Area Wide Optimization Program

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.

Officially started AWOP in 1997. Alabama implemented activities prior to officially starting AWOP. Prior to 1997, the State had a goal of 0.2 NTU when the limit was 0.5 NTU and 0.5 NTU when the limit was 1.0 NTU.

The Alabama Optimization Team publishes the "Drawing the Graph" newsletter twice per year in which optimization related topics are covered.

In 2003, Alabama began issuing awards to water treatment plants that meet the turbidity optimization goals.

In 1999, Alabama began holding a state wide "Surface Water Meeting" at which optimization activities are discussed along with other pertinent topics.

In 2016, US EPA Region 4 started issuing congratulatory letters to water systems who had a water treatment plant that met the turbidity optimization goals.

Official Adoption of AWOP Goals

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

AWOP goals have not been officially adopted by ADEM. However, parts of the goals were incorporated into regulations for the construction of new water treatment plants or water treatment plants desiring to increase their filtration rate. The program is supported by all levels of management, even though AWOP is considered a voluntary program.

Communication of AWOP to water systems is accomplished through on-site discussion (including AWOP printouts) with water systems during their yearly inspection, bi-annual publishing of the "Drawing the Graph" newsletter, presentations at various conferences and meetings, presentation of Optimization Awards at the Annual Surface Water Meeting, a display at the Alabama Rural Water Association's Annual Conference, and through regular communication with water systems.

National Optimization Goals adopted by your PWSS Program – Check all that apply:
(refer to Attachment I for descriptions of the NOLT optimization goals.)

Water Treatment Plants

Microbial (Turbidity): **Raw Water_X___ Individual Settled**_X___ CFE____ **IFE**__X__
Post BW w/FTW_X___ Post BW wo/FTW____ **Disinfection (CT)** _X___

DBPs (TTHM/HAA5): **Plant Effluent__X__ Enhanced Coagulation__X__ Disinfection__X__**

Chloramine Application: Ammonia Control____ Dosing (Chlorine & Ammonia) ____

Distribution Systems

Individual Site DBPs __X__ Long Term System DBPs_X___ Tank Operations_X___
Secondary Disinfection, Free Chlorine __X__
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.

Microbial Goal Modifications:

- Raw water turbidity is required to be recorded at least every 2 hours or continuous if filtration rate is above 2.0 gpm/SQ FT.
- By regulation CFE is not allowed in Alabama.
- Disinfection is handled differently in Alabama. WTP's have to meet a CT of 70. This is a worst case scenario for disinfection and only requires WTP's to report the minimum free chlorine level leaving the WTP for each day.
- Chloramines are not utilized in Alabama in our community water systems.

Disinfection Byproducts and TOC Modifications

- Alabama has adopted goals for the WTP effluent of 20 ppb for TTHMs and 15 ppb for HAA5. Monitoring of WTP effluent is mandatory.
- Total organic carbon goals are based on an annual WTP effluent of 1.7 mg/L or less. Alabama does not use the performance ratio for optimization purposes.
- Secondary disinfection is accomplished through the use of free chlorine, chloramines are not utilized.
- DBP monitoring is required at all master meters by the parent system. Ground water systems or systems with low DBPs can obtain a waiver.
- Joint OELs are required anytime a consecutive water system incurs a violations. All water systems from the point of production to consumption are required to complete the report and hold quarterly meetings until all water systems in the chain have returned to compliance.

Distribution System Modifications

- Water storage tanks should turn over in 4 days or less.
- pH of the distribution system should remain consistent (± 0.3 units) with the water leaving the producing WTP.
- Corrosion control should be implemented to minimize corrosion in the distribution system, especially to prevent changes of pH in the distribution system. No specific goals have been adopted as this area as it is currently under development.

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 2015, that information is being provided and if there are no changes, simply indicate "no change" in this section.)

