ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

WATER DIVISION - WATER SUPPLY PROGRAM

DIVISION 335-7

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

WATER DIVISION - WATER SUPPLY PROGRAM

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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CHAPTER 335-7-1
GENERAL PROVISIONS

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335-7-1-.01 Definitions. When used in these regulations, the following words and terms shall have the meaning assigned to them as shown. Additional terms may also be defined in other chapters at the time of their use.

(a) Clean compliance history—for the purposes of microbiological monitoring, a record of no maximum contaminant level violations, no monitoring violations, and no coliform treatment technique trigger exceedances or treatment technique violations.

(b) Coagulation--a process using coagulant chemicals and mixing to destabilize colloidal and suspended particles into floc.

(c) Combined Distribution System--the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

(d) Community Water System--a public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents. A community water system may maintain and use its own source of either surface water or ground water or obtain water from an adjacent system and thus be a consecutive system.

(e) Compliance cycle--the nine year calendar year cycle during which public water systems must monitor. Each compliance cycle contains three 3 year compliance periods. The first compliance cycle begins January 1, 1993 and ends December 31, 2001 cycle. Compliance period--a three year calendar period within a compliance

(f) Confluent growth--a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

(g) Consecutive system--a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

(i) Contaminant--matter which renders water unfit to use due to its physical, chemical, biological, or radiological properties.

(j) CT--the product of residual disinfection concentration (C) in milligrams per liter determined before the first customer and the corresponding disinfection contact time (T) in minutes.

(k) Department--the Alabama Department of Environmental Management as created under §§ 22-22A-1, et seq., Code of Alabama, 1975.

(l) Director--the Director of the Alabama Department of Environmental Management or his designee.

(m) Disinfectant--any oxidant including but not limited to chlorine, chlorine dioxide, chloramines or ozone, added to water in any part of the treatment or distribution process, with the intent to kill or inactivate pathogenic micro-organisms.

(n) Disinfection--the process of applying an approved disinfectant to destroy, neutralize, or inhibit the growth of pathogenic micro-organisms.

(o) Dual sample set--a set of two samples collected at the same time and same location, with one sample analyzed for total trihalomethanes (TTHM) and the other sample analyzed for haloacetic acids (HAA5).

(p) Engineer--a person currently licensed by the Alabama State Board of Registration for Professional Engineers and Land Surveyors to provide engineering services.

(q) Enhanced softening--the improved removal of disinfection byproduct precursors by precipitative softening.

(r) EPA--the Environmental Protection Agency.

(s) Exemption--the process of allowing a water system to be excused from meeting an established drinking water standard for a specific length of time.

(t) Federal Act--the Safe Drinking Water Act, Public Law 93-523, including all amendments.

(u) Filtration--a process for removing particulate matter from water by passage through media.

(v) Finished Water--water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as treatment is necessary to maintain water

quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

(w) Flocculation--a process to enhance agglomeration of smaller floc particles into larger more easily settleable particles through gentle stirring by hydraulic or mechanical means.

(x) GAC 10--granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency shall be 120 days when used as a best available technology for compliance.

(y) GAC 20--granular activated carbon filter beds with any empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

(z) Groundwater Source--a source of water that is obtained from wells or springs and not directly influenced by surface water.

(aa) Ground Water Under the Influence--any water beneath the surface of the ground with (1) significant occurrence of insects or other macro-organisms, algae, or large diameter pathogens such as Giardia lamblia, Cryptosporidium or (2) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the Department. The Department determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well construction characteristics and geology with field evaluation.

(bb) Haloacetic acids (five) (HAA5)--the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloracetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

(cc) Initial compliance period--the first full three-year compliance period which starts January 1, 1993 and ends December 31, 1995.

(dd) Level 1 assessment-- is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. It is conducted by the system operator or owner. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution

system.

(ee) Level 2 assessment-- is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system's monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. It is conducted by an individual approved by the State, which may include the system operator. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. The system must comply with any expedited actions or additional actions required by the State in the case of an *E. coli* MCL violation.

(ff) Locational running annual average (LRAA)--the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

(gg) Maximum Contaminant Level (MCL)--the maximum permissible level of a contaminant in drinking water, which is delivered to any user of a public water system.

(hh) Maximum residual disinfectant level (MRDL)--the level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDLs are enforceable in the same manner as maximum contaminant levels.

(ii) Maximum Total Trihalomethane Potential--the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25^{o}C or above.

(jj) Monitoring Trigger--a level established by EPA for each individual contaminant to be utilized to require more frequent monitoring for that contaminant.

(kk) Monitoring Waiver--the process by which a public water system is allowed to reduce or eliminate required monitoring during a specific monitoring period.

(ll) National Drinking Water Standards--drinking water standards adopted by EPA pursuant to the Federal Act.

(mm) Non-community Water System--a public water system that is not a community water system. A non-community water system is either a "transient non-community water system" or a "non-transient non-community water system (NTNC)."

(nn) Non-transient non-community Water Systems (NTNC)--a public water system that is not a community water system and that regularly serves at least 25 of the same individuals at least six months per year.

(oo) Permit--written authorization granted by the Department to construct, install, and operate a public water system and to furnish and supply water for human consumption or use.

(pp) Person--any individual, firm, partnership, corporation, local governmental unit, party, company, association, federal agency, state agency, or any other public or private legal entity.

(qq) Public Water System--a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals at least sixty (60) days out of the year. A public water system includes any source, collection, treatment, storage and distribution facilities under the control of the operator of such system and used primarily in connection with such system, and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a community water system, a non-community water system, or a non-transient non-community water system.

(rr) Raw water--water which has received no treatment nor the application of treatment chemicals.

(ss) Repeat compliance period--any subsequent compliance period after the initial compliance period.

(tt) Sanitary defect—a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.

(uu) Sanitary survey--an onsite review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

(vv) Seasonal system—a non-community water system that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and the end of each operating season.

(ww) Sedimentation--a process using gravity or separation for removal or concentration of solids prior to filtration.

(xx) Segmental Water System--An apartment complex or business mall

that is a consecutive water system that serves at least 25 individuals or has at least 15 service connections and obtains water from a permitted public water system. This type system serves less than 3300 population, does not contain pumps nor storage facilities, has a greater amount of plumbing lines than distribution lines and has no back siphonage potential or cross-connections. The designation of this type water system is based on assurances that monitoring and operation by the parent system is sufficient to demonstrate consistent satisfactory water quality and there is no threat to public health.

(yy) Service Connection--the point at which the water distribution main and the water service pipe are connected to serve water to a residence or water customer. A typical service connection is, but not limited to, the service line, backflow prevention device and meter.

(zz) Supplier of Water--any person who owns, operates, controls, directs, or is responsible for a public water system.

(aaa) Surface Water Source--a source of raw, untreated water that is open to the atmosphere and subject to surface water runoff or direct atmospheric contamination; or groundwater which is subject to direct influence of surface water.

(bbb) Technical, Managerial & Financial Capacity--the overall capability or wherewithal of a water system to consistently produce and deliver satisfactory drinking water and consistently meeting all Departmental regulations. Technical means the physical infrastructure of the water system including water source(s), treatment facilities, water storage, distribution and service connections. Managerial means the management and operational structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages to customers and regulatory agencies. Financial means the financial resources of the water system, including but not limited to revenue sufficiency, credit worthiness, and fiscal controls.

(ccc) TNTC--"Too Numerous To Count" means that the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

(ddd) Total Organic Carbon (TOC)--total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

(eee) Transient non-community Water System--means a non-community water system that does not regularly serve at least 25 of the same persons over six months per year.

(fff) Treated Water--water to be used by a public water system which has received the application of approved water treatment chemicals.

(ggg) Treatment Technique--a required treatment process, procedure, or activity necessary to provide deliverance of safe drinking water.

(hhh) Trihalomethane (THM)--one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

(iii) Total Trihalomethanes (TTHM)--the sum of the concentration in milligrams per liter of the trihalomethane compounds: chloroform, dibromochloromethane, bromodichloromethane and bromoform, rounded to two significant figures.

(jjj) Uncovered finished water storage facility--a tank, reservoir, or other facility used to store water that will undergo no further treatment to reduce microbial pathogens except residual disinfection and is directly open to the atmosphere.

(kkk) Unregulated Contaminant--any contaminant with established monitoring requirements but with no prescribed maximum contaminant level adopted.

(lll) Variance--the process by which a public water system is allowed to deviate from established regulations.

(mmm) Virus--a virus of fecal origin which is infectious to humans by waterborne transmission.

(nnn) Volatile Synthetic Organic Chemical (VOC)--a group of organic chemical compounds considered to be probable human carcinogens for which maximum contaminant levels and monitoring requirements have been adopted by the Department.

(ooo) Water Dispensing Machine--a device that complies with National Sanitation Foundation (NSF) standards for drinking water equipment, obtains all of its water from a permitted public water system, and dispenses unit servings of piped water to the public.

(ppp) Waterborne Disease Outbreak--the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the appropriate local or State agency.

(qqq) Wholesale system--a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

Author: Joe Alan Power, Thomas S. DeLoach, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Revised: September 23, 1992, September 19, 1995 (Emergency Rule); November 28, 1995; Revised December 8, 1998; effective: January 25, 1999. **Amended:** June 7, 2000; March 12, 2002; May 30, 2003; January 22, 2008; November 25, 2014.

335-7-1-.02 Applicability. Regulations and standards established under division 7 apply to each public water system in Alabama as defined in this chapter except water dispensing machines unless the water system meets all of the following conditions:

(a) Consists only of distribution and/or storage facilities and does not have any collection and treatment facilities,

(b) Obtains all of its water from, but is not owned or operated by, a public water system to which this chapter applies,

(c) Does not sell water to any person, and

(d) Is not a carrier which conveys passengers in interstate commerce.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990; January 22, 2008.

335-7-1-.03 Variance from Regulations. The Department may grant variances to design, treatment, and operational requirements based on the following conditions and procedures:

(a) No variance will be granted for treatment techniques or activities which will result in an unreasonable risk to public health, cause a public nuisance, create environmental pollution, or allow use of a surface source without filtration unless the system can demonstrate compliance with EPA Regulations 141.71, 141.72, and 141.75.

(b) No variance from the *E. coli* MCL will be granted.

(c) The Department may impose additional monitoring, require onsite treatability studies, and may require the applicant to obtain and keep in force a bond to ensure further treatment facilities are obtained to prevent any hazard to public health.

(d) The Department may establish a compliance schedule to obtain modifications to the treatment process, obtain a new source of supply, or other action deemed necessary to bring the system into full compliance with these regulations.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-35, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; effective: January 2, 1996; November 25, 2014.

335-7-1-.04 Variance Application. Any supplier of water requesting a variance from provisions of these regulations shall file a written application providing the following information:

(a) Specific regulation for which a variance is requested;

(b) The type and duration of the variance;

(c) Analytical results of system and source water quality and projected quality if the variance is approved;

(d) Data showing adequate water treatment will be provided based on information from plant studies, research, pilot plant results or other studies using the same or similar raw water sources; and

(e) A plan for the provision of safe drinking water if an excessive level of any contaminant affected by the variance should occur.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-35, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990; January 22, 2008.
Amended: November 25, 2014.

335-7-1-.05 Exemption. The Department may, upon written application, grant an exemption from drinking water standards not to include monitoring, based upon the following conditions and findings:

(a) The public water system was in operation on the date the MCL became effective.

(b) The granting of the exemption will not result in an unreasonable risk to the public health.

(c) No exemption from the *E. coli* MCL will be granted.

(d) The exemption may be granted for a period not to exceed three years from the date of issuance.

(e) The Department may require the applicant to obtain a bond in sufficient amount to correct a possible hazard to public health which may be created by the granting of this exemption.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-35, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: November 25, 2014.

335-7-1-.06 Exemption Application. Any supplier of water requesting an exemption from compliance of any water standard shall file a written application providing the following information:

(a) Contaminant to be considered plus historic and current analysis indicating the maximum and normal level found and the potential for increased levels.

(b) Health effects data demonstrating that no unreasonable risk to human health will occur.

(c) A detailed engineering report providing either proposed treatment or alternative sources which will meet all water standards.

(d) An economic statement demonstrating that funds will be available within two years to provide necessary system modification to meet all water standards.

(e) An explanation of the compelling factors, such as time or economics, which prevent the system from achieving present compliance.

(f) Any other information believed relevant by the applicant or requested by the Department.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-35, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.

335-7-1-.07 Exemption Disposition. Upon receipt of a complete application the Department shall take the following action:

(a) Approval - Should the Department favorably consider the exemption request, the following procedures must be followed:

1. At the expense of the applicant a public hearing will be held in the county where the greatest percent of customers will be affected.

2. The Department will provide notice to the affected public including:

(i) Contaminant,

(ii) Health-effects,

(iii) Time and location of public hearing and comment period,

(iv) Department established Compliance schedule, and

(v) Name, address, and telephone number of the person requesting the exemption.

3. EPA will be provided with copies of all applications and documents with a request made for concurrence with granting the exemption.

4. No later than 90 days after close of the comment period and hearing record the Department shall, after taking into consideration comments received, confirm, revise or rescind the compliance schedule and exemption.

5. Upon approval of the exemption, the applicant shall provide written notification to all persons affected in a manner acceptable to the Department. Such notice shall be repeated at least once every three months so long as the exemption remains in effect.

(b) Denial -- Should the Department deny the request, the applicant shall be notified in writing and provided a reason for the denial.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-32, 22-23-33, 22-23-35, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; effective: January 2, 1996; June 7, 2000.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-2
PRIMARY DRINKING WATER STANDARDS

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335-7-2-.01 Applicability. Drinking water standards established in these regulations are applicable to water systems required to monitor for the various contaminants. Systems are required to monitor at the frequency and time designated by the Department. All systems required to meet these standards must provide drinking water in compliance with regulation 335-7 at all times.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Revised: September 23, 1992; effective November 9, 1992. **Amended:** December 12, 2005.

335-7-2-.02 Sampling and Analytical Requirements. Samples to be used to demonstrate compliance with these regulations must be collected using procedures, containers, and preservatives established by EPA. Analysis of such samples must be performed using approved EPA methodology and by a laboratory certified by EPA or this Department which has demonstrated the ability to analyze the specific contaminants at an acceptable detectable limit established by EPA. Turbidity, chlorine residual, and secondary standards may be analyzed by a certified operator using procedures established by EPA. Confirmation samples may be required after the detection of a contaminant or the submittal of results which is questionable.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; effective January 2, 1996; December 12, 2005.

335-7-2-.03 Inorganic Chemical Standards and Monitoring Requirements.

(1) The following are MCLs for inorganic chemicals:

Contaminant	MCL (mg/L)
Antimony	0.006
Arsenic	0.01
Asbestos	7 Million Fibers*/Liter
Barium	2.0
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2
Fluoride	4.0
Lead	0.015
Mercury	0.002
Nickel	0.1
Nitrate (as N)	10
Nitrite (as N)	1
Total Nitrate/Nitrite	10
Selenium	0.05
Sulfate	500
Thallium	0.002

*Longer than 10 micrometers

(2) Should any inorganic contaminant exceed the MCL, the system must establish a treatment process using the best available technology to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department-issued compliance schedule. The Department may require the use of an alternate source of drinking water.

(3) Sampling for asbestos shall be as follows:

(a) Community and NTNC water systems shall analyze for asbestos during the first three-year compliance period of each nine-year compliance cycle.

(b) A system that is not vulnerable to asbestos contamination may apply to the Department for a waiver from asbestos monitoring for each three-year monitoring period. If the Department grants the waiver, the system is not required to monitor.

(c) A system vulnerable to asbestos contamination due to corrosion of asbestos-cement pipe shall collect at least one sample from a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur. A system determined to be vulnerable to asbestos contamination in source water shall monitor at least one sample representative of each suspected source after treatment.

(d) Community and NTNC water systems which exceed the MCL shall analyze for asbestos quarterly beginning in the next quarter after the violation occurred. Sampling may be reduced to initial monitoring requirements if the average of all analytical results is less than 3.5 million fibers/Liter. Groundwater systems shall analyze a minimum of two quarterly samples and surface water systems a minimum of four quarterly samples.

(e) The Department may require analysis of asbestos during a specific quarter of the year.

(f) The Department has the authority to determine compliance based on analytical results and other information compiled by Department staff.

(g) When the MCL for asbestos is exceeded, a second analysis shall be initiated within two weeks and the average of the two analyses shall be used as the compliance level. Should this level also exceed the MCL, the Department shall be notified within 48 hours.

(4) Sampling for nitrates shall be as follows:

(a) Community and NTNC water systems utilizing surface sources shall analyze for nitrates annually. Community and NTNC water systems utilizing a new surface source shall analyze for nitrates four consecutive quarters. Samples shall be collected during periods of normal operating conditions from the entry point to the distribution system for each surface source.

(b) Community and NTNC water systems utilizing surface sources shall analyze for nitrates annually if all analytical results from four consecutive quarters are less than 4.5 mg/L. A surface water system shall return to quarterly monitoring if any one sample is greater than 4.4 mg/L.

(c) Community and NTNC water systems utilizing groundwater sources and all non-community water systems shall analyze for nitrates annually. Samples shall be collected during periods of normal operating conditions from the entry point to the distribution system representing each source or treatment plant utilized.

(d) Community and NTNC water systems utilizing groundwater sources shall analyze for nitrates quarterly for at least one year following any one sample whose analytical result is greater than 4.4 mg/L. Sampling may be reduced to annually if the average of four consecutive quarterly results is less than 4.5 mg/L.

(e) The Department may require analysis of nitrates during a specific quarter of the year. Samples must be collected during the quarter which previously resulted in the highest analytical result unless laboratory availability or other conditions require sampling during another quarter.

(f) The Department has the authority to determine compliance based on analytical results and other information compiled by Department staff.

(g) When the MCL for nitrates is exceeded, a second analysis shall be initiated within 24 hours and the average of the two analyses shall be used as the compliance level. Should this level also exceed the MCL, the Department shall be notified within 48 hours. Should the system be unable to collect a confirmation sample within 24 hours, the system must immediately notify their customers for an acute violation and collect a confirmation sample within 14 days of the original sample date.

(5) Sampling for nitrites shall be as follows:

(a) Community and NTNC water systems utilizing a new surface source shall collect during periods of normal operating conditions one sample for nitrites annually. Community and NTNC water systems utilizing groundwater sources shall collect during periods of normal operating conditions from the entry point to the distribution system representing each groundwater source or treatment plant utilized one sample for nitrites every three years. One sample shall be collected from every new transient non-community water source prior to approval being given to place the new source into operation.

(b) All public water systems shall collect repeat samples for nitrites the quarter following any analytical result for nitrate which exceeds 4.4 mg/L. Systems shall monitor at least quarterly for one year following any one sample whose analytical result is greater than 0.54 mg/L. Sampling may be reduced to annually if the average of four consecutive quarterly results is less than 0.54 mg/L.

(c) The Department may require analysis of nitrites during a specific quarter of the year. Samples must be collected during the quarter which previously resulted in the highest analytical result unless laboratory availability or other conditions require sampling during another quarter.

(d) The Department has the authority to determine compliance based on analytical results and other information compiled by Department staff.

(e) When the MCL for nitrites is exceeded, a second analysis shall be initiated within 24 hours and the average of the two analyses shall be used as the compliance level. Should this level also exceed the MCL, the Department shall be notified within 48 hours. Should the system be unable to collect a confirmation

sample within 24 hours, the system must immediately notify their customers for an acute violation and collect a confirmation sample within 14 days of the original sample date.

(6) Sampling for inorganic chemicals other than asbestos, nitrates, and nitrites shall be as follows:

(a) Community and NTNC water systems utilizing surface sources shall analyze for inorganic chemicals annually. Samples shall be taken during periods of normal operating conditions from a representative point in the distribution system for each surface source.

(b) Community and NTNC water systems using groundwater sources shall analyze samples collected during periods of normal operating conditions from the distribution system representing each source or treatment plant utilized. Analysis will be performed on no less than a three year cycle.

(c) Non-community systems must sample at a frequency established by the Department.

(d) Community and NTNC water systems which exceed the MCL for an inorganic contaminant other than asbestos, nitrate and nitrite shall analyze quarterly for that contaminant beginning in the next quarter after the violation occurred. Sampling may be reduced to initial monitoring requirements if the average of all analytical results is less than one-half of the MCL. Groundwater systems shall analyze a minimum of two quarterly samples and surface water systems a minimum of four quarterly samples.

(e) The Department may require analysis of inorganic contaminants during a specific quarter or season of the year.

(f) The Department has the authority to determine compliance based on analytical results and other information compiled by Department staff.

(g) If the result of an analysis for an inorganic contaminant other than asbestos, nitrites and nitrates exceeds the established MCL, the supplier of water shall report to the Department within seven days of receipt of the results. Also an additional confirmation sample shall be collected from the same sampling point within fourteen days of the original sampling date. The average of the two samples shall be used to determine the compliance level. If more than the minimum number of samples are collected during a compliance period, the average of the values will be used as the compliance level.

1. Compliance with MCLs will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

2. For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of

compliance with the MCL. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

3. For systems monitoring annually or less frequently, if any sample result exceeds the MCL at any sample point, the system is out of compliance with the MCL.

4. Systems must include all samples taken and analyzed under the provisions of this rule in determining compliance, even if that number is greater than the minimum required.

5. If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

6. If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(h) Arsenic sampling results shall be reported to the nearest 0.001 mg/L.

(i) All new systems or systems that use a new source of water must demonstrate compliance with the MCL by monitoring the first year of operation. Monitoring conducted to allow a new source to be utilized may be substituted for this initial sample. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements of this rule.

(j) Community and NTNC water systems may apply to the Department for a waiver from monitoring inorganic chemicals other than asbestos, nitrates, and nitrites. Issuance of the waiver shall be based on established vulnerability criteria, results of water analysis and a demonstration by the system of no use, transport, storage or disposal in the watershed or Source Water Assessment Areas I and II. The waiver, if granted, shall be in effect for two compliance periods and the system must reapply for the waiver every two compliance periods. A system must collect one sample at each sampling point for inorganic chemicals other than asbestos, nitrates, and nitrites during the time frame the waiver is in effect.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
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335-7-2-.04 Synthetic Organic Chemical (SOCs) Standards and Monitoring Requirements.

(1) The following are the MCLs for SOCs:

Contaminant	MCL (mg/L)
Alachlor	0.002
Atrazine	0.003
Carbofuran	0.04
Chlordane	0.002
Dibromochloropropane	0.0002
2,4-D	0.07
Endrin	0.002
Ethylene Dibromide	0.00005
Heptachlor	0.0004
Heptachlor Epoxide	0.0002
Lindane	0.0002
Methoxychlor	0.04
Polychlorinated Biphenyls	0.0005
Pentaclorophenol	0.001
Toxaphene	0.003
2,4,5-TP	0.05
Benzo(a)pyrene	0.0002
Dalapon	0.2
Di(2-ethylhexyl) phthalate	0.006
Di(2-ethylhexyl) adipate	0.4
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Glyphosate	0.7
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Oxamyl (Vydate)	0.2
Picloram	0.5
Simazine	0.004
2,3,7,8-TCDD (Dioxin)	0.00000003

(2) The following are the monitoring requirements for SOCs:

(a) Community and NTNC water systems shall analyze for SOCs at the frequency listed below. Samples shall be collected during periods of normal operating conditions from the entry point to the distribution system for each surface source or from the entry point to the distribution system representing each source of water used after any application of treatment. Samples shall be collected during the period most susceptible to pesticide contamination. Raw water analysis may be used to determine compliance if no treatment processes are used for the reduction of SOCs.

1. Community and NTNC water systems serving a population of less than or equal to 3,300 persons must collect one sample during each repeat compliance period if no SOCs were detected in the initial compliance period.

2. Community and NTNC water systems serving a population of greater than 3,300 persons must collect a minimum of two quarterly samples in one year during each repeat compliance period if no SOCs were detected in the initial compliance period.

(b) Community and NTNC water systems using water from more than one source and blending prior to the entry point to the distribution system must sample at the entry point to the distribution system during periods of normal operating conditions. Sampling of raw water from each source may be required if a contaminant is detected.

(c) Community and NTNC water systems shall sample all new sources for SOCs for four consecutive quarters. The system may apply for a waiver for the new source after two quarters of monitoring for any SOC which has not been detected above the monitoring trigger.

(d) Confirmation samples may be required by the Department to confirm a negative or positive result. Confirmation samples must be collected from a point representing the source and unless investigation proves initial samples were contaminated because of conditions at the sampling site or because of sampling procedure the confirmation results will be averaged with the initial results to determine compliance.

(e) Community and NTNC water systems may apply to the Department for a waiver from monitoring of any SOC. The waiver application should demonstrate lack of transport, storage and disposal of the contaminant in the watershed or Source Water Assessment Areas I and II as identified by the Alabama Wellhead Protection Plan. The waiver if granted shall be in effect for one compliance period and the system must reapply for the waiver for each compliance period. Reduced initial monitoring may be allowed during the compliance period for the SOCs for which the waiver is granted.

(f) The Department may require analysis of SOCs during a specific quarter of the year.

(g) The Department has the authority to determine compliance based on analytical results and other information compiled by Department staff.

(h) Non-compliance with any SOC MCL will occur when:

1. For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

2. Any sample analysis exceeds the MCL, if monitoring is being conducted annually or less.

3. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) Upon exceeding the MCL, the system must establish a treatment process using the EPA approved best available technology to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department issued compliance schedule.

(j) Repeat samples must be analyzed according to the following schedule:

1. If an SOC is detected above the monitoring trigger, community and NTNC water systems must monitor quarterly for the particular SOC which is detected. If related contaminants (heptachlor and heptachlor epoxide) are detected, then subsequent monitoring shall analyze for all related compounds.

2. Monitoring may be reduced to annually if the average of all analytical results within the past two years is less than one half the MCL and no analytical result within the past two years exceeds 75% of the MCL. Groundwater systems shall analyze a minimum of two quarterly samples and surface water systems a minimum of four quarterly samples.

3. Community and NTNC water systems which have three consecutive annual sample results with no detection of a SOC may apply to the Department for a waiver according to the criteria listed in rule 335-7-2-.19.

4. Systems serving a population of less than or equal to 3,300 persons and which are granted a waiver for a SOC which has been previously detected must collect a minimum of one sample during each repeat compliance period.

5. Systems serving a population of greater than 3,300 persons and which are granted a waiver for a SOC which has been previously detected must collect a minimum of two quarterly samples in one year during each repeat compliance period.

6. Community and NTNC water systems which exceed the MCL for a SOC shall analyze quarterly for that contaminant beginning in the next quarter after the violation occurred. Sampling may be reduced to annually if the average of all analytical results within the past two years is less than one half of the MCL and no analytical result within the past two years exceeds 75% of the MCL. All community and NTNC water systems must analyze a minimum of four quarterly samples.

7. All repeat samples shall be collected at the sampling point where the detection occurred.

(k) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(l) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
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335-7-2-.05 Volatile Synthetic Organic Chemicals (VOCs) Standards and Monitoring Requirements.

(1) The following are the MCLs for VOCs:

Contaminant	MCL (mg/L)
Benzene	0.005
Carbon Tetrachloride	0.005
1,2-dichloroethane	0.005
Trichloroethylene	0.005
para-dichlorobenzene	0.075
1,1-dichloroethylene	0.007
1,1,1-trichloroethane	0.2
Vinyl chloride	0.002
cis-1,2-Dichloroethylene	0.07
1,2-Dichloropropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
O-Dichlorobenzene	0.6
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
Trans-1,2-Dichloroethylene	0.1
Xylene (Total)	10
Dichloromethane	0.005
1,2,4-Trichlorobenzene	0.07
1,1,2-Trichloroethane	0.005

(2) The following are the monitoring requirements for VOCs:

(a) Community and NTNC water systems shall analyze for each VOC during each three year monitoring period if no regulated VOC has been detected in the past. Samples shall be collected during periods of normal operating conditions from the entry point to the distribution system representing each source of water used after any application of treatment. Raw water analysis may be used to determine compliance if no treatment processes are used for the reduction of VOCs.

(b) Community and NTNC water systems shall sample all new sources for VOCs for four consecutive quarters. The system may apply for a waiver for the new

source after two quarters of monitoring for any VOC which has not been detected above the monitoring trigger.

(c) Community and NTNC water systems using water from more than one source and blending prior to the entry point to the distribution system must sample at the entry point to the distribution system during periods of normal operating conditions. Sampling of raw water from each source may be required if a contaminant is detected.

(d) Confirmation samples may be required by the Department to confirm a negative or positive result. Confirmation samples must be collected from a point representing the source and unless investigation proves initial samples were contaminated because of conditions at the sampling site or sampling procedures, the confirmation results will be averaged with the initial results to determine compliance.

(e) Community and NTNC water systems may apply to the Department for a waiver from monitoring VOCs. Issuance of the waiver shall be based on established vulnerability criteria, results of water analysis and a demonstration by the system of no use, transport, storage or disposal in the watershed or Source Water Assessment Areas I and II. The waiver, if granted, shall be in effect for two compliance periods and the system must reapply for the waiver every two compliance periods. A system must collect one sample at each sampling point for a VOC analysis during the time frame the waiver is in effect and update the vulnerability assessment within three years after the waiver is granted.

(f) The Department may require analysis of VOCs during a specific quarter of the year.

(g) The Department has the authority to determine compliance based on analytical results and other information compiled by Department staff.

(h) Non compliance with any regulated VOC MCL will occur when:

1. For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

2. Any sample analysis exceeds the MCL, if monitoring is being conducted annually or less frequently.

3. Upon exceeding the MCL, the system must establish a treatment process using the EPA approved best available technology to achieve compliance with the MCL or phase out using the source of supply in conjunction with a Department-issued compliance schedule.

4. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) Repeat samples must be analyzed after initial sampling has been completed according to the following schedule:

1. Community and NTNC water systems shall monitor for VOCs annually if no regulated VOCs are detected above the monitoring trigger in the initial compliance monitoring.

2. Monitoring may be reduced to one sample per compliance period for ground water systems if no regulated VOCs are detected above the monitoring trigger after a minimum of three years of annual sampling.

3. Monitoring may be reduced to one sample per compliance period for surface water systems if no regulated VOCs are detected above the monitoring trigger after a minimum of three years of annual sampling and the system is determined to be non-vulnerable according to previously approved EPA criteria.

4. If a regulated VOC is detected above the monitoring trigger, community and NTNC water systems must monitor quarterly for VOCs. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

5. Monitoring may be reduced to annually if the average of all analytical results within the past two years is less than one-half of the MCL and no analytical result within the past two years exceeds 75% of the MCL. Groundwater systems shall analyze a minimum of two quarterly samples and surface water systems a minimum of four quarterly samples.

6. Community and NTNC water systems which exceed the MCL for a regulated VOC shall analyze quarterly for that contaminant beginning in the next quarter after the violation occurred. Sampling may be reduced to annually if the average of all analytical results within the past two years is less than one-half of the MCL and no analytical result within the past two years exceeds 75% of the MCL. All community and NTNC water systems must analyze a minimum of four quarterly samples.

7. Community and NTNC water systems which have three consecutive annual sample results with no detection of a regulated volatile organic chemical may apply to the Department for a waiver according to the criteria listed in this chapter.

8. All repeat samples shall be collected at the sampling point where detection occurred.

9. Systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2 dichloroethane, 1,1,1-trichloroethane, cis-1,2 dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds were detected. If the results of the first analysis do not detect vinyl chloride, the system shall collect one sample during each compliance period.

(j) Consecutive systems which obtain all of their water from a public water system are exempt from monitoring for the regulated VOCs.

(k) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(l) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

Author: Dennis D. Harrison
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-2-.06 Turbidity Standards and Monitoring Requirements.

(1) Public water systems must meet the following levels for turbidity:

(a) Water systems using surface sources or groundwater sources under the direct influence of a surface water source must provide a filtration process to produce a filtered water turbidity no greater than 0.3 turbidity units (NTU) in 95% of filtered water samples analyzed each month and at no time exceeds 1.0 NTU. Should a turbidity treatment technique violation occur, public notification is required and the Department must be notified within 24 hours. If the Department is not notified within 24 hours, an acute violation occurs and the system must provide public notification within 24 hours.

(b) All other groundwater sources must produce treated water which at no time exceeds 5.0 NTU.

(c) Any system failing to meet these standards violates treatment technique requirements and shall provide public notification using appropriate language from Appendix C within 30 days.

(2) Turbidity monitoring and recording requirements for surface sources and ground water under the influence of surface water:

(a) Samples of the raw water shall be collected at least every other hour the plant is in operation and analyzed for turbidity. Samples from each clarification unit shall be collected and analyzed for turbidity every four hours the plant is in operation. Filtered water shall be analyzed for turbidity every 15 minutes from each filter that is in operation and the result recorded and maintained for 5 years. Each filter in service must be equipped with a continuous turbidity monitoring and recording analyzer. All turbidimeters must be calibrated and standardized according to standard methods and the procedure specified by the manufacturer and in accordance with EPA's standard methods. Results from the continuous turbidity monitoring analyzer may be used to demonstrate compliance with these standards if records are maintained at the plant that confirm proper calibration of this instrument in accordance with manufactures recommendation and which show that the accuracy of continuous turbidity monitoring analyzers is verified weekly and bench turbidimeters is verified daily.

(b) If there is a failure in the continuous turbidity monitoring equipment, a grab sample must be collected every two hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment. Systems must notify the Department within 48 hours of any failure in the continuous turbidity monitoring equipment that lasts for more than eight hours.

(c) Turbidity results must be logged on a daily operation report and the highest value determined during that operating day recorded on the monthly operation data report. Should any filtered water turbidity values exceed 0.3 NTU, the site shall be resampled within 15 minutes and if this repeat sample also exceeds 0.3 NTU, the Department shall be notified of the filter numbers, values, date and time within 24 hours of the occurrence. A filter self-assessment must be conducted within 14 days and a report submitted to the Department on any filter where the filtered water turbidity exceeds 0.5 NTU at any time unless it can be demonstrated to the Department the exceedance is due to other than ineffective treatment and filter performance. The minimum requirements for the filter self-assessment report are: an assessment of filter performance, a filter profile, identification and prioritization of factors limiting filter performance and an assessment of the applicability of corrections.

(d) If a turbidity measurement of filter effluent from any filter is greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the system must report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the system must arrange for a comprehensive performance evaluation (CPE) to be conducted by a party approved by the Department with adequate CPE training no later than 30 days following the exceedance and have the evaluation completed and submitted to the Department no later than 90 days following the exceedance. Within 45 days following Department approval of the CPE report, the system shall submit a written report outlining corrective measures to address the performance limiting factors identified by the CPE. The submittal shall contain an implementation schedule acceptable to the Department.

(e) Operation data reports showing daily levels of turbidity shall be provided to the Department within ten days after the end of each month. The total number of monthly turbidity measurements of the filtered water, the total number of measurements of the filtered water exceeding 0.3 NTU and the percentage of the filtered water measurements exceeding 0.3 NTU shall be reported.

(3) Public water systems using only groundwater and which are required to monitor for turbidity by the Department shall analyze and record the results of at least one turbidity measurement each day the source is in operation. Continuous turbidity monitoring devices may be used and the highest value indicated each day must be listed on the operational data report.

(a) Should any turbidity result of the finished or filtered water exceed 5.0 NTU, that site shall be resampled within 60 minutes and if this result exceeds 5.0 NTU, the Department shall be notified within 24 hours. If the average of these samples exceeds 5.0 NTU, the standard is exceeded. Public notification must be made, unless the source is immediately taken out of service after the second sample.

(b) Turbidity measurements must be reported to the Department within ten days after the end of each month.

Authority: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
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335-7-2-.07 Microbiological Standards and Monitoring Requirements.

(1) Public water systems will be in compliance with the *E. coli* MCL unless any of the conditions identified below exist:

(a) The system has an *E. coli* positive repeat sample following a total coliform positive routine sample.

(b) The system has a total coliform positive repeat sample following a *E. coli* positive routine sample.

(c) The system fails to take all required repeat samples following an *E. coli* positive routine sample.

(d) The system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(2) Water systems are required to monitor for microbiological contaminants at sites which are representative of water throughout a distribution system during any month of operation according to a written sample plan acceptable to the Department. All routine and repeat compliance samples showing total coliform positive must be analyzed for *E. coli* bacteria. If *E. coli* is present, the system must notify the Department no later than the end of the day the results are provided to the system, unless the system is notified of the result after the working hours of the Department and the Department does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Department before the end of the next business day. Failure to notify the Department following an *E. coli*-positive sample in a timely manner is a reporting violation of subparagraph 335-7-10-.06(13)(b). The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled. The Department may allow a public water system which uses both a surface water source or a ground water source under direct influence of surface water, and a ground water source, to take disinfectant residual samples at points other than the total coliform sampling points if the Department determines that such points are more representative of treated (disinfected) water quality within the distribution system. Systems must provide the results of monthly bacteriological monitoring to the Department.

Samples invalidated by the Department cannot be used to demonstrate compliance with this rule. Water systems must have analyzed a minimum number of monthly routine distribution compliance samples based on the population shown in the following chart:

Population Served	Compliance Samples
25 - 2,500	2
2,501 - 3,300	3
3,301 - 4,100	4
4,101 - 4,900	5
4,901 - 5,800	6
5,801 - 6,700	7
6,701 - 7,600	8
7,601 - 8,500	9
8,501 - 12,900	10
12,901 - 17,200	15
17,201 - 21,500	20
21,501 - 25,000	25
25,001 - 33,000	30
33,001 - 41,000	40
41,001 - 50,000	50
50,001 - 59,000	60
59,001 - 70,000	70
70,001 - 83,000	80
83,001 - 96,000	90
96,001 - 130,000	100
130,001 - 220,000	120
220,001 - 320,000	150
320,001 - 450,000	180
450,001 - 600,000	210
600,001 - 780,000	240
780,001 - 970,000	270
970,001 - 1,230,000	300
1,230,001 – 1,520,000	330
1,520,001 – 1,850,000	360
1,850,001 – 2,270,000	390
2,270,001 – 3,020,000	420
3,020,001 – 3,960,000	450
3,960,001 or more	480

(3) Public water systems shall collect bacteriological compliance samples at regular time intervals throughout the month. Systems required to collect five or fewer distribution compliance samples in one month and only use ground water may collect all required samples on a single day if they are taken from different sites. Systems required to collect more than five distribution compliance samples in one month shall not collect all of their samples on the same day. A system may conduct more compliance monitoring than is required by this subpart to investigate potential problems in the distribution system and use monitoring as a tool to assist in uncovering problems. A system may take more than the minimum number of required routine and repeat samples and must include the results in calculating whether the coliform treatment technique trigger has been exceeded only if the

samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system.

(4) Special samples may be required to provide information regarding the quality of raw water from existing and proposed sources and to determine whether disinfection practices following water main installation or repair is sufficient. Raw or plant water samples shall be taken at a frequency established by the Department. Neither raw samples nor special samples will be used to determine compliance with the microbiological drinking water standards. Repeat samples are not considered special purpose samples, and must be used to determine whether the coliform treatment technique trigger has been exceeded.

(5) Repeat samples shall be collected according to the following requirements:

(a) If a routine compliance sample is total coliform positive the public water system must collect a set of repeat samples within 24 hours of being notified of the positive results unless a time extension is obtained from the Department. No fewer than three repeat samples must be obtained for each total coliform positive sample found.

(b) Community water systems must collect at least one repeat sample from the sampling tap where the original total coliform positive sample was taken and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. The Department may waive the requirement to collect the downstream sample should the original sample be collected at the end of a distribution line. If the downstream sample is waived, one additional sample must be taken upstream at a location within five service connections upstream of the original sampling site.

(c) Transient non-community and NTNC water systems must collect at least one repeat sample from the sampling tap where the original total coliform positive sample was taken and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. The Department may allow alternative sample locations in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sample site. The alternative sample locations must be included in the site sampling plan required by paragraph 335-7-2-.07(6).

(d) The system must collect all repeat samples on the same day except a system with a single service connection may be allowed by the Department to collect the required set of repeat samples over a three-day period.

(e) If one or more repeat samples in a set is total coliform positive, the public water system must collect an additional set of repeat samples for each positive sample required above. The additional samples must be collected within 24 hours of being notified of the positive result. The system must repeat this process until either total coliforms are not detected in one complete set of repeat samples or the

system exceeds the treatment technique trigger for total coliforms and notifies the Department.

(f) Systems may propose repeat monitoring locations to the Department that the system believes to be representative of a pathway for contamination of the distribution system. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its sample siting plan. The system must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The Department may modify the SOP or require alternative monitoring locations as needed.

(g) Ground water systems serving 1,000 or fewer people may propose repeat sampling locations to the Department that differentiate potential source water and distribution system contamination. A ground water system with a single well required to conduct triggered source water monitoring may, with written Department approval, take one of its repeat samples at the monitoring location required for triggered source water monitoring if the system demonstrates to the Department's satisfaction that the sample siting plan remains representative of water quality in the distribution system. If approved by the Department, the system may use that sample result to meet the monitoring requirements for both the groundwater rule and this rule.

