

## **RAGHUNATHA RAO KOMARAGIRI**

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### **EXPERIENCE**

- Planning, budget development, economic analysis, preliminary design, final design, contract management, project management, procurement, and construction management of Multi-Million Dollar (USD) projects relating to Water and Wastewater Facilities
- Experience includes working for approx 2 years (full-time) as a Process Engineer, Project Engineer, Operations support Engineer, Client Management, at 220 Million Gallons a Day (MGD) and 60 MGD Conventional Activated Sludge Wastewater (with Anaerobic Digesters for Solids Handling) Facilities in USA.
- Experience includes managing projects relating to Water production (managing groundwater well construction), surface water treatment plants, groundwater treatment plants, water storage (tanks, reservoirs). water distribution (pipelines, pump stations), waste recycling (membrane wastewater treatment and conventional activated sludge processes), paving, grading, buildings, surveying, foundations, & retaining walls.

### **EDUCATION**

- Master of Science (M.S) Civil Engineering, December 2003
  - Arizona State University, Tempe, AZ, USA
  - Thesis: UV Disinfection of Viruses
- Bachelor of Engineering (B.E) Civil Engineering, June 2001
  - Osmania University, A.P, INDIA
  - Thesis: Geographic Information Systems

### **CERTIFICATIONS**

- State of California - Professional Civil Engineer, P.E, License Number: 79916
- Board Certified Environmental Engineer (BCEE), Water Supply/Wastewater, Certificate Number #13-10004, American Academy of Environmental Engineers and Scientists; top 4% experts.
- Qualified Environmental Professional, QEP (Internationally recognized), Certificate Number: 03120005
- Project Management Professional (PMP), Certificate #1695392, Project Management Institute
- Held State of California Water Treatment Operator Grade 2, ID 30595

- Held State of California Water Distribution Operator Grade 2, ID 42248
- Passed the Written Grade 5 (the highest grade level in California) Wastewater Treatment Plant Operator Examination administered by California State Water Resources Control Board
- American Water Works Association (AWWA) Wastewater Treatment Operations and Management Standards Committee Member
- Nominated to and participated in the American Water Works Research Foundation (AWWARF) Mentoring Program from City of Phoenix Water Services. Role involved participation as a Management trainee at the 220 Million Gallons a Day flow (MGD) Wastewater Treatment Facility
- Wastewater Treatment Plant Operator Grade 3 - Operator ID – 22067 (Expired June 2007 from Arizona)

## **PROFESSIONAL EXPERIENCE**

### **1) Principal Engineer – Arcadis, India/United Kingdom, September 2016 to Present**

- Managing Engineering and CAD staff in delivering Water/Wastewater projects to United Kingdom (UK) clients
- Global Design Excellence Center (GEC) - Bengaluru, India Water/United Kingdom (UK) Water Group.
- Principal Engineering lead managing and leading a team of 27 staff comprising of 9 Civil/Mechanical Engineers (2 Senior Civil Engineers, 1 Senior Mechanical Engineer, 1 Design Mechanical Engineer, 1 Design Civil Engineer - Wastewater Modeler, 2 Assistant Civil Engineers, 1 Assistant Engineer - Wastewater, and 1 Graduate Civil Engineer) AND 18 CAD staff (Civil 3D, Revit and BIM) in delivering Water and Wastewater projects for United Kingdom (UK) region.
- Currently reporting to the Associate Director
- Co-ordinate with Technical Director (Utilities) and GEC Service Leader.

### **2) Senior Engineer/Project Manager – California Water Company, USA (Private Water Utility), July 2007 to Feb 2015**

- Senior Engineer/Project Manager reporting to the Manager of Engineering
- Work with District (Operations) Managers, Superintendents, Water Quality Managers and prepare project scope of work, cost estimates for Capital Improvement projects and future projects (General Rate Case support)
- Design and Project Management of Capital Improvement projects related to Water and Wastewater Facilities
- Design drawings (Civil/Mechanical), Specifications and Bill of Material Preparation
- Work closely with AutoCAD drafters to prepare drawings
- Work closely and co-ordinate with different vendors and contractors
- Co-ordinate with local government agencies (County and City) in order to obtain permits and other appropriate approvals
- Contract documents and Bid Packages Preparation.

