Area Wide Optimization Program

EPA Region 4
Individual Program
Background Information
2019

Name of Agency:

Official Recognition of AWOP

Please provide the AWOP start date and describe any official recognition of AWOP in agency newsletters, web pages, awards programs, annual meetings, etc.

EPA Region 4 established its Multi-State AWOP in 1998.

In 2001, the Region 4 AWOP received the "Innovations in Water Management Division Award" for its role in ensuring safe drinking water.

In 2014, Region 4's AWOP earned mention in the EPA Administrator's blog upon being selected as a "High Five Highlight" under the Agency's "Aim High" Campaign for Protecting Water.

Official Adoption of AWOP Goals

Please describe when and how AWOP goals were adopted by your agency and communicated to the water systems.

EPA's microbial, DBP, and other distribution system goals are those established by the National Optimization Leadership Team (NOLT) – comprised of EPA's Drinking Water Technical Support Center, EPA Regional Offices participating in AWOP (including Region 4), and ASDWA.

In 1998, EPA Region 4 communicated microbial AWOP goals by letter to the one (1) surface water system for which the Region has direct regulatory jurisdiction. Applicable DBP and distribution goals have been communicated to the system through presentations at meetings and through electronic communication as these goals are developed and refined by NOLT.

National Optimization Goals <u>adopted</u> by your PWSS Program – Check all that apply:

(refer to Attachment I for descriptions of the NOLT optimization goals.)

<u>Water Treatment Plants</u>

Microbial (Turbidity): Raw Water__√__ Individual Settled_√___ CFE__√__ IFE__√__
Post BW w/FTW_√__ Post BW wo/FTW__√__ Disinfection (CT) __√__

DBPs (TTHM/HAA5): Plant Effluent__√__ Enhanced Coagulation__√__ Disinfection_√__

Chloramine Application: Ammonia Control__√_ Dosing (Chlorine & Ammonia) __√__

<u>Distribution Systems</u>

Individual Site DBPs __√_ Long Term System DBPs__√__ Tank Operations__√__
Secondary Disinfection, Free Chlorine __√__
Secondary Disinfection, Chloramines (monochloramine, Ammonia & Nitrite) __√___

Modifications to the national goals or other optimization goals utilized by your Agency:
Please describe any modified AWOP goals and/or any additional optimization goals adopted by your agency and communicated to the water systems.

N/A

Description of *Current* AWOP Team Members and Responsibilities

Please provide the name, position/title, description of AWOP duties and approximate FTE that each team member spends on AWOP. Also indicate who serves as the AWOP team lead/point of contact.
Example: Nevel O. Meter, District Engineer, PBT trainer, ~ 0.3 FTE

(Note that if you submitted this information in 2017, that information is being provided and if there are no changes, simply indicate "no change" in this section.)

1. AWOP Team Leader: Janine Morris, Environmental Engineer (~ 0.1 FTE)
2. Robert Burns, Environmental Engineer (~ 0.1 FTE)
3. Dale Froneberger, Environmental Scientist (~ 0.1 FTE)
4. Renea Hall, Environmental Engineer (~ 0.1 FTE)
5. Dominique Smith, Life Scientist (~ 0.1 FTE)

Description of *Former* AWOP Team Members:

Please provide the name of former AWOP team members, and their reason for leaving the team. This information is for historical purposes and also to support networking as AWOP continues to expand.

(Note that if you submitted this information in 2017, that information is being provided and if there are no changes, simply indicate "no change" in this section.)