1. If a repeat sample taken at the monitoring location required for triggered source water monitoring is *E. coli*-positive, the system has violated the *E. coli* MCL. If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring, the system may reduce the number of additional source water samples by the number of repeat samples taken at that location that were not *E. coli*-positive.

2. If a system takes more than one repeat sample at the monitoring location required for triggered source water monitoring, and more than one repeat sample is *E. coli*-positive, the system has violated the *E. coli* MCL.

3. If all repeat samples taken at the monitoring location required for triggered source water monitoring are *E. coli*-negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is *E. coli*-positive, the system has violated the *E. coli* MCL.

4. The system must demonstrate that the alternate repeat sampling sites identified in their sample site plan remains representative of the water quality in the distribution system. The Department may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution system problems.

(h) Failure to take every required monthly routine sample, repeated failure to provide results from required raw water samples and failure to analyze for E. coli following a total coliform-positive routine sample is a monitoring violation requiring

public notification. Failure to submit bacteriological monitoring results after a system properly conducts monitoring in a timely manner is a reporting violation.

(6) Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system. These plans are subject to Department review and revision. Systems must collect total coliform samples according to the written sample siting plan. Routine and repeat sample sites and any sampling points necessary to meet the requirements of the groundwater rule must be included in the sampling plan.

(7) All seasonal systems must demonstrate completion of a Department-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public. Seasonal system may be exempt from some or all of the requirements for seasonal systems if the entire distribution system remains pressurized during the entire period that the system is not operating. A treatment technique violation will occur when a seasonal system fails to complete a Department-approved start-up procedure prior to serving water to the public. Failure to submit certification of completion of Department-approved start-up procedure by a seasonal system is a reporting violation.

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335-7-2-.08 Radionuclide Standards and Monitoring Requirements.

(1) To determine compliance with the MCLs for natural radionuclides in picocuries per liter (pCi/L) listed below, the averages of data shall be used and shall be rounded to the same number of significant figures as the MCL for the contaminant in question:

Contaminant	MCL
Gross alpha particle	15 pCi/L[1]
Combined radium-226 & radium-228	5 pCi/L
Uranium	30 µg/L

[1] Includes radium 226 but excludes radon & uranium

(2) The MCLs for manmade radionuclides are:

Contaminant	MCL
Tritium	20,000 pCi/L
Strontium 90	8 pCi/L
Beta particle and photon	4 millirem/year radioactivity

(3) To determine compliance, the detection limits shall not exceed the concentrations listed below:

Contaminant	Detection Limit
Gross Alpha Particle Activity	3 pCi/L
Radium 226	1 pCi/L
Radium 228	1 pCi/L
Uranium	1 µg/L
Tritium	1,000 pCi/L
Strontium-89	10 pCi/L
Strontium-90	2 pCi/L
Iodin-131	1 pCi/L
Cesium 134	10 pCi/L
Gross Beta	4 pCi/L
Other Radionuclides	1/10 of the MCL

(4) Monitoring requirements for gross alpha particle activity, radium-226, radium-228 and Uranium in community water systems are as follows:

(a) Initial monitoring for all community system sources to determine compliance for naturally occurring radionuclides shall be completed by December 31, 2007. Community water systems utilizing surface and/or groundwater sources shall monitor at every entry point to the distribution system that is representative of each source of water used after any application of treatment. Community water systems using water from more than one source and blending prior to the entry point to the distribution system must sample at the entry point to the distribution system during periods of normal operating conditions. Sampling of raw water from each source may be required if a contaminant is detected. New community water systems or community water systems that use a new source of water must begin monitoring in the first quarter after initiating use of the source. Community water systems must conduct more frequent monitoring if there are conditions determined by the Department that may increase the concentration of radioactivity in finished water. All samples collected from each entry point must be collected at the same sampling point.

1. Systems without acceptable previous monitoring data must monitor for four consecutive quarters at all sampling points before December 31, 2007.

2. Appropriate monitoring data from each entry point for the last compliance monitoring period that began between June 2000 and December 8, 2003 may be used to satisfy initial monitoring requirements.

3. The Department may waive the final two quarters of initial monitoring if the results of the monitoring from the previous two quarters are below the detection limit.

4. A gross alpha particle activity measurement may be substituted for the required radium-226 analyses, provided that the measured gross alpha particle activity does not exceed five pCi/L. A gross alpha particle activity measurement may be substituted for the required Uranium analyses, provided that the measured gross alpha particle activity does not exceed 15 pCi/L. A gross alpha measurement shall have a confidence level of 95 percent (1.65σ, where σ is the standard deviation of the net counting rate of the sample) for Radium 226 and Uranium. When a system uses a gross alpha particle activity measurement in lieu of a radium-226 and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, one half the detection limit will be used to determine compliance and the future monitoring frequency.

(b) Community water systems may reduce monitoring for naturally occurring radionuclides after completing initial monitoring requirements.

1. If the average of the initial monitoring results for each contaminant (gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit, the system must monitor for that contaminant at that sampling point every nine years.

2. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below one half the MCL, the system must monitor for that contaminant at the sampling point every six years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below one half the MCL, the system must monitor for that contaminant at the sampling point every six years.

3. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above one half the MCL but at or below the MCL, the system must monitor for that contaminant at the sampling point every three years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above one half the MCL but at or below the MCL, the system must monitor for that contaminant at the sampling point every three years.

4. Systems must use the analytical results from the previous reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's sampling point is on a nine year monitoring period, and the sample result is above on half the MCL, then the next monitoring period for that sampling point is three years).

5. If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must monitor quarterly at that sampling point until

the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Department.

(c) If the average annual MCL for gross alpha particle activity, Radium 226, Radium 228 or Uranium is exceeded, the supplier of a community water system shall notify the Department and provide public notification. The system shall monitor quarterly at the monitoring point until results from four consecutive quarters are at or below the MCL or until a monitoring schedule as a condition to an exemption or enforcement action shall become effective. Upon exceeding the MCL, the system must establish a treatment process using the EPA approved best available technology to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department issued compliance schedule.

(5) Monitoring requirements for man-made radioactivity in community and NTNC water systems are as follows:

(a) Community water systems determined by the Department to be vulnerable shall monitor for beta particle and photon radioactivity. Systems must monitor quarterly for beta emitters and annually for tritium and strontium-90 at each entry point to the distribution system beginning within one quarter after being notified by the Department.

1. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L, the Department may reduce the frequency of monitoring at that sampling point to once every 3 years. Systems must collect all the samples required in the previous paragraph during the reduced monitoring period.

2. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance. Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.

3. Community water systems designated by the Department to monitor for beta particle and photon radioactivity cannot apply to the Department for a waiver from the specified listed above.

4. Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level of 50 pCi/L is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(b) Community water systems utilizing water contaminated by effluents from nuclear facilities shall monitor quarterly for gross beta particle and iodine-131 radioactivity and annually for strontium-90 and tritium at each entry point to the distribution system beginning within one quarter after being notified by the Department.

1. Quarterly monitoring for gross beta particle activity shall be based on the analyses of monthly samples.

2. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Department, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

3. Annual compliance for strontium-90 and tritium shall be based on the analyses of four quarterly samples.

4. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L, the Department may reduce the frequency of monitoring at that sampling point to every 3 years. Systems must collect all the samples required in this paragraph during the reduced monitoring period.

5. The Department may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the supplier of water where the Department determines such data are applicable to a particular water system. In the event that there is a release from a nuclear facility, systems that are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (5)(a) or (b) of this rule.

6. If the average annual MCL for man-made radioactivity is exceeded, the supplier of water shall give notice to the Department and to the public. Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the MCL as established by a rolling average of three monthly samples, or until a monitoring schedule as a condition of an exemption or enforcement action shall become effective. Systems who establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in this rule. Upon exceeding the MCL, the system must establish a treatment process using the EPA approved best available technology to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department issued compliance schedule.

(c) General monitoring and compliance requirements for radionuclides.

1. The Department may require more frequent monitoring than specified in this rule, or may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

2. Each public water system shall monitor at the time designated by the Department during each compliance period.

3. Compliance with radionuclide MCLs will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.

(ii) For systems monitoring more than once per year, if any sample result will cause the running average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.

(iii) Systems must include all samples taken and analyzed under the provisions of this rule in determining compliance, even if that number is greater than the minimum required.

(iv) If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

(v) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, one half the detection limit will be used to calculate the annual average.

(6) The Department has the discretion to delete results of obvious sampling or analytic errors.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990; May 30, 2003; January 28, 2004. **Amended:** December 12, 2005; January 22, 2008; September 25, 2012; August 5, 2016.

335-7-2-.09 Maximum Residual Disinfectant Levels and Monitoring Requirements (MRDLs).

(1) The following are the MRDLs:

Disinfectant	MRDL (mg/L)
Chlorine	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)
Chlorine Dioxide	0.8 (as ClO_2)

(2) Community and NTNC water systems measure for disinfectant residuals.

(a) Systems that use either chlorine or chloramines as a primary or secondary disinfectant must measure the disinfectant levels at the time and location of monthly distribution microbiological samples that are collected to determine compliance with the total coliform rule.

(b) Community, NTNC, and transient noncommunity water systems using chlorine dioxide must measure the chlorine dioxide level daily at the entrance to the distribution system. On each day following a daily sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system, the system must collect three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system, the system must collect one sample as close to the first customer as possible, one sample at a location representative of average residence time, and one sample representative of the maximum residence time in the distribution system.

(c) Non-compliance with the chlorine or chloramine MRDL will occur when the running annual average of monthly samples, computed quarterly, exceeds the MCL. When a water system switches between chlorine and chloramines, the average of all results must be used and the disinfectant utilized recorded on all monitoring reports. If a system fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(d) Acute non-compliance with the chlorine dioxide MRDL will occur when any daily sample taken at the entrance to the distribution system exceeds the MRDL and on the following day one or more of the three samples taken in the distribution system exceed the MRDL or the system fails to collect samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system. The system must also take immediate corrective action to lower the level of chlorine dioxide below the MRDL. Nonacute non-compliance with the chlorine dioxide MRDL will occur when any two consecutive daily samples

collected at the entrance to the distribution system exceed the MRDL and all distribution system samples collected are below the MRDL or the system fails to collect samples at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL. The system must also take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling.

Author: Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: June 7, 2000.
Amended: January 28, 2004; December 12, 2005; January 22, 2008; May 26, 2009; September 25, 2012.

335-7-2-.10 Special Monitoring and Analytical Requirements for Unregulated Contaminants.

(1) All community and NTNC water systems shall monitor for the following:

Unregulated/Miscellaneous SOCs		
Aldicarb	Carbaryl	Metolachlor
Aldicarb Sulfone	Dicamba	Metribuzin
Aldicarb Sulfoxide	Dieldrin	Propachlor
Aldrin	3-Hydroxycarbofuran	
Butachlor	Methomyl	

Unregulated VOCs		
Bromobenzene	o-Chlorotoluene	Isopropylbenzene
Bromochloromethane	p-Chlorotoluene	p-Isopropyltoluene
Bromodichloromethane	Dibromomethane	Methyl Tertiary Butyl Ether (MTBE)
Bromoform	m-Dichlorobenzene	
Bromomethane	Dichlorodifluoromethane	Naphthalene
n-Butylbenzene	1,1-Dichloroethane	n-Propylbenzene
sec-Butylbenzene	1,3-Dichloropropane	1,1,2,2-Tetrachloroethane
tert-Butylbenzene	2,2-Dichloropropane	1,2,3-Trichlorobenzene
Chlorodibromomethane	1,1-Dichloropropene	1,2,4-Trichlorobenzene
Chloroethane	1,3-Dichloropropene	1,2,3-Trichloropropane
Chloroform	Fluorotrichloromethane	1,2,4-Trimethylbenzene
Chloromethane	Hexachlorobutadiene	1,3,5-Trimethylbenzene

(2) The following are the monitoring requirements for the unregulated contaminants:

(a) All community and NTNC water systems shall sample for unregulated SOCs at the same sampling point and at the same time as the initial samples are collected for the analysis of the regulated SOCs.

(b) All community and NTNC water systems shall collect one sample at each sampling point for the unregulated inorganic chemicals at the same time as samples are collected for the analysis of the regulated inorganic chemicals.

(c) The monitoring frequency and analytical requirements for the unregulated and regulated VOCs shall be the same.

(d) Any water system required to monitor by this rule shall notify persons served by the system of the availability of the results of sampling. Results of such monitoring and notice shall be provided to the Department within 30 days of completion.

(e) The Department may increase monitoring where necessary to detect variations within a water system.

(f) In addition to the contaminants listed at paragraph (1) of this rule, the Department may require monitoring for other contaminants of concern in drinking water for which health advisories or toxicity values have been issued, at locations and frequencies as determined by the Department.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison, Aubrey White.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; **Repealed and Readopted:** Effective January 4, 1989; **Amended:** Effective October 31, 1990. **Amended:** Filed July 24, 1995; Effective November 28, 1995; **Amended:** Effective September 19, 1995 (ER); **Amended:** Filed November 28, 1995; Effective January 2, 1996; **Amended:** Filed December 21, 1998; Effective January 25, 1999; **Amended:** Filed May 2, 2000; Effective June 7, 2000; **Amended:** Filed: November 7, 2005; Effective December 12, 2005; **Amended:** Filed December 18, 2007; Effective January 22, 2008; **Amended:** Filed July 21, 2016; Effective August 5, 2016; **Amended:** Filed: June 25, 2019; Effective: August 9, 2019.

335-7-2-.11 Stage 1 Disinfection Byproducts. Community and NTNC water systems that use a surface water source, groundwater source or purchase water from another public water system must monitor for disinfection byproducts (DBPs).

(a) The following are the MCLs for DBPs:

Contaminant	MCL (mg/L)
Bromate	0.010
Chlorite	1.0
HAA5	0.060
TTHM	0.080

(b) Community and NTNC water systems using chlorine dioxide must collect daily samples for chlorite analysis at the entrance to the distribution system. If a daily sample exceeds the chlorite MCL of 1.0 mg/L, the system shall collect three additional samples from the distribution system the following day in addition to the daily sample required a the entrance to the distribution system. The distribution samples shall be collected from a location near the first customer, a location

representative of the average residence time and a location representative of the maximum residence time.

(c) In addition to daily chlorite monitoring, community and NTNC water systems using chlorine dioxide must collect at least three samples monthly for chlorite analysis. The samples must be collected in the distribution system on the same day from a location near the first customer, a location representative of the average residence time and a location representative of the maximum residence time. Monthly chlorite monitoring may be reduced to quarterly after one year of monitoring if no chlorite sample has exceeded the chlorite MCL. If any sample analyzed for chlorites exceeds the chlorite MCL, the system must revert to monthly monitoring.

(d) Non-compliance with the chlorite MCL will occur when the average of any three distribution sample set exceeds the MCL.

(e) Community and NTNC water systems using ozone must collect one sample per month for bromate analysis from each treatment plant using ozone. The samples shall be collected at the entrance to the distribution system while the ozonation system is operating under normal conditions. Systems required to analyze for bromate may reduce monitoring from monthly to quarterly if the system demonstrates that the system's running annual average bromate concentration is less than 0.0025 mg/L based upon representative monthly bromate measurements for one year. The system must return to routine bromate monitoring requirements if the running annual average bromate concentration is equal to or greater than 0.0025 mg/L based upon representative quarterly measurements.

(f) Non-compliance with the bromate MCL will occur when the running annual average of monthly samples, computed quarterly, exceeds the MCL. If a system fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(g) Community and NTNC water systems utilizing surface sources or groundwater under the direct influence of surface water shall sample each treatment plant for Total Organic Carbon (TOC) analysis. One sample shall be collected from the raw water and one sample shall be collected from the point of combined filter effluent. These samples are referred to as paired samples and shall be collected at the same time. At the same time as the raw water sample is collected, the alkalinity in the raw water prior to any treatment must be determined. Systems must collect one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and raw water quality. Water treatment plants with an average treated water TOC of less than 2.0 mg/L for two consecutive years determined quarterly, or less than 1.0 mg/L for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant every 90 days if the system is on reduced TTHM and HAA5 monitoring. The water treatment plant must revert to routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L or the system does not qualify for reduced TTHM and HAA5 monitoring. Systems with multiple water treatment plants must sample each water treatment plant at the same frequency.

(h) Community and NTNC water systems must monitor for TTHMs and HAA5s according to the following subparagraphs until January 1, 2012:

1. Community water systems utilizing surface sources or groundwater under the direct influence of surface water shall collect each quarter and have analyzed for TTHMs and HAA5s at least four samples that are representative of each treatment plant used by the system. Twenty five percent of these samples shall be collected at a location reflecting the maximum residence time of the water even if the sample is collected outside the system's distribution area. The remaining 75 percent shall be collected at locations representative of the average residence time in the distribution system taking into account the number of persons served, different sources of water, and different treatment methods employed. The results of these samples will be averaged to provide the quarterly compliance value. In addition to the samples required above, each system will take one sample per quarter from each water treatment plant effluent.

2. After four consecutive quarters of monitoring, a community water system using a surface source or groundwater under the direct influence of surface water may reduce the monitoring frequency to one sample per quarter for each treatment plant, if the annual average for TTHMs is less than or equal to 0.040 mg/L and the annual average for HAA5s is less than or equal to 0.030 mg/L and the source water TOC running annual average is ≤ 4.0 mg/L at each treatment plant. The sample must be collected from a point in the distribution system reflecting the maximum residence time of the water.

3. In order to qualify for reduced TTHM and HAA5 monitoring, systems that are required to monitor TOC shall take monthly samples every 30 days.

4. Community and NTNC water systems utilizing only groundwater sources not under the direct influence of surface water and serving at least 10,000 persons shall collect each quarter and have analyzed for TTHMs and HAA5s one sample from a point in the total service area reflecting the maximum residence time of the water. After four consecutive quarters of monitoring, the frequency may be reduced to one sample per year between the months of June and September for each groundwater treatment plant if the annual average for TTHMs is less than or equal to 0.040 mg/L and the annual average for HAA5s is less than or equal to 0.030 mg/L. The sample must be collected from a point in the total service area reflecting the maximum residence time of the water.

5. Community and NTNC water systems utilizing only groundwater sources not under the direct influence of surface water and serving less than 10,000 persons shall collect each year between the months of June and September and have analyzed for TTHMs and HAA5s one sample from a point in the total service area reflecting the maximum residence time of the water. The frequency may be reduced to one sample every three years between the months of June and September for each treatment plant if the annual average for TTHMs is less than or equal to 0.040 mg/L and the annual average for HAA5s is less than or equal to 0.030 mg/L for two consecutive years or if the annual average for TTHMs is less than or equal to 0.020 mg/L and the annual average for HAA5s is less than or equal to 0.015 mg/L for one

year. The sample must be collected from a point in the total service area reflecting the maximum residence time of the water in the system.

6. Community systems purchasing water from another system for more than 60 days a year must monitor for DBPs according to the following:

(i) Community systems purchasing water from a system that is surface water or ground water under the influence of surface water must monitor for TTHMs and HAA5s at four locations per purchase connection per quarter. Twenty-five percent of these samples shall be collected at a location reflecting the maximum residence time of the water and the remaining seventy-five percent shall be collected at locations representative of the average residence time in the distribution system taking into account the number of persons served. The results of all samples will be averaged to provide the quarterly compliance value.

(ii) After four consecutive quarters of monitoring, a community water system purchasing surface water or groundwater under the direct influence of surface water may reduce the monitoring frequency to one sample per quarter for each purchase connection if the annual average for TTHMs is less than or equal to 0.040 mg/L and the annual average for HAA5s is less than or equal to 0.030 mg/L. The sample must be collected from a point in the distribution system reflecting the maximum residence time of the water.

(iii) Community and NTNC water systems purchasing water only from a system(s) that is ground water not under the influence of surface water and is serving at least 10,000 persons shall collect each quarter and have analyzed for TTHMs and HAA5s one sample from a point in the distribution system reflecting the maximum residence time of the water from each purchase connection. After four consecutive quarters of monitoring, the frequency may be reduced to one sample per year between the months of June and September for each purchase connection if the annual average for TTHMs is less than or equal to 0.040 mg/L and the annual average for HAA5s is less than or equal to 0.030 mg/L. The sample must be collected from a point in the distribution system reflecting the maximum residence time of the water.

(iv) Community and NTNC water systems purchasing water only from a system(s) that is ground water not under the influence of surface water and serving less than 10,000 persons shall collect each year between the months of June and September and have analyzed for TTHMs and HAA5s one sample from a point in the distribution system reflecting the maximum residence time of the water from each purchase connection. The frequency may be reduced to one sample every three years between the months of June and September for each purchase connection if the annual average for TTHMs is less than or equal to 0.040 mg/L and the annual average for HAA5s is less than or equal to 0.030 mg/L for two consecutive years or if the annual average for TTHMs is less than or equal to 0.020 mg/L and the annual average for HAA5s is less than or equal to 0.015 mg/L for one year. The sample must be collected from a point in the distribution system reflecting the maximum residence time of the water in the system.

(v) Multiple purchase connections to the same system may be reduced to one set of four samples for surface water or one sample for ground water provided that the system proves to the Department that the purchase connections have the same water quality.

7. NTNC systems using a surface source or groundwater under the direct influence of surface water or purchasing surface water or ground water under the direct influence of surface water shall collect each quarter and have analyzed for TTHMs and HAA5s a minimum of one sample representing the maximum residence time in the distribution system for each plant and purchase connection.

8. Systems on a reduced monitoring schedule may remain on the reduced schedule as long as the annual average of all samples collected in the previous four quarters (for systems that monitor quarterly) or the result of a sample (for systems which that annually or less frequently) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. In addition, the source water TOC running annual average for a surface water or ground water under the influence of surface water must be ≤ 4.0 mg/L. Systems that do not meet these levels must resume monitoring at the initial monitoring frequency in the quarter immediately following the quarter in which the system exceeds 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. For systems using only ground water not under the influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is >0.080 mg/L or the HAA5 annual average is >0.060 mg/L the system must begin quarterly monitoring in the quarter immediately following the monitoring period in which the system exceeded 0.080 mg/L for TTHM or 0.060 mg/L for HAA5.

9. Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required for TTHM and HAA5 analysis.

10. All samples must be collected during periods of normal operating conditions.

11. Should a community or NTNC water system make significant modification to the existing treatment process for the purpose of achieving compliance with TTHM standards, the system must submit an engineering report demonstrating that the treatment changes will allow the system to continue to meet bacteriological standards and that the quality of the water will not be adversely impacted by the treatment change.

12. Upon exceeding the MCL, the system will be required to submit a schedule to either establish a treatment process using the EPA approved best available technology, specified in 40 CFR 141.64(a)(2) or (b)(1)(ii) as applicable, to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department issued compliance schedule.

13. If providing water to a consecutive system(s), the maximum and average residence time TTHM and HAA5 sample locations must reflect the entire

distribution system including the consecutive system(s) that utilize water produced by the plant being sampled until December 31, 2006.

14. Non-compliance with the TTHM and HAA5 MCL will occur when the running annual average of four consecutive quarterly analyses exceeds the MCL for systems that are sampling quarterly. For systems that have not completed the first four quarters of monitoring, should any individual quarter average cause the running annual average of that system to exceed the MCL, the system is in non-compliance at the end of that quarter. For systems monitoring less frequently than quarterly, compliance must be based on an average of samples collected that year. Systems on a reduced monitoring schedule whose annual average exceeds the MCL will not be considered in violation of the MCL until they have completed one year of routine monitoring. If a system on quarterly monitoring fails to complete four quarters' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(i) Upon exceeding the MCL, the system will be required to submit a schedule to either establish a treatment process using the EPA approved best available technology, specified in 40 CFR 141.64(a)(2) or (b)(1)(ii) as applicable, to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department issued compliance schedule.

(j) Compliance dates. Surface water or ground water under the influence of surface water systems serving 10,000 or more persons must comply with this rule beginning January 1, 2002. Surface water or ground water under the influence of surface water systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this rule beginning January 1, 2004.

(k) Analytical Methods: Analysis of all samples for compliance with MCLs contained in this rule shall comply with the approved EPA methodology found in 40 CFR 141.131 and by a laboratory certified by EPA or the Department.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.
Amended: May 26, 2009; January 18, 2011.

335-7-2-.12 Stage 2 Disinfection Byproducts. Community and NTNC water systems that use a surface water source, groundwater source or purchase water from another public water system must monitor for disinfection byproducts (DBPs).

(a) Beginning January 1, 2012 systems must be in compliance with the TTHM and HAA5 MCLs [located in paragraph 335-7-2-.11(a)]. Any site's locational running annual average that exceeds either MCL will be an MCL violation. Systems may be granted a compliance extension until January 1, 2014 if the system requires capital improvements to comply with the MCLs. The system must enter into a binding contract, which would result in significant penalties to the system if the

contract is not completed. All systems beginning January 1, 2012 must revert to routine monitoring until the system meets the reduced monitoring requirements below.

1. Systems must monitor during the month of the highest DBP concentrations.

2. Systems on quarterly monitoring must take dual samples sets every 90 days at each monitoring location.

3. The minimum number of samples, location of samples and sampling frequency are based upon the system's population and are in the following table. The sample locations must be at the locations identified in the system's Distribution System Evaluation (DSE) Report and cannot be moved without written approval from the Department. Systems that did not complete a DSE must monitor at the locations indicated in the system's monitoring plan. Systems must monitor according to the dates listed in the DSE Report or monitoring plan. In addition, surface water or ground water under the influence of surface water must collect one sample from the effluent of each treatment plant, prior to the first customer, at the same time the system conducts its DBP monitoring under this rule.

DBP Monitoring Frequency and Locations Beginning January 1, 2012:

Source Water Type[1]	Population	Monitoring Frequency	Distribution System Monitoring Location			
			Total per monitoring period	Highest TTHM Locations	Highest HAA5 Locations	Stage 1 Locations
Surface Water or Ground Water Under the Influence of Surface Water	< 10,000	per quarter	2	1	1	
	10,000-49,999	per quarter	4	2	1	1
	50,000-249,999	per quarter	8	3	3	2
	250,000-999,999	per quarter	12	5	4	3
	1,000,000-4,999,999	per quarter	16	6	6	4
	> 5,000,000	per quarter	20	8	7	5
Ground Water	< 500	per year	2	1	1	
	500-9,999	per year	2	1	1	
	10,000-99,999	per quarter	4	2	1	1
	100,000-499,999	per quarter	6	3	2	1
	> 500,000	per quarter	8	3	3	2

[1] Systems that receive both surface water and ground water must use the surface water section of the table to determine monitoring requirements.

4. Systems may reduce monitoring to the level specified in the following table any time the LRAA is ≤0.040 mg/L for TTHM and ≤0.030 mg/L for HAA5 at all monitoring locations. Systems may only use monitoring data collected under this rule or rule 335-7-2-.11 to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, must be ≤4.0 mg/L at each treatment plant treating surface water or ground water under the influence of surface water.

Reduced Monitoring Frequency

Source Type	Population	Monitoring Frequency [1]	Distribution System Monitoring Location per Monitoring Period
Surface Water or Ground Water Under the Influence of Surface Water	< 10,000	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	10,000-49,999	per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs
	50,000-249,999	per quarter	4 dual sample sets - at the locations with the two highest TTHM and two highest HAA5 LRAAs
	250,000-999,999	Per quarter	6 dual sample sets - at the locations with the three highest TTHM and three highest HAA5 LRAAs
	1,000,000-4,999,999	Per quarter	8 dual sample sets - at the locations with the four highest TTHM and four highest HAA5 LRAAs
	> 5,000,000	Per quarter	10 dual sample sets - at the locations with the five highest TTHM and five highest HAA5 LRAAs

Source Type	Population	Monitoring Frequency [1]	Distribution System Monitoring Location per Monitoring Period
Ground Water	< 500	every third year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter
	500-9,999	per year	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter
	10,000-99,999	per year	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement
	100,000-499,999	per quarter	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs
	> 500,000	per quarter	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs

[1] Systems on quarterly monitoring must take dual sample sets every 90 days.

5. Systems may remain on reduced monitoring as long as the TTHM LRAA is ≤0.040 mg/L and the HAA5 LRAA is ≤0.030 mg/L at each monitoring location for systems on quarterly reduced monitoring or each TTHM sample is ≤0.060 mg/L and each HAA5 LRAA is ≤0.045 mg/L for systems with annual or less frequent monitoring. In addition, the source water annual average TOC level, before any treatment must be ≤4.0 mg/L at each treatment plant treating surface water or ground water under the influence of surface water. Systems must return to routine monitoring if any of the levels are exceeded. The Department may return any system to routine monitoring at its discretion.

6. The following TOC monitoring requirements apply to systems qualifying for or on reduced TTHM and HAA5 monitoring. If a system is required to monitor for TOC per subparagraph 335-7-2-.11(i)8., monthly samples shall be taken every 30 days.

7. If a system is required to monitor annually or less the system must increase monitoring to dual samples sets once per quarter (taken every 90 days) at all locations if a TTHM sample is >0.080 mg/L or a HAA5 sample is >0.060 mg/L at any location. A system is in violation of the MCL when the LRAA exceeds the MCLs based upon four consecutive quarters of monitoring or the LRAA calculated based

on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters. Systems may return to routine monitoring once the systems has conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring location is ≤0.060 mg/L for TTHM and is ≤0.045 mg/L for HAA5.

8. If a system fails to collect any required sample, the system has incurred a monitoring violation. The system will receive a monitoring violation for each quarter in which the missed monitoring result would have been used to determine compliance.

9. Systems on increased monitoring under rule 335-7-2-.11 must remain on increased monitoring until the system meets the requirements of this rule for returning to routine monitoring.

10. Systems that are required to monitor quarterly must calculate LRAAs for TTHM and HAA5 using monitoring results collected under this rule and determine that each LRAA does not exceed the MCL. If the system does not collect four consecutive quarters of monitoring, the system must calculate compliance with the MCL based on the average of the available data from the most recent four quarters. If the system takes more than one sample per quarter at a monitoring location, they must average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

11. Systems that are required to monitor yearly or less frequently must determine that each sample taken is less than the MCL. If no sample exceeds the MCL, the sample result is considered the LRAA and the system is in compliance. If any sample exceeds the MCL the system is not in violation but must begin increased monitoring as outlined in this rule.

12. A system that is required to conduct quarterly monitoring must make compliance calculations at the end of the fourth quarter that follows the compliance date and at the end of each subsequent quarter or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters.

(i) Systems that monitor less frequently than quarterly must determine compliance beginning with the first compliance sample taken after the compliance date.

(ii) Upon exceeding the MCL, the system will be required to submit a schedule to either establish a treatment process using the EPA approved best available technology to achieve compliance with the MCL or cease using the source of supply in conjunction with a Department issued compliance schedule.

13. Systems that did not complete a DSE must develop and implement a monitoring plan for TTHMs and HAA5s. The monitoring plan must be submitted to the Department by the applicable date in rule 335-7-2-.13. Systems must identify and justify all monitoring locations.

(b) Wholesale systems (with the exception of systems with only ground water sources) shall submit the results of TTHM and HAA5 sampling at or near all points of delivery to consecutive systems. Consecutive systems who also sell to other consecutive systems shall submit the results of TTHM and HAA5 sampling at or near all points of delivery to other consecutive systems. These results shall be submitted with the routine sample results required by paragraph (a) of this rule.

1. The number of sample locations can be reduced by submitting justification to the Department that the point of delivery is not contributing to elevated TTHM and/or HAA5 levels in the downstream consecutive system(s).

2. If all consecutive systems served by the wholesale system are in compliance with the TTHM and/or HAA5 MCLs in accordance with paragraph (a) of this rule for four consecutive quarters, then the systems can request a reduction or end of the monitoring.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008; September 25, 2012.
Amended: November 25, 2014; August 5, 2016.

335-7-2-.13 Distribution System Evaluation. This rule establishes monitoring and other requirements for identifying compliance monitoring locations for use under rule 335-7-2-.12.

(a) This rule applies to:

1. Community water systems that use a primary or residual disinfectant other than ultraviolet light (UV) or deliver water that has been chemically treated with a primary or residual disinfectant;

2. Nontransient noncommunity water systems that serve at least 10,000 people and use a primary or residual disinfectant other than UV or deliver water that has been chemically treated by a primary or residual disinfectant.

(b) Systems must use a Distribution System Evaluation (DSE) to determine locations with high TTHM and HAA5 concentrations throughout the system's distribution system unless the system qualifies for one of the following exemptions:

1. If all TTHM and HAA5 samples collected under rule 335-7-2-.11 during an eight consecutive calendar quarter period beginning no earlier than the dates listed in the table below did not exceed 0.040 mg/L for TTHM and 0.030 mg/L for HAA5.

(i) 40/30 Certification Date Table

40/30 Certification Due	Beginning date of eligible TTHM and HAA5 Data
October 1, 2006	January 2004
April 1, 2007	January 2004
October 1, 2007	January 2005
April 1, 2008	January 2005

(ii) If a system is on reduced monitoring under rule 335-7-2-.11 and was not required to monitor during the period listed in the 40/30 Certification Date Table above, the system's eligibility must be based on compliance samples taken during the 12 months preceding the date listed in the table.

(iii) Systems must certify to the Department that every individual compliance sample taken under rule 335-7-2-.11 during the specified period in subparagraph 1.(i) of this paragraph were ≤ 0.040 mg/L for TTHM and ≤ 0.030 mg/L for HAA5 and that the system has not had a monitoring violation for TTHMs or HAA5s.

(iv) The Department may require the system to conduct a DSE under this rule even if the system meets the 40/30 certification requirements.

(v) Systems must retain a complete copy of their certification submitted under this rule for 10 years after the date it was submitted.

(vi) The certification, all data upon which the certification is based, and any Department notifications must be available for review by the Department or the public.

(vii) The 40/30 certification must be submitted to the Department by the applicable date listed in subparagraph (2)(a)1. of this rule.

2. A system that serves fewer than 500 people (<167 customers) and has at least one year of monitoring under rule 335-7-2-.11 is not required to conduct a DSE as outlined under this rule unless notified by the Department. Systems serving a population fewer than 500 people that have not monitored for at least 1 year under rule 335-7-2-.11 must complete a DSE as required under this rule.

(c) Systems must comply with the requirements of this rule based upon the schedule in the following table. Systems that are a part of a combined distribution system must comply with the schedule in the table below based upon the population of the largest system in the combined distribution system as defined by the Department.

DSE Schedule

System Population	Date to submit monitoring plan[1], system specific study, 40/30 certification or very small system waiver:	Standard monitoring plan or system specific study must be complete by:	Submit DSE report or monitoring plan to the Department by:[2]
≥ 100,000	October 1, 2006	September 30, 2008	January 1, 2009
50,000 – 99,999	April 1, 2007	March 31, 2009	July 1, 2009
10,000 – 49,999	October 1, 2007	September 30, 2009	January 1, 2010
< 10,000	April 1, 2008	March 31, 2010	July 1, 2010

[1] If, within 12 months after the date identified in this column, the system does not receive notification from the Department that plan submitted has been reviewed and accepted, the system must consider the plan as submitted approved and conduct its monitoring accordingly.

[2] If, within 3 months after the date listed in this column, the Department has not notified the system that its DSE report has been approved, the system may consider the report approved as submitted and must implement the recommended monitoring as required in rule 335-7-2-.12.

(d) Systems must complete a standard monitoring plan that meets the requirements in rule 335-7-2-.14 or a system specific study that meets the requirements in rule 335-7-2-.15 unless the system meets one of the exemption criteria in subparagraphs (b)1. and 2. of this rule.

(e) DSE results will not be used for the purpose of determining compliance with the MCLs. However, the system must report the results of the DSE in the system's CCR.

(f) Systems must conduct a DSE every 9 years if the system does not meet the exemption criteria in paragraph (b) of this rule. Systems must conduct a DSE if any of the criteria listed in subparagraphs (f)1. through 5. of this rule are met after the initial DSE report is submitted.

1. The system adds a new surface water or ground water under the influence of surface water source or treatment plant that does not have the same entry point as another water plant.

2. The system adds a new well or spring that is not considered in the same aquifer as the system's existing water sources.

3. The system adds a new connection to another system that is going to be used more than 60 days a year or starts using an existing connection for more than 60 days a year, unless the water quality is similar to water already being purchased from the source system.

4. The system consolidates with another water system. The resulting water system shall be responsible for conducting the DSE as required under this rule.

5. The Department requires the system to conduct another DSE.

(g) DSE reports must include the systems recommendations and justification for where and during what month(s) TTHM and HAA5 monitoring under rule 335-7-2-.12 should be conducted. The recommendations must be based on the following criteria:

1. Systems must select the number of monitoring locations specified in rule 335-7-2-.12. Systems will use these recommended locations as routine compliance monitoring locations under rule 335-7-2-.12 unless informed by the Department otherwise. The locations should be distributed throughout the distribution system to the extent possible.

2. Systems must recommend compliance monitoring locations based on standard monitoring results, system specific study results, and monitoring conducted under rules 335-7-2-.11 or 335-7-2-.12. Systems must use the following protocol when making a determination concerning the compliance monitoring sites. Systems that are required to monitor at more than eight locations must repeat the protocol as necessary. Systems that do not have monitoring results under rule 335-7-2-.11 or do not have enough existing compliance monitoring locations under rules 335-7-2-.11 or 335-7-2-.12, must repeat the protocol below, skipping subparagraphs (g)2.(iii) through (vii) of this rule as necessary until the system has identified the required number of monitoring locations.

(i) Location with the highest TTHM LRAA not previously selected as a compliance monitoring location.

(ii) Location with the highest HAA5 LRAA not previously selected as a compliance monitoring location.

(iii) Existing average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest HAA5 LRAA not previously selected as a compliance monitoring location.

(iv) Location with the highest TTHM LRAA not previously selected as a compliance monitoring location.

(v) Location with the highest TTHM LRAA not previously selected as a compliance monitoring location.

(vi) Location with the highest HAA5 LRAA not previously selected as a compliance monitoring location.

(vii) Existing average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems)

with the highest TTHM LRAA not previously selected as a compliance monitoring location.

(viii) Location with the highest HAA5 LRAA not previously selected as a compliance monitoring location.

3. Systems may recommend locations other than those specified in paragraph (b) of this rule if the system includes a rationale for selecting other locations. Once the locations are approved by the Department, systems must monitor at these locations to determine compliance under rule 335-7-2-.12.

4. The recommended compliance monitoring schedule must include the compliance monitoring during the month with historical peak concentrations for TTHM and HAA5, unless another month is approved by the Department. Once the peak historical month has been identified and the system is required to conduct routine monitoring at least quarterly, the system must schedule compliance monitoring under rule 335-7-2-.12.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.
Amended: May 26, 2009; August 5, 2016.

335-7-2-.14 Standard Monitoring Plan.

(1) The system's standard monitoring plan (SMP) must comply with the following subparagraphs. Systems must prepare and submit a standard monitoring plan to the Department according to the schedule in rule 335-7-2-.13.

(a) The SMP must include a schematic of the distribution system (including distribution system entry points and their sources, storage facilities, and any point of disinfectant addition), with notes indicating locations and dates of all projected standard monitoring and all projected compliance monitoring under rules 335-7-2-.11 or 335-7-2-.12.

(b) The SMP must include justification of standard monitoring location selection and a summary of data that was used to justify the selection.

(c) The SMP must specify the population served and system type (ground water, surface water or ground water under the influence of surface water).

(d) Systems must retain a complete copy of the SMP submitted under this rule, including any modifications required by the Department, for 10 years after the system submitted the SMP to the Department.

(2) Standard Monitoring.

(a) Systems must monitor as indicated in the following table. Systems must collect dual sample sets at each location. Systems must conduct one

monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month with the warmest water temperature. A review of available compliance, study, or operational data must be conducted to determine the peak historical month for TTHM or HAA5 levels or the warmest water temperature.

SMP Monitoring Requirements

Source Water Type	Population Size Category	Monitoring Periods and Frequency of Sampling	Distribution System Monitoring Locations[1]				
			Total per monitoring period	Near Entry Points	Average Residence Time	High TTHM Locations	High HAA5 Locations
Surface Water or Ground Water Under the Influence of Surface Water	< 3,300 consecutive systems	four (every 90 days)	2	1		1	
	< 3,300 non-consecutive systems		2			1	1
	3,301-9,999		4		1	2	1
	10,000-49,999	six (every 60 days)	8	1	2	3	2
	50,000-249,999		16	3	4	5	4
	250,000-999,999		24	4	6	8	6
	1,000,000-4,999,999		32	6	8	10	8
	≥ 5,000,000		40	8	10	12	10
Ground Water	< 500 consecutive systems	one (during peak historical Month)[2]	2	1		1	
	< 500 non-consecutive systems		2			1	1
	500-9,999	four (every 90 days)	2			1	1
	10,000-99,999		6	1	1	2	2
	100,000-499,999		8	1	1	3	3
	≥ 500,000		12	2	2	4	4

[1] A dual sample set must be taken at each monitoring location during each monitoring period.