- Evaluate Bids and Award Contract (Prepare requisition, obtain management approval and Purchase Order issuance)
- Construction Oversight and Final Inspection
- Approval of invoices based on Construction progress
- Operation and Maintenance Manual preparation
- Work with Treatment Operations staff relating to Process Improvements (BOD/COD, TSS, Turbidity removal, Sludge Handling) and troubleshooting process issues for Wastewater Treatment
- Membrane Bio Reactor Wastewater Treatment Plant Design support
- Budget and Finance experience - Participate in General Rate Case preparation for assigned districts (Project Justification preparation and cost estimate preparation)
- Prepare scope of work, perform preliminary treatment design, capital cost/O&M comparison analysis, permitting, equipment procurement, installation, construction, and start-up
- Responsible for capital projects (up to \$30 Million) and project management from initiation to closure
- Responsible for project charter preparation, project teams, resource management, stakeholder expectations
- Prepare project schedule using Microsoft Project Schedule and estimate resources needed to complete the project
- Responsible for adjusting project schedule based on progress, crash schedule, fast tracking
- Eliminate scope creep and manage project within established scope, budget and schedule
- Manage project to comply with Organization standards, Industry regulations, with primary focus on Safety
- Manage project by communicating project milestone progress, submitting project status updates, make presentations as necessary to Executive Management
- Analyze project risk and take actions accordingly
- Responsible for engineering design, contracts/procurement, construction, operations support, start-up, invoicing, payments, and close-out

**3) Civil Engineer II, City of Phoenix Water Services, Treatment Plant Engineering Group, Phoenix, USA, February 2006 – July 2007**

- Manage Engineering projects related Water and Wastewater Treatment (Consultants, project scope, schedule and budget)
- Review water/wastewater treatment plant design work
- Support operational personnel with troubleshooting Water and Wastewater Treatment Plant Optimization issues (Activated Sludge Process in Wastewater Treatment, and Total Trihalomethane reduction in Water Treatment – GAC Filters and Chlorine feed point relocation)

**4) Project Engineer, Valentine Environmental Engineers Phoenix, USA, February 2004 to February 2006**

- Design Project Engineer for Wastewater and Water Facilities
- Onsite Experience at 220 MGD (and 60 MGD) Conventional Activated Sludge with Anaerobic Digestion Wastewater Plants. Work with Plant staff, participate in process

meetings, provide operations support, design drawing reviews, maintenance meetings, job order contract meetings with contractors.

- Prepare/Update Standard Operating Procedures
- Prepare Plant Drawings Master Plan

**5) Graduate Research Assistant, Arizona State University, Tempe, USA, Oct 2001- Oct 2003**

- Performed original research on Ultraviolet Irradiation (UV) of viral aerosols at low and high relative humidity conditions under the supervision of Dr. Jordan Peccia
- Laboratory experiments with Viruses (Culturing and Inactivation)

## **REFERENCE PROJECTS**

### **Conventional Wastewater Treatment Reference Projects**

**1. Design Project Engineer for the 220 Million Gallons a Day (MGD) Wastewater Treatment Plant (WWTP) & 60 MGD Wastewater Treatment Plant Master Plan As-Built Drawings Project, Arizona, USA**

- Worked as an Onsite Engineer at an existing 220 Million Gallons a Day Conventional Activated Sludge Wastewater Treatment Facility (Liquid stream) with Anaerobic Digesters (Solids Handling)
- Worked as an Onsite Engineer at an existing 60 Million Gallons a Day Conventional Activated Sludge Wastewater Treatment Facility (Liquid stream) with Anaerobic Digesters (Solids Handling)
- Prepare the Master Plan for the existing 60 MGD and 220 MGD Wastewater Facilities to reflect design work progression over the past 60 years.
- Review Plant Maintenance Database and assist in planning maintenance work
- Attend Plant Safety meetings and participate in test evacuation drills
- Attend Process Meetings with Multiple Stakeholders (Operations Manager, Process Engineer other consultants) and participate in Wastewater Plant Operations Optimization/Efficiency meetings.
- Participate in Job Order Contract Project work undertaken with the intention to optimize, maintain the efficiency of the Wastewater Treatment Process
- Modify/Author existing Standard Operating Procedures to reflect any changes undertaken at the Plant
- Modify/Prepare Plant drawings to reflect field changes - Asbuilt drawings

**2. American Water Works Research Foundation (AWWARF) Mentoring Program, Arizona, USA**

- Design Engineer stationed at 220 Million Gallons a day Wastewater Treatment Plant (Conventional Activated Sludge Wastewater Treatment Plant)
- Worked as an onsite engineer at the plant shadowing operations staff and learning the treatment operations
- Submitted report to Management recommending improvements

**3. Design Project Engineer American Water Company Wastewater Treatment Plant, Arizona, USA**

- Assisted Senior Engineers with BioWin modeling for Arizona American Water Treatment plant project
- Simulated the performance of the existing activated sludge process and made recommendations to improve the treatment efficiency

**4. Engineering representative - Job Order Contracts, Arizona, USA**

- One Water Reclamation Facility (Plant Flow 8 MGD)
- Review Engineering drawings for any modifications, plant work undertaken at the Advanced Water Reclamation Facility.

