

## **RICHARD H. MARSHALL, JR**

BS, Civil Engineering, University of Massachusetts  
Registered Professional Engineer – OR, ME  
Certified Wastewater Treatment Plant Operator (Grade VII - MA)

### **PROFESSIONAL BACKGROUND:**

Mr. Marshall specializes in start-up, operation, and troubleshooting of wastewater and water treatment facilities, along with work in producing O & M manuals, troubleshooting guides, SOPs and other technical documents. He has over 47 years of experience dealing with municipal treatment systems and industrial wastewater treatment systems (pulp & paper, food and beverage, chemical, refinery, meat processing). He has dealt with operating problems ranging from sludge settling problems, floc formation problems, nutrient management, biomass toxicity, effluent toxicity, Effluent TSS and BOD problems, foaming and floating sludge problems. He has worked with different types of aerobic and anaerobic treatment processes. He has also worked with water reuse systems processing final effluent. He presents general workshops each year covering such topics as: Activated Sludge Operations, Troubleshooting Activated Sludge Operations, Aerated Stabilization Basins Operations and Using the Microscope to Evaluate Process. He has presented at WEFTEC workshops on Activated Sludge Operation.

### **RECENT PROJECT EXPERIENCE:**

**Boise Paper Solutions, MN.** (Integrated pulp (Kraft) and paper mill, UNOX activated sludge). Conducted plant audit for improving and optimizing plant operation. Conducted evaluation on feasibility for step feed of the UNOX reactor. Provided technical guidance on step feed operation. Provide technical assistance as needed.

**Verso Paper, MI.** (Kraft pulp and paper mill, activated sludge process). Conducted plant evaluation to evaluate potential of installing step feed system. Provide consulting and technical assistance as needed. Helped initiate short-term filament control program. Assisted in troubleshooting sludge settling problem and floating sludge problem. Conducted activated sludge process training.

**McKinley Paper Co, NM.** (Recycle, zero discharge activated sludge SBR system). Provided technical assistance on modifying the SBR aeration systems including selecting and replacing of diffusers after failure of initial diffuser replacement project. Provide technical assistance as required during sludge bulking periods. Provide technical guidance on process operation and operating targets. Developed microscopic poster as a reference for operators. Conducted pilot study for assessing feasibility of thermophilic activated sludge process operation.

**WestRock Company, WA.** (Kraft and OCC pulp and paper mill, Pure-oxygen activated sludge). Identified and corrected the cause of clarifier upsets in this pure oxygen activated sludge facility. Advised mill management on process changes to improve operability and facility performance. Conducts 3-day activated sludge workshops. Conducted annual refresher training. Developed a microscopic evaluation poster specific to the treatment system. Provided site-specific process troubleshooting guides. Providing weekly data review services.

**Millar Western Forest Products, AB.** (BCTMP mill, activated sludge process). Provided technical assistance and process troubleshooting assistance for foaming, floating sludge and sludge settling problems. Provide technical guidance as required. Provided guidance on upgrading treatment system through installation of step feed. Currently awaiting completion of installation of anaerobic reactor.

**Alberta Newsprint Company, AB.** (BCTMP mill, activated sludge process). Provided technical assistance for varied floating sludge and sludge settling problems. Conducts two 2-day activated sludge process workshops and annual 1-day refresher workshops. Providing quarterly data review and microscopic exams.

**Mackenzie Pulp BC.** (Kraft mill, ASB) Conducted plant evaluation for improving and optimizing treatment plant performance including report with findings and recommendations. Conducted ASB training workshops to mill personnel. Provided guidance on upgrading treatment system. Provided technical and troubleshooting assistance as needed such as solids management, operating targets, process upsets.

**Tembec Paper Group, ON.** (TMP/deink pulp and paper mill, activated sludge process). Provided technical assistance for clarifier sludge floating problem, and varied sludge settling problems. Provided 3-day activated sludge workshops. Provide biannual hands-on process refresher training. Provide technical assistance for optimizing and troubleshooting as required.

**Bowater Mersey Paper Co., NS.** (Groundwood/TMP, ASB) Provide technical assistance on the ASB effluent treatment system. Conducted comprehensive plant audit with a report for optimizing and improving plant operations. Provide regular data review and report per retainer. Providing guidance on upgrading treatment system including use of continuous dredging for solids management.

**Domtar – Espanola, ON.** Conducted plant evaluation for improving/optimizing the ASB plant operation. Evaluation included aeration assessment, solids depositions within cells and solids management, nutrient management, sampling/monitoring including on-line sensors and assessing primary clarifier performance.

**Kenyon Industries, RI.** Provided consulting services for analyzing sludge accumulations versus influent loadings, evaluating dredging operation impacts on the ASBs, review of geotube use for dewatering the dredged solids.

**Coca-Cola.** Provided technical assistance, troubleshooting, O&M documentation preparation and start-up assistance for nine (9) of the company wastewater treatment facilities. Treatment processes include: equalization (flow, pH, organic loading), anaerobic reactors, biogas conditioning and handling, activated sludge, MBR, MBBR, trickling filters, lagoon, sludge dewatering. Provided technical assistance for addressing aeration problems in a wastewater treatment facility. Work included evaluating/selecting new diffusers and revised layout, revising the blower control logic based on D.O. and ORP and revising operating targets for the aeration basin.

**Mountaire Farms, DE.** Provided troubleshooting services to improve performance of the anaerobic reactor (lagoon) activated sludge process and nitrification. Provided recommendations and operational targets and guidance to optimize and maintain process performance.

**Pinnacle Foods, DE.** Provided technical assistance and troubleshooting services to improve treatment plant performance. Provided technical consulting for installing a step feed system in the existing aeration basin. Provided technical assistance guidance as needed.

**Phillips 66, CA.** Conducted plant evaluation to improve sludge quality and plant performance though installation of step feed system into an orbital type aeration basin.

## **PUBLICATIONS:**

Industrial Activated Sludge Operations manual, 2<sup>nd</sup> ed., 2020.

Aerated Stabilization Basins Operations manual, 2020

Several papers dealing with effluent treatment plant operations with presentations at TAPPI Environmental conferences and published in industry magazines/publications.

Manual of Practice - Activated Sludge, contributing author, published by the Water Environment Federation, 1987.

Wastewater Engineering - Treatment, Disposal, Reuse, contributing author, Metcalf & Eddy, 1991.

**PROFESSIONAL MEMBERSHIPS:**

Water Environment Federation  
Pacific Northwest Water Environment Association  
Technical Association for Pulp and Paper Industry (TAPPI)  
IWA – International Water Association