[2] The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature.

(b) Systems must take samples at locations other than the existing monitoring locations used under rule 335-7-2-.11. Monitoring locations must be distributed throughout the distribution system.

(c) If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, the system must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, systems must take samples at entry points to the distribution system having the highest annual water flow.

(d) Each system must monitor at the number of locations in paragraph (2) of this rule. This monitoring cannot be reduced or combined with another system's monitoring.

(e) In addition to the minimum number of samples in subparagraph (2)(a) of this rule, one sample must be taken at a maximum residence time representing each source of water at the frequency listed in the above SMP Monitoring Requirements table. Wells in the same aquifer may be reduced to one sample at a maximum residence time with Department approval.

(3) The DSE Report must be submitted to the Department by the appropriate deadline in paragraph 335-7-2-.13(c). The system's DSE report must include the following elements:

(a) All TTHM and HAA5 analytical results from compliance monitoring conducted under rules 335-7-2-.11 or 335-7-2-.12 and all standard monitoring conducted during the period of the DSE as individual analytical results and LRAAs presented in a table or spreadsheet acceptable to the Department.

(b) Include a schematic of the distribution system, population served, and water system type if it has changed from the SMP submitted under this rule.

(c) An explanation of any deviations from the approved SMP.

(d) Recommended compliance monitoring locations for use under rule 335-7-2-.12 and the justification that was used to select the monitoring locations.

(4) The system must retain a complete copy of the DSE report submitted under this rule for 10 years after the date that the report was submitted. The system must also keep a copy of any modifications to the compliance monitoring locations required by the Department or any alternate monitoring locations approved by the Department for 10 years. The DSE report and any notification from the Department must be available for review by the Department or the public.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.
Amended: August 5, 2016

335-7-2-.15 System Specific Study.

(1) A system specific study plan must be based on either existing monitoring results as required under subparagraph (1)(a) of this rule or modeling as required under subparagraph (1)(b) of this rule. The system specific study plan must be submitted to the Department according to the schedule in paragraph 335-7-2-.13(c).

(a) Systems may comply by submitting monitoring results collected before the system is required to begin monitoring under paragraph 335-7-2-.13(c). The monitoring results must meet the following criteria:

1. TTHM and HAA5 results must be based on samples collected and analyzed in accordance with EPA approved procedures. Samples must be collected no earlier than five years prior to the study plan submission date.

2. The monitoring locations and frequency must meet the conditions identified in this subparagraph. Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month with the warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all monitoring conducted under rules 335-7-2-.11 or 335-7-2-.12 plus additional monitoring results as necessary to meet the minimum sample requirements listed in the following table.

Minimum Sample Requirements

Source Water Type	System Population	Number of Monitoring Locations	Number of Samples	
			TTHM	HAA5
Surface Water or Ground Water Under the Influence of Surface Water	≤ 3,300	3	18	18
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	≥ 5,000,000	60	360	360
Ground Water	< 500	3	3	3
	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	≥ 500,000	24	96	96

3. In addition to the minimum number of samples in the table above, one sample must be taken at a maximum residence time representing each source of water. Wells in the same aquifer may be reduced to one sample at a maximum residence time with Department approval.

4. Systems must report the following information when submitting monitoring results.

(i) Previously collected monitoring results and certify that the reported monitoring results include all compliance and non-compliance results generated during the time period beginning with the first reported result and ending with the most recent monitoring result conducted under rules 335-7-2-.11 or 335-7-2-.12.

(ii) Certify that the samples were representative of the entire distribution system and that treatment, and the distribution system have not changed significantly since the samples were collected.

(iii) Schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed or planned system specific study monitoring.

(iv) Population served and system type (surface, ground water under the influence of surface water, or ground water).

(v) A complete copy of the system specific study plan including any modifications by the Department must be retained for 10 years.

(vi) If the system submits previously collected data that fully meet the number of samples required under subparagraph (1)(a)2. of this rule and the Department rejects some of the data, the system must conduct additional monitoring to replace the rejected data on a schedule approved by the Department or conduct a standard monitoring plan.

(b) Systems may comply through analysis of an extended period simulation hydraulic model. The extended period simulation hydraulic model and analysis must meet the following criteria:

1. The model must simulate 24-hour variations in demand and show a consistently repeating 24-hour pattern of residence time.

2. The model must represent the following:

(i) 75% of pipe volume;

(ii) 50% of all pipe length;

(iii) All pressure zones;

(iv) All 12-inch diameter and larger pipes;

(v) All 8-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves, or are known or expected to be significant conveyors of water;

(vi) All 6-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;

(vii) All storage facilities with standard operations represented in the model;

(viii) All active pump stations with controls represented in the model; and

(ix) All active control valves.

3. The model must be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after plan submission.

(c) Reporting modeling. The specific study plan must include the following:

1. Tabular or spreadsheet data demonstrating that the model meets the requirements of subparagraph (1)(b)1. of this rule.

2. A description of all calibration activities undertaken, and if calibration is complete, a graph of predicted tank levels versus measured tank levels for the storage facility with the highest residence time in each pressure zone, and a time series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes to for the model to reach a consistently repeating pattern of residence time).

3. Model output showing preliminary 24-hour average residence time predictions throughout the distribution system.

4. Timing and number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual sample monitoring at a number of locations no less than would be required for the system under paragraph 335-7-2-.14(2) during the historical month of high TTHM. These samples must be taken at locations other than existing compliance monitoring locations.

5. Description of how all requirements will be completed no later than 12 months after the system specific study plan was submitted.

6. Schematic of the distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed system specific study monitoring (if calibration is complete) and all compliance monitoring.

7. Population served and system type.

8. The system must retain a completed copy of the system specific study plan including any Department modification for 10 years.

(d) If the model submitted does not fully meet the requirements of this rule, the system must correct the deficiencies and respond to Department inquiries concerning the model. If the deficiencies are not corrected or the system fails to respond to inquiries about the model to the Department's satisfaction, the system must conduct a standard monitoring plan.

(2) The DSE report must include the following elements in subparagraphs (2)(a) – (2)(g) of this rule. The DSE report must be submitted according to the schedule in paragraph 335-7-2-.13(c).

(a) The DSE report must include all TTHM and HAA5 analytical results from compliance monitoring and all system specific study monitoring conducted during the period of the system specific study presented in a tabular or spreadsheet format acceptable to the Department. If the system specific study plan submitted under paragraph (1) of this rule is changed, the DSE report must also include a schematic of the distribution system, the population served; and system type.

(b) If the modeling provision was used, the system must include final information for the elements described in subparagraph (1)(b)2. of this rule, and a 24-hour time series graph of residence time for each compliance monitoring location selected for use under rule 335-7-2-.12.

(c) The system must recommend and justify compliance monitoring locations and timing for use under subparagraph 335-7-2-.13(g)2.

(d) The DSE report must include an explanation of any deviations from the approved system specific study plan.

(e) The DSE report must include the basis (analytical and modeling results) and justification that was used to select the recommended compliance monitoring locations for use under rule 335-7-2-.12.

(f) The system may submit the DSE report in lieu of the system specific study plan on the schedule identified in paragraph 335-7-2-.13(c) for submission of the system specific study plan if the system believes that it has the necessary information by the time the system specific study plan is due. If this approach is chosen, the DSE report must also include all information required under paragraph (1) of this rule.

(g) The system must retain a completed copy of the DSE report submitted under this rule for 10 years after the date that it was submitted. The system must keep any correspondence related to the DSE report including any correspondence that modifies monitoring locations for 10 years. The DSE report and any Department correspondence must be available for review by the Department or the public.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.
Amended: August 5, 2016.

335-7-2-.16 Operational Evaluation Level.

(1) A system has exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus

twice the current quarter's TTHM result, divided by 4, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4, exceeds 0.060 mg/L.

(2) If the operational evaluation level has been exceeded, the system must conduct an operational evaluation and submit a written report of the evaluation to the Department no later than 90 days after being notified of the analytical result that causes the system to exceed the operational evaluation level. The written report must be made available to the public upon request.

(3) The operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedences.

(4) The system may request to limit the scope of the evaluation if the system is able to identify the cause of the operational evaluation level exceedance. The request to limit the scope of the evaluation does not extend the schedule in paragraph (2) of this rule for submitting the written report. The Department must approve this limited scope of evaluation in writing and the system must keep that approval with the completed report.

(5) If a consecutive system exceeds the TTHM and/or the HAA5 MCLs per paragraph 335-7-2-.12(a) then the following applies:

(i) A joint operational evaluation must be completed which includes the wholesale system that supplies water to the site where the exceedance occurred, and any consecutive system that conveys the water where the exceedance occurred.

(ii) The joint operational evaluation must be signed by responsible officials from each wholesale and consecutive system

(iii) Representatives from all systems involved shall meet quarterly to evaluate the effectiveness of the measures implemented based on the operational evaluation.

(I) An attendance list and meeting minutes shall be submitted to the Department within 30 days of the meeting.

(II) Once the consecutive system complies with the TTHM and/or HAA5 MCLs, then the quarterly meeting will no longer be required.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008; September 25, 2012.

335-7-2-.17 *Cryptosporidium* Monitoring and Compliance. The requirements of the following subparagraphs apply to all community, NTNC and TNC water systems utilizing surface water and/or ground water under the direct influence of surface water.

(a) Wholesale systems must comply with the requirements of this rule based on the population of the largest system in the combined distribution system.

(b) Systems must conduct the following monitoring on the schedule listed in subparagraph (d) of this rule unless the system will provide a total of at least 5.5-log of treatment for *Cryptosporidium*:

1. Systems serving 10,000 or more people must sample their source water for *Cryptosporidium*, *E. coli*, and turbidity at least monthly for 24 consecutive months.

2. Systems serving fewer than 10,000 people must sample their source water for *E. coli* at least once every two weeks for 12 consecutive months unless the system notifies the Department that it will monitor for *Cryptosporidium* as described in the subparagraph (b)3. of this rule. The system must notify the Department no later than 3 months prior to the date the system is otherwise required to start *E. coli* monitoring.

3. Systems serving fewer than 10,000 people must sample their source water for *Cryptosporidium* at least twice per month for 12 consecutive months or at least monthly for 24 months if they meet one of the following conditions based on the *E. coli* monitoring conducted:

(i) For systems using lake/reservoir sources, the annual mean *E. coli* concentration is greater than 10 *E. coli*/100 mL.

(ii) For systems using flowing stream sources, the annual mean *E. coli* concentration is greater than 50 *E. coli*/100 mL.

(iii) The system does not conduct *E. coli* monitoring as described in subparagraph (b)2. of this rule.

(iv) Systems using ground water under the influence of surface water must comply with the requirements of subparagraph (b)3. of this rule based on the *E. coli* level that applies to the nearest surface water body or the system must comply based on the requirements that apply to systems using lake/reservoir sources.

(c) Systems may sample more frequently than required under this rule if the sampling frequency is evenly spaced throughout the monitoring period.

(d) Systems must begin the monitoring required in this rule no later than the month beginning with the date listed in this table:

Population	Begin first round of monitoring by:	Begin second round of monitoring by:
≥ 100,000	October 1, 2006	April 1, 2015
50,000 to 99,999	April 1, 2007	October 1, 2015
10,000 to 49,999	April 1, 2008	October 1, 2016
< 10,000 monitor for *E. Coli*	October 1, 2008	October 1, 2017
< 10,000 & monitor for *Cryptosporidium* *	April 1, 2010	April 1, 2019

* Applies to systems that meet the conditions of subparagraph (b)3. of this rule.

(e) After completion of the second round of source water monitoring, systems must conduct another round of source water monitoring as outlined in this rule every 9 years.

(f) If a system chooses to provide at least 5.5-log treatment for *Cryptosporidium*, rather than start source water monitoring, the system must notify the Department in writing no later than the date the system is otherwise required to submit a sampling schedule for monitoring under this rule. Alternatively, a system may choose to stop sampling at any point after it has initiated monitoring if it notifies the Department in writing that it will provide at least 5.5-log treatment. Systems must install and operate technologies to provide this level of treatment by the applicable treatment compliance date in rule 335-7-6-.20.

(g) Systems with water plants operating only part of the year must conduct source water monitoring in accordance with this rule, but with the following modifications:

1. Systems must sample their source water only during the months that the plant is in operation unless the Department specifies another monitoring period based on plant operational practices.

2. Systems with plants that operate less than six months per year and that monitor for *Cryptosporidium* must collect at least six *Cryptosporidium* samples per year during each of two years of monitoring. Samples must be evenly spaced throughout the period that the plant is in operation.

(h) A system that begins using a new source of surface water or ground water under the influence of surface water or has a ground water source redesignated as ground water under the influence of surface water must begin monitoring according to subparagraph (b) of this rule within 3 months of using the new source or within 3 months of having a ground water source redesignated as under the influence of surface water. These requirements apply to any surface water or ground water under the influence of surface water system that begins operation after the monitoring start date applicable to the system's size in paragraph (d) of this rule. The water system must begin a second round of source water monitoring no later than six years following the initial bin classification or determination of the mean *Cryptosporidium* level. After the second round of monitoring the water system must begin monitoring required in paragraph (e) of this rule.

(i) Failure to collect any source water sample required under this rule in accordance with the sampling schedule, sampling location, analytical method, approved laboratory, and reporting requirements is a monitoring violation.

(j) Systems may use monitoring data collected prior to the applicable monitoring start date in paragraph (d) of this rule to meet the initial source water monitoring requirements in this rule. This data may be substituted for an equivalent number of months at the end of the monitoring period. All data submitted under this subparagraph must meet the following requirements:

1. The sample results and analysis must have been done according to EPA approved methods and be accepted by the Department.

2. The sampling location must meet the conditions in paragraphs (r) through (u) of this rule.

3. A system may submit previously collected samples to meet the requirements of paragraph (d) of this rule even though corresponding *E. coli* and turbidity samples are not available. A system that submits *Cryptosporidium* samples without *E. coli* and turbidity samples is not required to collect additional *E. coli* and turbidity samples when the system completes the requirements for *Cryptosporidium* monitoring.

4. Previously collected *Cryptosporidium* sample data must have been collected no less frequently than each calendar month on a regular schedule, beginning no earlier than January 1999. Sample collection intervals may vary for the conditions specified in paragraph (n) of this rule if the system provides documentation of the condition when reporting monitoring results.

5. The Department may approve previously collected data where there are time gaps in the sampling frequency if the system conducts additional monitoring, specified by the Department, to ensure that the data used to comply with the initial source water monitoring requirements of paragraph (d) of this rule are seasonally representative and unbiased.

6. Systems may submit previously collected data where the sampling frequency within each month varied. If the *Cryptosporidium* sampling frequency varied, systems must follow the monthly averaging procedure in subparagraph (x)5. of this rule, as applicable, when calculating the bin classification.

7. Systems that request the use of previously collected monitoring results must report the following information by the applicable dates listed below. Systems serving at least 10,000 people must report this information to EPA and to the Department. Systems serving fewer than 10,000 people must report this information to the Department.

(i) Systems must report that they intend to submit previously collected monitoring results for use. This report must specify the number of previously collected results the system will submit, the dates of the first and last sample, and whether a system will conduct additional source water monitoring to meet the

requirements of this rule. Systems must report this information no later than the date the sampling schedule under paragraph (d) of this rule is required.

(ii) Systems must report previously collected monitoring results, along with the associated documentation listed below no later than two months after the applicable date listed in paragraph (d) of this rule for the first round of monitoring.

(I) For each sample result, systems must report the applicable data elements in paragraph (w) of this rule.

(II) Systems must certify that the reported monitoring results include all results the system generated during the time period beginning with the first reported results and ending with the final reported result. This applies to samples that were collected from the sampling location specified for source water monitoring under this rule, not spiked, and analyzed using the laboratory's routine process for the analytical methods using an EPA approved method.

(III) Systems must certify that the samples were representative of a plant's source water(s) and the source water(s) have not changed. Systems must report a description of the sampling location(s), which must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including points of chemical addition and filter backwash recycle.

(IV) For *Cryptosporidium* samples, the laboratory or laboratories that analyzed the samples must provide a letter certifying that the quality control criteria specified in the methods were met for each sample batch associated with the reported results. Alternately, the laboratory may provide bench sheets and sample examination report forms for each field, matrix spike, initial precision and recovery (IPR), ongoing precision and recovery standard (OPR), and method blank sample associated with the reported results.

(iii) If the Department determines that a previously collected data set submitted for use was generated during source water conditions that were not normal for the system, such as a drought, the Department may disapprove the data. Alternately, the Department may approve the previously collected data if the system reports additional source water monitoring data, as determined by the Department, to ensure that the data set used under paragraphs (x) and (y) of this rule represents average source water conditions for the system.

(iv) If a system submits previously collected data that fully meets the number of samples required for initial source water monitoring under paragraph (b) of this rule and some of the data are rejected due to not meeting the requirements of this rule. The system must conduct additional monitoring to replace rejected data on a schedule approved by the Department. A system is not required begin this additional monitoring until two months after notification that data have been rejected and additional monitoring is necessary.

8. Analytical Methods:

(i) *E. coli* sample analysis. The analysis of *E. coli* samples must meet the analytical method and approved laboratory requirements of 40 CFR 141.704 through 141.705.

(ii) *Cryptosporidium* sample analysis. The analysis of *Cryptosporidium* samples must meet the criteria in 40 CFR 141.707(c).

(k) Following the completion of initial source water monitoring under this rule and each subsequent round of source water monitoring, a system that plans to make a change to its disinfection practice must create a disinfection profile and benchmark as outlined in the rule 335-7-6-.11 and submit the proposed changes along with the disinfection profile to the Department for approval.

1. In lieu of conducting new monitoring for disinfection profiling, systems, with Department approval, may elect to meet the following requirements:

(i) Systems that have at least one year of existing data that is substantially equivalent to data collected under the provisions of rule 335-7-6-.11 may use this data to develop disinfection profiles if the system has neither made a significant change to its treatment practice nor changed sources since the data were collected. Systems may develop disinfection profiles using up to three years of existing data.

(ii) Systems may use disinfection profile(s) previously developed under rule 335-7-6-.11 in lieu of developing a new profile if the system has neither made a significant change to its treatment practice nor changes sources since the profile was developed. Systems that have not developed a virus profile must develop a virus profile using the same monitoring data on which the Giardia lamblia profile is based.

(l) Systems required to conduct source water monitoring under this rule must submit a sampling schedule that specifies the calendar dates when the system will collect each required sample.

1. Systems must submit sampling schedules no later than three months prior to the applicable date listed in paragraph (d) of this rule for each round of required monitoring and three months prior to monitoring required under paragraph (e) of this rule.

2. Systems serving at least 10,000 people must submit their sampling schedule for the initial round of source water monitoring under paragraph (d) of this rule to EPA electronically. If a system is unable to submit the sampling schedule electronically to EPA, the system may use an alternative approach for submitting the sampling schedule that is approved by EPA.

3. All sampling schedules must be submitted to the Department.

4. If EPA or the Department does not respond to a system regarding its sampling schedule, the system must sample at the reported schedule.

(m) Systems must collect samples within two days before or after the dates indicated in their sampling schedule (i.e. within a five day period around the schedule date) unless one of the following conditions applies:

1. If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the system to be unable to sample in the scheduled five-day period, the system must sample as close to the scheduled data as is feasible unless the Department approves an alternative sampling date. The system must submit an explanation for the delayed sampling date to the Department concurrent with the shipment of the sample to the laboratory.

2. If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with analytical method requirements, including the quality control requirements or the failure of an approved laboratory to analyze the sample, then the system must collect a replacement sample.

(n) Any replacement samples must be collected no later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the system demonstrates that collecting a replacement sample within this time frame is not feasible or the Department approves an alternative resampling date. The system must submit an explanation for the delayed sampling date to the Department concurrent with the shipment of the sample to the laboratory.

(o) Systems that fail to meet the criteria of paragraph (n) of this rule for any source water sample required to be collected must revise their sampling schedules to add dates for collecting all missed samples. Systems must submit the revised schedule to the Department for approval.

(p) Systems required to conduct source water monitoring for *Cryptosporidium* must collect samples from each plant that treats surface water or ground water under the influence of surface water. When multiple plants draw from the same influent, such as the same pipe or intake, the Department may approve one set of monitoring results to be used to satisfy the monitoring requirements for all plants.

(q) Systems must collect source water samples prior to chemical treatment, such as coagulants, oxidants, and disinfectants, unless it is not feasible to collect the sample before chemical addition and the chemical treatment is unlikely to have a significant effect on the analysis of the sample, the system may request to collect the sample after chemical addition. The system must receive written approval before taking the samples after chemical addition.

(r) Systems that recycle filter backwash water must collect source water samples prior to the point of filter backwash water addition.

(s) Systems that use bank filtration as pretreatment to a filtration plant must collect source water samples from the well (i.e., after bank filtration). Use of bank filtration during monitoring must be consistent with routine operational

practices. Systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under rule 335-7-6-.22.

(t) Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and ground water sources must collect samples as specified below. The use of multiple sources during monitoring must be consistent with routine operational practice.

1. If a sampling tap is available where the sources are combined prior to treatment, systems must collect samples from this tap.

2. If a sampling tap where the sources are combined prior to treatment is not available, systems must collect samples at each source near the intake on the same day and must comply with one of the following for sample analysis:

(i) Systems may composite samples from each source into one sample prior to analysis. The volume of sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

(ii) Systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average must be calculated by multiplying the analysis result for each source by the fraction the source contributed to the total plant flow at the time the sample was collected and then summing these values.

(u) A description of the sampling location must be submitted to the Department with the sampling schedule. This description must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. If the Department does not respond to a system regarding sampling location(s), the system must sample at the reported location(s).

(v) Systems must report results from the source water monitoring required under this rule to the Department no later than 10 days after the end of the first full month when the sample is collected.

1. All systems serving a population of at least 10,000 must report the results from the initial source water monitoring to EPA electronically no later than 10 days after the end of the month when the sample is collected. If a system is unable to report monitoring results electronically, the system may use an alternative approach that is approved by EPA.

2. Systems must report the following data elements for each *Cryptosporidium* analysis:

Data Element
1. PWS ID
2. Facility ID
3. Sample collection date
4. Sample type (field or matrix spike)
5. Sample volume filtered (L), to the nearest ¼ L
6. Was 100% of the filtered volume examined
7. Number of oocysts

(i) For matrix spike samples, systems must also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

(ii) For samples in which less than 10 liters is filtered or less than 100% of the sample volume is examined, systems must also report the number of filters used and the packed pellet volume.

(iii) For samples in which less than 100% of sample volume is examined, systems must also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

3. Systems must report the following data elements for each *E. coli* analysis:

Data Element
1. PWS ID
2. Facility ID
3. Sample collection date
4. Analytical method number
5. Method type
6. Source type (flowing stream, lake/reservoir, GWUDI)
7. *E. coli*/100 ml
8. Turbidity *

* Systems serving fewer than 10,000 people that are not required to monitor for turbidity under subparagraph (b)2. of this rule are not required to report turbidity with their *E. coli* results.

(w) Following each round of source water monitoring required under this rule, systems must calculate a *Cryptosporidium* bin concentration for each plant for which monitoring was required. Calculation of the bin concentration must use the *Cryptosporidium* results reported under this rule and must follow the following procedures:

1. For systems that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

2. For systems that collect a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of

all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected.

3. For systems serving a population less than 10,000 that monitor for *Cryptosporidium* for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

4. For systems with plants operating only part of the year that monitor fewer than 12 months per year, the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

5. If the monthly *Cryptosporidium* sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in subparagraphs (x)1. through 4. of this rule.

(x) Systems must determine their bin concentration using the following table and the *Cryptosporidium* bin concentration calculated under subparagraphs (x)1. through 4. of this rule:

For systems that are	**Concentration**	**Bin Classification**
Required to monitor for *Cryptosporidium*	*Cryptosporidium* <0.075 oocysts/L	Bin 1
	0.075 oocysts/L ≤ *Cryptosporidium* < 1.0 oocysts/L	Bin 2
	1.0 oocysts/L ≤ *Cryptosporidium* < 3.0 oocysts/L	Bin 3
	Cryptosporidium ≥ 3.0 oocysts/L	Bin 4
Serving <10,000 population and NOT required to monitor for *Cryptosporidium*	NA	Bin 1

(y) Systems must report each bin classification as required by this rule to the Department for approval no later than 6 months after the system is required to complete source water monitoring based on the schedule in this rule. The bin classification report to the Department must include a summary of source water monitoring data and the calculation procedure used to determine bin classification. Failure to comply with this paragraph is treatment technique violation.

(z) Systems must provide the level of additional treatment for *Cryptosporidium* specified in rule 335-7-6-.19 for the bin classification as determined under this rule and according to the schedule in rule 335-7-6-.20. Systems must provide the level of treatment required in rule 335-7-6-.19 based upon the highest bin classification determined in any round of source water monitoring. Systems that make significant changes to their watershed to lower *Cryptosporidium* levels in the source water, and are not utilizing the watershed control program to meet treatment requirements, may request to be placed in a lower bin classification if additional

monitoring is conducted to ensure the lower bin classification is warranted. The bin reclassification must be based upon monitoring conducted in accordance with subparagraph (b) of this rule. Department approval is required for a system to be placed into a lower bin classification.

(aa) Analytical Methods: Analysis of all samples of *Cryptosporidium, E. coli* and turbidity for requirements contained in this rule shall comply with the approved EPA methodology found in 40 CFR 141.704 and by a laboratory certified by EPA or the Department.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.
Amended: May 26, 2009; January 18, 2011; August 5, 2016.

335-7-2-.18 Monitoring Requirements of Consecutive Systems. When a public drinking water system obtains water from another public water system, the Department may modify the monitoring requirements imposed by this chapter to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the Department and acceptable to the EPA.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005; January 22, 2008.

335-7-2-.19 Monitoring Waiver Criteria. Waivers to eliminate or reduce certain chemical monitoring requirements may be granted for the contaminants listed below, according to the criteria listed below. Statewide or regional waivers may be issued by the Department without application submittal. Individual source or system waivers may be issued after an application containing the provisions outlined in this rule is approved by the Department.

(a) No waivers will be granted for:

1. Microbiological contaminants

2. Nitrates and nitrites

3. Disinfection Byproducts

(b) Monitoring waivers may be granted for:

1. Inorganics except nitrates and nitrites

2. Dioxin

3. SOCs

4. VOCs

(c) All waiver applications must address the following:

1. Previous analytical results.

2. The proximity of a source to a potential point or non-point source of contamination.

3. The environmental persistence and transport of the contaminants.

4. How well the source is protected against contamination due to factors such as the depth of the source and well construction.

5. Elevated nitrate levels in the water supply source.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Adopted September 19, 1995.
Amended: December 8, 1998; effective January 25, 1999; December 12, 2005; January 22, 2008.

335-7-2-.20 Reporting Requirements.

(1) All persons subject to this chapter shall comply with the following:

(a) Except where a shorter reporting period is specified in these regulations, the supplier of water shall report to the Department the results of any test, measurement or analysis within the first 10 days following the month in which the result is received or the first 10 days following the end of the required monitoring period as stipulated by the Department, whichever is shortest.

(b) The supplier of water shall report to the Department within 48 hours the failure to comply with any primary drinking water standards (including failure to comply with monitoring requirements) set forth in this chapter.

(c) The supplier of water is not required to report analytical results to the Department in cases where a State Laboratory performs the analyses and reports the results to the Department.

(d) Within ten days of completion of each public notification, a certification that the system has fully complied with the public notification regulations and a representative copy of each type of notice shall be submitted to the Department. This includes the notice distributed, published, posted or made available to the persons served by the system or to the media as directed by the Department.

(e) The suppliers of water shall submit to the Department within the time stated in the request copies of any records required to be maintained or copies of any documents then in existence which the Department is entitled to inspect.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: January 28, 2004; December 12, 2005; January 22, 2008.

335-7-2-.21 Public Notification.

(1) Any public water system which fails to comply with an applicable MCL or MRDL established in these regulations, is granted an exemption from an applicable MCL, fails to comply with an applicable treatment process, fails to comply with the requirements of any schedule prescribed pursuant to an exemption, fails to collect any 3 months of *Cryptosporidium* monitoring as required in rule 335-7-2-.17, fails to determine the system's *Cryptosporidium* bin classification, fails to take corrective action, fails to maintain at least 4-log treatment of viruses before or at the first customer as required in 335-7-5-.22(6)(a), or has a treatment technique violation or reporting violation according to paragraph 335-7-2-.07(7) shall notify persons served by the systems as follows:

(a) Community systems shall provide notification within 30 days by other methods to reach persons not being reached by direct notification. These methods must include publication in a daily newspaper of general circulation in the area served by the system. If the area served by a public water system is not served by a daily newspaper of general circulation, notice shall instead be given in a weekly newspaper of general circulation serving the area. Public notification shall also be made by distribution of multiple copies to customers that provide drinking water to others, by the Internet, by posting for seven days or by delivery to community organizations if directed by the Department.

(b) Community water systems shall provide notification by direct mail, inclusion with a water bill or by hand delivery, within 30 days after the violation or failure.

(c) Following the initial notice given under this rule, the water system must give notice at least once every three months for as long as the violation or failure exists, unless the Department determines that appropriate circumstances warrant a different repeat notice frequency. The repeat notice must be given a minimum of at least once per year. No reduction in repeat notice frequency will be given for microbial contaminant maximum contaminant level violations.

(d) NTNC water systems must post notice in places of public view or provide hand delivery to those using the system within 30 days of becoming aware of the violation. The notice shall remain posted for a minimum of seven days or as

long as the failure continues, whichever is greater. A copy of the notice must also be furnished to a communications media that is most likely to serve the local area.

(e) Non-community water systems must post notice in places of public view instead of hand delivery within 30 days of becoming aware of the violation. The notice shall remain posted for a minimum of seven days or as long as the failure continues, whichever is greater. A copy of the notice must also be furnished to a communications media that is most likely to serve the local area.

(f) When violations of the MCL of contaminants that may pose an acute risk to human health occur, public notification must be provided by the system within 24 hours of the discovery of the violation by either radio and television, posting of the notice in conspicuous locations throughout the area served by the water system or by hand delivery of the notice to persons served by the water system. The water system must also consult with the Department within 24 hours to determine additional public notification requirements. The following violations are considered to be acute risk to human health:

1. Violation of the *E. coli* maximum contaminant level as specified in paragraph 335-7-2-.07(1).

2. Violation of the MCL for nitrates, nitrites or total nitrates and nitrites.

3. Violation of the MCL for organic or inorganic chemicals at a level determined by the Department to be an acute risk to human health.

4. An acute violation of the MRDL for chlorine dioxide.

5. Other violations or situations with significant potential to have serious adverse effects on human health as a result of short term exposure, as determined by the Department either in its regulations or on a case by case basis.

(g) Other situations which require public notification within 24 hours are:

1. Exceedance of the maximum allowable turbidity limit if the Department is not notified within 24 hours of the violation or when the Department determines that an acute violation has occurred.

2. Occurrence of a waterborne disease outbreak or other emergency such as a natural disaster that disrupts water treatment, a chemical spill or unexpected high levels of possible pathogens in the source water.

3. Detection of *E. coli*, enterococci, or coliphage in source water samples as specified under 335-7-5-.22(5)(a) and 335-7-5-.22(5)(b).

(2) A community water system must give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, any maximum residual disinfectant level, any treatment technique requirement or variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins.

(3) Notices given shall be written in a manner reasonably designed to inform fully the users of the system. The notice shall be conspicuous and shall not use unduly technical language, unduly small print or other methods which would frustrate the purpose of the notice. The notice shall disclose all material facts regarding the subject including the contaminant of concern and if applicable the contaminant level, when the violation or situation occurred, any potential adverse health effects, the population at risk, reasonably available methods of mitigating known or potential contamination in drinking water, steps being taken by the water system to mitigate problems in drinking water, and the necessity for seeking alternative water supplies, if any. Each notice shall contain the name, business address, and telephone number of the water system's owner, operator or designee as an additional source of information regarding the notice. The notice must also include what the water system is doing to correct the violation or situation and when the system expects to return to compliance or resolve the situation. When appropriate, a clear statement that a primary drinking water standard has been violated and any preventive measures that should be taken by the public. Notices for all MCL, treatment technique, MRDL, and monitoring violations shall contain the specific language as written in Appendix C. Notices must also include the standard distribution language as written in Appendix C. For public water systems serving a large proportion of non-English speaking consumers, the public notice must contain information in the appropriate language regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language.

(4) Any water system which fails to comply with an applicable testing procedure, fails to perform required monitoring, fails to maintain the required disinfectant residual, fails to notify of the availability of unregulated monitoring results, fails to notify of the exceedance of the secondary fluoride standard, fails to comply with reporting and recordkeeping requirements associated with microbial contaminants, or is granted an exemption shall notify persons served by the system as follows:

(a) Community water systems shall provide notification within one year of being notified of the violation by direct mail, inclusion with a water bill or by hand delivery. A copy of the notice must be furnished to a communications media that is most likely to serve the local area. Notification by mail or hand delivery must be made every three months following the initial newspaper notification for as long as the violation continues or exemption continues. Public notification shall also be made by distribution of multiple copies to customers that provide drinking water to others, by the internet, by posting for seven days or by delivery to community organizations if directed by the Department.

(b) In lieu of an individual notice, the public water system may use an annual report of monitoring violations or the CCR, as long as the method of delivery and content of the violation notice meets the requirements of the regulations and the CCR or annual report is provided to persons served within twelve months after the system learns of the violation.

(c) NTNC water systems must post a notice in places of public view instead of hand delivery. The notice shall remain posted for a minimum of seven days or as long as the failure continues, whichever is greater. A copy of the notice must also be furnished to a communications media that is most likely to serve the local area. In lieu of an individual notice, the public water system may use an annual report of monitoring violations, as long as the method of delivery and content of the violation notice meets the requirements of the regulations.

(d) Non-community water systems must post a notice in places of public view instead of hand delivery. The notice shall remain posted for a minimum of seven days or as long as the failure continues, whichever is greater. A copy of the notice must also be furnished to a communications media that is most likely to serve the local area. In lieu of an individual notice, the public water system may use an annual report of monitoring violations, as long as the method of delivery and content of the violation notice meets the requirements of the regulations.

(5) Each community and NTNC water system shall issue notice when required by the Department to persons served by the system that may be affected by lead contamination of their drinking water. Such notification is required even if there is no violation of the primary drinking water standards for lead. The notice for lead shall include the specific language as written in Appendix C.

(6) Each water system required to perform monitoring for unregulated contaminants shall notify persons served by the water system of the availability of said monitoring results no later than twelve months after the monitoring results are known. Community water systems shall provide notification by direct mail, inclusion with a water bill or by hand delivery. Public notification shall also be made by publication in a local newspaper, distribution of multiple copies to customers that provide drinking water to others, by the internet, by posting for seven days or by delivery to community organizations if directed by the Department. NTNC water systems must post a notice in places of public view instead of hand delivery. The notice shall remain posted for a minimum of seven days. The notice shall identify the system's owner, operator or designee and telephone number to contact for information on the monitoring results.

(7) Community water systems that exceed the fluoride secondary maximum contaminant level (SMCL) of 2 mg/l (determined by the last single sample), but do not exceed the MCL of 4 mg/l for fluoride, must provide the public notice in Appendix C to persons served by the system. The public notice must be provided as soon as practical but no later than 12 months from the day the water system learns of the exceedance. A copy of the notice must also be sent to all new billing units and new customers at the time service begins and to the State public health officer. The public water system must repeat the notice at least annually for as long as the SMCL is exceeded. If the public notice is posted, the notice must remain in place for as long as the SMCL is exceeded, but in no case less than seven days even if the exceedance is eliminated. Community water systems shall provide notification by direct mail, inclusion with a water bill or by hand delivery. Public notification shall also be made by publication in a local newspaper, distribution of multiple copies to customers that provide drinking water to others, by the internet, by posting for seven days or by delivery to community organizations if directed by the Department.

(8) Public water systems that provide water to trailer parks, apartments, nursing homes, schools, businesses and other similar facilities must include in their notice the following language: Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

(9) Public water systems that sell or otherwise provide drinking water to other public water systems are required to give public notice to the owner or operator of the consecutive system. The consecutive system shall provide public notice to the customers that it serves in accordance with this rule.

(10) If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the Department may allow the system to limit distribution of the public notice to only customers served by that portion of the system which is out of compliance. Written permission is required from the Department before limiting distribution of the notice.

(11) For continuing violations, the Department may allow the water system to notify their customers once a year.

Author: Joe Alan Power, Thomas S. DeLoach, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1999; March 12, 2002; January 28, 2004; December 12, 2005; January 22, 2008; May 26, 2009; November 25, 2014; August 5, 2016.

335-7-2-.22 Assessments

(1) Systems must conduct assessments after exceeding treatment technique triggers listed below:

(a) Level 1 treatment technique triggers.

1. For systems collecting 40 or more samples per month, the system exceeds 5.0% total coliform-positive samples for the month.

2. For systems collecting fewer than 40 samples per month, the system has two or more total coliform-positive samples in the same month.

3. The system fails to collect every required repeat sample after any total coliform-positive sample.

(b) Level 2 treatment technique triggers.

1. An *E. coli* MCL violation.

2. A second Level 1 trigger within a rolling 12-month period, unless the Department has determined a likely reason for the total coliform positive samples that caused the first Level 1 treatment technique trigger and has established that the system has corrected the problem.

(2) Requirements for the assessments include the following:

(a) Systems must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 2 assessments must be conducted by parties approved by the Department.

(b) When conducting assessments, the systems must ensure that the minimum elements are evaluated including review and identification of inadequacies in sample sites; sampling protocol; sample processing; non typical events that could affect distribution water quality or indicate that distribution water quality was impaired; changes in distribution system maintenance and operation that could affect distribution water quality (including water storage); source and treatment considerations that bear on distribution water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The system must conduct the assessment consistent with any Department directives that address specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

(c) The system must complete a Level 1 or 2 assessment as soon as practical after any trigger is exceeded. In the completed assessment form, the system must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified. The system must submit the completed Level 1 assessment form to the Department within 30 days after the system learns that it has exceeded a trigger.

(d) After the Department reviews the completed Level 1 or 2 assessment and determines that the assessment is not sufficient, revisions may be required to the assessment form. The system must submit a revised assessment form to the Department on an agreed-upon schedule not to exceed 30 days from the date of notification.

(e) A system must ensure that a Level 2 assessment consistent with Department requirements is conducted if the system exceeds one of the treatment technique triggers. The system must comply with any expedited or additional actions required by the Department in the case of an *E. coli* MCL violation.

(f) The system may conduct Level 2 assessments if the system has staff or management with the certifications or qualifications specified by the Department unless otherwise directed by the Department.

(3) Systems must correct sanitary defects found in either a Level 1 or 2 assessment. For corrective actions not completed by the time of submission of the assessment form, the system must complete the corrective action(s) in compliance with a timetable approved by the Department. The system must notify the Department when each scheduled corrective action is completed.

(4) A treatment technique violation occurs when a system exceeds a treatment technique trigger and then fails to conduct the required assessment or complete corrective actions within the timeframe specified in the assessment or by the Department.

(5) Failure to submit completed assessment form after a system properly conducts an assessment in a timely manner is a reporting violation.

Author: Thomas S. DeLoach.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: November 25, 2014.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-3
SECONDARY DRINKING WATER

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335-7-3-.01 Applicability. Secondary Drinking Water Standards established in these regulations are applicable to water systems required to monitor for these various contaminants.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-3-.02 Secondary Maximum Contaminant Levels.

Aluminum	0.2 mg/l
Chloride	250 mg/l
Color	15 units
Copper	1 mg/l
Foaming agents	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Odor	3 threshold odor number
Silver	0.1 mg/l
Sulfate	250 mg/l
Total Dissolved Solids	500 mg/l
Zinc	5 mg/l

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Revised September 23, 1992. Effective: November 9, 1992.

335-7-3-.03 Monitoring Requirements. Other than odor and foaming agents, contaminants identified in these regulations shall be monitored by community and NTNC systems at the same frequency as the monitoring performed for inorganic contaminants included in Chapter 335-7-2. More frequent monitoring and confirmation samples may be required by the Department.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-3-.04 Special Monitoring for Corrosivity Characteristics.

(a) All community and NTNC water systems shall monitor the following for corrosivity characteristics:

pH	Calcium
Total Alkalinity	Magnesium
Carbon Dioxide	Hardness
Sodium	Temperature
Sulfates	Specific Conductance or Total Dissolved Solids

(b) The supplier shall collect two samples from a representative entry point to the water distribution system per plant for analyses for each system using surface water sources. One sample shall be collected during midwinter and one during midsummer. The supplier of water shall collect one sample per plant for analysis for each plant using groundwater sources. The minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with Departmental approval, be considered one treatment plant for determining the minimum number of samples. Additional monitoring may be required by the Department.