1.	William McClimans	AWOP Team Leader; District Engineer; SWTR, DBPR and File-Net Coordinator, PBT Trainer
2.	Laura Taylor	Assistant AWOP Team Leader; System Inspector; CCR, LCR & RMP Coordinator, PBT Trainer
3.	Arshasmine Tellis	System Inspector; Assistant SDWIS and Permit Database Coordinator; PBT Facilitator
4.	Marc Chapman	District Engineer; Assistant Data Entry Coordinator; SRF & Grant Coordinator; PBT Facilitator
5.	Aimee White	District Engineer; Assistant Data Entry Coordinator; PBT Facilitator; Permit Database Coordin.
6.	Jack Mobley	District Engineer; Annual Report Coordinator; PBT Facilitator
7.	Anthony Roberts	System Inspector; Sample Collector; PBT Facilitator
8.	Taylor Littleton	District Engineer; PBT Facilitator
9.		
10.		

AWOP is considered a voluntary program and is in addition to required duties. Staff members use time management to provide time to conduct AWOP activities.

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 2015, that information is being provided and if there are no changes, simply indicate "no change" in this section.)

1.	Keith Lowery	Retired
2.	Charlie Davis	Retired
3.	Mark Anderson	Transferred within ADEM
4.	Benny Laughlin	Other duties assigned
5.	Shannon Golden	Transferred to ALDOT
6.	Craig Holloway	Transferred to Alabama Military Department, now back at ADEM in different division.
7.	James Daily	Transferred to SRF, now retired.
8.	Tom Garrett	Transferred to SRF
9.	Jim Ramsey	Retired
10.	William "Billy" Byars	Left state government
11.	Chris Griffin	Left state government

Inventory of State-Wide Treatment Facilities[1]	Number
Rapid rate filtration treatment plants[2,3]	
Utilizing static settling without tubes or plates	60
Utilizing static settling with tubes or plates	17
Utilizing sludge blanket clarification (upflow, pulsator)	1
Utilizing contact adsorption clarification	3
Utilizing sludge recirculation (including ballasted clarification)	1
Utilizing DAF, or other alternative clarification process	1
Utilizing direct/in-line filtration	8
Utilizing packaged filtration (package plants)	6
Slow sand filter plants	0
Diatomaceous earth filter plants	0
Membrane treatment plants	16
Bag or cartridge filtration plants	0
Primary disinfectant	
Free chlorine	97
Chloramines	0
Ozone	0
UV	0
Secondary disinfectant	
Free chlorine	97
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

That every member of the AWOP team is capable of conducting/operate every part of the AWOP program on their own or coordinate a larger group to carry out AWOP activities to help our water systems provide the best possible water quality to their customers.

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):

Water systems are ranked according to their performance in relation to the AWOP goals. The ranking lists are used as a guide when deciding which water systems to target with AWOP assistance.

Data integrity is still an area where we need to do more work.

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): CPE, PBT, CTA, TTA, ESS, TA and anything else we can come up with.

AWOP Maintenance Component Implementation:

Integrate

Please check the following areas where AWOP has been integrated into the PWSS Program:
Plan Reviews_X____ Permitting__X___ Capacity Development_____ Operator Training_____
Technical Assistance__X___ DWSRF Prioritization_____ Enforcement_____ Sanitary Surveys_X_ Other(identify)_____

Enhance

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

Recently the turbidity ranking list was automated (as best as possible) to eliminate unnecessary time by doing point calculation by hand. The point ranking list was redone to remove personal opinion and allow for complete automation of score.

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.).

The program issues newsletters each year (depending on time available) which covers AWOP topics and what other water systems have learned or are doing in regards to AWOP.

Optimization presentations are given at different in state conferences.

ADEM each year issues awards to water systems who have met the microbial (turbidity) goals.

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.

One lesson learned is that water systems in PBT do better when their manager attends all the sessions (not just first and last). These systems are more energized and willing to complete the work as they see the benefit of the additional work.

One other lesson learned was that you can stratify water mains, even a 10-inch water main.

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). —For systems in compliance with the TTHM and HAA5 MCLs, collect quarterly plant effluent DBP samples; for systems not in compliance, collect monthly plant effluent samples.
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.
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).