Workshop 2- Advanced Process Control and Optimization
Two-day Workshop

DAY 1

Time	Activity	Description
8:00 – 8:30	• Workshop overview	Review course schedule, introduce everyone, take course knowledge baseline exam
8:30 – 8:45	• History of Water Treatment	Discuss the impact that water treatment has had on public health
8:45 – 9:45	• Mixing, Coagulation & Clarification o Processes description o Process design	Purpose of the processes Multiple barrier approach Understand key design parameters Discuss different chemical properties and storage issues
9:45 - 10:00	• **Break**	
10:00 – 10:20	• Case study: impact of mixing optimization	Present data showing impacts of rapid mixing and flocculation on settled and filtered water turbidity. Facilitate class discussion
10:20 – 11:20	• Optimization techniques and jar testing SOP development (preparation for lab exercise)	Data analysis techniques Standard operating procedures Discussion of Day 2 bench testing lab
11:20 – 11:40	• Jar Testing DVD	Jar testing procedures.
11:40 – 12:30	• Pilot plant tour • Demonstration	Tour of pilot plant and Jar Testing Demonstration
12:30 – 1:00	• **Lunch (provided) – opportunity for attendees to discuss system-specific questions with workshop facilitators and with each other**	
1:00 – 2:00	• Filtration o Processes description o Process design	Deepen/strengthen filtration process knowledge Discuss filter operation set-points Discuss key design parameters
2:00 – 2:30	• Case Study: Filter data from CPE study	Review key data evaluation techniques and how to evaluate filter turbidity data
2:30 – 3:00	• Filter Optimization techniques (Day 2 lab preparation)	Review filter inspection tools, techniques, share plan for Day 2 lab exercises
3:00 -3:15	• **Break**	
3:15 – 3:45	• Full Plant Walkthrough	Tour of full-scale plant, utilize District Engineers to assist with tours
3:45 – 4:30	• Disinfection o Processes description o Process design	Key topics will include: • Water treatment disinfectants • Primary vs. secondary disinfection • Baffling factors

		• Pathogens and inactivation requirements (EPA tool demo) • CT calculations • Tracer studies
4:30 – 5:00	• Case Study: CT Calculations, Tracer Study Results	Present various tracer study results to groups. Have groups analyze data and report on findings.

Workshop 2- Advanced Process Control and Optimization
Two-day Workshop

DAY 2

Time	Activity	Description
8:00 – 8:30	• Review Day 1 activities and content	Review components from Day 1 Lay out items for Day 2
8:30 – 9:00	• Prepare for Lab Exercises	Review SOP development, optimization techniques and tools, break out into groups for lab
9:00 -9:15	• **Break**	
9:15 – 12:15	• Lab Exercise 1 Coagulation bench testing • Lab Exercise 2 Prepare filter inspection tools • Lab Exercise 3 Filter inspection techniques	Proper techniques in pretreatment jar testing including. Jar testing to include: • preoxidation • PAC • coagulation Construct filter inspection tools for: • Coring • Bed depth measurement • Solids retention • Filter turbidity profiling • Backwash evaluations Follow up discussion of results Hands on inspections • Coring • Bed depth measurement • Solids retention • Filter turbidity profiling • Backwash evaluations
12:15 – 12:45	• **Lunch (Provided)**	
12:45 – 2:15	• Lab Exercise 4: Filter Media Evaluation • Lab Exercise 5: Sludge evaluation • Lab Exercise 6: Coagulant performance	Build two sand columns and apply sludge to them (with and without polymer) to show class how residuals “release” water over time Evaluate various types and conditions of filter media using microscope.
2:15 – 3:15	• Residuals Management o Processes description o Process design	Discuss formulas and B value use Discuss residuals handling: sand drying bed, centrifuge, thickening methods, polymers, “release”
3:15 – 3:45	• DBP Control	Discuss/present strategies/optimization techniques for DBP control, case studies
3:45 – 4:00	• **Break**	
4:00 – 5:00	• Review, Final Game, Final testing	Review of all topics covered. Final testing exercise, survey.