(c) The supplier of water shall report to the Department the results of the analyses for the corrosivity characteristics no later than the tenth of the following month.

(d) Community water systems shall identify the presence of the following construction materials in the distribution system and report to the Department as required:

1. Lead piping, service lines, goosenecks, solder, caulking, or interior lining of distribution mains.

2. Galvanized pipe or service lines.

3. Asbestos cement pipe.

4. Vinyl lined asbestos cement pipe.

5. Coal tar lined pipes and tanks.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-3-.05 Analytical Requirements. For the purpose of determining compliance with these standards, samples must be analyzed by a laboratory certified by the Department or a certified operator using methodology and detection limits established by EPA.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-24-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-3-.06 Reporting Requirements.

(1) Except where a shorter reporting period is required, the supplier of water shall report the results to the Department of any test, measurement or analysis required by this chapter within the first ten days of the following month in which the result is received by the supplier.

(2) The supplier of water is not required to report analytical results to the Department in cases where a State Laboratory performs the analysis and reports the results to the Department.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-3-.07 Deviation from Secondary Standards. Upon receipt of a written request and assurance that neither an aesthetic nor health problems will occur because of an elevated level of a secondary contaminant, the Department may issue a deviation for a secondary standard. The request must include analysis of

the contaminant indicating the contaminant concentration is not increasing over time or use. Also to be submitted are any treatment or sequestration processes which will be employed to reduce the impact of the secondary contaminant being present. The Department may require posting or other forms of public notification in conjunction with the issuance of this deviation.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-3-.08 Public Notification.

(1) If a community or NTNC water system exceeds the MCL of a secondary standard, as confirmed by at least one check sample, or fails to comply with prescribed monitoring, the Department may require the supplier of water to give notice to persons served by the system in a newspaper of general circulation in the area.

(2) Notices given pursuant to this rule shall be written in a manner reasonably designed to fully inform the users of the system. The notice shall be conspicuous and shall not use unduly technical language, unduly small print or other methods which would frustrate the purpose of the notice. The notice shall disclose all material facts and, when appropriate, a clear statement that a secondary drinking water standard has been violated and any preventive measures that should be taken by the public. Notices may include a balanced explanation of the significance or seriousness of the subject of the notice, a fair explanation of steps taken by the system to correct any problem and the results of any additional sampling.

(3) Proof of completion of any notice required by this rule shall be received by the Department within ten days of the completion of the notice. Such proof of notification shall include a copy of the exact notice used with details as to manner and date of notification.

(4) Notice to the public required by this rule may be given by the Department on behalf of the supplier of water.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-34, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-4
PERMIT REQUIREMENTS AND PROCEDURES

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335-7-4-.01 Applicability. This chapter applies to each person in the state proposing to construct a new community or NTNC public water supply system or place into use a non-community water system. It also applies to each community, non-community, and NTNC water system seeking to make significant improvements or major modifications to an existing system.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005; **Amended:** January 22, 2008.

335-7-4-.02 Facility Permit. All public water systems must possess a current Water Supply Permit authorizing the furnishing of water for potable use prior to beginning operation, unless specifically exempted by 335-7-1-.02. All general and special conditions that are part of such permit must be met. All non- permitted systems or facilities meeting the definition of a public water system are prohibited from providing water for human consumption.

(a) Facility permits for community systems are issued for a period of six years.

(b) Facility permits for non-community and NTNC systems are issued for a period of ten years.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005.

335-7-4-.03 Permitting Requirements for System Additions.

(1) A permit to construct is required for, new water storage facilities, new or expanded water sources or treatment plants, pumping facilities, and distribution system additions which will significantly affect system hydraulics at community and NTNC water systems.

(2) Prior to submitting a permit application package for additions to an existing community or NTNC water system, an engineering report may be required by the Department. This report shall include the following:

(a) Details of the proposed project, including its location on a map,

(b) Its relationship to the existing system,

(c) Its impact on the existing system,

(d) The facilities to be included,

(e) If required by the Department, alternatives to the proposed project and the justification for choosing the proposed alternative, and

(f) Any additional information the Department deems necessary to adequately address the requirements of ADEM Regulations.

(g) All information should be submitted in electronic format unless paper format is approved by the Department in advance. The Department may require paper format.

(3) Prior to beginning construction on a system addition, the Department must issue a Water Supply Permit to construct the proposed addition.

(4) Community and NTNC systems shall submit the following permit application package when requesting a permit for the construction of significant modifications:

(a) A cover letter with a description of the project, the water system name, and any other pertinent information,

(b) A completed Department application form, paper format is acceptable,

(c) Permit fees as established by the Department,

(d) A layout map showing the location of the project as it relates to existing water system(s) in the area, and

(e) A set of plans and specifications reflecting acceptable construction techniques and design. Plans not meeting Departmental guidelines should be accompanied with documentation supporting design differences. If paper format is submitted, plans should be on 11X17 paper or smaller unless approved by the Department in advance.

(f) Information which demonstrates the applicant water system has technical, managerial and financial capacity may be required.

(5) From the effective date of the permit until the requirements of 335-7-4-.10 are met, the water system shall submit to the Department quarterly progress reports, which provide the status of construction and the estimated date of completion. A project update must also be submitted within 72 hours of a request from the Department.

(6) Transient non-community water systems proposing facility additions must provide the following:

(a) A completed Department application form, paper format is acceptable,

(b) Permit fee as established by the Department, and

(c) Any additional information the Department may require to complete a review of the facility addition.

Author: Joe Alan Power, Edgar K Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-2A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005; **Amended:** January 18, 2011; **Amended:** September 25, 2012.

335-7-4-.04 Requirements for New Water Systems and Purchase Systems Installing or Acquiring Surface or Ground Sources.

(1) Prior to submitting a permit application package for the construction of a new community or NTNC water system, an engineering report must be submitted to the Department. All documents associated with the application package should be in electronic format unless paper format is approved by the

Department in advance. The Department may require paper format. The engineering report is to provide the following:

(a) A description of the proposed service area;

(b) If the source of water is to be an existing permitted system, a copy of the executed purchase agreement;

(c) If the source of water is to be a new or newly acquired surface or ground source, a description of the source and treatment processes to be employed;

(d) An estimation of maximum and future water demands by the system;

(e) A narrative plan that details how the water system will meet the financial, technical and managerial requirements of ADEM Regulations;

(f) An asset management plan that includes the following elements:

1. Asset inventory;

2. The required sustainable level-of-service;

3. Determination of critical assets;

4. Determination of the lowest life-cycle cost options for providing the highest level-of-service over time; and

5. Long-term financing strategy.

(2) Community and NTNC systems shall submit a completed application package when requesting a permit for the construction of a new public water system.

(3) Proposed transient non-community water systems must provide the following:

(a) A completed Department permit application form, paper format is acceptable,

(b) Permit fee as established by the Department.

(c) A summary report describing the functions of the facility, number of anticipated people it will serve, bacteriological and nitrate analyses of the proposed source of supply, well construction data should the proposed source be a well and any sources of contamination which might impact the water quality, and

(d) Information which demonstrates the applicant water system has technical, managerial and financial capacity.

Author: Joe Alan Power, Edgar K. Hughes, Ross Caton.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: June 7, 2000; **Amended:** December 12, 2005; **Amended:** September 25, 2012; **Amended:** Filed: February 28, 2022; Effective: April 14, 2022.

335-7-4-.05 Engineering Requirements. Plans and specifications submitted for new community and NTNC water systems or significant improvements or major modifications to these systems must bear the seal and signature of an engineer licensed by the Alabama State Board of Registration for Professional Engineers and Land Surveyors.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: December 12, 2005.

335-7-4-.06 Permits Approval/Denial.

(1) Upon receipt of a complete application, appropriate fees, and necessary information to evaluate the water quality, system facilities, and operational aspects, existing and proposed system facilities will be evaluated. Existing and proposed systems must demonstrate technical, managerial, and financial capabilities to reliably meet performance requirements on a long term basis and be self-sustaining. After a determination has been made that the proposed water system or additions to the system are satisfactory and the existing system has technical, managerial and financial capacity and is in complete compliance with all regulations, a permit will be issued.

(2) If after the review of the application and information submitted shows water quality deficiencies, design problems or technical, managerial or financial capacity deficiencies, a formal request for additional information to clarify the problem areas will be made to the applicant. Upon failure to receive this additional information or if upon review of the supplemental information the proposal is still unsatisfactory, the permit will be denied. Permit denial will be made in writing to the applicant with reasons for the denial stated.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-44, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed and readopted: January 4, 1989; October 31, 1990; Revised: September 23, 1992; effective November 9, 1992.
Amended: June 7, 2000; **Amended:** December 12, 2005.

335-7-4-.07 Facility Permit Renewal.

(1) Public water systems are eligible for permit renewal by submitting a completed application, necessary fees, and any documentation necessary to show the system has technical, managerial and financial capacity and is in complete compliance with the existing permit conditions and regulations of this Department.

(2) Water systems must submit a satisfactorily completed permit application with the appropriate permit fee to the Department requesting permit renewal no less than 180 days prior to permit expiration. Such an application will be accepted by the Department for processing up to 12 months prior to the expiration of the facility permit.

(3) The Department may, based on compliance history or deficiencies noted during inspections, require an existing public water system to submit an asset management plan as detailed at 335-7-4-.04(1)(f) as a condition of permit renewal.

Author: Joe Alan Power, Edgar K. Hughes, Ross Caton.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: June 7, 2000; **Amended:** March 12, 2002; **Amended:** December 12, 2005; **Amended:** Filed: February 28, 2022; Effective: April 14, 2022.

335-7-4-.08 Revocation of a Water Supply Permit. A permit issued by the Department may be revoked for any of the following causes:

(a) Failure to comply with the general or special conditions of the permit;

(b) Failure to establish and maintain such records, make such reports, maintain treatment equipments or provide satisfactory operation of water facilities;

(c) Failure to provide water which meets state and federal drinking water standards;

(d) Failure to comply with provisions of a Departmental Administrative Order or regulations;

(e) Failure to allow identified employees of the Department access to all water facilities and records for the purpose of evaluating compliance with these regulations;

(f) Failure to begin construction on the project within 365 days of the permit issuance date;

(g) Failure to continue construction for a period of six months or more;

(h) Failure to construct water facilities in accordance with approved plans and specifications and regulations in this chapter; or

(i) Failure to demonstrate the water system has technical, managerial and financial capacity.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-44, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: June 7, 2000; **Amended:** January 22, 2008; **Amended:** January 18, 2011.

335-7-4-.09 Revisions to Approved Plans and Specifications. Any significant deviations from approved plans or specifications affecting capacity, hydraulic conditions, operating units, the functioning of water treatment processes, or the quality of water to be delivered must be approved in writing before such changes are made. Major revisions may require submittal of a revised permit package and issuance of a new or modified Water Supply Permit.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-44, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005.

335-7-4-.10 Completed Project Approval.

(1) The following information shall be submitted to the Department in electronic format, unless paper format is approved by the Department in advanced, prior to the final inspection:

(a) A written request to the Department to conduct a final inspection at least two weeks prior to the anticipated date of the final inspection.

(b) Water main pressure test results.

(c) Results of bacteriological analyses from distribution lines and storage tanks. A minimum of one bacteriological sample result will be collected for every 7000 linear feet of water main and on every dead end water line installed.

(d) All primary and secondary water quality analysis representing treated water from a new source or plant.

(e) A completed application for approval to use a well if applicable.

(2) The following information shall be submitted no later than 60 days after the final inspection:

(a) Record drawings of all parts of the project included in the project, if required by the Department. For water main installations, the record drawings will be accompanied by valve references. Record drawings submitted in paper format shall be submitted on 11X17 paper or smaller unless approved by the Department in advance.

(b) A project completion form signed by the permittee.

(c) Copies of any forms that require updating with the completion of the project.

(3) For new surface water treatment plants, the results of plant treatment test must be performed for a minimum of 40 hours, prior to the final inspection. The test must include the operation of all treatment equipment and processes to be used during normal plant operations. The Department may require that the treated water during this test period not enter the distribution system.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: December 12, 2005; **Amended:** January 18, 2011; **Amended:** September 25, 2012.

335-7-4-.11 Consecutive Water System Requirements.

(1) Consecutive systems must meet specific monitoring and reporting requirements as identified in subsequent chapters in these regulations.

(a) A purchase water contract shall be maintained by this system that allows sufficient water to be purchased to meet all system demands during normal operating periods. Upon expiration of such contract, the system shall not exceed a period of more than 30 consecutive days without a revised contract to ensure that adequate water can be provided to all existing customers. A copy of the new or revised water purchase contracts shall be provided to the Department within fifteen (15) days of execution.

(b) Water purchase contracts shall be modified to obtain additional capacity prior to the financial and construction commitment to serve additional customers that will cause the existing contract maximum allowable water purchased to be exceeded.

(2) Consecutive water systems must provide adequate operation through the employment of certified operators to ensure that the quality of water provided meets all State and Federal Drinking Water Standards.

(a) The system must employ an operator in responsible charge that meets the requirement of ADEM Administrative Code Division 10.

(b) The responsible certified operator or its designees shall collect the required minimum number of monthly bacteriological samples and have these analyzed at an ADEM certified laboratory.

(c) The system must maintain an updated Bacteriological Sample Site Plan indicating the location of sites to be used for monthly bacteriological sampling, the primary and backup certified laboratories for bacteriological analysis, a public notification procedure to be activated in case of monitoring or maximum contaminant level violations, and other pertinent information necessary to ensure compliance with the bacteriological monitoring and analysis requirements.

(d) Samples must be taken at intervals established by the Department to analyze for lead and copper in accordance with 335-7-11.

(e) An annual Consumer Confidence Report must be prepared and made available to consumers in accordance with 335-7-14.

(f) Monthly Operation Data Reports must be maintained at the system office and a copy provided to the Drinking Water Branch of ADEM within 10 days after the end of each reporting month.

1. Water systems serving a population of 3,300 or greater shall submit the Monthly Operation Data Report in an electronic format approved by the Department for all reports dated January 1, 2013 or later.

2. Water systems serving a population of less than 3,300 shall submit the Monthly Operation Data Report in an electronic format approved by the Department for all reports dated January 1, 2014 or later.

(g) A Cross-Connection Policy shall be established to minimize contamination through cross-connections and unapproved connections. This policy shall be updated periodically and enforced within the capabilities of the system.

(h) Any additional information or forms required by ADEM Regulations.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-32, 22-23-49, 22-23-49, 22-22A-5, 22-22A-6.
History: March 12, 2002.
Amended: December 12, 2005; **Amended:** January 22, 2008; **Amended:** September 25, 2012.

335-7-4-.12 Segmental Water System Requirements. A consecutive system can be designated as a segmental water system if it contains no pumping facilities or water storage tanks, and consists primarily of plumbing instead of distribution lines. This facility, such as an apartment complex or shopping center, must obtain water from a permitted public water system whose actions, activities, reports, and monitoring meets all State and Federal Standards and are sufficient to ensure that a proper quality of water is made available to the customers of the segmental system during all times of normal operation.

(a) Segmental water systems are not required to maintain a valid Water Supply Permit nor routinely collect water quality samples. However, water quality monitoring may be required by the Department if the quality of water being supplied by the parent water system does not meet drinking water standards, there is a high potential for the water to not meet drinking water standards, or if the parent water system fails to monitor water quality.

(b) Segmental Water Systems are subject to inspection and records review by ADEM staff after a 10-day intent notice is provided to the responsible operator or manager.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-32, 22-23-49, 22-23-49, 22-22A-5, 22-22A-6.
History: March 12, 2002.
Amended: December 12, 2005; **Amended:** January 22, 2008.

335-7-4-.13 Continuation of Expiring Permits. If the water system has submitted a timely and complete application for reissuance, the system has technical, managerial and financial capacity, is in complete compliance with all regulations and the delay in the permit issuance has not been caused by the actions of the water system, then the terms and conditions of an expiring facility permit are automatically extended pending issuance of a new facility permit.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-32, 22-23-49, 22-23-49, 22-22A-5, 22-22A-6.
History: January 28, 2004.
Amended: December 12, 2005.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-5
GROUNDWATER SOURCES AND TREATMENT

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335-7-5-.01 Applicability. This chapter is applicable to all public drinking water systems within the state using or proposing to use a groundwater source for water supply, unless specifically exempted by a part of these regulations.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005.

335-7-5-.02 Definitions. The following words and phrases, unless a different meaning is plainly required by the context, shall have the following meaning:

(a) ADEM--the Alabama Department of Environmental Management.

(b) Aquifer--a geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of groundwater to wells and springs.

(c) Contaminant--matter which renders water unfit to use due to its physical, chemical, biological, or radiological properties.

(d) Contamination--matter present which renders water unfit for use by causing a change in its physical, chemical, biological or radiological properties.

(e) Sinkhole--a funnel shaped depression caused by subterranean drainage.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: Adopted: December 8, 1998; effective: January 25, 1999.
Amended: December 12, 2005.

335-7-5-.03 Site Requirements. Wells or springs shall be constructed in a location such that the upper most extent of the outer casing or collection basin is above the 100 year flood plain and not subject to contamination or sinkhole subsidence. Along with the permit application, a USGS 7.5 minutes (1-24000 scale) map shall be provided, which identifies the location of the proposed groundwater sources, using the GPS method.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1999; December 12, 2005.

355-7-5-.04 Well Casing Requirements.

(1) Community and NTNC water supply wells shall be constructed with a protective casing of sufficient size to allow a minimum two-inch annular space between the casing and well hole. This casing shall be of unused steel, which meets requirements from the latest edition of the American Water Works Association Standards or other materials approved by the Department and shall be adaptable to both the stresses of installation and the corrosiveness of water. Joining by either welding or threaded coupling will be accepted. Minimum interior diameter of casing should be two inches larger than the pump bowls. The suction for the pump shall not be placed below or in the screens. Casings for

wells in all formations shall extend to the immediate vicinity of the water bearing formation unless specifically approved by the Department. This casing shall be centered and project at least l2 inches above the finished concrete slab around the well. The concrete slab shall have the minimum dimensions of 3 feet by 3 feet.

(2) Non-community water supply well casing materials shall be as indicated above or may be PVC thermoplastic water well casing produced in accordance with ASTM Standard F480-76 and approved for potable water by the NSF.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1999; May 30, 2003; December 12, 2005; August 5, 2016.

335-7-5-.05 Grouting Requirements.

(1) Well casings used in the construction of community and NTNC water supply wells, shall be pressure cement grouted. The grout shall be added at the bottom of the outer casing under pressure and flow in a continuous operation until the annular opening is filled and overflowing. Wells shall be grouted from the immediate vicinity of the uppermost formation to land surface unless otherwise approved by the Department. A sufficient annular space shall be available to provide a minimum of two inches of grout around the entire length of protective casing to protect the water bearing aquifer from surface water contamination and undesirable water in upper formations. Casing to be grouted in the drill hole or annular opening shall be provided with sufficient guides to permit unobstructed flow.

(2) Wells for non-community water systems may be grouted as above or by a tremie pipe method. Grout must be introduced at the bottom of the zone to be grouted, and the material continuously introduced. Minimum annular space shall be three inches. In wells greater than 100 feet the length of grout seal shall not be less than 100 feet as measured from the land surface to the end of the grout zone. Other methods of grouting must be approved by the Department prior to installation.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: June 7, 2000; December 12, 2005.

335-7-5-.06 Blasting, Cleaning and Chemical Conditioning. The Department shall be notified 14 days prior to reconditioning any well by blasting or use of chemical additives. Additives shall be of a type that will not adversely affect the aquifer. Analysis of the water showing it to be free of the additives used shall be available prior to reuse of the well.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective January 25, 1999; December 12, 2005.

335-7-5-.07 Aquifer Test. An aquifer test of a finished community system production well shall be conducted to determine the aquifer storage coefficient and transmissivity. The test method shall be clearly outlined in the engineering specifications for the project and the test procedure shall be continuous with adequate provisions taken to prevent disruption of the test. The calculated storage coefficient and transmissivity values shall be used to determine the SWAA.

(a) Several days before initiating the aquifer test, the well shall be pumped for several hours to determine the following:

1. The maximum anticipated drawdown,

2. The approximate capacity of the well and

3. If the pump discharge will affect recharge to the well during the anticipated period of the aquifer test.

(b) Steps shall be taken to assure accuracy of the drawdown during the aquifer test.

1. Accurate drawdown readings shall be taken in both the production and observation wells simultaneously. Readings will be taken every 2 minutes for the first hour, every 5 minutes for the next hour, every 10 minutes for the next 2 hours, every 30 minutes for the next 2 hours and then hourly until the end of the test.

2. Drawdown data collected during the period of testing shall be corrected for changes in barometric pressure and tidal oscillations.

3. Recovery water level data shall be determined and recorded simultaneously for both the observation well and production well.

4. The aquifer test shall be conducted for the continuous period required to stabilize the water level at the design capacity.

5. If the aquifer test cannot be conducted according to requirements of this paragraph, a written request shall be submitted to the Department supporting a waiver of this method.

(c) An aquifer test exemption may be granted for wells completed in karst formations under conduit flow conditions and for confined wells with sources of water greater than 600 feet deep. Waivers from the aquifer test can be considered by the Department after receipt of well logs, documented confining layers, proposed construction standards and a waiver request from the applicant.

(d) A public water system with a proposed well exempted from the aquifer test must conduct a capacity test in accordance with 335-7-5-.09.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: Adopted: September 19, 1995 (ER); November 28, 1995.
Amended: December 8, 1998; effective January 25, 1999; June 7, 2000; December 12, 2005.

335-7-5-.08 Development. After completion, a well shall be thoroughly developed to remove all sand, cuttings, and drilling fluids from the well and aquifer. The permanent pumping equipment shall not be used to develop a well.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and adopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005.

335-7-5-.09 Capacity Test. In addition to an aquifer test, all community and NTNC water supply wells shall be tested for yield, drawdown and recovery before being approved for use. The test method shall be clearly outlined in the engineering specifications for the project. The test pumping procedure must be continuous with adequate provisions taken to prevent disruption of the test. The length of the test shall be dependent on the clarity of the water, the amount of sand, or other material produced, and the fluctuation of the water level. During the pumping test, the water level shall not be lowered to the top of the uppermost water bearing formation used. A copy of all available information from the capacity test shall be forwarded to the Department for review.

(a) The capacity test for community system wells shall be conducted as follows:

1. The well shall be pumped at the design capacity until the water level has stabilized (+/- 1.0 foot),

2. After stabilization has occurred, the well shall be pumped for 24 hours with water level readings collected at regular intervals,

3. After the water level in the well has been stabilized at the design capacity for 24 hours, the pumping rate shall be increased to 150% of the design capacity,

4. Once the water level is stabilized the well shall be pumped for six hours with the water level recorded at regular time intervals, and

5. At the end of the six hour period the well pump shall be turned off and the water levels shall be recorded until the pre-test water level is obtained.

(b) If the capacity test cannot be conducted according to 335-7-5-.09(a) a written request shall be submitted to the Department supporting a waiver of this method. If the Department grants a waiver, the capacity test shall be conducted for a period of at least 10 days after the water level has stabilized at the proposed design capacity.

(c) The capacity test for NTNC system wells shall be conducted for the period necessary to stabilize the water level at the design capacity for a minimum of 12 hours.

(d) Department approval shall be obtained prior to any significant increases in capacity to an existing well source. A proposal to significantly increase the capacity of an existing well source shall be accompanied by a satisfactory capacity test at the proposed site, (using procedures a or b above), a set of chemical (regulated and unregulated) and bacteriological analysis, an updated SWAA delineation, contaminant source inventory, susceptibility analysis and an application (with fee) for a permit modification.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1999; June 7, 2000; December 12, 2005; January 18, 2011.

335-7-5-.10 Well Construction Information. Drill cuttings from community and NTNC water wells shall be obtained at ten foot intervals and all pronounced changes in formations. Cuttings shall be logged on site or bagged and submitted to a geologist for geologic log interpretations. The following shall be submitted to the Department:

(a) An accurate record of the drill hole diameters and depths,

(b) The assembled order of size and length of casings and liners,

(c) Grouting depths,

(d) Well schematic or diagram and a geologic log which describes and identifies depth and thickness of the formations penetrated,

(e) Static and pumping water levels for projected operation, and

(f) Location of blast shots, test wells, or observation wells.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective January 25, 1999; June 7, 2000; December 12, 2005.

335-7-5-.11 Water Level Measurement. Provisions shall be made for periodic measurement of the static and pumping water levels in all community wells and all NTNC wells constructed after the effective date of this rule.

(a) An airline with depth gauges for periodic measurement of water level shall be constructed of minimum 3/8" diameter material sufficient to prevent rupturing or cracking as a result of age and environmental conditions inside the well; or

(b) A continuous monitoring and recording water level measurement system.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998 effective January 25, 1999; June 7, 2000; December 12, 2005; August 5, 2016.

335-7-5-.12 Shallow Wells. Community and NTNC wells directly influenced by surface water are considered a surface source and must comply with chapter 335-7-6. Therefore, unless specifically approved by the Department no proposed well shall be accepted as a groundwater source if the water bearing formation is less than 100 feet from the ground surface. The following information is required to evaluate any proposed community well source with a water bearing formation less than 100 feet from the ground surface:

(a) A comprehensive geologic report complying with SWA requirements and demonstrations the proposed well will be protected from surface water influences and contaminants in its recharge area.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1999; June 7, 2000; December 12, 2005.

335-7-5-.13 Springs. Springs, quarries, and other groundwater sources open to the atmosphere and under the direct influence of surface water are classified as a surface source requiring complete treatment and filtration. A proposal for use of a spring without complete treatment shall meet the following requirement:

(a) The results of flow, turbidity and temperature data taken twice weekly for a minimum of 12 consecutive months,

(b) Total and fecal coliform (or *E. coli*) bacteria results from weekly sampling for a minimum of 12 consecutive months,

(c) Data indicating the site is not subject to flooding, and

(d) Analysis results from a certified laboratory for all contaminants identified in the primary and secondary standards and any listed unregulated contaminants.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977, Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1998; June 7, 2000; December 12, 2005; September 25, 2012.

335-7-5-.14 Abandoned Wells. Abandoned wells and bore holes shall be filled and sealed to prevent contamination of ground water formations. Where feasible or when required by the Department, wells shall be completely filled with neat cement. Other wells shall be sealed in accordance with the most recent American Water Works Association Standards, except that the sealing material for the top 20 feet of fill must be neat cement and no material that could impart taste, odor, or toxic components to water may be used in the sealing process.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective January 25, 1999; December 12, 2005.

335-7-5-.15 Ground Water Quality. The quality of water produced from wells and springs must be determined through analysis of samples representative of the sources.

(a) Physical Quality. Water produced from wells or springs to serve a community or NTNC system shall be free of rock or sand particles, silt, mud, or other foreign material. If compliance cannot be judged through visual observation, the following procedures shall be followed:

1. A turbidity test shall be performed according to methods approved by the Department and the results submitted to the Department.

2. A sample of the water shall be subjected to centrifuge or filtering tests. The test method shall be submitted by the project engineer to the Department which shall review and approve the method and apparatus prior to testing. If the design and apparatus are approved, the full capacity of the well upon start-up shall be tested for ten minutes. The maximum acceptable amount of material collected is one part per million.

(b) Bacteriological Quality. Every new, modified or reconditioned groundwater source shall be tested for bacteriological quality. A minimum of three chlorine free water samples collected at various periods during the capacity test shall be analyzed for both total and fecal coliform (or *E. coli*) bacteria by a laboratory certified by the Department. After the final pumping equipment has been installed and properly disinfected, at least two samples of chlorine free water shall be analyzed by a laboratory certified by the Department for total and fecal coliform (or *E. coli*) bacteria. All results shall be submitted to the Department.

(c) Chemical Quality. After completion of the finished community or NTNC well, representative samples shall be analyzed for all primary and secondary contaminants, including inorganic, radiological and VOCs (regulated and unregulated). These analyses must be performed by a laboratory certified by the Department and a copy of the results shall be submitted to the Department prior to a request for a final inspection. Plans for providing treatment facilities should be provided at this time should any parameter not meet established standards.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: September 19, 1995 (ER); November 28, 1995; December 8, 1998; effective January 25, 1999; June 7, 2000; December 12, 2005; September 25, 2012.

335-7-5-.16 Treatment of Groundwater. Treatment facilities must be constructed by community and NTNC systems to provide water meeting all primary and secondary drinking water standards. Treatment facilities maintaining more than 2500 pounds of chlorine should contact ADEM Air

Division to determine responsibilities under the Accidental Release Prevention and Risk Management Program.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective January 25, 1999; December 12, 2005.

335-7-5-.17 Disinfection Requirements. Disinfection of the water shall be accomplished using a chemical or treatment technique accepted by the Department. Sufficient contact time to allow proper disinfection to take place must be provided as follows:

(a) A chlorine concentration time (CT) of at least 60 shall be provided when the average monthly turbidity is less than five NTU, and

1. The geologic conditions are such that contamination may occur, or

2. The average total coliform count of the raw water exceeds 20 per 100 milliliters but is less than 100 per 100 milliliters for an average of weekly samples for a minimum of four consecutive months, or

3. The average fecal coliform (or *E. coli*) count of the raw water exceeds five per 100 milliliters but is less than 20 per 100 milliliters for an average of weekly samples for a minimum of four consecutive months.

4. Should a disinfectant other than chlorine be used, an equivalent CT time will be provided by the Department.

(b) Water systems shall maintain an adequate level of disinfectant residual in the distribution system at all times. This residual shall be determined and recorded daily from an approved sampling site or other representative point in the system. For systems using chlorine as disinfectant, the residual shall be maintained at a level no less than 0.2 mg/L free chlorine. Should the residual at a sampling site fall below 0.2 mg/L and not be restored within four hours, a treatment technique violation has occurred requiring appropriate public notification within 14 days. Should the disinfectant residual not be restored within 24 hours, microbiological samples representative of the effected area shall be collected. Should these samples show system contamination, an acute violation has resulted, requiring appropriate notification.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective: January 25, 1999; June 7, 2000; December 12, 2005; September 25, 2012.

335-7-5-.18 Filtration Requirements. Treatment processes to include filtration are required when raw water quality from a groundwater source exceeds any of the following parameters:

(a) Turbidity - 5.0 NTU

(b) Total Coliform - 100 per 100 milliliter of sample

(c) Fecal Coliform (or *E. coli*) - 20 per 100 milliliter of sample

(d) Iron - 0.6 milligrams per liter

(e) Manganese - 0.1 milligrams per liter

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective: January 25, 1999; June 7, 2000; December 12, 2005; September 25, 2012.

335-7-5-.19 Filtration Processes. Treatment processes, including filtration, are required to reduce contaminant levels to meet existing standards. Coating materials inside the filter shall not impart an undesirable taste, odor or contribute to an increase in the concentration of any regulated contaminants to the water. A minimum of two filter units shall be installed. Provisions shall be made for the control of the filtration and wash rates, for an adequate supply of backwash water and for a separate filter-to-waste system for each filter. Filtration rates shall not exceed 4 gpm/sf, unless approved by the Department.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective January 25, 1999; December 12, 2005.

335-7-5-.20 Chemicals Used in Ground Water Treatment.

(1) Chemicals used in groundwater treatment, other than alum, lime, chlorine, potassium permanganate, caustic soda, soda ash, powdered activated carbon, and hydrofluosilicic acid must be approved by the Department prior to use. Systems currently using chemicals other than these and not having prior ADEM concurrence shall submit required information within six months of the effective date of these regulations. Information regarding company name, telephone number, address and chemicals supplied must be maintained in a file at the plant. All chemical manufacturers supplying chemicals to the treatment plant for the past two years shall be maintained on this list. Water Systems shall determine that the chemical or substance to be added and the proposed application rate meets the ANSI/NSF standard 60. Only products meeting these

standards shall be used by supplier of water and certification that such a product meets these standards must be determined through evaluation by a program certified by the American National Standards Institute or Underwriters Laboratory. Water Systems shall provide a list of the type, name, and manufacturer, and certification document requesting departmental approval prior to use of the substance or chemical. Water treatment chemicals containing acrylamide or epichlorohydrin are prohibited from use in water treatment plants unless the system provides annually a written certification to the department that when acrylamide and/or epichlorohydrin are used to treat water, the combination of dose and monomer level does not exceed the following levels: acrylamide - 0.05% dosed at 1ppm or equivalent. Epichlorohydrin - 0.01% dosed at 20 ppm or equivalent. Name of the chemical used and daily average dose rate shall be shown on the monthly operation data report for the plant.

(2) Chemicals shall be stored in containers as received or otherwise their containers shall be labeled to indicate the name of the chemical. Chemicals shall be controlled to prevent contamination with other chemicals and to eliminate any dangerous mixing of chemicals. Acid storage tanks must be vented to the outside atmosphere in a separate vent stack.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990.
Amended: December 8, 1998; effective: January 25, 1999; December 12, 2005.

335-7-5-.21 Additional Requirements for Ground Water Under the Influence of Surface Water. Systems deemed ground water under the influence of surface water must meet the requirements established in 335-7-6.

Author: William D. McClimans, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: May 30, 2003.
Amended: December 12, 2005.

335-7-5-.22 Ground Water Rule.

(1) Applicability. This rule applies to all public water systems that use ground water except that it does not apply to public water systems that combine all of their ground water with surface water or with ground water under the direct influence of surface water prior to treatment of surface water or ground water under the influence of surface water. For the purposes of this rule, "ground water system" is defined as any public water system meeting this applicability statement, including consecutive systems receiving finished ground water.

(2) General requirements. Systems subject to this rule must comply with the following requirements:

(a) Sanitary survey information requirements for all ground water systems as described in paragraph (4) of this rule.

(b) Microbial source water monitoring requirements for ground water systems that do not treat all of their ground water to at least 99.99 percent (4-log) treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer as described in paragraph (5) of this rule.

(c) Treatment technique requirements, described in paragraph (6) of this rule, that apply to ground water systems that have fecally contaminated source waters, as determined by source water monitoring conducted under paragraph (5) of this rule, or that have significant deficiencies that are identified by the Department or that are identified by EPA under SDWA Section 1445. A ground water system with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this rule must implement one or more of the following corrective action options: correct all significant deficiencies; provide an alternate source of water; eliminate the source of contamination; or provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer.

(d) Ground water systems that provide at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in subparagraph (6)(b) of this rule.

(e) If requested by the Department, ground water systems must provide the Department with any existing information that will enable the Department to perform a hydrogeologic sensitivity assessment. For the purposes of this rule, "hydrogeologic sensitivity assessment" is a determination of whether ground water systems obtain water from hydrogeologically sensitive settings.

(3) Compliance date. Ground water systems must comply, unless otherwise noted, with the requirements of this rule beginning December 1, 2009.

(4) Sanitary surveys for ground water systems.

(a) Ground water systems must provide the Department, at the Department's request, any existing information that will enable the Department to conduct a sanitary survey.

(b) For the purposes of this rule, a "sanitary survey," as conducted by the Department, includes but is not limited to, an onsite review of the water source(s) (identifying sources of contamination by using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to

evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

(c) The sanitary survey must include an evaluation of the applicable components listed in subparagraphs (c)1. through 8. below:

1. Source,

2. Treatment,

3. Distribution system,

4. Finished water storage,

5. Pumps, pump facilities, and controls,

6. Monitoring, reporting, and data verification,

7. System management and operation, and

8. Operator compliance with Department requirements.

(d) Ground water systems must comply with any changes the Department makes to the site sampling plan required by ADEM Admin. Code 335-7-2-.07. This includes any changes made during a special monitoring evaluation of their plan by the Department during a sanitary survey.

(5) Ground water source microbial monitoring and analytical methods.

(a) Triggered source water monitoring.

1. General requirements. A ground water system must conduct triggered source water monitoring if the conditions identified in subparagraphs (5)(a)1.(i) - (ii) below exist.

(i) The system does not provide at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for each ground water source; and

(ii) The system is notified that a sample collected under rule 335-7-2-.07 is total coliform-positive and the sample is not invalidated by the Department in implementing rule 335-7-2-.07.

2. Sampling requirements. A ground water system must collect, within 24 hours of notification of the total coliform-positive sample, at least one ground water source sample from each ground water source in use at the time the total coliform-positive sample was collected under rule 335-7-2-.07, except as provided in subparagraph (a)2.(ii) of this paragraph.

(i) The Department may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the ground water source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Department must specify how much time the system has to collect the sample.

(ii) If approved by the Department, systems with more than one ground water source may meet the requirements of subparagraph (5)(a)2. of this rule by sampling a representative ground water source or sources. If directed by the Department, systems must submit for Department approval a triggered source water monitoring plan that identifies one or more ground water sources that are representative of each monitoring site in the system's sample siting plan under rule 335-7-2-.07 that the system intends to use for representative sampling under this paragraph. The system must list the ground water source(s) that will be used for each site and the conditions in which they will use each site.

3. Additional requirements. If the Department does not require corrective action under subparagraph (6)(a)2. of this rule for a fecal indicator-positive source water sample collected under subparagraph (5)(a)2. of this rule that is not invalidated under subparagraph (5)(d) of this rule, the system must collect five additional source water samples from the same source within 24 hours of being notified of the fecal indicator-positive sample.

4. Consecutive and wholesale systems.

(i) In addition to the other requirements of this paragraph, a consecutive ground water system that has a total coliform-positive sample collected under rule 335-7-2-.07 must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

(ii) In addition to the other requirements of this paragraph, a wholesale ground water system must comply with subparagraphs (I) and (II) below.

(I) A wholesale ground water system that receives notice from a consecutive system it serves that a sample collected under rule 335-7-2-.07 is total coliform-positive must, within 24 hours of being notified, collect a sample from its ground water source(s) under subparagraph (5)(a)2. of this rule and analyze it for a fecal indicator under subparagraph (5)(c) of this rule.

(II) If the sample collected under subparagraph (5)(a)2. of this rule is fecal indicator-positive, the wholesale ground water system must notify all consecutive systems served by that ground water source of the fecal indicator source water positive within 24 hours of being notified of the ground water source sample monitoring result and must meet the requirements of subparagraph (5)(a)3. of this rule.

5. Exceptions to the triggered source water monitoring requirements. A ground water system is not required to comply with the source water monitoring requirements of subparagraph (5)(a) of this rule if either of the following conditions exists:

(i) The Department determines, and documents in writing, that the total coliform-positive sample collected under rule 335-7-2-.07 is caused by a distribution system deficiency; or

(ii) The total coliform-positive sample collected under rule 335-7-2-.07 is collected at a location that meets Department criteria for distribution system conditions that will cause total coliform-positive samples.

(b) Assessment source water monitoring. If directed by the Department, ground water systems must conduct assessment source water monitoring that meets Department-determined requirements for such monitoring. A ground water system conducting assessment source water monitoring may use a triggered source water sample collected under subparagraph (5)(a)2. of this rule to meet the requirements of subparagraph (5)(b) of this rule. Department-determined assessment source water monitoring requirements may include:

1. Collection of a total of 12 ground water source samples that represent each month the system provides ground water to the public,

2. Collection of samples from each well unless the system obtains written Department approval to conduct monitoring at one or more wells within the ground water system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting,

3. Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used,

4. Analysis of all ground water source samples using approved EPA methodology found in 40 CFR 141.402(c)(2) and by a laboratory certified by EPA or the Department for the presence of *E. Coli*, enterococci, or coliphage.

5. Collection of ground water source samples at a location prior to any treatment of the ground water source unless the Department approves a sampling location after treatment, and

6. Collection of ground water source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the Department approves an alternate sampling location that is representative of the water quality of that well.

(c) Analytical methods.

1. A ground water system subject to the source water monitoring requirements of paragraph (5) of this rule must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

2. A ground water system must analyze all ground water source samples collected under paragraph (5) of this rule using approved EPA

methodology found in 40 CFR 141.402(c)(2) and by a laboratory certified by EPA or the Department for the presence of *E. Coli*, enterococci, or coliphage.

(d) Invalidation of a fecal indicator-positive ground water source sample.

1. A ground water system may obtain Department invalidation of a fecal indicator-positive ground water source sample collected under subparagraph (5)(a) of this rule only under the conditions specified in subparagraph (5)(d)1.(i) - (ii) of this rule.

(i) The system provides the Department with written notice from the laboratory that improper sample analysis occurred; or

(ii) The Department determines and documents in writing that there is substantial evidence that a fecal indicator-positive ground water source sample is not related to source water quality.

