systems, and digester gas collection and utilization systems.

Alternative Solids Project Morris Forman Wastewater Treatment Plant, Louisville and Jefferson County MSD, Louisville, Kentucky

Process Mechanical Engineer – Oversaw the design of rehabbing four existing primary digesters including replacement of sludge piping, new digester gas collection system and new digester heating system.

Fritz Island Wastewater Treatment Plant, City of Reading, Pennsylvania

Process Mechanical Engineer – Evaluated existing mechanical systems including digester facilities and solids handling facility. Provided input in report on findings and recommendations.



Advanced Wastewater Treatment Capacity Improvements, City of Dayton, Ohio

Process Mechanical Engineer – Evaluated existing heating water system including engine heat recovery and boilers systems to determine improvements to meet future heating requirements. Designed boiler replacement facility and heating water improvements.

Digester Facility Improvements, John E. Egan Water Reclamation Plant, Metropolitan Water Reclamation District of Greater Chicago, Illinois

Process Mechanical Engineer - Designed new digester gas system, digester heating system, and digester mixing system for four existing primary and secondary digesters.

Northwest Water Reclamation Plant Expansion, City of Mesa, Arizona

Process Mechanical Engineer - Designed digester gas system, digester and building heating system, and digester mixing system for two new primary digester. Design digester gas utilization system using cogeneration unit and boilers. Designed new blowers for aeration system. Designed plant compressed air system.

Wastewater Treatment Plant, City of Mankato, Minnesota

Process Mechanical Engineer - Designed digester gas system, digester heating system, and digester mixing system for addition on one new primary digester. Designed blower replacement for aeration system improvements.



Project Title:

Structural Task Lead

Specialty / Discipline:

Structural Engineer

Total Years Experience:

26

Years with Black & Veatch:

8

Special Attributes:

- ✓ Structural engineer for numerous WWTPs design
- ✓ Extensive experience in design of concrete, steel, masonry and wood structures

Professional Registration:

California, Oregon, Washington

Education:

B.S., Architectural Engineering,
Seoul National University, 1976
M.S., Civil Engineering, University
of Texas at Austin, 1982

Professional Associations:

SEAONC

Summary of Recent Project Experience / Role:

City of Soledad Wastewater Treatment Plant, Soledad, California.

Lead Structural Engineer. Responsible for overall review on structural design for the project.

Yakima Regional Wastewater Treatment Plant, Phase 1 Facility Improvements, City of Yakima, Washington.

Structural Engineer. Prepared structural design for the entire improvement project.

Altamont Water Treatment Plant, Zone 7 Water Agency, Livermore, California.

Lead Structural Engineer. Responsible for overall review on structural design for the project.

Modesto Regional Water Treatment Plant Phase II Expansion, Modesto Irrigation District, Modesto, California.

Lead Structural Engineer. Prepared structural design for Membrane Building, Ozone Contactor, and miscellaneous structures at the WTP.

Ophir Water Treatment Plant, Placer County Water District, Placerville, California.

Lead Structural Engineer. Provided structural design for Treated Water Reservoir, Treated Water Pump Station, Pretreatment Complex, and miscellaneous structures.

Carson Regional Water Recycling Plant, West Basin Municipal Water District, Carson, California.

Structural Engineer. Provided structural design for an equalization /nitrification tank.

Saint George Wastewater Treatment Plant Expansion, St. George, Utah.

Structural Engineer. Prepared design of Cascade Aerator, Main Electrical Building, Utility Water Pump Station, and UV Disinfection Facilities for the Project. Also provided coordination during design.

Water Reclamation Plant, Livermore, California.

Structural Engineer. Provided structural design for the disinfection facility.

Pepsi Wastewater Pre-Treatment Facility, Hayward, California.

Structural Engineer. Designed two-story wastewater pre-treatment basins with pile foundation.

Andritz Solids Recycling Facility, Sacramento Regional County Sanitation District, Sacramento, California.

Structural Engineer. Provided structural designs for mat foundations and centrifuge platform using SAP2000 software.

Del Valle Water Treatment Plant Solids Handling Project, Zone 7 Water Agency, Livermore, California.

Structural Engineer. Responsible for structural design for the project.



Wilson Creek Regional Wastewater Treatment Plant, Expansion No. 3, North Texas Municipal Water District, Wylie, Texas.