1. Vivian Doyle – Transferred from Drinking Water Program
2. David Parker – Promoted to Management Position
3. Pamela Riley – Workload Constraints
4. Brian Smith – Promoted to Management Position

Inventory of State-Wide Treatment Facilities[1]	**Number**
Rapid rate filtration treatment plants[2,3]	1
Utilizing static settling without tubes or plates	0
Utilizing static settling with tubes or plates	1
Utilizing sludge blanket clarification (upflow, pulsator)	0
Utilizing contact adsorption clarification	1
Utilizing sludge recirculation (including ballasted clarification)	0
Utilizing DAF, or other alternative clarification process	0
Utilizing direct/in-line filtration	0
Utilizing packaged filtration (package plants)	1
Slow sand filter plants	0
Diatomaceous earth filter plants	0
Membrane treatment plants	0
Bag or cartridge filtration plants	0
Primary disinfectant	
Free chlorine	0
Chloramines	0
Ozone	0
UV	1

Secondary disinfectant	
Free chlorine	1
Chloramines	0

[1]Limited to surface water treatment plants (includes surface, GUDI, blended sources).
[2]All surface water treatment plants, except cartridge, membrane and slow sand.
[3]When a plant utilizes multiple treatment processes or configurations identified below, please include them all in this inventory, e.g., a package plant that utilizes a CAC will be included as a rapid rate plant using CAC and packaged filtration.

AWOP Vision:

Please describe the vision for your AWOP

Short-Term Vision: Achieve and document progress in reducing DBP non-compliance and progress in meeting microbial optimization goals among water systems in Region 4 through the application of AWOP tools.

Long-Term Vision: Sustain and expand Region 4's AWOP network by ensuring that the program continues to succeed in helping meet the public health protection and drinking water quality needs of water systems, states, and EPA.

Status Component Implementation:

Please describe status component activities that are implemented in your agency, e.g., (are water systems ranked according to public health risk and how is this information used; how is water system data integrity ensured):

Region 4 has only one surface water system under its direct regulatory jurisdiction, and it tracks the performance of this system with respect to microbial and DBP optimization goals.

Targeted Performance Improvement (TPI) Implementation:

Please list all activities that are implemented as TPI activities in your state, e.g., CPEs, PBT, Enhanced Sanitary Surveys, technical assistance, other):

Region 4 has applied numerous TPI tools to the one surface water system under its direct regulatory jurisdiction, including: (1) microbial CPE; (2) microbial PBT; (3) and targeted technical assistance in areas such as filter profiling, Enhanced Terminal Subfluidization Wash (ETSW), chlorine mapping for design of a unidirectional flushing program, and data integrity.

Region 4's AWOP Team places top priority on its role in facilitating Multi-State Planning Meetings, participating in National Optimization Leadership Team (NOLT) meetings, and building awareness of the program. Building awareness is typically carried out by preparing and transmitting congratulatory letters (at the request of a state) to water system meeting a state's optimization goals, by delivering remarks about the program at water system AWOP award ceremonies hosted by states, and by delivering AWOP-related presentations at drinking program meetings and workshops attended by EPA and states.

AWOP Maintenance Component Implementation:

Integrate

Please check the following areas where AWOP has been integrated into the PWSS Program:
Plan Reviews_____ Permitting_____ Capacity Development__√___ Operator Training_____
Technical Assistance__√___ DWSRF Prioritization_____ Enforcement_____ Sanitary Surveys____ Other(identify)_____

Enhance

Please describe any AWOP enhancements that have been implemented in your program. One example could include modifying status component criteria

N/A

Sustain

Please describe any activities that you implement to sustain your agency's AWOP. Some examples could include efforts to promote and incentivize AWOP (e.g., publish regular newsletter, awards program, AWOP participation = higher ranking for grant/loan funding, etc.).

Region 4 strives to identify and communicate connections between AWOP and statutorily- and regulatory-driven elements of the drinking water program and other EPA strategic priorities, so that states – and in turn water systems – will maintain strong incentive for fulfilling their role in the National AWOP Network.

Lessons Learned:

Please list "lessons learned" that you feel would be helpful to other programs, e.g., how to build and maintain internal support, how to integrate AWOP into your PWSS program, etc). If you are new to AWOP, please list a question or concern you'd like to know more about.