2. If the Department invalidates a fecal indicator-positive ground water source sample, the ground water system must collect another source water sample under subparagraph (5)(a) of this rule within 24 hours of being notified by the Department of its invalidation decision and have it analyzed for the same fecal indicator using the analytical methods in subparagraph (5)(c) of this rule. The Department may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Department will specify how much time the system has to collect the sample.

(e) Sampling location.

1. Any ground water source sample required under subparagraph (5)(a) of this rule must be collected at a location prior to any treatment of the ground water source unless the Department approves a sampling location after treatment.

2. If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a Department-approved location to meet the requirements of subparagraph (5)(a) of this rule if the sample is representative of the water quality of that well.

(f) New sources. If directed by the Department, a ground water system that places a new ground water source into service after November 30, 2009, must conduct assessment source water monitoring under subparagraph (5)(b) of this rule. If directed by the Department, the system must begin monitoring before the ground water source is used to provide water to the public.

(g) Public notification. A ground water system with a ground water source sample collected under subparagraph (5)(a) or (b) of this rule that is fecal indicator-positive and that is not invalidated under subparagraph (5)(d) of this

rule, including consecutive systems served by the ground water source, must conduct public notification under 335-7-2-.21(1)(f).

(h) Monitoring violations. Failure to meet the requirements of subparagraphs (5)(a) – (f) of this rule is a monitoring violation and requires the ground water system to provide public notification under subparagraphs 335-7-2-.21(4)(a) - (d).

(6) Treatment technique requirements for ground water systems.

(a) Ground water systems with significant deficiencies or source water fecal contamination.

1. The treatment technique requirements of this rule must be met by ground water systems when a significant deficiency is identified or when a ground water source sample collected under subparagraph (5)(a)3. of this rule is fecal indicator-positive.

2. If directed by the Department, a ground water system with a ground water source sample collected under subparagraphs (5)(a)2., (5)(a)4., or (5)(b) of this rule that is fecal indicator-positive must comply with the treatment technique requirements of this rule.

3. When a significant deficiency is identified at a public water system that uses both ground water and surface water or ground water under the direct influence of surface water, the system must comply with provisions of this paragraph except in cases where the Department determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or ground water under the direct influence of surface water.

4. Unless the Department directs the ground water system to implement a specific corrective action, the ground water system must consult with the Department regarding the appropriate corrective action within 30 days of receiving written notice from the Department of a significant deficiency, written notice from a laboratory that a ground water source sample collected under subparagraph (5)(a)3. of this rule was found to be fecal indicator-positive, or direction from the Department that a fecal indicator's positive collected under subparagraphs (5)(a)2., (5)(a)4., or (5)(b) of this rule requires corrective action. For the purposes of this rule, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the Department determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

5. Within 120 days (or earlier if directed by the Department) of receiving written notification from the Department of a significant deficiency, written notice from a laboratory that a ground water source sample collected under subparagraph (5)(a)3. of this rule was found to be fecal indicator-positive, or direction from the Department that a fecal indicator-positive sample collected

under subparagraphs (5)(a)2., (5)(a)4., or (5)(b) of this rule requires corrective action, the ground water system must either:

(i) Have completed corrective action in accordance with applicable Department plan review processes or other Department guidance or direction, if any, including Department-specified interim measures; or

(ii) Be in compliance with a Department-approved corrective action plan and schedule subject to the conditions specified in subparagraphs (6)(a)5.(ii)(I) through (II) below.

(I) Any subsequent modifications to a Department-approved corrective action plan and schedule must also be approved by the Department.

(II) If the Department specifies interim measures for protection of the public health pending Department approval of the corrective action plan and schedule or pending completion of the corrective action plan, the system must comply with these interim measures as well as with any schedule specified by the Department.

6. Corrective action alternatives. Ground water systems that meet the conditions of subparagraph (6)(a)1. or 2. of this rule must implement one or more of the following corrective action alternatives:

(i) Correct all significant deficiencies;

(ii) Provide an alternate source of water;

(iii) Eliminate the source of contamination; or

(iv) Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

7. Special notice to the public of significant deficiencies or source water fecal contamination.

(i) In addition to the applicable public notification requirements of 335-7-2-.21(1)(f), a community ground water system that receives notice from the Department of a significant deficiency or notification of a fecal indicator-positive ground water source sample that is not invalidated by the Department under subparagraph (5)(d) of this rule must inform the public served by the water system under rule 335-7-14-.04(6) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the ground water source is determined by the Department to be corrected under subparagraph (6)(a)5. of this rule.

(ii) In addition to the applicable public notification requirements of 335-7-2-.21(1)(f), a non-community ground water system that receives notice

from the Department of a significant deficiency must inform the public served by the water system in a manner approved by the Department of any significant deficiency that has not been corrected within 12 months of being notified by the Department, or earlier if directed by the Department. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

(I) The nature of the significant deficiency and the date the significant deficiency was identified by the Department;

(II) The Department-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and

(III) For systems with a large proportion of non-English speaking consumers, as determined by the Department, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

(iii) If directed by the Department, a non-community water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under subparagraph (6)(a)7.(ii) of this rule.

(b) Compliance monitoring.

1. Existing ground water sources. A ground water system that is not required to meet the source water monitoring requirements of this rule for any ground water source because it provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for any ground water source before December 1, 2009, must notify the Department in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified ground water source and begin compliance monitoring in accordance with subparagraph (6)(b)3. of this rule by December 1, 2009. Notification to the Department must include engineering, operational, or other information that the Department requests to evaluate the submission. If the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source, the system must conduct ground water source monitoring as required under paragraph (5) of this rule.

2. New ground water sources. A ground water system that places a ground water source in service after November 30, 2009, that is not required to meet the source water monitoring requirements of this rule because the system provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before

or at the first customer for the ground water source must comply with the requirements of subparagraphs (6)(b)2.(i) - (iii) below.

(i) The system must notify the Department in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source. Notification to the Department must include engineering, operational, or other information that the Department requests to evaluate the submission.

(ii) The system must conduct compliance monitoring as required under subparagraph (6)(b)3. of this rule within 30 days of placing the source in service.

(iii) The system must conduct ground water source monitoring under paragraph (5) of this rule if the system subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for the ground water source.

3. Monitoring requirements. A ground water system subject to the requirements of subparagraphs (6)(a), (6)(b)1. or (6)(b)2. of this rule must monitor the effectiveness and reliability of treatment for that ground water source before or at the first customer as follows:

(i) Chemical disinfection.

(I) Ground water systems serving greater than 3,300 people. A ground water system that serves greater than 3,300 people must continuously monitor the residual disinfectant concentration using approved EPA methodology found in 40 CFR 141.74(a)(2) at a location approved by the Department and must record the lowest residual disinfectant concentration each day that water from the ground water source is served to the public. The ground water system must maintain the Department-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. If there is a failure in the continuous monitoring equipment, the ground water system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

(II) Ground water systems serving 3,300 or fewer people. A ground water system that serves 3,300 or fewer people must monitor the residual disinfectant concentration using approved EPA methodology found in 40 CFR 141.74(a)(2) at a location approved by the Department and record the residual disinfection concentration each day that water from the ground water source is served to the public. The ground water system must maintain the Department-determined residual disinfectant concentration every day the ground water system serves water from the ground water source to the public. The ground water system must take a daily grab sample during the hour of peak flow or at another time specified by the Department. If any daily grab sample measurement falls below the Department-determined residual disinfectant concentration, the

ground water system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the Department-determined level. Alternatively, a ground water system that serves 3,300 or fewer people may monitor continuously and meet the requirements of subparagraph (6)(b)3.(i)(I) of this rule.

(ii) Membrane filtration. A ground water system that uses membrane filtration to meet the requirements of this rule must monitor the membrane filtration process in accordance with all Department-specified monitoring requirements and must operate the membrane filtration in accordance with all Department-specified compliance requirements. A ground water system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when:

(I) The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;

(II) The membrane process is operated in accordance with Department-specified compliance requirements; and

(III) The integrity of the membrane is intact.

(iii) Alternative treatment. A ground water system that uses a Department-approved alternative treatment to meet the requirements of this rule by providing at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer must:

(I) Monitor the alternative treatment in accordance with all Department-specified monitoring requirements; and

(II) Operate the alternative treatment in accordance with all compliance requirements that the Department determines to be necessary to achieve at least 4-log treatment of viruses.

(c) Discontinuing treatment. A ground water system may discontinue 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source if the Department determines and documents in writing that 4-log treatment of viruses is no longer necessary for that ground water source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of paragraph (5) of this rule.

(d) Failure to meet the monitoring requirements of subparagraph (6)(b) of this rule is a monitoring violation and requires the ground water system to provide public notification under subparagraphs 335-7-2-.21(4)(a) - (d).

(7) Treatment technique violations for ground water systems.

(a) A ground water system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the Department) of receiving written notice from the Department of the significant deficiency, the system:

1. Does not complete corrective action in accordance with any applicable Department plan review processes or other Department guidance and direction, including Department specified interim actions and measures, or

2. Is not in compliance with a Department-approved corrective action plan and schedule.

(b) Unless the Department invalidates a fecal indicator-positive ground water source sample under subparagraph (5)(d) of this rule a ground water system is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the Department) of meeting the conditions of subparagraph (6)(a)1. or subparagraph (6)(a)2. of this rule the system:

1. Does not complete corrective action in accordance with any applicable Department plan review processes or other Department guidance and direction, including Department-specified interim measures, or

2. Is not in compliance with a Department-approved corrective action plan and schedule.

(c) A ground water system subject to the requirements of subparagraph (6)(b)3. of this rule that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log virus inactivation and removal) before or at the first customer for a ground water source is in violation of the treatment technique requirement if the failure is not corrected within four hours of determining the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

(d) Ground water system must give public notification under subparagraphs 335-7-2-.21(1)(a) - (e) for the treatment technique violations specified in subparagraphs (7)(a), (7)(b) and (7)(c) of this rule.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 26, 2009; September 25, 2012.
Amended: August 5, 2016

335-7-5-.23 New Groundwater Facilities.

(1) Wells, treatment facilities, pumping stations and tanks permitted as of January 1, 2012 must meet the following requirements:

(a) Have a lockable fence that is of sufficient size and height as to deter entry of unauthorized persons;

(b) Have an enclosure(s) for wells, treatment facilities and pumping stations that is (are) lockable to deter entry of unauthorized personnel and of sufficient size to allow for proper maintenance, and,

(c) Be equipped with auxiliary power capacity capable of operating the essential equipment at each facility or have the ability to connect a portable generator capable of operating the essential equipment.

(2) If any of the requirements of this rule cannot be met or are being met by an equivalent design, a written request, along with sufficient justification, shall be submitted to the Department for a waiver from all or part of this rule.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 18, 2011.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-6
SURFACE WATER SOURCES AND TREATMENT

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335-7-6-.01 Definitions. The following words and phrases, unless a different meaning is plainly required by the context, shall have the following meaning:

(a) Bag filters--pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric media housed in a pressure vessel in which the direction of flow is from the inside of the bag to outside.

(b) Bank filtration--a water treatment process that uses a well to recover surface water that has naturally infiltrated into ground water through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s).

(c) Cartridge filters--pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed as a rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

(d) Clarification--a process with the primary purpose of reducing the concentration of suspended matter in a liquid.

(e) Comprehensive performance evaluation (CPE)--a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. The comprehensive performance evaluation must consist of at least the following components: Assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

(f) Conventional treatment--treatment of surface water or ground water under the influence that includes the addition of a coagulant to the raw water and undergoes coagulation, flocculation, sedimentation, filtration and disinfection. Filtration is by gravity and the media is either slow sand or dual/multi-media.

(g) Day Tank--a tank sized to hold one day's average chemical usage.

(h) Disinfection profile—a summary of daily *Giardia lamblia* inactivation through the treatment plant and to the first customer.

(i) Disinfection segment--each individually confined volume of water before the first customer between the first point of disinfectant addition and the next point of disinfectant addition or the first customer.

(j) Enhanced coagulation--the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

(k) Filter profile--a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

(l) Flowing stream--a course of running water flowing in a definite channel.

(m) Intake--the structure where raw water is removed from source water for the purpose of transferring it to a water treatment plant.

(n) Lake/reservoir--refers to natural or man made basin or hollow of the Earth's surface in which water collects or is stored that may or may not have a current or single direction of flow.

(o) Membrane filtration--a pressure or vacuum driven separation process in which particulate matter larger than 1 micrometers is rejected by an engineered barrier, primarily through size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

(p) Mixing Basin--a tank, basin or pipe wherein agitation is applied to increase the dispersion rate of chemicals.

(q) Multi-stage flocculation--two or more defined stages or compartments that impart different G values to the coagulated water.

(r) Plant intake--the works or structures at the head of a conduit through which water is diverted from a source (e.g., river or lake) into a treatment plant.

(s) Presedimentation--a preliminary treatment process used to remove gravel, sand and other particulate material from the source water though settling before the water enters the primary clarification and filtration processes in a treatment plant.

(t) Raw water--water within a watershed used to supply an intake structure.

(u) Two-stage lime softening--a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

(v) SUVA--Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of a water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.
Amended: January 22, 2008.

335-7-6-.02 Applicability. These regulations apply to all public water systems using or proposing to utilize a surface water or ground water under the influence of surface water source as a supply of drinking water.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5,

22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.03 Source Selection Report. Any applicant for a permit proposing to utilize surface water or groundwater under the influence of surface water as a source for a drinking water treatment plant shall file a report in electronic format, unless paper format is approved by the Department in advanced, including the following:

(a) A map of the proposed source showing the drainage area in the vicinity of the proposed intake.

(b) Information showing the raw water source meets raw water quality criteria and has a use classification of public water supply in accordance with ADEM Admin. Code chapter 335-6-11.

(c) The system must provide verification that the source has adequate capacity at all times, even during drought years, to meet the proposed capacity of the water treatment plant.

(d) An approved source water assessment meeting the requirements of ADEM Admin. Code r. 335-7-15.

(e) Twelve months of raw water data, including the following:

1. weekly results of turbidity, temperature, pH, alkalinity, iron, manganese and color,

2. monthly results for total coliform and *E. coli* bacteria,

3. quarterly analysis results from a certified laboratory for all contaminants identified in the primary and secondary standards and any listed unregulated contaminants,

4. quarterly analysis indicating the potential maximum TTHM and HAA5 levels, and

5. monthly analyses of the TOC levels, *Cryptosporidium* and *Giardia*.

(f) A study showing the source will be responsive to the treatment outlined in the engineering report and that the expected finished water will comply with all primary and secondary standards.

(g) The Department's written concurrence of this report shall be received by the applicant prior to the submittal of a permit application package for construction of the intake.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005; January

22, 2008; September 25, 2012.

335-7-6-.04 Treatment Requirements. The treatment provided for all surface water and ground water under the influence of surface water must meet the following requirements:

(a) Conventional surface water treatment shall be required at all surface water or ground water under the influence of surface water treatment facilities, unless otherwise approved by the Department.

(b) Provisions to bypass various processes in the treatment are prohibited, unless approved by the Department.

(c) Treatment provided shall produce water meeting both primary and secondary standards with a goal for particulate removal to result in a clarified water turbidity less than 2.0 NTU when the raw water turbidity level is greater than 10.0 NTU, a clarified water turbidity level less than 1.0 NTU when the raw water turbidity level is less than or equal to 10.0 NTU and a filtered water turbidity level less than 0.10 NTU, and be free of *Giardia lamblia*, *Cryptosporidium* oocysts, viruses, heterotrophic plate count bacteria, and Legionella.

(d) No exemptions from the filtration and disinfection processes are allowed.

(e) The treatment requirements consist of installing and properly operating water treatment processes which achieve the following:

1. At least 99.9 percent removal and/or inactivation of *Giardia lamblia* cyst and at least 99 percent removal of *Cryptosporidium* oocyst prior to service of the first customer, and

2. 99.99 percent removal and/or inactivation of viruses prior to service of the first customer.

3. Drinking water meeting all primary and secondary standards.

(f) Plants with a raw water source receiving treated or untreated wastewater or having a watershed with high contaminant potential may be required to install equipment to measure, count and record particle size of particles passing through plant filters to demonstrate compliance with the requirements of 335-7-6-.04(e).

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005, Readopted: December 12, 2005; September 25, 2012.

335-7-6-.05 Surface Water Intake Structures. All surface water intake

structures that are permitted for construction after December 31, 2005 must meet the following requirements, unless a waiver is granted by the Department:

(a) Provide for the withdrawal of water from more than one level unless written approval is obtained from the Department.

(b) All motors and electrical controls must be located above grade and the 100 yearflood level except when submersible pumps are approved by the Department.

(c) Structures must be equipped with removable or traveling screens before the pump suction well or equipped with other means for clearing the screens.

(d) A minimum of two pumps sized to meet the treatment plant design capacity are required. Intakes with more than two pumps must be able to meet the treatment plant design capacity with the largest pump out of service.

(e) Incorporate into the design provisions for preventing surge or water hammer damage when necessary.

(f) Equip discharge piping from the raw water pumping station with a device capable of measuring and totaling the flow.

(g) Provide ample space in the interior of the raw water pumping station for adequate maintenance.

(h) Structures should have adequate lighting to provide for the necessary observation of equipment operation.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005; September 25, 2012.

335-7-6-.06 Conventional Treatment Processes. All surface water and ground water under the influence of surface water treatment plants utilizing a conventional treatment process must meet the following requirements:

(a) Existing facilities (facilities constructed or permitted for construction prior to January 1, 2006) may obtain a waiver from these regulations for any portion that they currently do not comply with. Existing facilities modified after this date must include provisions to address these regulations.

(b) Mixing Basins: Provision shall be made for the rapid disbursement of coagulants in the raw water and the development of a floc according to the following:

1. A minimum of two mixing units shall be provided when mechanical mixers are used. Hydraulic mixing is permitted with prior approval from the Department.

2. Provision shall be made for the application of chemicals at various points in the treatment train.

3. A minimum detention time of 30 minutes shall be provided under normal flow conditions in the flocculation basin. The plant must demonstrate a minimum of sixty percent detention time before requesting authorization to place the water treatment plant into service.

4. A minimum of two multi-stage flocculation units is required.

5. Each flocculation unit shall be equipped with variable speed drive unless hydraulic flocculation is utilized.

(c) Settling Basins: Provision shall be made for the settling of floc according to the following:

1. A minimum of two sedimentation basins is required. A minimum settling period of four hours shall be provided in the basins. The plant must demonstrate a minimum of sixty percent settling time before requesting authorization to place the water treatment plant into service. Existing plants having only one sedimentation basin may obtain a waiver from the Department for the requirement for two sedimentation basins if the Department determines that construction of the additional basin would have a negative impact on plant and system operation.

2. Each basin shall be equipped with an automatic sludge removal system and drains.

3. Each basin shall be designed with a minimum length to width ratio of 2:1 and shall have a maximum surface overflow rate of 850 gallons per day per square foot of basin area.

4. Inlet and outlet design shall prevent short-circuiting and destruction of floc particles.

(d) Conventional Filtration: Provision shall be made for the filtering of settled water according to the following:

1. A minimum of two gravity type rapid dual media filters are required.

2. The rate of filtration shall not exceed two gallons per minute per square foot of filter bed area unless otherwise approved by the Department.

3. Each filter must be equipped with filter-to-waste capability.

4. Sufficient head room shall be available above filters to allow

inspection of the facility and access to the filter and sufficient illumination shall be provided above all filters that are enclosed.

5. Sample taps shall be provided on the filter effluent line from each filter.

6. Media used shall meet departmental design requirements.

7. A method of constantly controlling the rate of flow through each filter shall be provided.

8. A filter flow indicator and head loss indicator shall be present at each filter.

9. Provisions shall be made for continuously monitoring and recording the turbidity of the effluent from each filter and the filter-to-waste.

1.1 Equipment shall be installed and maintained to allow proper cleaning and backwashing of filters. Filters shall be backwashed when the head loss approaches or exceeds six feet, effluent turbidity approaches or exceeds 0.3 NTU, or there is a rapid increase in effluent turbidity. Water used for all backwashing procedures shall meet primary and secondary drinking water standards. A flow control device shall be available to regulate and indicate the rate of backwashing. Filters shall be designed to allow the operator to observe the backwashing procedures. After backwashing, the filter shall be filtered to waste until the turbidity in the filter to waste water is approximately NTU, but no greater than 0.3 NTU.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.07 Alternative Treatment Processes. All surface water and ground water under the influence of surface water treatment plants utilizing anything other than conventional treatment processes must meet the following requirements:

(a) Existing facilities (facilities constructed or permitted for construction prior to January 1, 2006) may obtain a waiver from these regulations for any portion that they currently do not comply with. Existing facilities modified after this date must include provisions to address these regulations.

(b) The minimum treatment processes required are mixing, clarification, conventional filtration and disinfection. Any deviation must have written Departmental approval.

(c) A pilot study is required to demonstrate the effectiveness of the process to achieve the required log removals of *Giardia lamblia* cyst, *Cryptosporidium* oocysts, and viruses as specified in rule 335-7-6-.04(e) on the

proposed raw water source. The duration of the pilot study must be a minimum of 30 consecutive days. The pilot study shall be conducted during a time when raw water turbidity is historically at its highest. A report on the pilot study must be submitted to the Department and approval obtained prior to the submittal of an application for a permit to construct.

(d) The Department will determine minimum design requirements for each individual treatment technology as they are proposed. These design requirements will be based on manufacturer recommendations and/or the results of the pilot study for the proposed treatment technology.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History Repealed: November 7, 2005; Readopted: December 12, 2005.
Amended: January 22, 2008; January 18, 2011.

335-7-6-.08 Membrane Filtration. Membrane filtration units may be used in place of conventional filtration. Membrane filtration units must meet the following requirements:

(a) A pilot study may be required to demonstrate the effectiveness of membrane filtration to achieve the required log removals of *Giardia lamblia* cyst, *Cryptosporidium* oocysts, and viruses a specified in rule 335-7-6-.04(e) on the proposed raw water source. The duration of the pilot study must be a minimum of 30 consecutive days. The pilot study shall be conducted during a time when raw water turbidity is historically high. A report on the pilot study must be submitted to the Department and approval obtained prior to the submittal of a construction application permit.

(b) Maximum flow rates through membrane filtration units will be determined based on the lowest historical water temperature for the raw water source.

(c) A minimum of two membrane filtration units is required.

(d) Each membrane train shall have a turbidimeter and an instrument capable of measuring particles less than 3 micrometers installed on the effluent side of the train.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: November 7, 2005; Readopted: December 12, 2005.
Amended: January 22, 2008.

335-7-6-.09 High Rate Filtration Requirements. Filtration rates for conventional filters greater than two gpm per square foot of filter area require a permit modification. For high rate filtration approval, the following requirements

must be met prior to the system requesting a permit modification:

(a) The duration of the High Rate Study must be a minimum of 30 consecutive days and during a time when raw water turbidity is historically at its highest. The plant must be operated 24 hours per day for the duration of the study.

(b) All treatment units must be utilized for the entire duration of the High Rate Study and operated at the proposed capacity. Any deviation from this requirement requires Departmental approval.

(c) The coagulation process shall be controlled either by zeta potential, streaming current detector or other approved methods.

(d) Indicating and recording turbidity monitors shall be provided for monitoring the turbidity of:

1. Raw water;

2. Clarified water prior to filtration at representative points;

3. Filter effluent from each filter.

(e) pH monitoring equipment shall be provided for monitoring

1. Raw water;

2. Treated water;

3. Finished water.

(f) Chlorine residual indicating and recording monitors shall monitor the finished water leaving the plant.

(g) Filtration rates shall not exceed eight gallons per minute per square foot of filter area.

(h) Filters shall be of the dual media or multimedia type.

(i) The plant shall meet the following parameters for a 12-month period prior to applying for approval to conduct a high rate study and applying for an increase in the filtration rate.

1. The treatment facility shall meet the Area Wide Optimization Program goals as set forth in the latest revision of EPA's handbook: Optimizing Water Treatment Plant Performance Using the Composite Correction Program or as specified by the Department.

2. The water system shall not have exceeded any primary or secondary water quality standards within the past 12-month period.

3. The water system shall have no outstanding violations or major

system deficiencies.

(j) The minimum detention time for the settling basins must be two hours with sludge removal and four hours without sludge removal. Basins equipped with tube settlers or plate settlers and continuous sludge removal do not have to meet the detention time requirement, but the flow rate through the tube or plate settlers cannot exceed the manufacturer's maximum recommended flow rate. A demonstration of the actual settling basin detention times must be completed along with the high rate filtration study.

(k) The detention times for the flash mix and flocculator basins will be waived.

(l) Water Treatment plants requesting high rate approval after December 31, 2005 must have a minimum of two treatment trains. These trains must be capable of independent operation from flocculation through filtration.

(m) Systems operating at filtration rates above four gpm/sf must meet the following additional requirements:

1. System must have 24 hour per day access to bacteriological analysis capabilities.

2. An annual evaluation of the raw water source shall be performed. This must include fecal coliform monitoring and an inventory of all discharges and activities which may impact the raw water quality available to the plant.

3. The system must analyze one sample per day from the water treatment plant's effluent for the presence of coliform and E-coli if any result is coliform positive. Any positive sample must be reported to the Department within 24 hours. The Department may increase the system's monthly bacteriological sampling requirements due to any positive result.

(n) Upon completion of the High Rate Study a report must be submitted to the Department for approval.

(o) Approval to operate at an increased filtration rate above two gpm per square foot of filter area can be revoked if any of the above conditions are not met or if the water system receives an unsatisfactory score on a Sanitary Survey Report.

Authors: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.
Amended: January 22, 2008; May 26, 2009.

335-7-6-.10 Disinfection.

(1) A disinfectant application rate must be provided to all filtered water to provide at least a one log *Giardia lamblia* cyst and a two log virus inactivation. This shall be demonstrated by providing a suitable contact time with a primary disinfectant. The acceptable primary disinfectants are chlorine, chlorine dioxide and Ultraviolet Light (UV). Chlorine is the preferred primary disinfectant. Chloramines may not be used as a primary disinfectant.

(a) Should chlorine be used as the primary disinfectant, a CT of at least 70 must be available or the system must demonstrate that a CT acceptable to the Department corresponding to the water characteristics and detention is available, but the chlorine residual entering the distribution system from each plant shall not be less than the level included on the facility's operating permit or less than 1.0 mg/L at any time.

(b) Approval from the Department must be obtained before using any disinfectant other than chlorine. Duplicate equipment may be required. A minimum CT for the disinfectant shall be provided in accordance with Departmental calculations and EPA guidance.

(c) Systems utilizing a primary disinfectant other than chlorine must add a secondary disinfectant to maintain disinfectant residuals in the distribution system. Acceptable secondary disinfectants are chlorine and/or chloramines. Chlorine is the preferred secondary disinfectant. If chlorine is used as a secondary disinfectant the minimum residual entering the distribution system from each treatment plant shall not be less than 1.0 mg/l at any time. Chloramines may be used as a secondary disinfectant only with written Departmental approval. The minimum chloramines residual entering the distribution system from each plant shall not be less than 2.0 mg/L at any time. Systems utilizing chloramines as a secondary disinfectant must revert to initial lead and copper monitoring as outlined in 335-7-11 for a minimum of three years.

(2) Any system that is proposing to change its primary disinfectant must submit to the Department a description of the proposed change, a disinfection profile (graphically) for *Giardia lamblia* and viruses, disinfection benchmark, and an analysis of how the proposed changes will affect the current level of disinfection.

(3) Failure to provide disinfection as required or correct a deficiency within 4 hours of occurrence results in a treatment technique violation requiring public notification within 14 days of occurrence. The Department shall be notified of all such deficiencies and resulting action no later than 48 hours of the occurrence of the deficiency.

(4) Any change to the disinfection practices which may affect the contact time must have prior written Departmental approval.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.11 Disinfection Profiling and Benchmarking.

(1) Systems must conduct disinfection profiling for all surface water sources and sources that have been designated as ground water under the influence of surface water that does not comply with one of the following must conduct disinfection profiling for up to three years beginning not later than March 16, 2000.

(a) The water system has conducted simultaneous monitoring of water in the distribution system for HAA5 and TTHM that meets the monitoring sample number and location requirements for TTHM. The arithmetic average of all results for the last four quarters of monitoring completed by March 16, 1999 is not greater than .064 mg/L for TTHM and not greater than .048 mg/L for HAA5.

(b) The water system has conducted monitoring in accordance with the Information Collection rule (ICR) and the arithmetic average of all results for the last four quarters of monitoring for TTHM is not greater than .064 mg/L and monitoring for HAA5 is not greater than .048 mg/L.

(c) The water system confirms a minimum CT using chlorine of no less than 70 is available between the filter effluent and the first customer and submits graphs of filtered water turbidity and probability profiles that demonstrate that the maximum turbidity of water each day from each water treatment plant filter determined every fifteen minutes for the last 12 consecutive months is no greater than 0.1 NTU in 95% of all samples analyzed and no individual turbidity determined on water from any filter exceeds 0.3 NTU.

(2) Any system required to conduct a disinfection profile must daily, during peak hourly flow, for a period of 12 consecutive calendar months:

(a) Determine the temperature, pH and residual disinfectant concentration (C) of water at a point just before each disinfectant is added and at or before the first customer,

(b) Determine the disinfectant contact time (T) in each disinfection segment before the first customer,

(c) Determine the total CT (CT_{Total}) of water before the first customer by adding the individual CT determined for each disinfection treatment segment before the first customer,

(d) Calculate the total *Giardia lamblia* and virus inactivation ratio by dividing the calculated CT (CT_{calc}) by the CT required for 99.9% inactivation ($CT_{99.9}$) for each successive disinfection segment,

(e) Determine the total logs of *Giardia lamblia* and virus inactivation by multiplying the sum of the *Giardia lamblia* and virus inactivation ratios ($CT_{calc}/CT_{99.9}$) for each successive disinfection segment by 3 (3 x Sum ($CT_{calc}/CT_{99.9}$)), and

(f) Retain the disinfection profile data in graphic form for onsite review by the Department and/or for submittal to the Department for review if requested.

(3) Any system required to develop a disinfection profile that decides to make a significant change or modification to its disinfection practice must contact the Department prior to making such change. Significant changes or modifications to disinfection practice include changes to the point of disinfection; disinfectant(s) used in the treatment plant; the disinfection process; or any other modifications identified by the Department as a significant change to disinfection.

(4) Any system that is proposing to change or alter its disinfection practice must submit a description of the proposed change, the disinfection profile (graphically), disinfection benchmark and an analysis of how the proposed changes will affect the current level of disinfection.

(5) Benchmarking is the process of defining the lowest *Giardia lamblia* inactivation value.

(a) For systems with one year of profiling data the disinfection benchmark is the lowest of 12 monthly average *Giardia lamblia* inactivation values.

(b) For systems with more than one year of profiling data the disinfection benchmark is the average of the lowest monthly *Giardia lamblia* inactivation average value in each year divided by the number of years profile data is collected.

(6) When determining the *Giardia lamblia* or virus inactivation, systems must use a method approved by the Department or EPA.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.
Amended: January 22, 2008.

335-7-6-.12 Chemicals Used In Water Treatment.

(1) Chemicals used in water treatment must be approved by the Department prior to use. Water Systems shall determine that the chemical or substance to be added and the proposed application rate meets the ANSI/NSF standard 60 or 61. Only products meeting these standards shall be used by supplier of water and certification that such a product meets these standards must be determined through evaluation by a program certified by the American National Standards Institute. Water Systems shall provide a list of the type, name, and manufacturer, and certification document requesting departmental approval prior to use of the substance or chemical. Water treatment chemicals containing acrylamide or epichlorohydrin are prohibited from use in water

treatment plants unless the system provides annually a written certification to the Department that when acrylamide and/or epichlorohydrin are used to treat water, the combination of dose and monomer level does not exceed the following levels: acrylamide - 0.05% dosed at 1ppm or equivalent. Epichlorohydrin - 0.01% dosed at 20 ppm or equivalent.

(2) Chemicals shall be stored in packages or containers as received or otherwise their containers shall be labeled to indicate the name of the chemical. Acid storage tanks must be vented to the outside atmosphere in a separate vent stack.

(3) Chemicals shall be controlled to prevent contamination with other chemicals and to eliminate any dangerous mixing of chemicals.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.13 Treatment Process Equipment.

(1) Existing treatment plants must comply with these requirements by December 31, 2007.

(2) Where a treatment process is necessary for the production of safe drinking water, such as chlorination or coagulation, a minimum of two sets of chemical feeders shall be provided. A standby unit or combination of units of sufficient capacity shall be made available to replace the largest unit during shutdowns. The capacity and design must comply with the following:

(a) Feeders shall be able to deliver the necessary amounts of treatment chemical accurately at all times.

(b) Feeders must be designed to prevent treatment chemicals from being siphoned into the water supply.

(c) Service water supply lines must be equipped with backflow prevention devices or an air gap must be provided between the supply line and solution tank.

(d) Feeders and supply lines must be resistant to the aggressiveness of the chemical solution.

(e) A means for calibration of the amount of chemical being fed should be available for each individual chemical feeder.

(f) Chlorine feed systems must be capable of accurately determining the amount of chemical being fed at each individual point of application.

Author: Edgar K. Hughes.

Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.14 Enhanced Coagulation. Systems using surface water or groundwater under the direct influence of surface water shall operate with enhanced coagulation to achieve the TOC percent removal levels specified in this section unless the system meets at least one of the alternative compliance criteria listed below.

(a) Systems that meet any of the following criteria do not have to demonstrate that the system has achieved TOC removal percentages in this section.

1. The system's raw water TOC running annual average, calculated quarterly, is less than 2.0 mg/L.

2. The system's treated water TOC running annual average, calculated quarterly, is less than 2.0 mg/L.

3. The treatment plant's raw water TOC annual average, calculated quarterly, is less than 4.0 mg/L, the raw water alkalinity annual average, calculated quarterly, is greater than 60 mg/L (as CaCO3), and either the TTHM and HAA5 annual averages for the treatment plant's sample sites are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to January 1, 2001, the system has made a clear and irrevocable financial commitment not later than January 1, 2001 to use technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. The water system must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the Department for approval not later than January 1, 2001. These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation.

4. The system's TTHM and HAA5 annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

5. The treatment plant's raw water SUVA annual average, measured monthly and calculated quarterly, is less than or equal to 2.0 L/mg-m.

6. The treatment plant's finished water SUVA annual average, measured monthly and calculated quarterly, is less than or equal to 2.0 L/mg-m.

(b) Each water treatment plant in the system must achieve the percent reduction of TOC specified below (Step 1) between the raw water and the

combined filter effluent, unless the Department approves the system's request for alternate minimum TOC removal (Step 2).

1. Required Step 1 TOC reductions, indicated in the following table, are based upon specified raw water parameters.

Step 1 required removal of TOC by enhanced coagulation for systems using conventional treatment:

Raw-Water TOC, mg/L	**Source Water alkalinity, mg/L as $CaCO_3$**		
	0-60 %	> 60-120 %	>120 %
>2.0-4.0	35.0	25.0	15.0
>4.0-8.0	45.0	35.0	25.0
>8.0	50.0	40.0	30.0

(c) Each water treatment plant that cannot achieve the Step 1 TOC removals due to water quality parameters or operational constraints must apply to the Department, within three months of failure to achieve the Step 1 TOC removals, for approval of alternative minimum Step 2 TOC removals. If the Department approves the alternative minimum Step 2 TOC removals, Step 2 requirements can be made retroactive for the purposes of determining compliance. Until alternate minimum Step 2 TOC removals are approved, the system must achieve the Step 1 TOC removals.

(d) Applications made to the Department for approval of alternative minimum Step 2 TOC removal must include, as a minimum, results of bench- or pilot-scale testing conducted under the requirements of this rule and used to determine the alternate enhanced coagulation level.

1. Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in this section such that an incremental addition of 10 mg/L of alum (as aluminum) or an equivalent amount of another coagulant (if a coagulant other than alum is used) results in a TOC removal of < 0.3 mg/L. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the system. Once approved by the Department, this minimum requirement supersedes the minimum Step 1 TOC removal. This requirement will be effective until such time as a new value is approved based on the results of a new bench and pilot scale test. Failure to achieve an alternate minimum TOC removal is a violation.

2. Bench or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (as aluminum) or equivalent amounts of an alternate coagulant until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH indicated in the following table:

Alkalinity (mg/L as $CaCO_3$)	Target pH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

3. For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or the equivalent addition of an alternate coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 until the TOC removal of 0.3 mg/L per 10 mg/L alum added (as aluminum) or equivalent addition of an alternate coagulant is reached.

4. The system may operate at any coagulant dose or pH necessary to achieve the approved minimum TOC percent removal.

5. If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose (as aluminum) at all dosages of alum or the equivalent addition of an alternate coagulant, the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the Department for a waiver of enhanced coagulation requirements.

(e) Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by paragraph (2) of this rule may use one of the following alternative compliance criteria in lieu of complying with paragraph (2) of this rule. Systems must still comply with monitoring requirements in rule 335-7-2-.11.

1. Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as $CaCO_3$), measured monthly according to rule 335-7-2-.02 and calculated quarterly as a running annual average.

2. Softening that results in removing at least 10 mg/L of magnesium hardness (as $CaCO_3$), measured monthly according to rule 335-7-2-.02 and calculated quarterly as a running annual average.

(f) Systems must calculate compliance quarterly, beginning after the system has collected 12 consecutive months of data, by determining an annual average using the following method:

1. For each treatment plant use the following method to determine the actual TOC percent removal and the required TOC percent removal for each month. Divide the actual TOC percent removal by the required TOC percent removal. Determine compliance by averaging these values for the previous twelve months. If this value is less than 1.00, the system is in non-compliance with TOC percent removal requirements.

2. In any month that the treatment plant's treated or raw water TOC level is less than 2.0 mg/L, the system may assign a monthly value of 1.0 when

calculating compliance with TOC removal requirements.

3. In any month that the treatment plant's treated or raw water SUVA is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 when calculating compliance with TOC removal requirements.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.
Amended: January 22, 2008.

335-7-6-.15 Lighting and Power Requirements.

(1) Proper illumination shall be available to allow evaluation of treatment processes at the water treatment plant at all times.

(2) New community treatment facilities permitted for construction after December 31, 2005 shall have sufficient auxiliary power capacity available to operate essential equipment at the plant.

(3) All community surface water treatment facilities shall have sufficient auxiliary power available to operate essential equipment no later than December 31, 2010.

(a) Essential equipment includes, but is not limited to, raw water pumps, laboratory testing equipment, monitoring equipment, and high service pumps needed to meet expected customer demand for finished drinking water during emergency conditions.

(b) If a water system owns more than one water treatment facility, it can designate one facility as the primary facility and this facility must meet the requirements of this paragraph and be capable of supplying the entire distribution system during emergency conditions.

(c) The auxiliary power requirement can be met by having an on-site generator or an equivalent design approved by the Department.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.
Amended: January 18, 2011; September 25, 2012.

335-7-6-.16 Treatment Plant Security Requirements. Each intake structure and treatment plant must have adequate security to prevent the entrance of unauthorized personnel. As a minimum each intake structure and treatment plant should have a perimeter fence and locks on all exterior entrances.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.17 Laboratory Facilities. All treatment plants permitted for construction after December 31, 2005 must have laboratory facilities as specified in the following:

(a) General Requirements:

1. Laboratory equipment and facilities shall be compatible with the raw water source, intended design of the treatment plant, daily monitoring and the complexity of the treatment process involved.

2. Recognized laboratory procedures must be utilized and the testing equipment shall be acceptable to the Department.

3. Laboratory facilities should not be used for activities and/or purposes that are not pertinent to the operation of the plant or in the execution of the duties of the operator and/or the laboratory analyst.

(b) Laboratory Space and Facilities

1. Laboratory facilities shall be located in a separate room from all non laboratory activities.

2. Sufficient bench space, adequate ventilation, adequate lighting, storage room, laboratory sink and auxiliary facilities shall be provided.

3. If a treatment plant has a certified bacteriological laboratory it shall have adequate counter space and shall be located in a separate area from the water quality laboratory.

(c) Sample taps shall be provided so that water samples can be obtained from each water source and from appropriate locations in each treatment unit process. Taps shall be consistent with sampling needs and not be of petcock type. Sample lines and pumps shall be sized to minimize time between point of sampling and point of sample collection.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.18 Filter Backwash Recycling. All systems that employ conventional filtration or direct filtration treatment and that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the following requirements:

(a) Reporting. A system must notify the state in writing by December 8, 2003, if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification must include, at a minimum:

1. A plant schematic showing the origin of all recycled flows, the hydraulic conveyance used to transport them and the location where they are reintroduced back into the treatment plant. The schematic shall also show all treatment processes and all chemical addition points.

2. Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), permitted operating capacity for the plant.

3. Documentation proving the system can recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes and continuously produce water that meets the requirements of rule 335-7-6-.04.

(b) Treatment technique requirement. Any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the following minimum treatment requirements:

1. All recycle flows must undergo independent clarification before being reintroduced to the treatment processes.

2. All recycle flows must enter the main raw water supply before this combined water source enters the plant's first treatment process.