Structural Engineer. Provided structural design and QA/QC review for the Solids Building design at the plant.

Sharp Park Pump Station, City of Pacifica, California.

Structural Engineer. Project included structural modifications for the pump station and the frit handling facilities. Responsible for setting up design criteria, preparing specifications, and providing design coordination.

Wastewater Treatment Plant, City of Twin Falls, Idaho.

Structural Engineer. Setup design criteria and prepared design specifications for the headworks building and grit handling facilities. Also provided design coordination and budget / expenditure monitoring and control for the project.

Sacramento Regional Wastewater Treatment Plant, Sacramento, California.

Structural Engineer. Provided design and coordination of the gravity belt thickener building.

Gilroy/Morgan Hill Wastewater Treatment Plant, Gilroy, California.

Structural Engineer. Provided design and coordination of the oxidation ditch.

Digester Tanks, Control Building, and Modifications of Existing Denitrification, Aeration Basin, and Sludge Dewatering Building, City of Roseville, California.

Structural Engineer. Design coordination and design of structures. Project included wastewater structures and buildings.

Los Vaqueros Reservoir Project, Contra Costa Water District, California.

Structural Engineer. Setup design criteria and prepared design specifications for the design of pipe crossing bridge, intake, and pump stations. Provided design coordination and monitored / controlled budget.

Headworks Pumping and Screening Facility and Chlorination Contact Basin, City of Fort Collins; Fort Collins, Colorado.

Structural Engineer. Design coordination and design of structures. Project included wastewater structures and buildings.



Project Title:

Electrical Task Lead

Specialty / Discipline:

Electrical Engineer

Total Years Experience:

28

Years with Black & Veatch:

1996-2000; 2007

Special Attributes:

- ✓ Design of electrical systems for water and wastewater facilities

Professional Registration:

California, Maryland

Education:

B.S., Electrical Engineering, University of Madras, India

Summary of Recent Project Experience / Role:

Construction Management – City of San Francisco/Hetch Hetchy Water and Power-Hydro Power Plant, Moccasin, California

Provide Resident Engineering and Project Management Services for project dealing with replacement of mechanical governor into a micro processor based governor system.

Desalination Plant and Water Conveyance Project, Chile Santiago, for BHP Billiton and MEL, Chile

Lead Electrical Engineer – Completed feasibility and definition phase studies for 3200 lps capacity facilities consisting of sea water reverse osmosis desalination plant, medium and high pressure pump stations with 320 MW power demand. Similar study for 1600 lps capacity is under progress. Provide Electrical Lead and Management team support for development of HV, MV, LV design criteria, load calculations, electrical calculations including, load flow, short circuit, motor start, power distribution design, preparation of electrical specifications, assist in development of cost estimates and assist in development of definition phase study (DPS) reports.

Santa Clara Valley Water District/City of San Jose, Advanced Recycle Water Facility, San Jose, California

Lead Electrical Design Engineer – 10 mgd recycled water treatment plant. Provide cost estimation, preparation of electrical design criteria and conceptual power distribution design, study of various power source options, conduct load calculations, conduct energy cost evaluation for different power source options, conduct present worth analysis for various power options and provide technical coordination with local utility company.

Stockton East Water District – Water Treatment Plant 72 MGD Expansion, Stockton, California

Lead Electrical Engineer – Expansion from 50 mgd to 72 mgd water treatment plant. Provide Electrical capacity evaluation of existing electrical service and equipment, load calculations for expansion, evaluation of existing standby generator for expansion and develop design criteria.

Modesto Irrigation District – Phase 2 Expansion Project

Electrical lead support in execution of construction phase services. Electrical submittal reviews covering medium voltage switchgear, low voltage switchgear, 480 V MCCs, power panels, variable frequency drives, general purpose and special purpose motors. Responding to contractor’s technical questions and request for information.

Orange County Sanitation District - Expansion Project

–construction of thickening and dewatering equipment - As Lead Electrical Engineer provided services for development of load calculations and conceptual power distribution scheme, development load criticality table, and setting up the power distribution model using ETAP software.