Challenges in meeting DBP compliance standards – and the public notification requirements associated with DBP non-compliance (where standard health effects language includes "increased risk of getting cancer") – may result in water systems weakening their barriers protecting against microbial pathogens.

Application and results of Targeted Performance Improvement tools such as voluntary CPEs at water systems can sometimes carry significant implications for senior-level decision makers within local and state government.

Attachment I: Optimization Goals Adopted by the NOLT

Category	Goal	Applies to	Description
Microbial	Minimum Data Monitoring Goal Raw Water Turbidity	Rapid Rate Filtration Plants	— Record maximum daily raw water turbidity.
Microbial	Individual Sedimentation Basin Performance and Monitoring Goals	Rapid Rate Filtration Plants	— Settled water turbidity ≤ 2 NTU in 95% of readings when the annual average raw turbidity is > 10 NTU. Optimization is based on the daily maximum values recorded from all readings. — Settled water turbidity ≤ 1 NTU in 95% of readings when the annual average raw turbidity is ≤ 10 NTU. Optimization is based on the daily maximum values recorded from all readings. — Record individual sedimentation basin effluent turbidity readings at intervals of 4-hours or less if taking grab samples, or 15 minutes or less for continuous monitoring.
Microbial	Individual and Combined Filter Performance and Monitoring Goals	Rapid Rate Filtration Plants	— Combined filter effluent turbidity ≤ 0.10 NTU in 95% of readings. Optimization is based on the daily maximum values recorded from all readings. — Individual filter effluent turbidity ≤ 0.10 NTU in 95% of readings (excluding 15-minute period following filter backwash). Optimization is based on the daily maximum values recorded from all readings. —Post backwash individual filter effluent turbidity for filters <u>without</u> filter-to-waste capability: Maximum individual filter effluent turbidity following backwash ≤ 0.30 NTU and achieve ≤ 0.10 NTU within 15 minutes. —Post backwash individual filter effluent turbidity for filters <u>with</u> filter-to-waste capability: Minimize individual filter effluent turbidity during filter-to-waste period and record maximum value. Return the filter to service at ≤ 0.10 NTU. — Record individual and combined filter effluent turbidity readings at intervals of 1-minute or less for continuous monitoring.
Microbial	Disinfection Performance and Monitoring Goals	Rapid Rate Filtration Plants	—Meet CT requirements to achieve inactivation of *Giardia* and viruses plus a system-specific factor of safety. — Record disinfectant residual, temperature, and pH at maximum daily flow for CT calculations.
Disinfection By-Product	Plant Effluent Disinfection Byproducts (DBPs) Performance and Monitoring Goals	Surface Water and Groundwater Under the Direct Influence of Surface Water Plants	—System Specific Targets: Could be a discrete value or range that is based on a running annual average. Recommended goal value/range should be 30% to 50% of long term LRAA goals (e.g., 20-30 ppb for TTHM, 15-20 ppb for HAA5). —Collect quarterly TTHM and HAA5 samples at the plant effluent and distribution system compliance sites.
Disinfection By-Product	Enhanced Coagulation Performance and Monitoring Goals	Surface Water and Groundwater Under the Direct Influence of Surface Water Plants	—Meet Stage 1 D/DBP Rule TOC removal requirements for enhanced coagulation, which are based on source water alkalinity and TOC levels, or an alternative compliance criterion, as a running annual average (RAA) of the performance ratio (actual TOC removal/required TOC removal) plus a factor of safety of 10% (or performance ratio ≥ 1.1). —Collect monthly total organic carbon samples for raw and treated water (only applies to parent systems).
Disinfection By-Product	Disinfection Performance and Monitoring Goal	Surface Water and Groundwater Under the Direct Influence of Surface Water Plants	—Meet CT requirements to achieve inactivation of *Giardia* and viruses plus a system-specific factor of safety. —Record disinfection residual, temperature, and pH at maximum daily flow for CT calculations (only applies to parent systems).

