



TROUBLESHOOTING ACTIVATED SLUDGE

AN ADVANCED COURSE FOR EXPERIENCED WASTEWATER TREATMENT PROFESSIONALS

INSTRUCTORS

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- Richard Weigand, WV WEA
- Lynn Marshall, TWC Enterprises
- Jon van Dommelen, OEPA

INTRODUCTION

- In the late 70s the US EPA determined the main causative factors in noncompliance at wastewater treatment plants to be the lack of process control testing and proper application of process control.
- This effort resulted in the publication of a white paper by WEF (i.e. WPCF) advocating the necessity for hands-on process control training of operators.

COURSE DESCRIPTION

This course provides the type of training discussed in these studies by US EPA and the WPCF White Paper. The course has proven helpful to wastewater treatment operators, managers and engineers.

- You can't control what you don't measure
- Class is arbitrarily divided into 3 groups for 3 separate plant "trips"
- Each group experiences extensive hands-on activities in the performance of assigned measurements in plant

HOST:ALUM CREEK WRC

- Date: May 9 - 11, 2017
- Time: 9 AM – 4 PM
- Address: Alum Creek Water Reclamation Facility
7767 Walker Wood Blvd.
Lewis Center, Ohio 43035
740-549-1906
- Contact Hours: 18

COMBINED CONTROL STRATEGIES

SLUDGE QUALITY CONTROL

- TSS Control
 - Where are the solids?
 - How much is there?
 - For how long?
- Microscopic Examination
- Ammonia Limitations
 - OEPA Troubleshooting Chart

FIELD TRIP MEASUREMENTS

- Trip 1- Influent characteristics
- Trip 2- Aeration tank(s) parameters
- Trip 3- Clarifier(s) parameters

DATA COLLECTION

TRIP I - INFLUENT

- Pretreatment/Primary Treatment
- Industrial waste/Tank dimensions
- Raw waste characterization: COD, TSS meter, Test kits for ammonia, pH, alkalinity
- Flow meter(s) accuracy

DATA COLLECTION

TRIP 2- AERATION TANKS

- Flow Splitting & Mixing
- DO Profiling
- Process Measurements: ORP, alkalinity, pH, ammonia, nitrate, MLSS meter, Centrifuge spins, Settleometer test
- Microbiology: floc, protozoa, metazoa, filaments

DATA COLLECTION TRIP 3- CLARIFIERS

- Flow splitting
- Baffling
- Short circuiting & currents
- RAS/WAS solids concentrations
- Sludge Blankets

DATA INTERPRETATION

After each plant trip the class reconvenes in the classroom to post and discuss findings

- Solids Inventory & balance
- RAS Control: Settled Sludge Concentration (SSC) vs Return Sludge Concentration (RSC)
- WAS Control: Age Calculations & Microscopic Evaluation

TYPICAL PROCESS CONTROL NUMBERS

- SVI vs Settleometer
- Sludge Age (days) : SRT, MCRT, AGE, DSA
- F/M (#Food/#Microorganisms)
 - F: BOD, COD, TOC, SOUR
 - M: MLSS, MLVSS

CLASS PARTICIPATION

- As the course proceeds, the entire class is encouraged by the instructors to provide findings and information discovered during the field trip. These findings are discussed in the classroom after each field trip.
- The amount of data accumulated in the short period of the course allows for class recommendations for operational improvement

INSTRUCTOR COMMENT

- Rich Weigand invited me to assist him in presenting this course in West Virginia. It has been quite successful. We want to now hold it in Ohio with the very capable assistance of Jon van Dommelen of OEPA's Compliance Assistance group.
- I have been in the wastewater profession since 1962 and trained Activated Sludge Process Control since 1974, This is the best course in which I have trained. Its value lies in the students' extensive testing and the interpretation involved.
 - Lynn S. Marshall