3. Equipment must be installed to measure turbidity found in recycle flows before being introduced to the raw water supply, prior to the plant's first treatment process.

4. All capital improvements required to modify recycle processes, to meet these requirements, must be completed no later than June 8, 2006.

(c) Recordkeeping. The system must collect and retain on file, for a period of no less than 5 years, the following recycle flow information for review and evaluation by the Department beginning June 8, 2004:

1. Copy of the recycle notification and information submitted to the Department under paragraph (a) of this section.

2. List of all recycle flows and the frequency with which they are returned.

3. Average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.

4. Typical filter run length and a written summary of how filter run length is determined.

5. The type of treatment provided for the recycle flow.

6. Data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used, average dose, frequency of use, and frequency at which solids are removed.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed: November 7, 2005; Readopted: December 12, 2005.

335-7-6-.19 *Cryptosporidium* Treatment Requirements. Filtered systems must provide the level of additional treatment for *Cryptosporidium* specified in the following table based upon their bin classification as determined under rule 335-7-2-.17.

(a) Additional treatment requirement for *Cryptosporidium* based upon bin classification:

Additional Treatment Requirements for *Cryptosporidium*				
Bin classification	The system is in full compliance with 335-7-6-2, then the additional treatment requirements are…			
	Conventional filtration treatment (including softening)	Direct Filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
Bin 1	No additional treatment	No additional treatment	No additional treatment	No additional treatment
Bin 2	1-log treatment	1.5-log treatment	1-log treatment	(1)
Bin 3	2-log treatment	2.5-log treatment	2-log treatment	(2)
Bin 4	2.5-log treatment	3-log treatment	2.5-log treatment	(3)

(1) As determined by the Department such that the total *Cryptosporidium* removal and inactivation is at least 4.0-log.

(2) As determined by the Department such that the total *Cryptosporidium* removal and inactivation is at least 5.0-log.

(3) As determined by the Department such that the total *Cryptosporidium* removal and inactivation is at least 5.5-log.

(b) Systems must use one or more of the treatment and management options listed in rule 335-7-6-.21 to comply with the additional *Cryptosporidium* treatment required in subparagraph (a) of this rule.

(c) Systems classified in Bin 3 or Bin 4 must achieve at least 1-log of the additional *Cryptosporidium* treatment required under this section using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as described in

rule 335-7-6-.22.

(d) Failure by a system in any month to achieve treatment credit by meeting the criteria in rules 335-7-6-.22 through 335-7-6-.26 for microbial toolbox options that is at least equal to the level of treatment required in subparagraph (a) of this rule is a violation of the treatment technique requirement.

(e) If the Department determines during a sanitary survey or an equivalent source water assessment that after a system completed the monitoring conducted under rule 335-7-2-.17, significant changes occurred in the system's watershed that could lead to increase contamination of the source water by *Cryptosporidium*, the system must take actions specified by the Department to address the contamination. These actions may include additional source water monitoring and/or implementation of microbial toolbox options listed in rule 335-7-6-.21.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-6-.20 *Cryptosporidium* Treatment Requirement Schedule. Following bin classification, systems must provide the level of treatment for *Cryptosporidium* required under rule 335-7-6-.19 according to the schedule below:

(a) *Cryptosporidium* treatment compliance dates.

***Cryptosporidium* Treatment Compliance Dates**	
System Population	**Treatment installation deadline[a]**
At least 100,000	April 1, 2012
50,000 to 99,999	October 1, 2012
10,000 to 49,999	October 1, 2013
< 10,000	October 1, 2014

[a] The Department may allow up to an additional two years for complying with the treatment requirement for systems making capital improvements.

(b) If the bin classification for a system changes following any round of source water monitoring, the system must provide the level of treatment for *Cryptosporidium* required under rule 335-7-6-.19 on a schedule approved by the Department.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-6-.21 Microbial Toolbox Options. Systems receive treatment credits listed in the following table by meeting the conditions for microbial toolbox options described in rules 335-7-6-.22 through 335-7-6-.26. Systems apply these treatment credits to meet the treatment requirements in rule 335-7-6-.19.

(a) Microbial Toolbox Summary Table: Options, Treatment Credits and Criteria:

Microbial Toolbox Summary	
Toolbox Option	***Cryptosporidium* treatment credit with design and implementation criteria**
Source Protection and Management Toolbox Options (For specific criteria, see rule 335-7-6-.22)	
Watershed control program	0.5-log credit for Departmental approved program comprising required elements, annual program status report to the Department, and regular watershed survey.
Alternate source/intake management	No prescribed credit. Systems may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies.
Pre-Filtration Toolbox Options (For specific criteria, see rule 335-7-6-.23)	
Presedimentation basin with coagulation	0.5-log credit during any month that Presedimentation basins achieve a monthly mean reduction of 0.5-log or greater in turbidity or alternative Department-approved performance criteria. To be eligible, basins must be operated continuously with coagulant addition and all plant flow must pass through basins.
Two-stage lime softening	0.5-log credit for two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow must pass through both stages. Single-stage softening is credited as equivalent to conventional treatment.
Bank Filtration	0.5-log credit for 25-foot setback; 1.0-log credit for 50-foot setback; aquifer must be unconsolidated sand containing at least 10 percent fines; average turbidity in wells must be less than 1 NTU. Systems using wells followed by filtration when conducting source water monitoring must sample the well to determine bin classification and are not eligible for additional credit.

Microbial Toolbox Summary	
Treatment Performance Toolbox Options (For specific criteria, see rule 335-7-6-.24)	
Combined filter performance	0.5-log credit for combined filter effluent turbidity less than or equal to 0.15 NTU in at least 95 percent of measurements each month.
Individual filter performance	0.5-log credit (in addition to 0.5-log combined filter performance credit) if individual filter effluent turbidity is less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter.
Demonstration of performance	Credit awarded to unit process or treatment train based on a demonstration to the Department with a Department-approved protocol.
Additional Filtration Toolbox Options (For specific criteria, see rule 335-7-6-.25)	

Bag or cartridge filters (individual filters)	Up to 2-log credit based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety.
Bag or cartridge filters (in series)	Up to 2.5-log credit based on the removal efficiency demonstrated during challenge testing with a 0.5-log factor of safety.
Membrane filtration	Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing.
Second stage filtration	0.5-log credit for second separate granular media filtration stage if treatment train includes coagulation prior to first filter.
Slow sand filters	2.5-log credit as a secondary filtration step; 3.0-log credit as a primary filtration process. No prior chlorination for either option.
Inactivation Toolbox Options (For specific criteria, see rule 335-7-6-.26)	
Chlorine Dioxide	Log credit based on measured CT in relation to CT table.
Ozone	Log credit based on measured CT in relation to CT table.
UV	Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operating conditions.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-6-.22 Source Toolbox Components.

(1) Watershed control program. Systems receive 0.5-log *Cryptosporidium* treatment credit for implementing a watershed control program that meets the following requirements:

(a) Systems that intend to apply for the watershed control program credit must notify the Department of this intent no later than two years prior to the treatment compliance date applicable to the system in rule 335-7-6-.20.

(b) Systems must submit to the Department a proposed watershed control plan no later than one year before the applicable treatment compliance date in rule 335-7-6-.20. The Department must approve the watershed control plan for the system to receive watershed control program treatment credit. The watershed control plan must include the following elements:

1. Identification of an "area of influence" outside of which the likelihood of *Cryptosporidium* or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under subparagraph (1)(e)2. of this rule.

2. Identification of both potential and actual sources of *Cryptosporidium* contamination and an assessment of the relative impact of these sources on the system's source water quality.

3. An analysis of the effectiveness and feasibility of control measures that could reduce *Cryptosporidium* loading from sources of contamination to the system's source water.

4. A statement of goals and specific actions the system will undertake to reduce source water *Cryptosporidium* levels. The plan must explain how the actions are expected to contribute to specific goals, identify watershed partners and their roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

(c) Systems with existing watershed control programs (i.e., programs in place before January 5, 2006, are eligible to seek this credit. Their watershed control plans must meet the criteria in subparagraph (1)(b) of this rule and must specify ongoing and future actions that will reduce source water *Cryptosporidium* levels.

(d) If the Department does not respond to a system regarding approval of a watershed control plan submitted under this section and the system meets the other requirements of this section, the watershed control program will be considered approved and 0.5-log *Cryptosporidium* treatment credit will be awarded unless and until the Department subsequently withdraws such approval.

(e) Systems must complete the following actions to maintain the 0.5-log credit:

1. Submit an annual watershed control program status report to the Department. The annual watershed control program status report must describe the system's implementation of the approved plan and assess the adequacy of the plan to meet its goals. It must explain how the system is addressing any shortcomings in plan implementation, including those previously identified by the Department or as the results of the watershed survey conducted under subparagraph (1)(e)2. of this rule. It must also describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If a system determines during implementation that making a significant change to its approved watershed control program is necessary, the system must notify the Department prior to making any such changes. If any change is likely to reduce the level of source water protection, the system must also list in its notification the actions the system will take to mitigate this effect.

2. Undergo a watershed sanitary survey every three years and submit the survey report to the Department. The survey must be conducted according to Department guidelines and by persons approved by the Department.

a. The watershed sanitary survey must meet the following criteria: encompass the region identified in the Department-approved watershed control plan as the area of influence; assess the implementation of actions to reduce source water *Cryptosporidium* levels; and identify any significant new sources of *Cryptosporidium*.

b. If the Department determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, systems must undergo another watershed sanitary survey by a date established

c. by the Department, which may be earlier than the regular date in subparagraph (1)(e)2. of this rule.

d. The system must make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents must be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The Department may approve systems to withhold from the public portions of the annual status report, watershed control plan, and watershed sanitary survey based on water supply security considerations.

(f) If the Department determines that a system is not carrying out the approved watershed control plan, the Department may withdraw the watershed control program treatment credit.

(2) Alternative source.

(a) A system may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If approved by the Department, a system may determine its bin classification under rule 335-7-2-.17 based on the alternative source monitoring results.

(b) If systems conduct alternative source monitoring under subparagraph (2)(a) of this rule, systems must also monitor their current plant intake concurrently as described rule 335-7-2-.17.

(c) Alternative source monitoring under subparagraph (2)(a) of this rule must meet the requirements for source water monitoring to determine bin classification, as described in rule 335-7-2-.17. Systems must report the alternative source monitoring results to the Department, along with supporting information documenting the operating conditions under which the samples were collected.

(d) If a system determines its bin classification under rule 335-7-2-.17 using alternative source monitoring results that reflect a different intake location or different procedure for managing the timing or level of withdrawal from the source, the system must relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in rule 335-7-6-20.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-6-.23 Pre-Filtration Treatment Toolbox Components.

(1) Presedimentation. Systems receive 0.5-log *Cryptosporidium*

treatment credit for a presedimentation basin during any month the process meets the following criteria:

(a) The presedimentation basin must be in continuous operation and must treat the entire plant flow taken from a surface water or ground water under the direct influence of surface water source.

(b) The system must continuously add a coagulant to the presedimentation basin.

(c) The presedimentation basin must achieve the following performance criteria:

1. Demonstrate at least 0.5-log mean reduction in influent turbidity. This reduction must be determined using the daily average turbidity measurements taken every four hours in the presedimentation process influent and effluent and must be calculated as follows: $\log_{10}$ (monthly mean of daily influent turbidity) – $\log_{10}$ (monthly mean of daily effluent turbidity).

2. Comply with Department-approved performance criteria that demonstrate at least 0.5-log mean removal of micron sized particulate material through the presedimentation process.

(2) Two-stage lime softening. Systems receive an additional 0.5-log *Cryptosporidium* treatment credit for a two-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages must treat the entire plant flow taken from a surface water or ground water under the direct influence of surface water source.

(3) Bank filtration. Systems receive *Cryptosporidium* treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the following criteria. Systems using bank filtration when they began source water monitoring under rule 335-7-2-.17 must collect samples as described and are not eligible for this credit.

(a) Wells with a ground water flow path of at least 25 feet receive 0.5-log treatment credit; wells with a ground water flow path of at least 50 feet receive 1.0-log treatment credit. The ground water flow path must be determined as specified in subparagraph (3)(d) of this rule.

(b) Only wells in granular aquifers are eligible for treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A system must characterize the aquifer and demonstrate that in at least 90 percent of the core length, grains less than 1.0 mm in diameter constitute at least 10 percent of the core material.

(c) Only horizontal and vertical wells are eligible for treatment credit.

(d) For vertical wells, the ground water flow path is the measured distance from the edge of the surface water body under high flow conditions

(determined by the 100 year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For horizontal wells, the ground water flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

(e) Systems must monitor each wellhead for turbidity at least once every four hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the system must report this result to the Department and conduct an assessment within 30 days to determine the cause of the high turbidity levels in the well. If the Department determines that microbial removal has been compromised, the Department may revoke treatment credit until the system implements corrective actions approved by the Department to remediate the problem.

(f) Springs and infiltration galleries are not eligible for treatment credit under this section, but are eligible for credit under rule 335-7-6-.24.

(g) Bank filtration demonstration of performance. The Department may approve *Cryptosporidium* treatment credit for bank filtration based on a demonstration of performance study that meets the following criteria. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in subparagraphs (3)(a) – (e) of this rule.

1. The study must follow a Department-approved protocol and must involve the collection of data on the removal of *Cryptosporidium* or a surrogate for *Cryptosporidium* and related hydrogeologic and water quality parameters during the full range of operating conditions.

2. The study must include sampling both from the production well(s) and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production well(s).

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-6-.24 Treatment Performance Toolbox Components.

(1) Combined filter performance. Systems using conventional filtration treatment or direct filtration treatment receive an additional 0.5-log *Cryptosporidium* treatment credit during any month the system meets the criteria in this paragraph. Combined filter effluent (CFE) turbidity must be less than or equal to 0.15 NTU in at least 95 percent of the measurements. Turbidity must be measured using an EPA approved method and must be measured every 15 minutes that the water treatment plant is in operation.

(1) Individual filter performance. Systems using conventional filtration treatment or direct filtration treatment receive 0.5-log *Cryptosporidium* treatment credit, which can be in addition to the 0.5-log credit under paragraph (1) of this section, during any month the system meets the criteria in this paragraph. Compliance with these criteria must be based on individual filter turbidity monitoring as described in rule 335-7-2-.06.

(a) The filtered water turbidity for each individual filter must be less than or equal to 0.15 NTU in at least 95 percent of the measurements recorded each month.

(b) No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

(c) Any system that has received treatment credit for individual filter performance and fails to meet the requirements of subparagraph (2)(a) or (b) of this rule during any month does not receive a treatment technique violation under rule 335-7-2-.06 if the Department determines the following:

1. The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance.

2. The system has experienced no more than two such failures in any twelve month period.

3. Any system that that has two such failures in any 12 month period must complete a self assessment according to EPA's handbook: Optimizing Water Treatment Plant Performance Using the Composite Correction Program or as specified by the Department. The report must be submitted to the Department within 90 days of the second occurrence.

(3) Demonstration of performance. The Department may approve *Cryptosporidium* treatment credit for drinking water treatment processes based on a demonstration of performance study that meets the criteria in this paragraph. This treatment credit may be greater than or less than the prescribed treatment credits in this chapter and may be awarded to treatment processes that do not meet the criteria for the prescribed credits.

(a) Systems cannot receive the prescribed treatment credit for any toolbox box option in this chapter if that toolbox option is included in a demonstration of performance study for which treatment credit is awarded under this paragraph.

(b) The demonstration of performance study must follow a Department-approved protocol and must demonstrate the level of *Cryptosporidium* reduction the treatment process will achieve under the full range of expected operating conditions for the system.

(c) Approval by the Department must be in writing and may include monitoring and treatment performance criteria that the system must

demonstrate and report on an ongoing basis to remain eligible for the treatment credit. The Department may designate such criteria where necessary to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.

335-7-6-.25 Additional Filtration Toolbox Components.

(i) Bag and cartridge filters. Systems receive *Cryptosporidium* treatment credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by meeting the following criteria. To be eligible for this credit, systems must report the results of challenge testing that meets the requirements of subparagraphs (1)(b) through (i)of this rule to the Department. The filters must treat the entire plant flow taken from a surface water or ground water under the influence of surface water source.

(a) The *Cryptosporidium* treatment credit awarded to bag or cartridge filters must be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria in subparagraphs (1)(b) through (i) of this rule. A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit. Systems may use results from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria specified in subparagraphs (1)(b) through (i) of this rule.

(b) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of *Cryptosporidium*. Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

(c) Challenge testing must be conducted using *Cryptosporidium* or a surrogate that is removed no more efficiently than *Cryptosporidium*. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate must be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity may not be used.

(d) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using the following equation:

Maximum Feed Concentration = 1 x 10^4 x (Filtrate Detection Limit)

(e) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(f) Each filter evaluated must be tested for a duration sufficient to reach 100 percent of the terminal pressure drop, which establishes the maximum pressure drop under which the filter may be used to comply with the requirements of this subpart.

(g) Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$$

where LRV = log removal value demonstrated during challenge testing; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. In applying this equation, the same units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term C_p must be set equal to the detection limit.

(h) Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within two hours of start-up of a new filter; when the pressure drop is between 45 and 55 percent of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100 percent of the terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRV_{filter}) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

(i) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest LRV_{filter} among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the 10th percentile of the set of LRV_{filter} values for the various filters tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10^{th} percentile may be calculated using linear interpolation.

(j) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted to the Department.

(1) Membrane filtration.

(a) Systems receive *Cryptosporidium* treatment credit for membrane filtration that meets the criteria of this paragraph. Membrane cartridge filters that meet the definition of membrane filtration are eligible for this credit. The level of treatment credit a system receives is equal to the lower of the values

determined under subparagraphs (2)(a)1. and 2. of this rule.

1. The removal efficiency demonstrated during challenge testing conducted under the conditions in subparagraph (2)(b) of this rule.

2. The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in subparagraph (2)(b)3. of this rule.

8. Challenge Testing. The membrane used by the system must undergo challenge testing to evaluate removal efficiency, and the system must report the results of challenge testing to the Department. Challenge testing must be conducted according to the criteria in subparagraphs (2)(b)1. Through 8 of this rule. Systems may use data from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria in subparagraphs (2)(b)1. through 8. of this rule.

1. Challenge testing must be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the system's treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

2. Challenge testing must be conducted using *Cryptosporidium* oocysts or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts. The organism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

3. The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:

$$\text{Maximum Feed Concentration} = 3.16 \times 10^6 \times (\text{Filtrate Detection Limit})$$

4. Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (i.e., backwashing).

5. Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$$

where LRV = log removal value demonstrated during the challenge test; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term Cp is set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.

6. The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value (LRVC-Test). If fewer than 20 modules are tested, then LRVC-Test is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then LRVC-Test is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

7. The challenge test must establish a quality control release value (QCRV) for a nondestructive performance test that demonstrates the *Cryptosporidium* removal capability of the membrane filtration module. This performance test must be applied to each production membrane module used by the system that was not directly challenge tested in order to verify *Cryptosporidium* removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

8. If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane must be conducted and submitted to the Department.

(b) Direct integrity testing. Systems must conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process and meets the requirements described in subparagraphs (2)(c)1. through 4. of this rule. A direct integrity test is defined as a physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e., one or more leaks that could result in contamination of the filtrate).

1. The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

2. The direct integrity method must have a resolution of 3 micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

3. The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the Department, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity must be determined using the following approach as applicable to the type of direct integrity test the system uses.

(i) For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10}(Q_p / (VCF \times Q_{breach}))$$

where LRV_{DIT} = the sensitivity of the direct integrity test; Q_p = total design filtrate flow from the membrane unit; Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured; and VCF = Volumetric Concentration Factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.

(ii) For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10}(C_f) - LOG_{10}(C_p)$$

where LRV_{DIT} = the sensitivity of the direct integrity test; C_f = the typical feed concentration of the marker used in the test; and C_p = the filtrate concentration of the marker from an integral membrane unit.

4. Systems must establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the Department.

5. If the result of a direct integrity test exceeds the control limit established under subparagraph (2)(c)4. of this rule, the system must remove the membrane unit from service. Systems must conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.

6. Systems must conduct direct integrity testing on each membrane unit at a frequency of not less than once each day that the membrane unit is in operation. The Department may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium*, or reliable process safeguards.

(c) Indirect integrity monitoring. Systems must conduct continuous indirect integrity monitoring on each membrane unit according to the following criteria. Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A system that implements continuous direct integrity testing of membrane units

in accordance with the criteria in subparagraphs (2)(c)1. through 4. of this rule is not subject to the requirements for continuous indirect integrity monitoring. Systems must submit a monthly report to the Department summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

1. Unless the Department approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.

2. Continuous monitoring must be conducted at a frequency of no less than once every 15 minutes.

3. Continuous monitoring must be separately conducted on each membrane unit.

4. If indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (i.e., two consecutive 15-minute readings above 0.15 NTU), direct integrity testing must immediately be performed on the associated membrane unit as specified in subparagraphs (2)(c)1. through 5. of this rule.

5. If indirect integrity monitoring includes a Department-approved alternative parameter and if the alternative parameter exceeds a Department-approved control limit for a period greater than 15 minutes, direct integrity testing must immediately be performed on the associated membrane units as specified in subparagraphs (2)(c)1. through 5. of this rule.

(2) Second stage filtration. Systems receive 0.5-log *Cryptosporidium* treatment credit for a separate second stage of filtration that consists of sand, dual media, GAC, or other fine grain media following granular media filtration if the Department approves. To be eligible for this credit, the first stage of filtration must be preceded by a coagulation step and both filtration stages must treat the entire plant flow taken from a surface water or GWUDI source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The Department must approve the treatment credit based on an assessment of the design characteristics of the filtration process.

(3) Slow sand filtration (as secondary filter). Systems are eligible to receive 2.5-log *Cryptosporidium* treatment credit for a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or GWUDI source and no disinfectant residual is present in the influent water to the slow sand filtration process. The Department must approve the treatment credit based on an assessment of the design characteristics of the filtration process. This paragraph does not apply to treatment credit awarded to slow sand filtration used as a primary filtration process.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.

History: January 22, 2008.

335-7-6-.26 Inactivation Toolbox Components.

(1) Calculation of CT values.

(a) CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). Systems with treatment credit for chlorine dioxide or ozone under paragraph (2) or (3) of this section must calculate CT at least once each day, with both C and T measured during peak hourly flow using EPA approved analytical methods.

(b) Systems with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Under this approach, systems must add the *Cryptosporidium* CT values in each segment to determine the total CT for the treatment plant.

(2) CT values for chlorine dioxide and ozone.

(a) Systems receive the *Cryptosporidium* treatment credit listed in this table by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in paragraph (1) of this rule.

CT Values (mg•min/L) for *Cryptosporidium* Inactivation by Chlorine Dioxide[1]											
Log credit	**Water Temperature, °C**										
	<=0.5	**1**	**2**	**3**	**5**	**7**	**10**	**15**	**20**	**25**	**30**
0.25	159	153	140	128	107	90	69	45	29	19	12
0.5	319	305	279	256	214	180	138	89	58	38	24
1.0	637	610	558	511	429	360	277	179	116	75	49
1.5	956	915	838	767	643	539	415	268	174	113	73
2.0	1275	1220	1117	1023	858	719	553	357	232	150	98
2.5	1594	1525	1396	1278	1072	899	691	447	289	188	122
3.0	1912	1830	1675	1534	1286	1079	830	536	347	226	147

1 Systems may use this equation to determine log credit between the indicated values: Log credit = $[0.001506 \times (1.09116)^{Temp}] \times CT$

(b) Systems receive the *Cryptosporidium* treatment credit listed in this table by meeting the corresponding ozone CT values for the applicable water temperature, as described in paragraph (1) of this rule.

CT Values (mg•min/L) for *Cryptosporidium* Inactivation by Ozone[1]											
Log credit	**Water Temperature, °C**										
	<=0.5	**1**	**2**	**3**	**5**	**7**	**10**	**15**	**20**	**25**	**30**
0.25	6.0	5.8	5.2	4.8	4.0	3.3	2.5	1.6	1.0	0.6	0.39

0.5	12	12	10	9.5	7.9	6.5	4.9	3.1	2.0	1.2	0.78
1.0	24	23	21	19	16	13	9.9	6.2	3.9	2.5	1.6
1.5	36	35	31	29	24	20	15	9.3	5.9	3.7	2.4
2.0	48	46	42	38	32	26	20	12	7.8	4.9	3.1
2.5	60	58	52	48	40	33	25	16	9.8	6.2	3.9
3.0	72	69	63	57	47	39	30	19	12	7.4	4.7

1 Systems may use this equation to determine log credit between the indicated values: Log credit = $[0.0397 \times (1.09757)^{Temp}] \times CT$

(3) Site specific study. The Department may approve alternative chlorine dioxide or ozone CT values to those listed in paragraph (2) of this rule on a site-specific basis. The Department must base this approval on a site-specific study a system conducts that follows a Department-approved protocol.

(4) Ultraviolet light. Systems receive *Cryptosporidium*, *Giardia lamblia*, and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in subparagraph (4)(a) of this rule below. Systems must validate and monitor UV reactors as described in subparagraphs (4)(b) and (c) below to demonstrate that they are achieving a particular UV dose value for treatment credit.

(a) UV dose table. The treatment credits listed in this table are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, systems must demonstrate an equivalent germicidal dose through reactor validation testing, as described in subparagraph (4)(b) below. The UV dose values in this table are applicable only to post-filter applications of UV.

UV dose table for *Cryptosporidium*, *Giardia lamblia*, and virus inactivation credit			
Log credit	***Cryptosporidium* UV dose (mJ/cm^2)**	***Giardia lamblia* UV dose (mJ/cm^2)**	**Virus UV dose (mJ/cm^2)**
0.5	1.6	1.5	39
1.0	2.5	2.1	58
1.5	3.9	3.0	79
2.0	5.8	5.2	100
2.5	8.5	7.7	121
3.0	12	11	143
3.5	15	15	163
4.0	22	22	186

(b) Reactor validation testing. Systems must use UV reactors that have undergone validation testing to determine the operating conditions under

which the reactor delivers the UV dose required in subparagraph (4)(a) of this rule above (i.e., validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

1. When determining validated operating conditions, systems must account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of online sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical system components; and inlet and outlet piping or channel configurations of the UV reactor.

2. Validation testing shall include the following: Full scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

3. The Department may approve an alternative approach to validation testing provided the system shows that the alternative approach proves at least equivalent results.

(c) Reactor monitoring.

1. Systems must monitor their UV reactors to determine if the reactors are operating within validated conditions, as determined under subparagraph (4)(b) of this rule above. This monitoring must include UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters the Department designates based on UV reactor operation. Systems must verify the calibration of UV sensors and must recalibrate sensors in accordance with a protocol the Department approves.

2. To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in subparagraphs (4)(a) and (4)(b) of this rule. Systems must demonstrate compliance with this condition by the monitoring required under subparagraph (4)(c)1. of this rule.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 22, 2008.
Amended: May 26, 2009.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-7 DISTRIBUTION OF DRINKING WATER

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335-7-7-.01 Applicability. This chapter applies to all community and NTNC water systems distributing drinking water for consumption by the public.

Author: Joe Alan Power; Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: December 12, 2005; **Amended:** January 22, 2008.

335-7-7-.02 Permit Requirements.

(1) A public water system shall be designed and operated such that a minimum of 20 pounds per square inch (psi) of water pressure is supplied at the water system meter under all normal operating conditions.

(2) Any projects involving water system storage, new sources, pumping stations, or water main additions which will significantly affect system hydraulics must be permitted by the Department prior to construction.

Author: Joe Alan Power; Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective: December 5, 1990.
Amended: December 12, 2005; **Amended:** January 22, 2008; **Amended:** January 18, 2011.

335-7-7-.03 Distribution Facilities Design and Construction Requirements. To prevent contamination of the drinking water, the following are required in the design and construction of drinking water facilities:

(a) Water Main Facility Requirements:

1. Water mains shall be constructed of materials which will neither contaminate nor allow deterioration of the water quality.

2. Gaskets, O-rings, and other products used for joining pipe, setting meters or valves, or other appurtenances shall not be made nor coated with materials which will support microbiological growth and shall be certified as meeting the specifications of the National Sanitation Foundation (NSF)/American National Standard Institute (ANSI) Standard 61.

3. Water mains permitted by the Department shall be properly pressure tested and disinfected after installation. Copies of the pressure test and bacteriological results showing absence of coliform shall be provided to the Department along with a request for a final inspection prior to the setting of meters to serve customers on these lines.

4. Unless otherwise approved by the Department, the following applies when installing water mains after January 1, 2013;

(i) A minimum horizontal separation of five feet shall be maintained between water mains and sanitary sewer mains.

(ii) When water and sewer main crossings are necessary, place a continuous casing around one of the mains to allow a minimum five-foot separation between each end of the cased and uncased main.

(iii) Where possible, install the water main such that the top elevation of the sewer main is a minimum of 18 inches below the bottom elevation of the water main.

(iv) Unless adequately cased to protect against cross contamination, do not install any water main such that it comes in contact with any part of a sewer manhole, septic tank field lines, or soil saturated with organic solvents or gasoline.

(b) Pumping stations shall be located or constructed so that the pumps and piping will be protected from flooding and shall be designed and operated in such a manner as to allow satisfactory pressure and service to customers on the suction and discharge side of the station.

(c) Finished Water Storage Requirements:

1. An uncovered finished water storage reservoir used to store water that will undergo no further treatment except residual disinfection and is open to the atmosphere is prohibited.

2. All finished water storage structures shall have suitable water tight roofs, hatches, and covers to exclude outside contamination.

3. Access manholes shall be provided with a locking mechanism.

4. Clearwells and pumping sumps associated with surface treatment plants may not be constructed adjacent to unfinished water units when the compartments are separated by a single wall.

5. All metal water storage facilities shall be protected by paints or other protective coatings. Inside paint systems shall not use lead primer but shall otherwise conform to AWWA D102 or latest revision Coating Steel Water- Storage Tanks or other standards accepted by the Department.

6. Protective coatings shall be used and applied in such a manner as to prevent contamination of the water in contact with these coatings.

7. Storage tanks permitted after December 31, 2006 shall meet the following requirements:

(i) Shall provide for a minimum fluctuation of 50% in water height during all normal operating conditions. Deviations must have prior written approval from the Department. Deviations from this requirement must be requested in writing. The request must include reasons the deviation should be granted and the deviation cannot be made until written approval is received by the Department.

(ii) Shall minimize water age and shall provide adequate mixing of water. Inlet pipe diameters or wet risers greater than 36 inches are not allowed unless approved by the Department. The request must be in writing and include reasons for the larger diameter and include design calculations showing that the tank will mix properly and water age will be minimized.

(iii) Shall be designed to allow the water storage tank to be removed from service for cleaning and repair as required by the Water Storage Tank Maintenance section of this chapter.

(iv) Shall be properly disinfected and upon refilling, two bacteriological samples must be collected showing absence of coliform prior to use. Documentation of the disinfection and bacteriological analyses information must be provided to the Department along with a request to place the tank into service.

Author: Joe Alan Power, Edgar Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; **Amended:** Repealed and readopted: January 4, 1989; **Amended:** Effective: October 31, 1990; **Amended:** Effective: December 5, 1990. **Amended:** Effective: June 7, 2000; **Amended:** Effective: January 28, 2004; **Amended:** Effective: December 12, 2005; **Amended:** Effective: January 22, 2008; **Amended:** Effective: September 25, 2012; **Amended:** Filed: June 25, 2019; Effective: August 9, 2019.

335-7-7-.04 Water Storage Tank Maintenance.

(1) For the purposes of this rule, "water storage tank" or "storage tank" shall mean any vessel designed to store finished drinking water that is owned or operated by the public water system. This includes clearwells, hydropneumatic tanks with hatches or manholes for access to its interior, and storage tanks that are out of service but still connected to the distribution system.

(2) Public water systems shall develop and implement a written maintenance plan for all water storage tanks. The plan at a minimum shall include the following:

(a) Schedule for the inspection/cleaning of each water storage tank, not to exceed 5 year intervals.

(b) The current coating type for each water storage tank, with particular emphasis placed on coatings which contain lead, coal tar, other coatings no longer NSF approved for use in a water storage tank.

(c) Separate specifications for the inside and outside coatings describing when the coating has failed and must be repaired.

(d) The method that will be used to disinfect the water storage tank after each inspection/cleaning. The disinfection method selected shall comply with AWWA C652 (latest edition) for Disinfection of Water-Storage Facilities. After the storage tank has been properly disinfected and refilled to an acceptable disinfectant residual in accordance with ADEM Admin. Code r. 335-7-10-.04, two consecutive bacteriological samples shall be collected not less than 30 minutes apart and analyzed to be absent of total coliform before the storage tank may be returned to service.

(e) Schematics (as-built drawing if available) depicting the water storage tank's dimensions and configuration for all major components. If a mixer is present, the plan shall include the operational parameters for the mixing system if applicable.

(3) Inspection/Cleaning Requirements.

(a) All storage tanks constructed prior to January 1, 2022, shall have an initial inspection/cleaning under this regulation completed by December 31, 2027.

(b) All storage tanks constructed on or after January 1, 2022, shall have an initial inspection/cleaning under this regulation completed no later than five years from the date of construction.

(c) All storage tanks shall be inspected/cleaned at least once every five years following the date of the initial inspection/cleaning under this regulation.

(4) No storage facility may be returned to service until all significant deficiencies have been repaired. A significant deficiency is any deficiency where there

is a potential for the water to become contaminated. This includes, but is not limited to, the following:

(a) Missing roof hatches;

(b) Missing or incorrectly sized screens on vent pipes. The proper size screen is #20 mesh or smaller made from a non-corroding material;

(c) Holes in the roof or walls;

(d) Roof joints that are no longer properly sealed;

(e) Overflow lines without proper protection which includes a screen and flap valve or another acceptable configuration (e.g., duckbill valve);

(f) Improper air gap for an overflow line;

(g) Connection to a sanitary sewer system; or

(h) Missing or cracked rubber gaskets (if required) around hatches.

(5) If any tank has a significant deficiency identified, a summary report shall be written and submitted to the Department within 14 days of the inspection. This report should also include the corrective action and the timeframe for repair.

(6) A final inspection report shall be written separate from a summary report and shall be maintained on file at the water system for public review and review during inspections. The report shall be maintained for a minimum of 10 years.

(7) The final report shall include a description of any objects or contaminants found in the water storage tank and the most likely entry point.

(8) The final report shall be detailed, including pictures and/or videos, describing all conditions discovered during the inspection, not just a list of deficiencies.

(9) All inspection and summary reports shall be signed by a qualified tank inspection professional. This individual shall possess experience inspecting storage tanks of similar design and size, according to generally recognized standards of the water utility industry.

Author: Edgar Hughes, Dennis D. Harrison, Ross Caton.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005; **Amended:** January 22, 2008; **Amended:** Filed: February 28, 2022; Effective: April 14, 2022.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-8
LEAD BAN REQUIREMENTS

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335-7-8-.01 Applicability. These regulations are applicable to all water systems, cities, counties, and persons, firms or businesses which supply, use, or distribute plumbing materials.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 4, 1989; Repealed and readopted: October 31, 1990. Effective: December 5, 1990.

335-7-8-.02 Plumbing Codes. City and county plumbing codes shall incorporate statements to limit use of piping containing more than 8 percent lead in repair or installation of water mains. These codes shall also limit the use of flux and solder used to join copper piping should they contain more than 0.2% lead. Plumbing codes shall be modified no later than May 10, 1989.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.

335-7-8-.03 Materials Distribution Requirements. Import, distribution, or sale of plumbing materials and appurtenances not meeting lead free requirements for use in installation or repair of water systems conveying drinking water is prohibited. Piping and connections containing more than 8 percent lead and solder and flux containing more than 0.2 percent lead shall be clearly labeled that the product is not to be used in the repair or installation of drinking water facilities or plumbing.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-

22A-6.
History: January 4, 1989; Repealed and readopted: October 31, 1990 Effective: December 5, 1990.
Amended: March 12, 2002.

335-7-8-.04 Installation Restrictions. Water mains, plumbing, and other piping used to convey water for drinking purposes may not be constructed nor repaired with piping or materials containing greater than 8 percent lead. Flux and solder containing greater than 0.2 percent lead may not be used in the joining of piping, however, leaded joints for use in the installation of cast iron water mains are excluded if the lead does not make contact with the drinking water. Plumbing fittings and fixtures intended by the manufacturer to dispense water for human ingestion shall meet NSF standards.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: January 4, 1989; Repealed and readopted: October 31, 1990. Effective: December 5, 1990.
Amended: March 12, 2002.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-9
CROSS-CONNECTION CONTROL REQUIREMENTS

TABLE OF CONTENTS

335-7-9-.01 Applicability. These regulations apply to all community water systems and, where indicated, to NTNC water systems.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.
Amended: December 12, 2005; January 22, 2008.

335-7-9-.02 Cross Connections Prohibited. A public water system shall be designed, installed, maintained, and operated in such a manner as to prevent contamination from being introduced through any water service connection in the system.

(a) The installation or continued use of a water service connection to any premises where cross connections may exist is prohibited unless such cross connections are properly controlled.

(b) Any connection with a facility or system whereby unapproved water may enter the public water system must be approved by the Department.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.
Amended: December 12, 2005.

335-7-9-.03 Protection Required. A suitable backflow prevention device shall be installed on each new water service connection and on each customer water service connection replaced after January 1, 2006. Replacement of a water service

connection is defined as the removal and installation of the existing customer meter and service line.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.
Amended: December 12, 2005; January 22, 2008.

335-7-9-.04 Responsibility of the Supplier of Water.

(1) Community systems must have a formally adopted written cross connection control policy. This policy must meet the provisions of this chapter and shall be provided to customers on request.

(2) This policy shall include an inspection program, with records of health hazards found and corrective action taken kept at the water office for a minimum of five years. These records shall be made available to the Department upon request.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.
Amended: December 12, 2005.

335-7-9-.05 Discontinuance of Service. The supplier of water shall deny or discontinue water service to a customer if a required backflow prevention device is not installed or properly maintained. Water service shall not be restored to such premises until the deficiencies have been corrected or eliminated to the satisfaction of the supplier and the Department.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990. Effective: December 5, 1990.
Amended: December 12, 2005.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-10
OPERATION, RECORD KEEPING, AND REPORTS

TABLE OF CONTENTS

335-7-10-.01 Applicability. These regulations apply to all community and NTNC water systems and, where indicated, shall apply also to non-community systems.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005; January 22, 2008.

335-7-10-.02 Certified Operator Requirements. Community and NTNC water systems shall employ operators certified in accordance with ADEM Division 10 regulations to be responsible for system or plant operations.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989, October 31, 1990. Revised September 19, 1995 (ER); November 28, 1995; effective January 2, 1996.
Amended: December 12, 2005.

335-7-10-.03 Water Quality Control Tests. In addition to monthly microbiological monitoring and periodic chemical/radiological/TTHM/VOC monitoring, the following control tests shall be performed and recorded at the specified frequency:

(a) At surface water or ground water under the influence of surface water treatment plants serving community and NTNC systems,

the following tests shall be performed and recorded during plant operation:

1. Disinfectant residual of the finished water every other hour. Also, those plants serving a population of 3,300 or greater must have continuous recording and indicating disinfectant residual equipment;

2. Carbon dioxide of the raw water once per shift;

3. Color, iron, manganese and total alkalinity of the raw and finished water daily;

4. Fluoride of the raw water weekly and of the finished water daily when the concentration is adjusted;

5. *E. coli* and total coliform bacteria of the raw water source once per month or as required by the Department to evaluate quality of the raw source or treated water. Results must be reported as number of counts per 100 mL of sample;

6. pH of the raw and finished water each shift,

7. Turbidity:

(i) Raw water every other hour,

(ii) Each clarification unit every four hours, and

(iii) Filtered water from each filter every fifteen minutes or on a continuous basis if a recording turbidimeter is used, and

8. Other tests at the frequency required by the Department.

(b) At groundwater treatment facilities serving community and NTNC systems, the following tests shall be performed and recorded at least daily:

1. Free chlorine residual of the finished water representing each source or plant;

2. Fluoride of the finished water if the level is adjusted;

3. Iron of the raw and finished water, when the raw water concentration exceeds 0.3 mg/l;

4. Manganese of the raw and finished water, when the raw water concentration exceeds 0.05 mg/l;

5. pH of the finished water from each source or plant if a chemical is fed to adjust the pH or if the pH is below 7.0;

6. Turbidity of the raw water if directed by the Department or if the turbidity exceeds 5.0 NTU;

7. Other tests at the frequency determined necessary by the Department.

(c) Results of all water quality control tests shall be provided to the Department as specified in the Reports section of this chapter (ADEM Admin. Code 335-7-10-.06).