Arc Flash Calculations- Astra Zeneca Pharmaceutical Facility- Delaware

Lead Electrical Engineer- 8 MVA power capacity including medium voltage and low voltage distribution. Completed survey of electrical equipment, reproduced electrical power distribution, created power distribution model, conducted short circuit and protective device coordination studies for the existing distribution system and then conducted arc flash calculations using electrical computing tool EDSA based on NFPA 70E and IEEE 1584.

Johore River Water Works Project, Public Utility Board (PUB), Singapore

Deputy Project manager- Mechanical/Electrical, I&C, Automation- Responsible for supervising contractors work E,I&C part of the process/mechanical plant contract, electrical power distribution contract, generator plant contract, RWPS and TWPS contract, SCADA contract. Review contractor’s design of power distribution, I&C, SCADA design, electrical subsystems design, review of the product/equipment submittals, witnessing factory testing of electrical equipment. Electrical,I&C systems include 22 kV switchgear, 6.6 kV switchgear, MCCs, starters, 410 V MCCs, switchboards, LV panel boards, MV, LV transformers, GE Fanuc PLCs, GE Cimplicity SCADA client/server architecture, fiber optic networking, coordinate with Malaysian utility company for 22 kV power input and coordination requirements.

Johore River Water Works Project, Public Utility Board (PUB), Singapore

Electrical Design Engineer- Supervise and design to develop project bid documents for electrical power distribution system, Instrumentation and controls and SCADA., evaluate bidders’ technical proposals, qualifications, and provide technical recommendation and assist PUB with award of contracts to Electrical contractor, mechanical contractor, SCADA contractor, design include 22 kV switchgear, 6.6 kV switchgear, 6.6 kV MCCs, 410 V MCCs and LV panel boards, MV and LV transformers, duct bank routing. 2000- KW diesel generators, 6.6 kV generators paralleling switchgear and electrical equipment for the process/mechanical contract.



Project Title:

Building Mechanical Task Lead

Specialty / Discipline:

Mechanical Engineer

Total Years Experience:

13

Years with Black & Veatch:

8

Special Attributes:

✓ LEED Design

Professional Registration:

Missouri, Maryland, Rhode Island

Education:

B.S., Mechanical Engineering,
Brigham Young University, 1981

Professional Associations:

ASHRAE, USGBC

Summary of Recent Project Experience / Role:

Middle Oconee Water Reclamation Facility, Public Utilities Department, Athens-Clarke County, Georgia.

Mechanical Engineer. Responsible for the mechanical portion of a LEED feasibility study on the existing administration building, including production of the study report that described the LEED process and recommended modifications to achieve LEED certification.

Mill Creek Regional WWTP Odor Control Project, Johnson County Wastewater, Johnson County, Kansas.

Mechanical Engineer/Discipline Lead. Responsible for odor control and HVAC system design, drawings and specifications for addition of carbon adsorption odor control to the headworks and screenings buildings at the existing wastewater treatment plant.

Lemay Wastewater Treatment Plant Wet Weather Expansion, Metropolitan St. Louis Sewer District, St. Louis, Missouri.

Mechanical Engineer. Responsible for detailed odor control and HVAC system design, drawings and specifications for new buildings and renovation of existing buildings at the existing wastewater treatment plant. Design included addition of a Carbon Adsorption Odor Control System to the existing Incinerator and Filter Building, addition, renovation and replacement of steam and hydronic heating and cooling equipment, including the systems serving the operator facilities.

Biosolids Thermal Drying Project, South Valley Water Reclamation District, West Jordan, Utah.

Mechanical Engineer/Discipline Lead. Responsible for mechanical design and detailed HVAC design for the new 9,000 square foot masonry block and steel frame building housing biosolids thermal drying equipment and operator facilities. HVAC systems included direct and indirect evaporative cooling equipment as well as refrigerant air conditioning systems.

Basin Treatment Plant Expansion and Nutrient Removal project, Johnson County Wastewater, Olathe, Kansas.

Mechanical Engineer. Responsible for detailed odor control and HVAC system design, drawings and specifications for new buildings and renovation of existing systems at the existing wastewater treatment plant.

Wastewater Treatment Plant Improvements Phase 2, City of Leavenworth, Kansas.

Mechanical Engineer/Discipline Lead. Responsible for mechanical design and detailed HVAC design for new garage facility and replacement of HVAC equipment in existing pump building.