**Wastewater Collection and Lift Station Projects**

**1. Design Engineer for Sewer Diversion Structures, Arizona, USA**

- Design Report for the Project; worked with AutoCAD staff in preparing drawings.
- Designed replacement of Gates and minor modifications to the Sewer Diversion Structures

**2. Design Project Engineer American Water Company 111th Avenue Lift Station, Arizona, USA**

- Evaluated the condition of the Lift Station and submitted recommendations

**Advanced Waste Treatment/Water Recycling Reference Projects**

**1. Advanced Water Recycling Treatment Plant, California, USA**

- Project design team member responsible for the designing of a new 150,000 Gallons Per Day Kubota Membrane Bioreactor (MBR) Wastewater Treatment Plant
- Project Engineer/Manager responsible for the Process Optimization and Treatment Modifications to the existing Wastewater Plant
- Membrane Bio Reactor Wastewater Treatment Plant Design support

## **2. Optimization of Existing Water Recycling Plant, California, USA**

- Existing Extended Aeration Wastewater Treatment Plant Process Optimization, Operator Support and troubleshooting; work with Treatment Operations staff relating to Process Improvements (BOD/COD, TSS, Turbidity removal, Sludge Handling) and troubleshooting process issues for Wastewater Treatment
- Existing Sand Filter Evaluation and Design alternative recommendation – Sequential Bioreactor + Aqua cloth media disc filters OR Membrane Bioreactor (Only)
- Interact with Vendors (GE, Kubota and Aqua aerobic systems) relating to preliminary designs and cost estimates
- Presentation to the Company Management (Test results – Graphs, Data analysis, Design options, and Cost Estimates)

## **Surface Water Treatment Reference Project List**

### **1. Granular Activated Carbon (GAC) Filtration for the Disinfection Byproduct Control (Total Trihalomethanes) at the existing Surface Water Treatment Plant, California, USA**

- Design Project Engineer/Manager responsible for the Design and Construction of GAC Vessels to treat 300 Gallons Per Minute (GPM) flow; Treatment plant hydraulics, Booster Pump and Polyethylene tank design

### **2. Design and Construction of 100 Million Gallons a Day (MGD) Water Treatment Plant Project, Arizona, USA**

- Project Engineer assisting Managers with the Design of the Treatment Plant
- Design Engineer for the Polymer Feed System for the Kruger Actiflo Sedimentation
- Sized the chemical tanks, eductor and the related piping
- Designed/sized the Solids Handling Facility Wash-Water New Clarifier to accommodate the blow-downs from the new GAC filters

**3. Design Engineer for the Conventional Water Treatment Plant Optimization Project (Plant flow 200 MGD), Arizona, USA**

- Responsibilities included performing preliminary designs including sizing pipelines, selecting pumps by generating pump curves, creating design reports and performing cost estimates.

**4. Project Manager, Arc Flash Hazard Analysis Project, Arizona, USA**

- Managed Program Manager implementing Arc Flash Study at the Plants
- Responsible for managing seven different consultants
- Project implemented at Five Water Treatment Plants, Two Wastewater plants

**5. Project Manager responsible for the Managing of all the Job Order Contracts, Arizona, USA**

- Five City of Phoenix Water Treatment Plants (Plant Flows ranged from 150 Million Gallons a Day to 225 Million Gallons a Day) and One Water Reclamation Facility (Plant Flow 8 Million Gallons a Day)
- Involves review of detailed plans, specifications, and estimates for Water and Wastewater Treatment Facilities

**Ground Water Treatment Reference Projects**

**1. Groundwater Well Stations Cost Estimates, California, USA**

- Based on the Water Quality analysis of the various groundwater wells - recommended treatment options; included a combination of some of the following processes (depending on the contaminants) - Reverse Osmosis, Nano Filtration, Ultra Filtration, Micro Filtration, Granular Activated Carbon, Greensand Filtration, Aeration, Chemical Feed, and Advanced Oxidation
- Worked with vendor, GE Water & Process Technologies and performed preliminary design calculations, associated process calculations, sizing of the vessels and piping layouts for different well stations
- Based on preliminary design, prepared planning level construction cost estimates (budgetary) for the above treatment facilities

**2. Greensand Filtration Vessels for Iron/Manganese Treatment from Well Water, California, USA**

- Project Manager responsible for managing the Design-Build contractor relating to the construction of the Greensand Filtration Vessels (removal of Iron and Manganese contaminants)