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; **Amended:** September 19, 1995 (ER); November 28, 1995; effective January 2, 1996.
Amended: December 12, 2005; January 22, 2008.

335-7-10-.04 Disinfectant Residual Requirements. All public water systems required to provide disinfection shall maintain a residual level to provide protection of the water throughout the distribution system. These systems must meet the following requirements:

(a) Departmental approval is necessary for use of any disinfectant other than chlorination.

(b) Systems, with Department approval, may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

(c) Systems must maintain a minimum disinfectant residual level established by the Department. The minimum disinfectant level in the distribution system shall be no less than 0.2 mg/L for free chlorine or 0.5 mg/L for chloramines. Systems must also not exceed the maximum residual disinfection level at any time.

(d) Upon the determination that the disinfectant level in the service area distribution system falls below the established minimum or exceeds the maximum and is not corrected within four hours, a treatment technique violation has occurred requiring the following action:

1. The treatment process must be revised to correct the violation.

2. The Department must be notified by the end of the next business day.

3. The system must provide proper notification to customers affected in a newspaper of general circulation serving the area within 14 days of the occurrence or for NTNC systems, post notice in appropriate locations.

4. Should the disinfectant residual not be restored within 24 hours, microbiological samples must immediately be collected from representative locations within the area of insufficient disinfectant residual. Should these samples show system contamination an acute violation has resulted, requiring appropriate notification required under rule 335-7-2-.21.

(e) A maximum residual of no more than 4.0 mg/L for chlorine or chloramines or 0.8 mg/L for chlorine dioxide shall be maintained at any point in the distribution system.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005; January 22, 2008; May 26, 2009.

335-7-10-.05 Records. The following records shall be maintained by community and NTNC water systems, unless otherwise specified:

(a) Operational records on which all required water quality control tests are recorded shall be maintained by the water system for review by the Department during sanitary surveys for no less than three years or until the next sanitary survey, whichever is longer.

(b) For systems utilizing surface water or ground water under the influence of surface water, daily log sheets shall be completed for each shift. These records shall be maintained for five years for inspection by the Department.

(c) Records of bacteriological or microbiological analyses made pursuant to this part shall be kept for not less than five years or as indicated elsewhere in these regulations. Records of chemical analyses made pursuant to this part shall be kept for not less than ten years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

1. The date, place, and time of sampling, and the name of the person who collected the sample;

2. Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;

3. The date of analysis;

4. The laboratory and person responsible for performing analysis;

5. The analytical technique/method used; and

6. The analysis results.

(d) Each water system shall maintain a complaint file including the date, location, type of complaint and action taken. Records shall be maintained for no less than three years after a complaint is received.

(e) Records of action taken by the system to correct violations of primary drinking water regulations shall be kept for a period of not less than three years after the last action taken with respect to the particular violation involved.

(f) Copies of any written reports, summaries or communications relating to sanitary surveys of the system, annual inspection or other site visit conducted by the system itself, by a private consultant, or by any local, state or federal agency shall be kept for a period not less than ten years after completion of the event involved.

(g) Records concerning an exemption granted to the system shall be kept for a period ending not less than five years following the expiration of such exemption.

(h) Any records or reports pertaining to the quality of water or operation of the water supply system shall be furnished to the Department upon request and must be available for review by the public.

(i) Each system required to monitor for disinfection byproducts or disinfectant residuals is required to develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the Department and the general public no later than December 31, 2000. Community and NTNC systems utilizing surface sources or groundwater under the direct influence of surface water must submit a copy of the monitoring plan to the Department no later December 31, 2000. The Department may also require the plan to be submitted by any other system. After review, the Department may require changes in any plan elements. The plan must include at least the specific locations, a map with the locations marked and schedules for collecting samples for any disinfection byproducts or disinfectants and how the system will calculate compliance with MCLs, MRDLs, and treatment techniques for those contaminants. Failure to monitor in accordance with an approved monitoring plan is a violation and public notification is required according to the provisions of rule 335-7-2-.21.

1. Beginning July 1, 2007, all community and NTNC systems utilizing surface water and ground water under the influence of surface water must maintain a copy of the system's current monitoring plan on file with the Department. Changes to the monitoring plan must be

approved by the Department and a copy submitted to the Department before conducting monitoring under the revised plan. The monitoring plan must be modified to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation.

2. The Department may require the monitoring plan to be submitted by water systems other than community and NTNC systems utilizing surface water or ground water under the influence of surface water.

3. After review, the Department may require changes in any plan elements.

4. The plan must include, as a minimum, the sample locations, a map with the locations marked, the schedules for collecting samples for any disinfection byproducts or disinfectants, and how the system will calculate compliance with MCLs, MRDLs, and treatment techniques for those contaminants.

5. Beginning January 1, 2012, if a monitoring plan is changed, the sites with the lowest LRAA must be replaced with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels.

6. Failure to monitor in accordance with an approved monitoring plan is a violation and public notification is required according to the provisions rule 335-7-2-.21.

(j) Systems that were required to perform disinfection profiling and/or disinfection benchmarking must keep results of the profile, including raw data and analysis, indefinitely.

(k) A record of the company name, telephone number, address and chemicals supplied must be maintained in a file at the treatment plant. All chemical manufacturers supplying chemicals to the treatment plant for the past two years shall be maintained on the list.

(l) Copies of all monitoring plans shall be kept for the same period of time as the records of monitoring results taken under the plan are required to be kept, except as specified elsewhere in these regulations.

(m) Systems must keep the results from each round of source water monitoring for cryptosporidium until the next round of source water monitoring is completed, but in no case shall records be kept for less than 3 years.

(n) Systems must keep any notification to the Department that they will not conduct source water monitoring due to meeting the requirements of rule 335-7-2-.17 (at least 5.5-log treatment for *Cryptosporidium*) for three years.

(o) Systems must keep the results of treatment monitoring associated with microbial toolbox options in rule 335-7-6-.21 until the next sanitary survey or three years, whichever is longer.

(p) Systems must report to the Department in accordance with the following table for any microbial toolbox option used to comply with treatment requirements in rule 335-7-6-.21. Alternatively, the Department may approve a system to certify operation within required parameters for treatment credit rather than reporting monthly operational data for toolbox options.

Microbial Toolbox Reporting Requirements		
Toolbox Option	**Required Information**	**Schedule**
Watershed control program (WCP)	(i) Notice of intention to develop a new or continue an existing watershed control program.	No later than two years before the applicable treatment compliance date in 335-7-6-.20.
	(ii) Watershed control plan	No later than one year before the applicable treatment compliance date in 335-7-6-.20.
	(iii) Annual watershed control program status report	Every 12 months, beginning one year after the applicable treatment compliance date in 335-7-6-.20.
	(iv) Watershed sanitary survey report	Every three years beginning three years after the applicable treatment compliance date in 335-7-6-.20.
Alternative source/intake management	Verification that system has relocated the intake or adopted the intake withdrawal procedure reflected in monitoring results.	No later than the applicable treatment compliance date in 335-7-6-.20.
Pre-sedimentation	Monthly verification of the following: (i) Continuous basin operation. (ii) Treatment of 100% of the flow. (iii) Continuous addition of a coagulant. (iv) At least 0.5-log mean reduction of influent turbidity or compliance with alternative Department-approved performance criteria.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Two-stage lime softening	Monthly verification of the following: (i) Chemical addition and hardness precipitation occurred in two separate and sequential softening stages prior to filtration. (ii) Both stages treated 100% of the plant flow.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Bank filtration	(i) Initial demonstration of the following: (A) Unconsolidated, predominantly sandy aquifer (B) Setback distance of at least 25 ft. (0.5-log credit) or 50 ft. (1.0-log credit).	No later than the applicable treatment compliance date in 335-7-6-.20.

Microbial Toolbox Reporting Requirements		
Toolbox Option	**Required Information**	**Schedule**
	(ii) If monthly average of daily max turbidity is greater than 1 NTU then system must report result and submit an assessment of the cause.	Report within 30 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Combined filter performance	Monthly verification of combined filter effluent (CFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of the 4 hour CFE measurements taken each month.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Individual filter performance	Monthly verification of the following: (i) Individual filter effluent (IFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter (ii) No individual filter greater than 0.3 NTU in two consecutive readings 15 minutes apart.	Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Demonstration of performance	(i) Results from testing following a Department approved protocol.	No later than the applicable treatment compliance date in 335-7-6-.20.
	(ii) As required by the Department, monthly verification of operation within conditions of Department approval for demonstration of performance credit.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Bag filters and cartridge filters	(i) Demonstration that the following criteria are met: (A) Process meets the definition of bag or cartridge filtration. (B) Removal efficiency established through challenge testing that meets the criteria in rule 335-7-6-.25.	No later than the applicable treatment compliance date in 335-7-6-.20.
	(ii) Monthly verification that 100% of plant flow was filtered.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Membrane filtration	(i) Results of verification testing demonstrating the following: (A) Removal efficiency established through challenge testing that meets criteria in this subpart. (B) Integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline.	No later than the applicable treatment compliance date in 335-7-6-.20.

Microbial Toolbox Reporting Requirements		
Toolbox Option	**Required Information**	**Schedule**
	(ii) Monthly report summarizing the following: (A) All direct integrity tests above the control limit; (B) If applicable, any turbidity or alternative Department-approved indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Second stage filtration	Monthly verification that 100% of flow was filtered through both stages and that first stage was preceded by a coagulation step.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Slow sand filtration (as secondary filter)	Monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100% of flow.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Chlorine dioxide	Summary of CT values for each day as described in 335-7-6-.26.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
Ozone	Summary of CT values for each day as described in 335-7-6-.26.	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.
UV	(i) Validation test results demonstrating operating conditions that achieve required UV dose.	No later than the applicable treatment compliance date in 335-7-6-.20.
	(ii) Monthly report summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose as specified in 335-7-6-.26(4).	Within 10 days following the month in which monitoring was conducted, beginning on the applicable treatment compliance date in 335-7-6-.20.

(q) A ground water system regulated under the ground water rule (GWR) in rule 335-7-5-.22 must maintain the following information in its records:

1. Documentation of corrective actions. Documentation shall be kept for a period of not less than ten years.

2. Documentation of notice to the public as required under rule 335-7-5-.22(6)(a)7. Documentation shall be kept for a period of not less than three years.

3. Records of decisions under rule 335-7-5-.22(5)(a)5.(ii) and records of invalidation of fecal indicator-positive ground water source samples under rule 335-7-5-.22(5)(d). Documentation shall be kept for a period of not less than five years.

4. For consecutive systems, documentation of notification to the wholesale system(s) of total-coliform positive samples that are not invalidated by the Department in implementing rule 335-7-2-.07. Documentation shall be kept for a period of not less than five years.

5. For systems, including wholesale systems, that are required to perform compliance monitoring under rule 335-7-5-.22(6)(b):

(i) Records of the Department-specified minimum disinfectant residual. Documentation shall be kept for a period of not less than ten years.

(ii) Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the Department-prescribed minimum residual disinfectant concentration for a period of more than four hours. Documentation shall be kept for a period of not less than five years.

(iii) Records of Department-specified compliance requirements for membrane filtration and of parameters specified by the Department for Department-approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours. Documentation shall be kept for a period of not less than five years.

(r) All water systems that are required to complete a Source Water Assessment per chapter 335-7-15 shall maintain a copy of their current Source Water Assessment for review by the Department during sanitary surveys.

(s) All log sheets shall be filled out legibly using ink. Any correction made shall have a single line drawn through it, initialed by the operator, and the correct entry written near the incorrect entry.

(t) All water systems must meet the following recordkeeping requirements:

1. The system must maintain any assessment form required by rule 335-7-2-.22, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions for the Department to review. This record must be maintained by the system for a

period not less than five years after completion of the assessment or corrective action.

2. The system must maintain a record of any repeat samples taken that the Department granted an extension of the 24-hour period for collecting repeat samples in accordance with rule 335-7-2-.07(5)(a).

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990, September 19, 1995 (ER); November 28, 1995; effective January 2, 1996.
Amended: March 12, 2002, May 30, 2003, December 12, 2005, January 22, 2008; May 26, 2009; September 25, 2012; November 25, 2014.

335-7-10-.06 Reports.

(1) The monthly operating report shall be submitted to the Department no later than the tenth of the following month in a format approved by the Department. The report shall contain the results of all required water quality control tests specified in rule 335-7-10-.03 of this chapter, except where individual samples or longer averaging times are specified in this paragraph. The daily minimum disinfection levels shall be reported. When required by the Department, the following shall be provided:

(a) Maximum daily raw, clarified and individual filter effluent turbidity;

(b) The average of the carbon dioxide, color, iron, manganese, total alkalinity, pH and fluoride test results for each day;

(c) Water production records;

(d) Ground water level information;

(e) Filter operation records;

(f) Distribution pressure measurements; and,

(g) Water loss information.

(2) Records of chemical analyses shall be provided to the Department no later than the tenth of the month following the end of the required monitoring period. As a minimum, these reports shall include the location, date and result of each sample collected during the monitoring period. When directed by the Department, the number of samples collected, the quarterly average, the annual average and whether the MCL was exceeded shall be reported.

(3) Systems that are required to meet enhanced coagulation shall also report the alternative criterion that the system is using and the percent TOC removal.

(4) The system shall notify the Department within 24 hours of any instance of filtered surface water exceeding 1.0 NTU or finished ground water turbidity exceeding 5.0 NTUs; the disinfectant residual in the system being less than 0.2 mg/l for free chlorine or 0.5 mg/L for chloramine; or a waterborne disease outbreak potential.

(5) Any records or reports pertaining to the quality of water or operation of the water supply system shall be furnished to the Department upon request and must be available for public review.

(6) The water system shall maintain a copy of each monthly operating report. The report must be signed by a certified operator. This copy shall be readily available for inspection by the Department.

(7) Any operational evaluation level that was exceeded must be reported within 10 days after the end of the quarter. In addition, the system must report the date, location and the calculated TTHM and HAA5 levels for each site that exceeded the operational evaluation level.

(8) Any surface water or ground water under the influence of surface water system that is seeking to qualify for or remain on reduced TTHM and HAA5 monitoring must report the following source water TOC information:

(a) The number of TOC samples taken each month during the last quarter including the date and result of each sample.

(b) The quarterly average of monthly samples taken during last quarter or the results of the quarterly sample.

(c) The running annual average (RAA) of quarterly averages from the past four quarters.

(d) Whether the RAA exceeded 4.0 mg/L.

(9) Each membrane filtration unit shall undergo a direct integrity test each day the unit is in operation. The results of the test shall be reported monthly to the Department.

(10) Any membrane filtration unit exceeding 0.15 NTU for two consecutive readings, 15 minutes apart, shall be removed from service and undergo direct integrity testing. Additionally, any membrane unit that fails a direct integrity test shall be removed from service.

(a) Any unit that fails a direct integrity test shall be removed from service, repaired and not returned to service unit it passes two consecutive direct integrity tests.

(b) The Department shall be notified within 48 hours of any membrane unit that exceeds 0.15 NTU or fails a direct integrity test. This information must be reported on the system's monthly operational report along with the date and time of when the Department was notified.

(c) Any membrane unit that exceeds 0.15 NTU for 2 consecutive readings, but passes its direct integrity test shall not be returned to service until the unit is able to produce water with a turbidity of less than 0.15 NTU.

[**Note:** Paragraphs (9) and (10) above apply only to surface water and ground water under the influence of surface water systems. Compliance monitoring reporting for ground water systems is covered in paragraph (11) below.]

(11) Ground water systems must submit the following to the Department:

(a) A ground water system conducting compliance monitoring under rule 335-7-5-.22(6)(b) must notify the Department any time the system fails to meet any Department-specified requirements including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The ground water system must notify the Department as soon as possible, but in no case later than the end of the next business day.

(b) After completing any corrective action under rule 335-7-5-.22(6)(a), a ground water system must notify the Department within 30 days of completion of the corrective action.

(c) If a ground water system subject to the requirements of rule 335-7-5-.22(5)(a) does not conduct source water monitoring under rule 335-7-5-.22(5)(a)5.(ii), the system must provide documentation to the Department within 30 days of the total coliform positive sample that it met the Department criteria.

(12) Reports submitted in accordance with this rule shall meet the following requirements:

(a) Monthly operating reports required by paragraph (1) or records of chemical analysis required by paragraph (2) above, shall comply with the following:

(i) Water systems serving a population of 3,300 or greater shall submit the reports in an electronic format approved by the Department for all reports dated January 1, 2013 or later

(ii) Water systems serving a population of less than 3,300 shall submit the reports in an electronic format approved by the Department for all reports dated January 1, 2014 or later

(iii) A waiver can be granted by the Department if requested in advance.

(b) All other reports may be submitted in an electronic or paper format approved by the Department.

(13) All water systems must meet the following reporting requirements:

(a) E. coli:

(i) A system must notify the State by the end of the day when the system learns of an E. coli MCL violation as defined in rule 335-7-2-.07(1), unless the system learns of the violation after working hours of the Department and the Department does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Department before the end of the next business day, and notify the public in accordance with rule 335-7-2-.21.

(ii) A system must notify the Department by the end of the day when the system is notified of an E. coli- positive routine sample, unless the system is notified of the result after the working hours of the Department and the Department does not have either an after-hours phone line or an alternative notification procedure, in which case the system must notify the Department before the end of the next business day.

(b) A system that has violated the treatment technique for microbiological standards as defined in rule 335-7-2-.07(7) or 335-7-2-.22(4) must report the violation to the Department no later than the end of the next business day after it learns of the violation, and notify the public in accordance with rule 335-7-2-.21.

(c) A system required to conduct an assessment under the provisions of rule 335-7-2-.22 must submit the assessment report within 30 days. The system must notify the Department in accordance with rule 335-7-2-.22(3) when each scheduled corrective action is completed for corrections not completed by the time of submission of the assessment form.

(d) A system that has failed to comply with a coliform monitoring requirement found in rule 335-7-2-.07 must report the monitoring violation to the State within 10 days after the system discovers the violation, and notify the public in accordance rule 335-7-2-.21.

(e) A seasonal system must certify, prior to serving water to the public, that it has complied with the State-approved start-up procedure referenced in rule 335-7-2-.07(7).

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: May 23, 1977; Repealed and readopted: January 4, 1989; October 31, 1990; effective December 5, 1990.
Amended: December 12, 2005, January 22, 2008; May 26, 2009; September 25, 2012; November 25, 2014.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-11
CONTROL OF LEAD AND COPPER

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335-7-11-.01 Definitions. When used in this chapter, the following words and terms shall have the meaning assigned to them as shown.

(a) Action Level--The concentration of lead or copper in water which is used to determine compliance with these regulations. This action level value is the 90th percentile level determined from monitoring water at specific sites in the distribution system.

(b) Corrosion inhibitor--A substance capable of reducing the corrosivity of water towards metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

(c) Compliance Limit--the level of 0.015 mg/l of lead and 1.3 mg/l of copper in drinking water. To determine compliance, a system shall compare its lead/copper action levels with these values.

(d) Effective Corrosion Inhibitor Residual--A concentration of corrosion inhibitor sufficient to form a passivating film on the interior walls of a pipe.

(e) First draw sample--A one liter sample of tap water which has been standing in plumbing piping for at least six hours prior to collection and is

collected without flushing the tap. Samples shall be taken from residential housing from a cold water kitchen or bathroom tap or from a non-residential building collected at a tap used for water consumption.

(f) Large water system--A public water system serving 50,000 or more persons.

(g) Lead Service line--A water service line made of lead connecting the water main to a building inlet. This service line includes all fittings attached or connected to it.

(h) Medium size water system--A public water system that serves greater than 3,300 population and less than 50,000 population.

(i) Optimal corrosion control treatment--Treatment of the water that minimizes the lead and copper concentrations at users taps while ensuring that the treatment does not cause non-compliance with other established drinking water standards.

(j) Service line sample--A one liter sample of water which has been standing in a lead service line for at least six hours.

(k) Single family structure--A building constructed as a single family residence that is currently used as either a residence or a place of business.

(l) Small water system--A public water system that serves 3,300 population or less.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992. Effective: November 9, 1992.

335-7-11-.02 Applicability. The regulations established by this chapter apply to all community and NTNC water systems. All water systems shall establish water treatment techniques to produce a non-aggressive water to minimize the exposure to its consumers of lead and copper which may be present in the materials of construction, both in the water system and in customer plumbing. Additional steps may be necessary to minimize exposure to lead and copper by replacing water distribution piping and appurtenances.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992. Effective: November 9, 1992.

335-7-11-.03 Compliance with Lead and Copper Levels. All water systems shall determine a lead and copper action level based on the monitoring requirements established in this chapter. A system is considered in compliance if the lead action level is equal to or less than the lead compliance limit (0.015 mg/l) and the copper level is equal to or less than the copper compliance limit (1.3 mg/l.) This action level shall be determined using all monitoring at the

selected sites, not just the minimum shown in Table 11-1.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992. Effective: November 9, 1992.

335-7-11-.04 Initial Monitoring to Establish Action Levels.

(1) All new community and NTNC water systems shall monitor for lead and copper at the number of established monitoring sites for two consecutive six-month monitoring periods starting the first six-month period the system is in operation.

(2) Any community and NTNC water system that exceeds a lead or copper action level shall monitor for lead and copper at the number of established monitoring sites during at least two consecutive six-month compliance periods.

(3) Any water system which has demonstrated satisfactory action levels and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Department during two consecutive six-month monitoring periods may reduce monitoring sites and frequency of monitoring to once per year if it receives written approval from the Department. The number of initial and reduced monitoring sites is shown in Table 11-1. The reduced monitoring shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(4) A community or NTNC water system that significantly changes the source of its drinking water, its treatment to control the corrosivity of the water or if the source water quality significantly changes, may be required by the Department to conduct initial monitoring under this rule.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; January 22, 2008; May 26, 2009; November 25, 2014.

335-7-11-.05 Repeat Monitoring Requirements.

(1) Systems monitoring on a yearly basis shall use the number of reduced monitoring sites shown in Table 11-1. All monitoring must be taken from previous sites and must be collected during June, July, August, or September of that year unless the water system receives written approval from the Department for an alternative monitoring period.

(2) After three consecutive years of demonstrating satisfactory action levels, a small or medium water system may reduce monitoring to once every three years.

(3) After three consecutive years of demonstrating satisfactory action levels and maintaining the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Department, any water system may reduce monitoring sites and frequency of monitoring to once every three years with written approval from the Department.

(4) A system with a 90th percentile level less than or equal to .005 mg/L for lead and 0.65 mg/L for copper for two consecutive six-month periods may reduce monitoring to once every three years.

(5) Any system exceeding a lead or copper compliance limit shall increase monitoring consistent with the initial monitoring compliance requirements. Monitoring must be collected from the initial sites and monitoring must take place during six-month compliance cycles (January – June or July – December) until compliance is achieved. Monitoring shall begin with the next available compliance cycle after the exceedance occurred. If optimum corrosion control treatment or source water treatment is initiated by the system, monitoring during six-month compliance cycles must continue for two six-month periods after the treatment has been installed demonstrating compliance with the compliance limits.

(6) Any system that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Department for more than nine days in any six-month period shall increase monitoring consistent with the initial monitoring compliance requirements. Monitoring must be conducted utilizing the initial monitoring sites and monitoring must take place during six-month compliance cycles January – June or July – December) until compliance is achieved. Monitoring shall begin with the next available compliance cycle after the exceedance occurred.

(7) A system may be allowed to monitor during months other than June, July, August and September. The alternate monitoring period shall be no longer than four months in duration when the highest lead levels are likely to occur. Systems monitoring annually must conduct their next round of monitoring during a time period that ends no later than 21 months after the previous round of monitoring. Systems monitoring every three years must conduct their next round of monitoring during a time period that ends no later than 45 months after the previous round of monitoring.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; May 26, 2009; November 25, 2014.

335-7-11-.06 Number of Lead-Copper Monitoring Sites. Water systems shall collect at least one sample during each monitoring period from the number of sites established by Table 11-1. A system conducting reduced monitoring under this rule shall collect at least one sample from the number of sites specified in the Reduced Monitoring Sites column below. Such reduced monitoring sites shall be representative of the sites required for standard monitoring. A public water

system that has fewer than five drinking water taps that can be used for human consumption shall collect at least one sample from each tap and then shall collect additional samples from those taps on different days during the monitoring period to meet the required minimum number of sample sites list in Table 11-1. Under no circumstance can a water system reduce the minimum number of samples below 5 per monitoring period.

TABLE 11-1
LEAD/COPPER MONITORING SITES

Population	Initial Monitoring Sites	Reduced Monitoring Sites
> 100,000	100	50
10,001-100,000	60	30
3,301-10,000	40	20
501-3,300	20	10
101-500	10	5
≤ 100	5	5

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992. Effective: November 9, 1992.
Amended: March 12, 2002; May 26, 2009; November 25, 2014.

335-7-11-.07 Monitoring Site Selection. Only monitoring conducted utilizing acceptable sites can be used to determine compliance with this chapter. Water systems shall complete a materials evaluation of its distribution system to identify targeted sample sites. Sufficient sample sites shall be selected to allow an availability of acceptable sites and thus allow monitoring based on the number of samples required in Table 11-1.

(a) Monitoring sites for Community systems--Community water systems must conduct all lead and copper monitoring utilizing tier one sites or document the lack of sufficient sites and conduct the remaining monitoring from tier two sites. Water systems with insufficient tier one and two sites may utilize tier three sites. A community water system with insufficient tier one, two or three sites shall monitor utilizing replacement sites throughout the distribution system. A replacement site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system but not conforming to tier one, two or three requirements.

1. Any water system whose distribution system contains lead service lines shall conduct at least 50% of the monitoring from these sites during each monitoring period. Monitoring shall be conducted from the lead service line. Should a sufficient number of sites be unavailable to provide 50% of the required monitoring, written documentation is necessary to demonstrate why the system was unable to locate a sufficient number of such sites.

2. Tier one sites--These sites include single family structures containing lead pipe or plumbing, are served by a lead service line, or contain copper pipes with lead solder and were constructed after 1982.

3. Tier two sites--These sites include buildings and multiple family residences containing lead pipe or plumbing, are served by a lead service line, or contain copper pipes with lead solder and were constructed after 1982.

4. Tier three sites--These sites include single family structures containing copper pipes with lead solder which were constructed prior to 1983.

(b) Monitoring sites for NTNC water systems--NTNC systems shall conduct all lead and copper monitoring from tier one sites. Systems with insufficient tier one sites may use tier two sites and those systems consisting of fewer structures than required sites may collect more than one sample at a structure, but from different spigots which consist of building containing copper pipes with lead solder installed before 1983. A NTNC water system with insufficient tier one or two sites shall conduct the remaining monitoring from replacement sites throughout the distribution system. A replacement site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system but not conforming to tier one or two requirements.

1. Tier One Sites--These sites include buildings with lead pipes or plumbing, are served by a lead service line or contain copper pipes with lead solder constructed after 1982.

2. Tier Two Sites--These sites include buildings with copper pipes and lead solder constructed before 1983.

(c) Lead service line samples--Any water system whose distribution system contains lead service lines shall conduct 50% of the monitoring from sites served by a lead service line each monitoring period. If a sufficient number of sites served by a lead service line cannot be identified, all identified sites shall be monitored.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992. Effective: November 9, 1992.
Amended: March 12, 2002.

335-7-11-.08 Lead/Copper Monitoring Collection Procedures. Tap and service line monitoring shall be collected in accordance with the following:

(a) Tap monitoring for lead and copper shall be first draw and one liter in volume. The water shall stand motionless in the plumbing system for at least six hours prior to collection. Collection shall be from the cold water kitchen tap or bathroom sink tap from tier 1 sites or from an interior tap typically used for obtaining water for consumption from tier 2 and tier 3 sites. Monitoring may be conducted by the resident after proper instructions and procedures have been provided by the water system. Follow up tap monitoring shall be conducted from the same sites. Should a site no longer be available, an alternate acceptable site may be selected which is in reasonable proximity of the original site. Taps used for monitoring may not include faucets that have point of use or treatment devices installed.

(b) Service line monitoring shall be one liter in volume and have remained in the lead service line for at least six hours prior to collection. Service line monitoring may be collected directly by tapping into the lead service line, or by flushing the volume of water between the tap and the lead service line until either the calculated amount of water between the tap and the service line has been discharged or for single family residences until there is a significant change in temperature which would indicate the water available was standing in the lead service line.

(c) Water systems with insufficient taps that can supply first draw samples may apply to the state in writing to substitute non–first-draw samples. These systems must collect as many of the samples as possible from first-draw taps and identify the monitoring times and locations that would likely result in the longest standing times for the remaining samples. Non-first-draw samples shall be one liter in volume and collected from an interior tap from which water is typically drawn for consumption.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992. Effective: November 9, 1992.
Amended: March 12, 2002.

335-7-11-.09 Invalidation of Lead or Copper Tap Water Samples. A sample invalidated under this rule does not count toward 90th percentile levels or toward meeting minimum monitoring requirements.

(a) A sample may be invalidated for one of the following reasons.

1. The laboratory establishes that improper sample analysis caused erroneous results.

2. The State determines that the sample was taken from a site that did not meet the site selection criteria of this rule.

3. The sample container was damaged in transit.

4. There is substantial reason to believe that the sample was subject to tampering.

(b) The system must report the results of all samples to the State and all supporting documentation for samples the system believes should be invalidated.

(c) The water system must collect replacement samples for any samples invalidated under this rule if, after the invalidation of one or more samples, the system has not collected the minimum number of samples. Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the State invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The

replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for monitoring during the monitoring period.

Author: Thomas S. Deloach.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: March 12, 2002.
Amended: January 22, 2008.

335-7-11-.10 Monitoring Waivers. A small system that meets the requirements of this rule may apply to the state to reduce the frequency of monitoring for lead and copper to once every nine years.

(a) The system must submit a materials survey showing the system is free of lead and copper containing materials as detailed below.

1. It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and

2. It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the NSF Standard 61 Section 9.

3. The system contains no copper pipes or copper service lines.

(b) The system must have completed at least one six-month round of standard tap water monitoring for lead and copper demonstrating that the 90th percentile levels for all rounds of monitoring conducted since the system became free of all lead-containing and copper-containing materials were less than or equal to .005 mg/L for lead and 0.65 mg/L for copper.

(c) A system that has been granted a waiver must monitor for lead and copper at the reduced number of monitoring sites specified in Table 11-1 every nine years. The system must also submit a materials survey along with the monitoring results.

(d) A system must return to monitoring for lead and copper at least every three years if the system no longer meets than materials criteria, has a 90th percentile level for lead greater than .005 mg/L or a 90th percentile level for copper greater than .065 mg/L.

(e) The system shall notify the Department within 60 days after determining the system is no longer free of materials that contain lead or copper.

(4) Any water system with a waiver shall notify the Department, in writing, of any upcoming long-term change in treatment or addition of a new source.

Author: Thomas S. DeLoach, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: March 12, 2002.

Amended: May 30, 2003; January 22, 2008; May 26, 2009; February 3, 2017.

335-7-11-.11 Action Level Non-Compliance. Any water system with an action level exceeding the compliance limit for lead or copper shall complete the following requirements in the manner and by the deadline established by these regulations:

(a) Water systems must install and maintain adequate corrosion control treatment equipment to ensure that the lead/copper compliance limit can be met. The Department may require that an in-depth study be completed to determine the optimum corrosion control process for the system.

(b) Systems installing corrosion control treatment requirements shall monitor the parameters at the frequency established by these regulations. All parameters established must be reported on the monthly operation data reports by the 10th of the following month. Exceedance of the established values which indicate optimum corrosion control is considered a treatment technique violation.

(c) The lead and copper level in the source water serving the areas exceeding the compliance limit must be monitored to determine compliance with the primary drinking water standards in chapter 335-7-2. The source must be taken out of service and provided with satisfactory treatment, approved by the Department, to reduce the lead or copper level to meet these drinking water standards.

(d) A system that fails to meet the lead/copper compliance limit after the installation of corrosion control shall develop a program to replace lead service lines. All lead service lines in the system shall be identified and at least 7% replaced on an annual basis. More rapid replacement may be required by the Department.

(e) Systems which exceed the lead compliance limit shall deliver public educational materials according to the methods specified in the regulations. The language used in this public education notice must include specific language contained in the Appendix C.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; January 22, 2008; September 25, 2012.

335-7-11-.12 Corrosion Control Treatment Requirement. Any water system which has been deemed to have optimized corrosion control and has corrosion control treatment in place shall continue to operate and maintain treatment to ensure that optimal corrosion control is maintained.

(a) All water systems with an action level which exceeds a lead or copper compliance limit and any new drinking water source proposed for use after the effective date of these regulations shall install and properly operate

optimum corrosion control processes continuously to reduce the potential for lead or copper exposure by the consumers. Within six months of exceeding the compliance limit a system shall provide a detailed report indicating the process and equipment to be used to provide corrosion control treatment. Installation and start up of the equipment must be completed within 24 months of approval of the Department. A corrosion control treatment study may be required by the Department to determine the optimum process to be installed. Those systems practicing corrosion control in their treatment process prior to the effective date of these regulations and acceptable to the Department may have the treatment study requirements waived. Systems required to perform a corrosion control treatment study shall complete the study and submit its results along with a proposal for the process to be used to the Department within 12 months of exceeding a compliance limit. This report must include a proposed construction schedule for installation of the equipment. This project must be completed no more than 24 months after the study submittal. All systems installing corrosion control treatment processes shall monitor initial site during the next two consecutive six-month compliance periods.

(b) The water in a water system is considered to meet optimum corrosion control when the distribution system:

1. Water quality parameters reflected on the Baylis Curve indicates no incrusting or corrosion will occur, or

2. The Langelier Index of the water is between -1.0 to +2,

3. The Ryznar Index is between 7 and 11,

4. A phosphate or silicate corrosion inhibitor is continuously applied at the manufacturer/supplier recommended level resulting in minimum complaints, or

5. The Calcium Carbonate Precipitation Potential (CCPP) is maintained between 4-10 mg/l, and limits.

6. The water continuously meets the lead and copper compliance

(c) Any water system may be considered to optimize corrosion control treatment if it demonstrates that it has conducted activities equivalent to the corrosion control steps outlined in this rule. Water systems deemed to have optimized corrosion control under this subparagraph shall operate in compliance with the State-designated optimal water quality control parameters and continue to conduct lead and copper tap and water quality parameter monitoring as required by these regulations. The system shall provide to the Department:

1. The results of all monitoring for each of the water quality parameters listed in 335-7-11-.13(c);

2. A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in 335-7-11-13(a), the results of all tests conducted and the basis for the system's selection of optimal corrosion control treatment;

3. A report explaining how corrosion control has been installed and how it is being maintained to ensure minimal lead and copper concentrations at consumer's taps; and

4. The information from tap water monitoring conducted in accordance with 335-7-11-.07 above the compliance limit.

(d) Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with 335-7-11-.08 and source water monitoring in accordance with 335-7-11-.15 that demonstrates for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water level computed under 335-7-11-.03 and the highest source water lead concentration is less than 0.005 mg/l.

1. Those systems whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this subparagraph if the 90th percentile tap water lead level is less than or equal to 0.005 mg/l for two consecutive 6-month monitoring periods.

2. Any water system deemed to have optimized corrosion control in accordance with this subparagraph shall continue to monitor for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of monitoring sites and conducting the monitoring at times and locations specified in these regulations.

3. Any water system deemed to have optimized corrosion control shall notify the Department in writing pursuant of any change in treatment or the addition of a new source. Any new source or long-term change in water treatment shall have written approval from the Department before being placed into service or implemented. The system may be required to conduct additional monitoring or to take other action to ensure that the system maintains minimal levels of corrosion in the distribution system.

4. Any system triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this subparagraph shall implement corrosion control treatment in accordance with the deadlines in the regulations. Large systems shall adhere to the schedule specified in the paragraph for medium size systems; with the time periods for completing each step being triggered by the date the system is no longer deemed to have optimized corrosion control under this paragraph.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; January 22, 2008; May 26, 2009; January 18, 2011; September 25, 2012.

335-7-11-.13 Corrosion Control Study. Systems proposing to use a new source or exceeding the lead and copper compliance limit may be required to conduct and submit a corrosion control study to determine the optimum

corrosion control process to minimize exposure of lead and copper to the consumers.

(a) Any water system performing a corrosion control study shall evaluate the effectiveness of each of the following treatment processes and if appropriate, any combination of these processes:

1. Alkalinity and pH adjustment,

2. Calcium hardness adjustment, and

3. The addition of a phosphate or silicate based corrosion inhibitor at a concentration to maintain an effective residual in the distribution system.

(b) The study shall use either a pipe-loop test, metal coupon test, partial system test, or analysis based on documented treatment activities from other water systems with similar water chemistry, similar system size, and same distribution system configuration.

(c) The following water quality parameters shall be measured during the test conducted to allow proper evaluation of the processes:

1. Lead

2. Copper

3. pH

4. Total alkalinity

5. Calcium

6. Conductivity

7. Orthophosphate (when a phosphate inhibitor is evaluated)

8. Silicate (when a silicate compound is evaluated)

9. Water temperature

(d) The study shall identify all chemical or physical constraints that may limit or prohibit the use of a particular corrosion treatment method, identify any previously used corrosion control treatment that was found ineffective, or adversely affected any treatment processes, shall evaluate the effect of the proposed chemicals to be used on the water quality treatment processes demonstrating adequate corrosion control, and shall provide a recommendation of the proposed process to be installed.

(e) Information to be included with the recommended process shall include cost of the proposed installation, equipment to be used including model number and brand, chemical to be added including proposed concentration rate, NSF approval document, and availability information on the chemical and a

construction schedule demonstrating the equipment can be operational within 24 months of the study submittal. After review of the recommended process, the Department will determine the optimum corrosion control process and the water quality parameter values. Lead and copper monitoring shall continue each six-month compliance period from the date the parameter values are set.

Author: Joe Alan Power.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; September 25, 2012.

335-7-11-.14 Corrosion Control Parameter Monitoring Requirements.

(1) All large water systems and water systems utilizing a corrosion control process to meet the requirements established under rule 335-7-11-.12 shall begin monitoring within ten days of process activation.

(2) Monitoring parameters will be determined for each specific water system and may include requirements for monitoring pH, alkalinity, orthophosphate, silica, calcium, conductivity, water temperature, and other parameters designated by the Department. Compliance may be demonstrated by monitoring the treated water from each individual source for designated parameters on a daily and weekly basis or by establishing distribution system locations and monitoring during six-month monitoring periods (January – June or July – December). Compliance monitoring shall begin with the next full six-month period.

(a) Systems using the Baylis Curve may demonstrate proper corrosion control by monitoring the treated water from each water source on a daily basis for pH and total alkalinity. Should the system utilize the Langelier Index or Ryznar Index for evaluating the corrosive level of the water, the treated water from each source must be monitored for pH and alkalinity daily and calcium, water temperature, and hardness on a weekly basis. Should an orthophosphate or silicate inhibitor be used, the system shall monitor pH on a daily basis and the phosphate or silicate level on a weekly basis for each treatment facility.

(b) With the approval of the Department, a system may select representative sites throughout the distribution system, taking into consideration the number of different sources of water, different treatment methods, seasonal variability, and density of service. The number of sites must be no less than those designated in Table 11-2.

TABLE 11-2 Water Quality Monitoring	
Population	**Number of sites**
> 100,000	25
10,001-100,000	10
3301-10,000	3
501-3300	2
<500	1

(c) Two samples shall be obtained from each of the designated sites and two samples shall be obtained from each entry point from a treatment facility operating under normal conditions and analyzed for pH, alkalinity, Orthophosphate, (when a phosphate compound is used), silica (when a silicate compound is used), calcium, conductivity, and water temperature. These samples shall be collected each six-month monitoring period and reported by the 10th of the following month after samples are collected.

(d) All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the State for all monitoring conducted. Compliance with the requirements of this subparagraph shall be determined every six months. A water system is out of compliance for a six-month period if it has excursions for any State-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a monitoring location is below the minimum value or outside the range designated by the State. Daily values are calculated as follows:

1. On days when more than one measurement for the water quality parameter is collected at the monitoring location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab monitoring, or a combination of both.

2. On days when only one measurement for the water quality parameter is collected at the monitoring location, the daily value shall be the result of that measurement.

3. On days when no measurement is collected for the water quality parameter at the monitoring location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the site.

(3) The water system shall maintain water quality parameter values within the ranges established by the Department to demonstrate production of satisfactory water. Should an analysis indicate a value outside the established level, immediate steps shall be taken to adjust the treatment process and conduct additional monitoring within 24 hours to verify compliance with acceptable value(s). Analysis of corrosion control parameters shall be conducted using analytical methods established by EPA.

(4) Any small or medium-sized systems shall conduct water quality parameter monitoring according to the requirements of this rule when the water system exceeds the lead or copper action level.