McDowell Creek Wastewater Treatment Plant – Expansion to 12 MGD, Charlotte-Mecklenburg Utilities, Charlotte, North Carolina.

Mechanical Engineer. Responsible for detailed odor control and HVAC system design, drawings and specifications for expansion facilities.



Biosolids Management and Capital Improvements project, Grand Forks Wastewater Treatment Plant, City of Grand Forks, North Dakota.

Mechanical Engineer. Responsible for ventilation study report for existing corrosion problems, detailed odor control and HVAC system design, drawings and specifications for a new maintenance building and replacement of existing ventilation systems at the existing wastewater treatment plant. New ventilation designed to provide odor control by means of rooftop high plume dilution exhaust fans.

NW Cobb Water Reclamation Facility Expansion, Cobb County Water System, Marietta, Georgia.

Mechanical Engineer. Responsible for detailed odor control and HVAC system design, drawings and specifications for new facilities and additions to existing facilities at the existing wastewater treatment plant.

Northside Wastewater Treatment Plant – Contract 3, City of Kinston, North Carolina.

Mechanical Engineer. Responsible for detailed HVAC system design, drawings and specifications for new Administration Building with laboratory at existing treatment plant.

Pelham Wastewater Treatment Plant – Upgrade/Expansion, Western Carolina Regional Sewer Authority, Greenville, South Carolina.

Mechanical Engineer. Responsible for detailed odor control and HVAC system design, drawings and specifications for expansion facilities.

Cactus Avenue Pump Station, Eastern Municipal Water District, Riverside County, Perris, California.

Mechanical Engineer/Discipline Lead. Responsible for HVAC design, drawings, and specifications, collaborated on plumbing design for the potable water pumping station.

Central Feeder Groundwater/Conjunctive Use Project; San Bernardino Pump Station No. 2, San Bernardino Valley Municipal Water District, Redlands, California.

Mechanical Engineer/Discipline Lead. Responsible for HVAC and plumbing design, drawings, and specifications for the design/build pumping station.

Chaparral Water Treatment Plant, City of Scottsdale, Arizona.

Mechanical Engineer. Collaborated on mechanical design and responsible for detailed HVAC design of a 30 mgd membrane water treatment plant and pumping facilities. The facilities included an administration building, maintenance facility, multiple pumping facilities, membrane and granular activated carbon (GAC) filters, chemical feed and storage facilities.



Project Title:

Instrumentation & Controls Task Lead

Specialty / Discipline:

Electrical Engineer

Total Years Experience:

8

Years with Black & Veatch:

8

Special Attributes:

- √ Achieved specialization in bioinstrumentation systems.
- √ Training for DeviceNet Communications
- √ Training on Wonderware control systems

Education:

B.S., Electrical Engineering, Kansas State University, 2000

Summary of Recent Project Experience / Role:

City of Paso Robles, California, Water Treatment Plant Project

Controls Engineer - Provided I&C design of the instrumentation and control systems and membrane vendor pre-selection for a new 6-MGD membrane filtration water treatment plant. The City of Paso Robles is a Project Stakeholder in the Nacimiento Water Project (NWP) implemented by the San Luis Obispo County Flood Control and Water Conservation District. The NWP is a regional water supply system that will convey raw water from Lake Nacimiento to communities in San Luis Obispo County, including the City. The City will construct a Water Treatment Plant (WTP) Project to treat surface water received from Lake Nacimiento. The design incorporated multiple major OEM vendors including membrane filtration system, chemical sub-systems, high-rate AquaDAF pretreatment system, and an Ozone disinfection system. Designed controls and instrumentation for the Plant while incorporating the plant into the City’s existing SCADA system including remote telemetry via radio to multiple well sites and pump stations. Developed specifications for the programmable logic control system, prepared P&IDs, I/O schedules, device schedules and specifications

Wastewater Treatment Plant Upgrade and Expansion Phase III, Town of Prescott Valley, Arizona

Controls Engineer – Completed I&C design for a major plant expansion. a wastewater plant upgrade and expansion from 2.5 to 3.75 mgd. New liquid facilities include grit removal, oxic basins, final clarifier, tertiary filters, ultra-violet disinfection, and effluent pumping station. New solid facilities include a solids building. Support facilities include sludge pumping station and blower building. Designed improvements to an existing SCADA system to incorporate monitoring and control of I/O points, instruments, PLCs, and hardware including pumps, motors, and valves.