Distribution System	Disinfection Byproducts Performance and Monitoring Goals	Parent and Consecutive Water Systems that Utilize any Secondary Disinfectant	—Individual Site Goal: Quarterly Maximum Locational Running Annual Average TTHM/HAA5 values not to exceed 70/50 ppb. —Long-Term System Goal: Average of Maximum Locational Running Annual Average TTHM/HAA5 values not to exceed 60/40 ppb (the average of the last 8 quarters cannot exceed 60/40 ppb). —For systems in compliance with the TTHM and HAA5 MCLs, collect quarterly DBP samples at all compliance locations; for systems not in compliance, collect monthly samples.
Free Chlorine Distribution System	Disinfection Performance and Monitoring Goals	Parent and Consecutive Water Systems that Utilize Free Chlorine as a Secondary Disinfectant	—Maintain ≥ 0.20 mg/L free chlorine residual at all monitoring sites in the distribution system, at all times. —Monitoring should be performed at least monthly, but more frequently at critical times (i.e., summer months). —Sample locations should include bacteriological and DBP compliance sites, all distribution system entry points (e.g., plant effluent, consecutive system connections), all tanks (preferably while draining), and identified critical sites base on investigative sampling (minimum of one critical site in each quadrant of the system, four sites total).
Plants that Utilize Chloramine	Disinfection: Ammonia Control Performance and Monitoring Goals	Parent and Consecutive Water Systems that Utilize Chloramine as a Secondary Disinfectant	—Maintain a detectable free ammonia residual in the plant effluent ≤ 0.10 mg/L as NH3-N. —Monitor free ammonia at <u>least</u> once per day in the plant effluent. • The monitoring frequency may be adjusted based on the variability observed over an extended period of time. • Free ammonia may be monitored in the source water periodically (e.g., once per week) to assess variability.
Plants that Utilize Chloramine	Operational Guideline Chlorine and Ammonia Dosing	Parent and Consecutive Water Systems that Utilize Chloramine as a Secondary Disinfectant	—Maintain a chlorine-to-nitrogen mass ratio between 4.5:1 and 5.0:1 (or chlorine-to-ammonia mass ratio between 3.7:1 and 4.1:1), which should result in a detectable free ammonia in the plant effluent that is ≤ 0.10 mg/L as NH3-N.
Chloramine Distribution System	Disinfection: Monochloramine and Nitrification-Related Parameters Performance and Monitoring Goals	Parent and Consecutive Water Systems that Utilize Chloramine as a Secondary Disinfectant	—Maintain ≥ 1.50 mg/L monochloramine residual at all monitoring sites in the distribution system, at all times, to provide a disinfection barrier against both microbial contamination and nitrification prevention. —Monitor monochloramine, free ammonia, and nitrite in the distribution system and at the entry points (to establish a baseline). • Monochloramine and free ammonia should be monitored at <u>all sample locations</u>. • Nitrite should be monitored at sample locations where monochloramine is ≤ 1.50 mg/L; nitrate may also be monitored, to further assess nitrification. • Sample locations should include bacteriological and DBP compliance sites, all distribution system entry points (e.g., plant effluent, consecutive system connections), all tanks (preferably while draining), and identified critical sites base on investigative sampling (minimum of one critical site in each quadrant of the system, four sites total). • Monitoring should be done at least monthly, but more frequently at critical times (e.g., summer months).
Distribution System	Operational Guidelines Tank Operations	Parent and Consecutive Water Systems that Contain Storage Tanks (any secondary disinfectant)	—Maintain an average turnover time < 5 days; or establish and maintain a water turnover rate at each storage facility. —Maintain good mixing (i.e., Performance Ratio ≥ 1) at all times; for tanks where the PR cannot be calculated, adequate mixing (i.e., uniform water quality) should be confirmed by alternate means (e.g., tank profiling/water quality sampling).