**3. Ground Water Rule (GWR) Compliance of the Water Systems, California, USA**

- Project Engineer responsible for the analysis of the existing water systems for compliance with the Ground Water Rule
- Involves design of a tank/pipeline for provision of contact time for the respective disinfectant chemical (Concentration x Time; CT Concept)

**4. Chloramination Treatment Design, Well Station Flow rate 1000 Gallons Per Minute GPM and 150 GPM Wells, California, USA**

- Design of Chloramination Disinfection Treatment System for a Groundwater Well Station; Ground Water Rule Compliance Analysis

**5. Treatment for a New Groundwater Well, California, USA**

- Project Manager responsible for coordinating installation of appropriate treatment for a 2000 Gallons a Minute flow well.

**Water Distribution/Transmission Projects**

**1. Existing Hydro-pneumatic Tank Removal and Installation of a new Surge Anticipator Valve Design, California, USA**

- Co-ordinate removal of existing 10,000 gallon hydro-pneumatic tank
- Design and Installation of new Surge Anticipator Valve and associated piping
- Co-ordination with Electrical Engineers for the installation of Variable Frequency Drive capable (VFD) Booster Pumps
- Installation of a new reduced pressure backflow prevention device assembly

**2. Water Main Offsets Design - Storm Drain Project, California, USA**

- Project Engineer/Manager responsible for the Design and Construction of water-pipeline offsets at conflict points with the new storm drain.



**3. New Water Meter Design, Fire-hydrants and Services, Direct Connect Booster Pumps - Air Gap Device/Surge Tank, California, USA**

- Project Engineer responsible for the design of new water meters for home and businesses
- Project Engineer responsible for the review of drawings for installation of new fire hydrants and water line services (1 to 8 inches)
- Review Direct Connect Booster Pump Installation Submittals, size/recommend approved air gap installation including appropriate surge bladder tank.

**4. Design Project Engineer WaterCAD modeling, Arizona, USA**

- As project engineer, performed water system modeling (Water CAD) to determine if modifications to the distribution system can be made to control hot water concerns.

**5. Pressure Reducing Valve (PRV) Station, California, USA**

- Design of 6" PRV with a 2" PRV bypass and 8" PRV; Design of 4" Pressure Relief Valve
- Preparation of Drawings, Bill of Materials, Co-ordination with Cla-Val and Contractor

**6. Seismic Retrofits for Tank Inlet/Outlet Piping, California, USA**

- Design of EBAA Flex-Tend (flexible joints) for the Reservoir Inlet/Outlet piping
- Preparation of Drawings, Bill of Materials, Co-ordination with EBAA and Contractor

**7. New Emergency Interconnection, California, USA**

- Design and installation of a bi-directional flow meter and associated piping inside a vault to permit water exchange between two different Water systems

**Water Production Projects**

**1. Drilling and Construction of a new 2000 Gallons Per Minute Well, California, USA**

- Project Manager responsible for the construction of a new well
- Procurement of Driller for the pilot hole before the construction of the new well
- New Well Design and Construction
- Well pump design and installation
- Well Discharge Piping Design and Installation

- Well Treatment System Design and Construction
- Co-ordination with Environmental Affairs, local County for permits, Electrical Engineers, Hydraulic Modeling group, and Water Quality Manager as needed on the project

## **Water Storage Projects**

### **1. Site Purchase, Design and Construction of New 3 to 4 Million Gallons Concrete/pumpstation Storage Reservoir**

- Lead Project Manager responsible for managing the external consultant tasks in completing the above project. High profile, multiple stakeholders and resources management.

### **2. Concrete Reservoir 5 Million Gallons Capacity Tank Mixing Improvements**

- Project Manager responsible for the Installation of Solar-Powered Mixer (Solar-Bee) inside the 5MG tank to promote efficient mixing and reduce nitrification of the Chloraminated Water

### **3. Design and Construction of New 3.5 Million Gallons Steel Reservoir and Destruction of Existing 0.5MG steel tank**

- Design Project Engineer/Manager responsible for the design and construction of a new 3.5 Million Gallons Steel Reservoir
- Co-ordination with the local City on the permitting process
- Preparation of site grading plan & onsite drain line design
- Tank inlet/outlet piping design
- New Cla-Val Altitude valve design
- New EBAA force-balanced flex-tend design to permit expansion/contraction in the inlet/outlet piping during earthquakes
- New Solar powered mixer design and installation (SolarBee)
- Destruction of the existing 0.5MG Steel Reservoir