Milwaukee Metropolitan Sewer District, Inline Storage System Pump Station Upgrades, Milwaukee, Wisconsin

The deep tunnel Inline Storage System (ISS) which is dewatered by the ISS Pump Station (3 pumps), and located at the Jones Island Water Reclamation Facility (JIWRF) is used to convey the stored wastewater to one of two head tanks for later processing. The pump station design included rehabilitation and improvements to the pump station. The improvements involved the replacement of three existing 4000hp wound rotor motors and liquid rheostat drives with new 5000hp induction motors and variable frequency drives. The controls and interface to the pumps and associated equipment were replaced and/or improved including the installation of individual pump PLC controls and advanced vibration monitoring for the pumps and motors. Provided detailed programming control descriptions, instrumentation and equipment specifications, P&IDs, Installation/Panel Details, I/O Schedule, and Device Schedule.



Flood Control and Water Conservation District, Lopez Water Treatment Plant Upgrade, San Luis Obispo County, California

Controls Engineer - Lead I&C designer of the instrumentation and control systems for an upgrade of a conventional water treatment facility to a new 6.7 MGD membrane filtration water treatment system. The design incorporates multiple major OEM vendors including membrane filtration system, chemical sub-systems and high-rate AquaDAF pretreatment system. Developed specifications for the programmable logic control system, prepared P&IDs, I/O schedules, device schedules and specifications.

Grand Valley Regional Biosolids Authority, Joint Regional Biosolids Management Project, Grand Rapids/Wyoming, Michigan

Controls Engineer – Served as the lead I&C design engineer for a cooperative biosolids management project designed in four segments The City of Grand Rapids Wastewater Treatment Plant and the City of Wyoming Clean Water Plant have collectively formed the Grand Valley Regional Biosolids Authority, charging the newly formed Authority with implementation of a regional biosolids processing program for the two cities. The project was segmented into four stages involving a pumping facility at the Wyoming CWP site; parallel pipelines and communication conduit containing multiple fiber pairs of approximately 2.75 miles connecting the two sites; a storage facility at the Grand Rapids WWTP; and finally Dewatering facilities located at the Grand Rapids WWTP, including centrifuge dewatering and sliding frame storage silos, for eventual land fill disposal. Participated in multiple meeting and conferences with each entity to define and coordinate unique SCADA design requirements for each plant and coordination of communications methods and protocol between each facility. Coordinated separate design projects to integrate each facility as they came on-line.

Johnson County Wastewater, Wastewater Treatment Plant Expansion, Johnson County, Kansas

Controls Engineer – Completed final I&C design of a major plant expansion that improved the plant’s capacity from 3 mgd to an average design flow of 10.5 mgd. The design included an expansion and improvement to an existing fiber optic communication ring in conjunction with the expansion, improvement and relocation of the plant’s control room facilities. Provided detailed programming control descriptions, instrumentation and equipment specifications, P&IDs, Installation/Panel Details, I/O Schedule, and Device Schedule for designed improvements to the existing SCADA system to incorporate the monitoring and control of I/O points, instruments, PLCs, and hardware including pumps, motors, and valves.



Project Title:

Chemical Feed Task Lead

Specialty / Discipline:

Chemical Engineer

Total Years Experience:

13

Years with Black & Veatch:

13

Special Attributes:

✓ Chemical feed system design

Professional Registration:

Missouri

Education:

B.S., Chemical Engineering, 1994

Summary of Recent Project Experience / Role:

Bundamba Advanced Water Treatment Plant, Brisbane, Australia.

Process Engineer. Responsible for ferric chloride, sodium bisulfite, sulfuric acid, ammonium sulfate, antiscalant, methanol, hydrogen peroxide, carbon dioxide, sodium hydroxide, sodium hypochlorite, and lime systems.

Modesto Irrigation District Water Treatment Plant, Modesto, California.

Process Engineer. Responsible for design of sodium hypochlorite, sodium hydroxide, coagulant aid polymer, filter aid polymer, DAF polymer, alum, sulfuric acid, calcium chloride, and lime systems.

NTMWD Water Treatment Plant, Wylie, Texas.

Process Engineer. Responsible for design of chlorine dioxide system.

Ophir Water Treatment Plant, Placer County Water Agency, Placerville, California.

Process Engineer. Responsible for design of alum, polyaluminum chloride, sodium hydroxide, sodium hypochlorite, solids handling polymer, and powder activated carbon systems.

CAP Water Treatment Plant, Mesa, Arizona.

QA/QC Reviewer. Responsible for quality assurance/quality control for the chemical feed facilities (including the chlorine dioxide generation facilities) for the expansion to 60 mgd.

Nearman Water Treatment Plant, Kansas City BPU, Kansas City, Kansas.

QA/QC Reviewer. Responsible for document review and quality assurance/quality control for the chemical feed facilities (including the chlorine dioxide generation facilities) for the expansion to 72 mgd.

Lake Pleasant Water Treatment Plant, Phoenix, Arizona.

Process Engineer. Responsible for coagulant aid dry polymer, filter aid liquid polymer, gravity thickener liquid polymer, plate settler liquid polymer, centrifuge liquid polymer, ferric chloride, ferrous chloride, sulfuric acid, sodium hydroxide, hydrofluosilicic acid, chlorine gas, chlorine dioxide, sodium chlorite, and hydrogen peroxide system design.

West Valley Water District, Lytle Creek Water Treatment Plant, San Bernardino, California.

Process Engineer. Responsible for OSG sodium hypochlorite, alum, sodium hydroxide, and coagulant aid polymer design.

Chandler Water Treatment Plant, Chandler, Arizona.

Process Engineer. Responsible for OSG sodium hypochlorite, alum, sodium hydroxide, and coagulant aid polymer, carbon dioxide, hydrofluosilicic acid, sodium bisulfite, gravity thickener polymer, and plate settler polymer system design.

Ontario CA Pump Stations, Ontario, California.

Process Engineer. Responsible for OSG sodium hypochlorite design.



Chaparal Water Treatment Plant, Scottsdale, Arizona.

Process Engineer. Responsible for centrifuge liquid polymer, OSG sodium hypochlorite, ferric chloride, sodium hydroxide, sodium bisulfite, and citric acid system design.

Longmont Water Treatment Plant, Longmont, Colorado.

Process Engineer. Responsible for filter aid liquid polymer, coagulant aid liquid polymer, soda ash, hydrated lime, carbon, sodium silicafluoride, sodium hypochlorite, and alum system design.

West Valley Water District, Oliver P. Roehmer Water Treatment Plant, San Bernardino, California.

Process Engineer. Responsible for coagulant aid liquid polymer, sodium hydroxide, and alum system design.

Madison Metropolitan Sewerage District, Nine Springs Wastewater Treatment Plant, Madison, Wisconsin.

Process Engineer. Responsible for centrifuge liquid and dry polymer, and gravity belt thickener liquid and dry polymer system design.

Metropolitan Water District of Southern California, Weymouth Filtration Plant, California.

Process Engineer. Responsible for belt filter press dry polymer system design.

Metropolitan Water District of Southern California, Robert B. Diemer Filtration Plant, California.

Process Engineer. Responsible for belt filter press dry polymer system design.

Pelham Wastewater Treatment Plant, Pelham, North Carolina.

Process Engineer. Responsible for belt filter press dry polymer, and sodium hypochlorite system design.

O'Fallon Water Treatment Plant, O'Fallon, Missouri.

Process Engineer. Responsible for coagulant aid liquid polymer, and sodium hypochlorite system design.

Ruston Wastewater Treatment Plant, Ruston, Louisiana.

Process Engineer. Responsible for belt filter press liquid polymer, and sodium hypochlorite system design.

Water Treatment Plant, Springfield, Missouri.

Process Engineer. Responsible for liquid polymer, sodium hydroxide, and sodium hypochlorite system design.

Residuals Management Facilities, Bloomington, Indiana.

Process Engineer. Primary responsibilities included design of multiple liquid polymer feed systems, the sodium bisulfite chemical feed system, and the muriatic acid feed system.

Wastewater Treatment Plant Phase II Improvements, Yankton, South Dakota.

Process Engineer. Primary responsibilities included design of dry polymer feed system, and aeration blower system.