(5) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during three consecutive years of monitoring may reduce the frequency of monitoring to once per year if it receives written approval from the Department. The reduced monitoring shall begin during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during three consecutive years of annual monitoring may reduce the frequency of monitoring to every three years if it receives written approval from the Department. The sampling begins no later than the third calendar year following the end of the monitoring period in which the third consecutive year of monitoring occurs.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; January 22, 2008; May 26, 2009; November 25, 2014.

335-7-11-.15 Source Water Monitoring and Treatment. Any system which exceeds the lead or copper compliance limit must analyze the treated water for the contaminant using the same methodology and location as required for inorganic contaminants in each source used by the system. This analysis must be completed within 180 days after the date of the initial exceedance. During the analysis, if a level exceeds 0.015 mg/l lead or 1 mg/l copper, then the system must perform confirmation monitoring within seven days. The value of the initial and all confirmation monitoring will be averaged. Treatment modifications must be installed which will result in the finished water meeting the lead and copper action levels based on monitoring throughout the distribution system, as specified in rule 335-7-11-.03. Modifications to the treatment process must be approved and permitted by the Department in accordance with rule 335-7-4-.03. Unless the Department gives written approval of the modifications, the source must be taken out of service within sixty days of the Department determining that treatment modifications are required and remain out of service until the treatment modifications are installed. Prior to reactivation of the source, monitoring of the treated water shall demonstrate compliance with drinking water standards and a second set of lead and copper monitoring conducted within six months of returning to service. All initial sites for lead and copper shall be monitored for the next two six-month compliance periods.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; May 26, 2009; February 3, 2017.

335-7-11-.16 Lead Service Line Replacement.

(1) Systems which exceed the compliance limit for lead after installation or modification of corrosion control processes or source water treatment and which contain lead service lines shall identify the number and location of lead service lines and develop and implement a removal action plan.

(a) This plan shall identify the number of lines, including an identification of the portion owned by the system, general distribution locations, cost of replacement, proposed disposal site for removed lines, and a time schedule for removal.

(b) This plan shall be provided within six months of exceeding the compliance limit and shall be implemented within twelve months of the end of the monitoring period in which the exceedance occurred. If the monitoring frequency is annual or less, the end of the monitoring period is September 30 of the year in which the sampling occurred.

(c) The plan shall provide for full replacement of all services lines, except those excluded in the following subparagraphs, within 15 years.

1. At least 7% of the initial number of lead service lines shall be replaced annually. Lead service lines which have demonstrated to meet the compliance limit for lead through service line monitoring can be excluded from the process. The state may require a water system to replace more than 7% of the lead service lines annually.

2. The plan shall demonstrate the legal ownership of service lines and if the water system does not control or own the entire lead service line up to the building, it shall include provisions to notify the customer of its existence and offer to replace that service line for a fair and equitable cost.

3. The process of replacing service lines may cease when the system can demonstrate through two consecutive monitoring periods that first draw samples collected from lead service lines are meeting the compliance limit due to enhanced corrosion control activity.

4. A water system that does not replace the entire length of the service line shall comply with the following:

(i) At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide notice to the residents of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The Department may allow the water system to provide this notice less than 45 days prior to commencing partial lead service line replacement where such replacement is done in conjunction with emergency repairs. In addition, the water system shall inform the residents served by the line that the system will, at the system's expense, collect a sample for a lead analysis from each partially-replaced lead service line within 72 hours after the completion of the partial replacement of the service line. The system shall collect the sample and report the results of the

analysis to the owner and the residents served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered "on time."

(ii) The water system shall provide the information required by this rule to the residents of individual dwellings by mail or by other methods approved by the Department. In instances where multi-family dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

(2) The process of replacing service lines may cease when the system can demonstrate through two consecutive monitoring periods that first tap draw monitoring conducted from lead service lines are meeting the compliance limit due to enhanced corrosion control activity. If first draw tap monitoring in any such system thereafter exceeds the lead action level, the system shall recommence replacing lead service lines as required by this rule.

(3) A water system resuming a lead service line replacement program after the cessation of its lead service line replacement program shall update its inventory of lead service lines to include those sites that were previously determined not to require replacement under subparagraph (1)(c)1.

(a) The lead service line replacement program shall be completed within 15 years. The 15 years shall include any previous time allowed under this rule.

(b) If a system has completed a 15 year replacement program, any exceedance of the action level will require the system to consult with the Department to determine a retesting or replacement schedule for the remaining lead service lines in the system.

Author: Joe Alan Power, Thomas S. DeLoach, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; January 28, 2004; January 22, 2008; May 26, 2009.

335-7-11-.17 Public Education Requirement.

(1) Water systems shall provide each customer with the results of any lead and copper monitoring conducted at the customer's tap. These results shall be provided to the customers within 30 days of receipt of the results by the water system.

(a) In addition to the results, the water system shall provide an explanation of the health effects of lead, steps consumers can take to reduce exposure to lead, the water system's contact information, maximum contaminate level goal (MCLG), the action level (AL) for lead and the definition of MCLG and AL.

(b) The notice to the consumer shall be mailed or provided by an

alternate method approved by the Department. Non-transient non-community water systems may post the results on a bulletin board in the facility that is readily accessible by all employees.

(c) Notice shall be provided to customers who do not receive a water bill.

(2) Any water system with a lead action level that exceeds the compliance limit shall provide public education materials containing the required language located in paragraph (3) below to the consumers within sixty days of the end of the monitoring period unless the system is being required to meet the repeat public education requirements of this rule. In communities where a significant proportion of the population speaks a language other than English, this material shall be in the appropriate language. This information shall include specific guidance as presented and use the language in subparagraph (c) above. Systems may delete information pertaining to lead service lines, upon approval of the Department, if no lead service lines exist anywhere in the water system service area. Public education language may be modified regarding building permit record availability and consumer access to these records, if approved by the Department. Systems may also continue to utilize pre-printed materials that meet the public education language requirements.

(3) A water system that exceeds the lead action level shall deliver the following public education materials in accordance with paragraph (4) of this rule.

(a) Content of written public education materials.

1. Community and non-transient non-community water systems shall include the following elements in printed materials (brochures and pamphlets) in the same order as listed below. The information in paragraphs (i) and (ii) below shall be included exactly as written except for the text in brackets, where the information shall be water system specific.

(i) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [INSERT NAME OF WATER SYSTEM] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

(ii) Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

(iii) Sources of lead.

(I) Explain what lead is.

(II) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead.

(III) Discuss other important sources of lead exposure in addition to drinking water (e.g. paints).

(iv) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

(I) Encourage running the water to flush out the lead.

(II) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

(III) Explain that boiling water does not reduce lead levels.

(IV) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

(V) Suggest that parents have their child's blood tested for lead.

(v) Explain why there are elevated levels of lead in the system's drinking water (if known) and what the water system is doing to reduce the lead levels in homes/buildings in this area.

(vi) Include information on where additional assistance may be obtained. The language which follows is suggested: For more information, call us at [INSERT PHONE NUMBER] or visit our website at [INSERT WEBSITE ADDRESS HERE] if applicable. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's website at http://www.epa.gov/lead or contact your health care provider.

2. Any additional information presented by a water system shall be consistent with the information above and be in plain language that can be understood by the general public.

3. Any information provided to the public under this rule shall have prior written approval by the Department.

(b) Community water systems shall also discuss lead in plumbing components, the difference between low lead and lead free, and how the consumers can get their water tested.

(4) Delivery of public education materials.

(a) Public water systems servicing a large proportion of non-English speaking consumers shall include information in the educational material in the appropriate languages(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

(b) Community water systems that exceed the lead action level that is not already conducting public education shall conduct public education within 60 days of the end of the monitoring period in which the exceedance occurred. The end of the monitoring period for systems that are monitoring no greater than annually shall be September 30 of the year in which the exceedance occurred or if the Department has established an alternative monitoring schedule, the last day of that period.

1. Printed materials meeting the content requirements of this rule shall be provided to all bill paying customers and all other organizations and entities as required by this rule.

2. The water system shall contact consumers who are most at risk by delivering educational materials that meet the content of this rule to local public health agencies even if they are not located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users.

(i) The water system shall contact the local public health agencies by phone or in person.

(ii) The water system shall provide the required public educational materials to all organizations provided by the local public health agencies that target the affected populations. This list may include organizations inside or outside of the water system's service area.

(iii) The water system shall request the following list of organizations from public health agencies, including ones not in the water system's service area, and provide these organizations with the educational materials required under this rule along with an informational notice that encourages distribution to all potentially affected customers or users.

(I) Licensed childcare centers.

(II) Public and private preschools.

(III) Obstetricians-Gynecologists and Midwives.

3. The water system shall contact customers who are most at risk by delivering materials to the following organizations that are located in the water system's service area along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users:

(i) Public and private schools or school boards;

(ii) Women, Infants and Children (WIC) and Head Start Programs;

(iii) Public and private hospitals and medical clinics;

(iv) Pediatricians;

(v) Family planning clinics; and,

(vi) Local welfare agencies.

(c) Each quarter that the water system has exceeded the lead action level, the water system shall prove public notice to each customer. The water system shall include the following information in subparagraph (c)1. below (exactly as written] on at least one water bill each quarter.

1. [INSERT NAME OF WATER SYSTEM HERE] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [INSERT NAME OF WATER SYSTEM HERE] [or visit (INSERT NAME OF WEBSITE HERE)].

2. Systems unable to include the statement in paragraph (i) above on its water bill shall consult with the Department for other approved methods of delivery.

(d) Systems with a population greater than 100,000 shall post all required public education material on the water system's publicly accessible website and provide the address to the Department.

(e) Water systems shall submit a press release to all newspapers, television and radio stations that service the water system's service area.

(f) In addition to the public notification and educational materials required above, the water system shall select and implement at least three activities from one or more of the categories below. The selection of activities and educational content shall be approved by the Department prior to implementation.

1. Public Service Announcements.

2. Paid advertisements.

3. Public Area Information Displays.

4. E-mails to customers.

5. Public Meetings.

6. Household Deliveries.

7. Targeted Individual Customer Contact.

8. Direct material distribution to all multi-family homes and institutions.

9. Other methods as approved by the Department.

(5) A community water system that continues to exceed the action level shall repeat the activities in paragraph (4) above as follows:

(a) A community water system shall repeat the tasks contained in subparagraphs (4)(b) and (4)(f) every 12 months.

(b) A community water system shall repeat the tasks contained in subparagraph (4)(c) with each billing cycle.

(c) A community water system serving a population greater than 100,000 shall maintain on a publically accessible website a copy of all public educational material required under paragraph (3) until the water system no longer exceeds the action level.

(d) A community water system shall repeat the tasks contained in subparagraph (4)(e) twice every 12 months on a schedule approved by the Department.

(6) A non-transient non-community water system shall deliver the public education materials specified in paragraph (3) of this rule within 60 days after the end of the monitoring period unless it is already providing public education as required under this rule. The end of the monitoring period for a system that is monitoring no greater than annually shall be September 30 of the year in which the sampling occurred or the last day of an alternative monitoring schedule. The distribution of public educational materials shall be as follows:

(a) Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system.

(b) Informational pamphlets and/or brochures on lead in drinking water shall be distributed to each person served by the water system.

(c) The public educational materials shall be distributed as required in this rule at least once each year in which the system exceeds the lead action level.

(7) A community water system serving a population less than 3,301 people may limit certain aspects of its public education program as follows:

(a) At least one of the activities under subparagraph (4)(f) shall be implemented instead of the three required in subparagraph (4)(f).

(b) The water system may limit the distribution of public education materials required under subparagraph (4)(b)2. to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

(c) The water system may request to have the requirements of subparagraph (4)(e) waived provided the system distributes notices to every household served by the system.

(8) A community water system which is a facility such as a prison or hospital where the population is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices or is a system that provides water as part of the cost of services and does not charge separately for water consumption may request in writing to only use the text

specified in paragraph (3) of this rule and provide notification according to paragraph (6) of this rule.

(9) A water system may discontinue delivery of public educational materials if the system has met the lead action level during the most recent six-month monitoring period conducted in accordance with this section. Public education shall resume, in accordance with this section, if the water system exceeds the lead action level during any monitoring period.

(10) A water system that fails to meet the lead action level on the basis of tap samples collected under this rule shall offer to sample the tap water of any customer who requests it. The water system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; January 22, 2008; May 26, 2009; September 25, 2012; November 25, 2014.

335-7-11-.18 Reporting Requirements.

(1) Tap Water Monitoring. All water systems shall provide the results of all tap water monitoring for lead and copper and for all water quality parameter samples by the 10th of the month following the end of the compliance period. The end of the compliance period is the last date that samples can be collected during the monitoring period.

(a) Included shall be information regarding the tap, the tier level of the site, identification as a non first draw sample and length of standing time, documentation for all tap water lead and copper monitoring that the system requests invalidation, and an explanation for any site which was not monitored during the previous monitoring period or why sites may have changed.

1. Systems with lead service lines not providing 50% of the monitoring from these sites will provide a letter demonstrating why it was unable to locate a sufficient number of each site. Values shall be placed in descending order with the highest value first and the 90th percentile value either circled or labeled.

2. All systems utilizing non first draw samples shall provide the Department prior to the first monitoring period after these regulations become effective the locations and standing times of all such monitoring. Systems applying for or systems that have been granted a waiver shall provide a certification that the system's distribution and plumbing materials are lead and copper free. A water system that has been granted a waiver and later determines the system's materials are no longer lead or copper free shall provide the basis of that determination and a corrective action plan to remove those materials within 60 days of the determination.

(b) Source Water Monitoring. The lead/copper results from source water required to be monitored shall be provided by the 10th of the month following the analysis.

(c) Corrosion Control Treatment. Systems with an approved corrosion control treatment system on the effective date of these regulations will continue to provide monthly monitoring reports providing the required information. These reports must be received by the 10th of the following month. For systems required to establish optimized corrosion control, daily and weekly analysis may be provided on the monthly operation reports which must be submitted by the 10th of the following month. For systems monitoring during a six-month compliance cycle, the analysis must be provided by the 10th of the month following the analysis.

(d) Lead Service Line Replacement. Systems required to replace service lines shall provide yearly information by December 31 regarding the number and location of service lines replaced, the number remaining, the location and lead concentration of any lead service line monitoring, and any proposed modification to the lead service line removal plan.

(2) Record Keeping of Reporting Requirements. All systems shall retain in its office or on its premises original records of all monitoring data, analysis, reports, surveys, letters, evaluations, schedules, state determinations and other information reflecting activities to demonstrate compliance with the lead and copper requirements of this Department. These records shall be retained for no less than 12 years.

(3) Any water system proposing the addition of a new source or any long-term change in water treatment shall submit a written report to the Department on how the change or source addition will affect the system's ability to comply with the lead and copper action levels and water quality parameter monitoring before implementing changes in treatment (or treatment processes) or using a new source.

(a) Examples of long-term water treatment changes include the addition of a new treatment process or modification of an existing treatment process.

(b) Examples of modifications include switching secondary disinfectants, switching coagulants and switching corrosion inhibitor products.

(c) Long term changes can include dose changes to existing chemicals if the system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

(4) Within 12 months after the end of the monitoring period in which the water system exceeded the lead action level, the water system shall submit the following written documentation to the Department.

(a) Material evaluation conducted as required in rule 335-7-11-.07.

(b) A list of all lead service line locations in the distribution system at the time the exceedance occurred.

(c) Schedule for replacing at least 7 percent of the initial lead service lines annually.

(5) Within 12 months after the end of the monitoring period in which the water system exceeded the lead action level and every 12 months thereafter, the water system shall demonstrate in writing either:

(a) The water system has replaced in the previous 12 months at least 7 percent (or as required by the Department) of the initial lead service lines or

(b) The water system has replaced at least 7 percent (or as required by the Department) of the initial lead service lines and/or demonstrated through monitoring that that at least 7 percent (or as required by the Department) of the initial lead service lines no longer exceeds the lead action level.

(6) The annual report submitted to the Department under this rule shall contain at a minimum the following information:

(a) Number of lead service lines scheduled to be replaced during the previous year of the system's lead service line replacement program.

(b) The location of each full or partial lead service line replaced with an indicator if the replacement was a full or partial replacement.

(c) If measured, the lead concentration of any lead service line. The water system shall also report the analytical method used and the date of the sample.

(d) The schedule of lead service lines to be replaced in the upcoming year along with the latest monitoring results for these locations.

(7) Any water system that collects lead service line samples following a partial lead service line replacement shall report the results to the Department within the first ten days of the month in which the water system receives the laboratory results.

(8) Public Education Program Reporting Requirements.

(a) Any water system that is subject to the public education requirements of this chapter shall, within ten days after the end of each period in which the system was required to perform public education send written documentation to the Department that contains:

1. A demonstration that the water system has delivered the public education materials that met the content and delivery requirements of this chapter.

2. A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the system delivered public education

materials during the period in which the water system was required to perform public education tasks.

(b) Each water system shall mail a sample copy of the consumer notification of tap results to the Department along with a certification that the notification has been distributed in a manner consistent with this chapter. The sample copy and certification shall be submitted to the Department within 3 months following the end of the monitoring period.

Author: Joe Alan Power, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted: September 23, 1992; Amended: September 19, 1995 (ER); November 28, 1995. Effective: January 2, 1996.
Amended: March 12, 2002; May 26, 2009; November 25, 2014; February 3, 2017.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-12
WELLHEAD PROTECTION PROGRAM

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335-7-12-.01 Purpose. This chapter implements the Alabama Wellhead Protection Program, as required by the Safe Drinking Water Act and as authorized pursuant to the Alabama Underground Storage Tank and Wellhead Protection Act of 1988, to assist public water systems in protecting areas surrounding public water supply wells within their jurisdictions against contaminants that may have adverse effects on human health. Development of a Local Wellhead Protection Plan for approval by the Department is voluntary. This chapter sets forth the requirements of a voluntary Local Wellhead Protection Plan that public water systems may establish to qualify for certain waivers under Division 7.

Author: Enid Bittner.
Statutory Authority: Code of Alabama 1975, §§ 22-36-7, 22-36-10, 22-22A-5. See also, Safe Drinking Water Act, 42 U.S.C. §300-h.
History: Adopted: September 19, 1995 (ER); November 28, 1995. Revised: October 28, 1997; December 8, 1998. Effective: January 25, 1999.

335-7-12-.02 Applicability. Each community public water system in Alabama utilizing a groundwater source shall develop a Source Water Assessment Program (SWAP) in accordance with chapter 335-7-5. Upon approval of the SWAP by ADEM a community water system may voluntarily proceed with developing a Local Wellhead Protection Plan in accordance with this chapter and the ADEM Wellhead Protection Program Guidance Document.

Author: Enid Bittner.
Statutory Authority: Code of Alabama 1975, §§ 22-36-7, 22-36-10; 22-22A-5.
History: Adopted September 19, 1995 (ER); November 28, 1995. Revised: October 28, 1997; December 8, 1998. Effective: January 25, 1999.

335-7-12-.03 Definitions. The following words and phrases, unless a different meaning is plainly required by the context, shall have the following meaning:

(a) ADEM - the Alabama Department of Environmental Management.

(b) Legal authority - a local governing body, board or water authority that has statutory authority to implement the LWHPP.

(c) Local Wellhead Protection Plan (LWHPP) - the Wellhead Protection Plan designed and implemented by a local water authority, board or system pursuant to the provisions of this chapter.

Author: Enid Bittner.
Statutory Authority: Code of Alabama 1975, §§ 22-36-7, 22-36-10; 22-22A-5.
History: Adopted: September 19, 1995 (ER); November 28, 1995. Revised: October 28, 1997; December 8, 1998. Effective: January 25, 1999.

335-7-12-.04 Local Wellhead Protection Plan. A Local Wellhead Protection Plan shall include the following elements.

(a) Local Wellhead Protection Committee. A committee responsible for the design of the LWHPP should be formed. The committee may include a variety of professions such as local government, education, and civic organization leaders, as well as representatives of business and industry.

(b) An ADEM approved Source Water Assessment Report developed in accordance with chapter 335-7-5.

(c) Local Wellhead Protection Plan (LWHPP). A protection plan should be developed that provides strategies for protecting the water resource. The LWHP Plan should include the following:

1. Regulatory and Non-regulatory Protection Strategies. Protection strategies can include one or more of the following: acquisition; bonding; building codes; conservation; education and training; subdivision regulations; water rate changes; zoning; identifying an alternate source of supply; or other similar measures.

2. Identification of Local, County and State Rules. A compilation of ordinances and rules that identify the individuals, agencies or boards responsible for implementation.

3. Establishment of Compliance Procedures. The water system shall identify the local authority responsible for conducting inspections and provide a mechanism for reporting violations and problems found during inspections to the appropriate organizations or authorities for enforcement.

4. Procedures for Local Notification. The water system should notify residents, as well as owners and operators of potential sources of contamination within the SWA. The notification should request that the owner/operator notify the local water system in the event of any activity that may have a negative impact on the groundwater.

5. Public Education. Education and outreach activities such as posting signs, distributing brochures and publishing articles that describe the wellhead protection program may be included in the plan.

(d) Contingency Plan. All contingency plans should address potential emergencies, such as well or well field contamination, water shortages due to droughts or flooding, and interruption of water sources and supply due to spills, accidents, power outages or equipment failures. The following four items may be included in the plan.

1. Water Demand. Water demand such as maximum daily, maximum monthly and projected future demand.

2. Chain of command. Identify the area of responsibility for each entity involved during an emergency.

3. Short Term Water Availability. Describe the local response to short term emergencies

4. Long Term Water Availability. Describe the local response to long term shortages.

(e) Plan for new sources. All new drinking water sources must comply with chapter 335-7-5.

(f) Procedures for Review, Modification and Update. Water Systems should modify the LWHPP every six (6) years, on the occasion of overall system permit renewal. The LWHPP should also be modified when the following conditions occur: new wells are added to the system, there is a significant increase in the withdrawal rate (greater than 25 percent), use of existing wells is discontinued, and there is an increase in the number of potential contaminant sources.

Author: Enid Bittner.
Statutory Authority: Code of Alabama 1975, §§ 22-36-7, 22-36-10; 22-22A-5.
History: Adopted September 19, 1995 (ER); November 28, 1995. Revised: October 28, 1997; December 8, 1998. Effective: January 25, 1999.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-13
LABORATORY CERTIFICATION

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335-7-13-.01 Purpose. This chapter provides the mechanism to assure the validity and quality of the data being generated to determine compliance with the requirements of this division.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.02 Applicability. This chapter applies to any laboratory performing Department-required analyses to determine the quality of drinking water.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.03 Definitions. The following words and phrases, unless a different meaning is plainly required by the context, shall have the following meaning:

(1) Analytical Method – "method" number assigned by EPA that describes the proper process for obtaining accurate and repeatable analyte concentration results.

(2) Certificate – the document issued by the Department showing those drinking water parameters and the EPA-approved Drinking Water method for

which a laboratory has received certification, and the type of certification. The certificate remains the property of the Department and must be surrendered at its direction.

(3) Certification – a declaration by the Department that a laboratory has been evaluated under the State Drinking Water Laboratory Certification Program and found acceptable to analyze specified parameters.

(4) Certification Authority (CA) – the agency in a state, or EPA, which certifies drinking water laboratories. In the state of Alabama, the CA for Drinking Water laboratories is the Department.

(5) Certified Laboratory – a laboratory that meets the regulatory performance criteria and any other requirements for the drinking water parameters and methods listed on the certificate.

(6) Corrective Action Plan – report submitted by a laboratory detailing steps it must take to satisfactorily correct deficiencies either found during an audit or that caused an unsatisfactory result on a performance evaluation (PE) sample and prevents their reoccurrence.

(7) Department – the Alabama Department of Environmental Management.

(8) EPA – the United States Environmental Protection Agency.

(9) EPA Manual for the Certification of Laboratories Analyzing Drinking Water – the latest edition and any addendums, which describes criteria and procedures that EPA uses in evaluating laboratories for certification.

(10) Interim Certification – a laboratory that is granted certification when it is impossible or unnecessary to perform an on-site audit.

(11) Not Certified – a laboratory, which possesses deficiencies, and the Department has determined cannot consistently produce valid data.

(12) On-site Audit – an inspection of a drinking water laboratory that seeks to be certified or plans to continue certified status. This inspection will include an evaluation of their facility, instrumentation, sample analysis processes, quality assurance manual/system, and personnel training and capabilities.

(13) On-site Auditor – a person approved by the CA and/or EPA to conduct an on-site audit.

(14) Parameter – a drinking water analyte for which a laboratory is seeking certification.

(15) Performance Evaluation (PE) Sample – an annual (or more frequent if required by the method) sample received from an American National Standards Institute (ANSI)-certified PE vendor that is analyzed by the laboratory. The

laboratory results are compared to the known value by the certified PE vendor, and determined to be either acceptable or unacceptable.

(16) Provisionally Certified – a laboratory that has deficiencies but demonstrates its ability to consistently produce valid data within the acceptance limits specified in the National Primary Drinking Water Regulations (NPDWR) and within the requirements of their certification authority.

(17) Reciprocity – a type of certification that is issued by the Department to out of state laboratories that hold equivalent certification issued by EPA or EPA-approved state programs.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.04 Parameters Requiring Certification. Certification of the laboratory is required before the Department will accept analytical data for any parameter required by this division or a Water Supply Permit issued pursuant to this division, unless specifically exempted.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.05 Certification Manual. Unless otherwise directed in writing by the Department, certified laboratories and laboratories seeking certification shall comply with the EPA Manual for the Certification of Laboratories Analyzing Drinking Water. If there is a conflict between the Certification Manual and the EPA method, the EPA method shall govern.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.06 Certification Process. A laboratory must hold a valid certification issued by the Department before analyzing parameters that require certification and submitting the results to the Department.

(1) The certification of a laboratory is effective for one year.

(2) In order for a laboratory located in Alabama to be certified, the laboratory must complete the following:

(a) Submit a completed ADEM-approved application form. This form must include the parameters for which the laboratory is seeking certification.

(b) Submit the appropriate application fee.

(c) Submit a satisfactory set of PE samples for the parameters, using the EPA-approved drinking water analytical method for which the laboratory is applying to be certified.

(d) Successfully pass an on-site audit, conducted by an on-site auditor, within the previous three years.

1. For a laboratory seeking certification for the first time, the audit will not be scheduled until after submittal of the application and fee.

2. As a result of the on-site audit, the Department may require a corrective action plan that includes the steps to be taken to satisfactorily address any deficiencies noted in the audit report. The corrective action plan must be submitted within 60 days of receipt of the audit report.

(3) In order for a laboratory located outside of Alabama to be granted certification reciprocity, the laboratory must complete the following:

(a) Submit a completed ADEM-approved application form. This form must include the parameters for which the laboratory is seeking certification.

(b) Submit the appropriate certification fee.

(c) A copy of the certification package (certificate and scope of analysis) for the appropriate parameters, from the CA which issued the laboratory's original certification. This certification shall come directly from the CA and may not be submitted by the applicant.

(4) A certified laboratory must notify the CA in writing within 30 days of major changes in personnel, equipment, or laboratory location.

(a) A major change in personnel is the loss or replacement of the laboratory supervisor or a situation in which a trained and experienced analyst is no longer available to analyze a particular parameter for which certification has been granted.

(b) Upon notification by the Department that the change has resulted in a deficiency, the laboratory shall correct the deficiency by the deadline established by the Department.

(5) If a complete renewal application with satisfactory PE results, audit report, and fee is not received by the certification expiration date:

(a) The laboratory may apply to renew its certificate up to 30 days after expiration.

(b) After 30 days, the laboratory may submit a complete application for initial certification if it wishes to resume analyzing drinking water samples.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: **Filed:** April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.07 Types of Certification.

(1) Certified Laboratory. A Certified Laboratory may submit to the Department analytical results for compliance purposes for those analytes for which it is certified.

(2) Provisionally Certified Laboratory.

(a) A Provisionally Certified Laboratory may analyze drinking water samples for compliance purposes for those analytes for which it is certified.

(b) The public water system shall be given written notification of the certification status.

(c) The certification status shall be noted on all applicable analyte result reports.

(d) The certification will not be issued if the Department determines the laboratory cannot perform an analysis within the acceptance limits specified by the EPA Method, by EPA regulations, or by the EPA Manual for the Certification of Laboratories Analyzing Drinking Water.

(3) Interim Certification.

(a) A laboratory may be granted Interim Certification if the laboratory has the appropriate instrumentation, is using the approved methods, has adequately trained personnel to perform the analyses, and has satisfactorily analyzed PE samples for the analytes in question.

(b) The public water system shall be given written notification of the certification status.

(c) The certification status shall be noted on all analyte results reports for which it is relevant.

(4) Not Certified. A laboratory that is not certified shall not submit analytical results to the Department for compliance purposes for the relevant parameters.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: **Filed:** April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.08 Certification Downgrade Process.

(1) A laboratory may be downgraded to "provisionally certified" status for a parameter or group of parameters for any of the following reasons:

(a) Failure to satisfactorily analyze a PE sample at least annually, or as directed by the Department;

(b) Failure of a certified laboratory to notify the Department within 30 days of major changes (e.g., in personnel, equipment, or laboratory location);

(c) Failure to satisfy the Department that the laboratory is maintaining the required standard of quality, based upon an on-site audit; or

(d) Failure to report compliance data to the public water system or the Department in a timely manner.

(2) If a laboratory is subject to downgrading in accordance with paragraph (1) of this rule, it shall respond to an intent to downgrade notification from the Department within 30 days. The written response shall specify the corrective actions being taken, the time frame those actions will take to complete, and any proposed actions that need the concurrence of the Department.

(3) A laboratory that fails to satisfactorily analyze a PE sample may avoid a downgrade in certification if it identifies and corrects the problem to the Department's satisfaction within 30 days of being notified of the failure.

(a) The laboratory shall submit a second PE sample within the Department-specified timeframe from the first unsatisfactory PE sample.

(b) If the second PE sample is unsatisfactory, the laboratory may be downgraded to "provisionally certified".

(4) After the Department notifies a laboratory that it has been downgraded to "provisionally certified" status for procedural, administrative, equipment, or personnel deficiency, the laboratory must correct any noted issues within 90 days.

(5) If the laboratory was downgraded to "provisionally certified" status because of a failure to satisfactorily analyze a PE sample, the laboratory shall correct its deficiencies and satisfactorily analyze another PE sample within 30 days of receipt of the certification downgrade.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.09 Certification Revocation Process.

(1) A laboratory may be downgraded from certified, provisionally certified, or interim certified status to "not certified" for a particular parameter analysis for any of the following reasons:

(a) Reporting PE data from another laboratory as its own;

(b) Falsification of data or other deceptive practices;

(c) Failure to use the analytical methodology specified in the regulations;

(d) For provisionally certified laboratories, failure to successfully analyze a PE sample for a particular contaminant within the acceptance limits specified;

(e) For provisionally certified laboratories, failure to satisfy the Department that the laboratory has corrected deficiencies identified during on-site evaluations;

(f) For provisionally certified laboratories, persistent failure to report compliance data to the public water system or the Department in a timely manner;

(g) Refusal to participate in an on-site audit; or,

(h) Failure to submit complete application package.

(2) A laboratory may respond to a determination to revoke its certificate up to 30 days after notification by the Department. If the Department does not receive a response by that date or, if the response does not fully resolve the deficiencies noted by the Department, the certificate is immediately revoked.

(a) The response shall include an explanation of the reasons for the challenge and shall be signed by the laboratory's responsible authority (such as the director, owner, or president).

(b) Denial of the response by the Department results in the immediate revocation of the certificate.

(c) If the Department determines the response to be valid, the Department may suspend the revocation of certification or upgrade the certification status to "provisionally certified" or "certified".

(d) A laboratory with a revoked certificate shall not submit analyses to the Department for compliance purposes for any analyte covered by the revocation.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.10 Certification Upgrade/Reinstatement Process.

(1) A laboratory shall submit a written request to the Department seeking an upgrade or reinstatement of certification.

(2) The laboratory shall demonstrate to the Department's satisfaction that any noted deficiencies which resulted in provisionally certified status or revocation have been corrected.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.11 Recordkeeping.

(1) A laboratory shall maintain easily accessible records for five years from the creation of a record or until the next on-site audit is complete, whichever is longer.

(2) The laboratory shall make copies of analyses, raw data, calculations, and quality control data available to the relevant client water system upon request.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

335-7-13-.12 Special Requirements.

(1) A laboratory shall notify the Department and the water system of any exceedance of a lead/copper action level or total coliform/E Coli positive result within 24 hours of completion of the analysis.

(a) The notification shall be made to the Drinking Water Branch staff by a method approved by the Department.

(b) If the analysis result is determined outside of normal business hours, the laboratory shall use a method approved by the Department to notify the Drinking Water Branch staff as soon as possible the next business day.

Author: Aubrey H. White III, James M. Arnold.
Statutory Authority: Code of Alabama 1975, §§ 22-23-49.
History: Filed: April 30, 2021; **Effective:** June 14, 2021.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION – WATER SUPPLY PROGRAM

CHAPTER 335-7-14
CONSUMER CONFIDENCE REPORTS

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335-7-14-.01 Applicability. These regulations require that all community water systems to develop and provide an annual consumer confidence report (CCR) in accordance with the requirements of this chapter.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: June 7, 2000.
Amended: December 12, 2005.

335-7-14-.02 Definitions. The following words and terms, when used in this chapter, shall have the following meanings unless the context clearly indicates otherwise.

(a) Certification--form submitted to the Department, and signed by a responsible system representative that the CCR has been distributed in accordance with these regulations; the information is correct; and the information is consistent with compliance monitoring data previously submitted to the Department. The form also states that, for systems who sell water to adjacent systems, the required information was delivered to the purchasing system(s) no later than April 1.

(b) Consumer--any person who regularly consumes water supplied by a community water system. The number of consumers, or population, of a community water system is estimated by multiplying the number of customers by a factor of three.

(c) Customer--billing units or service connections to which water is delivered by a community water system.

(d) New Community Water System--a community water system permitted by the Department after the effective date of these regulations. This definition shall not include the merger of two or more existing community water systems.

(e) Detected--for the purposes of this chapter, means the level at which an EPA Drinking Water Certified laboratory can find a contaminant.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: June 7, 2000.
Amended: January 1, 2005; December 12, 2005; January 22, 2008; August 5, 2016.

335-7-14-.03 Effective Dates.

(1) An existing community water system shall distribute its first Consumer Confidence Report (CCR) by July 1, 2000. Subsequent reports shall be delivered by July 1 annually thereafter. The first CCR shall contain data collected during or prior to calendar year 1999. Each CCR thereafter shall contain data collected during, or prior to, the previous calendar year.

(2) A new community water system shall distribute its first CCR by July 1 of the year following its first full year of operation and annually thereafter.

(3) A community water system that sells water to another community water system shall deliver to the buyer system by April 1 of each year, information needed by the buyer system to produce its CCR. The information regarding detected contaminants delivered to a buyer system by a seller system shall include the same information that the seller system will use in its CCR except for monitoring already conducted by the buyer system. The information shall also include source water information of the seller system including treatment used by the seller system. If specified in the written purchase agreement, seller and buyer may agree on a different date for delivery.

Author: Joe Alan Power, Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: June 7, 2000.
Amended: December 12, 2005.

335-7-14-.04 Content of Reports.

(1) Each CCR shall provide information on the water system sources of water to include type of source (surface water, groundwater, or combination), commonly used names (if any), general location (a map may be included), and a brief summary of treatment used. If a source water assessment has been completed, the CCR shall notify consumers of the means to obtain a copy. Additionally, the CCR shall summarize the source water assessment pursuant to

rule 335-7-6-.15. If no source water assessment has been completed, the CCR shall notify customers of the status of efforts to complete it. All systems utilizing a groundwater source shall indicate whether it has established a Wellhead Protection Plan.

(2) Each CCR shall include the following definitions:

(a) Maximum Contaminant Level Goal or MCLG - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(b) Maximum Contaminant Level or MCL - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

(c) Maximum Residual Disinfectant Level Goal or MRDLG - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(d) Maximum Residual Disinfectant Level or MRDL - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(3) If applicable, the following definitions shall be included:

(a) Variances and Exemptions - The Department or EPA permission not to meet an MCL or a treatment technique under certain conditions

(b) Treatment Technique - A required process intended to reduce the level of a contaminant in drinking water.

(c) Action Level - The concentration of a contaminant that triggers treatment or other requirement a water system shall follow.

(d) Level 1 Assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

(e) Level 2 Assessment: A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

(4) Below are the reporting requirements for drinking water contaminants subject to mandatory monitoring.

(a) Each CCR shall include a Table of Primary Drinking Water Contaminants. This table shall include the MCL for each contaminant, and the highest detected level used to determine compliance. Any contaminant detected

will also be displayed in the Table of Detected Contaminants as required below. A list of primary drinking water contaminants and MCLs appears in Appendix A.

(b) Each CCR shall contain a discrete Table of Detected Contaminants or several adjacent Tables of Detected Contaminants depicting the data specified below. Any additional monitoring results that a water system includes in the report shall be displayed separately. The data used in the table shall be derived from the monitoring and analytical results collected to comply with EPA and ADEM regulations:

1. Regulated contaminants subject to an MCL, action level, maximum residual disinfectant level, or treatment technique.

2. Unregulated contaminants monitored as required by the Department including monitoring required under the Information Collection Rule (ICR).

3. Disinfection by-products or microbiological contaminants that are detected in finished water.

(c) If a water system monitors certain contaminants less frequently than annually, the CCR shall include the most recent sample results, the date samples were collected, and a brief statement indicating that the data presented is from the most recent testing done in accordance with applicable regulations. A water system may exclude data more than five (5) years old.

(d) The Table of Detected Contaminants shall include detected contaminant name, MCL of the as expressed in Appendix B, the MCLG of the contaminant expressed in the same units as the MCL, the range of detected levels (if applicable), and the likely source of contamination. If there is no MCL for a detected contaminant, the table shall note whether there is a treatment technique or specify the action level applicable to that contaminant.

(e) For contaminants subject to an MCL, except turbidity, fecal coliform, *E. coli* and total coliform, the Table of Detected Contaminants shall list the highest contaminant level used to determine compliance with National Primary Drinking Water Regulation (NPDWR) and the range of detected levels as follows:

1. If compliance with the MCL is determined annually or less frequently, the Table of Detected Contaminants shall include the highest detected level at any sampling point and the range of detected levels.

2. If compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point, the Table of Detected Contaminants shall include the highest average of any of the sampling points and range of all sampling points. For the MCLs for TTHM and HAA5 systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all monitoring locations. If more

than one location exceeds the TTHM or HAA5 MCL, the system must include the locational running annual average for all locations that exceed the MCL.

3. If compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points, the Table of Detected Contaminants shall include the average and range of detected levels. The system is required to include individual sample results conducted under rule 335-7-2-.13 when determining the range of TTHM and HAA5 results to be reported in the annual consumer confidence report for the calendar year that the DSE samples were taken.

(f) Turbidity shall be reported in the Table of Detected Contaminants as follows:

1. When reported pursuant to rule 335-7-2-.06 (turbidity as an MCL), the highest average monthly value.

2. When reported pursuant to rule 335-7-2-.06 (turbidity as a treatment technique), the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits. In addition, an explanation of the reasons for measuring turbidity shall be included.

(g) For lead and copper, each CCR shall contain the 90th percentile of the most recent round of sampling and the number of sampling sites exceeding the action level.

(h) All systems shall report the total number of positive *E. coli* samples. Total and fecal coliform and *E. coli* results of raw water and special samples are not included in this requirement.

(i) The likely source(s) of detected contaminants to the best of the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the operator. If the operator lacks specific information on the likely source, the report must include one or more of the typical sources for that contaminant listed in Appendix B to this subpart that is most applicable to the system.

(j) If a water system distributes water to its customers from multiple, hydraulically independent distribution systems that are fed by different sources, the Table of Detected Contaminants shall contain a separate column for each service area. A water system may produce a separate CCR for each service area.

(k) The Table of Detected Contaminants shall clearly identify regulated contaminants detected in violation of an MCL, MRDL, treatment technique, or contaminants exceeding an action level. In addition, the CCR shall include a clear and readily understandable explanation of the violation including the length of the violation, the potential adverse health effects, and actions taken by the system to address the violation. To describe the potential health effects, the system shall use the relevant language of Appendix C.

(l) For detected unregulated contaminants for which monitoring is required, (except *Cryptosporidium*) the Table of Detected Contaminants shall contain the average and range at which the contaminant was detected. The CCR may include a brief explanation of the reasons for monitoring unregulated contaminants.

(5) The following subparagraphs govern the reporting of information on *Cryptosporidium*, radon, and other contaminants.

(a) If the system monitored for and detected *Cryptosporidium* in the raw water or the finished water including monitoring to satisfy the requirements of the information collection rule (ICR), the CCR shall include the following:

1. The results of the monitoring.

2. Information on how the monitoring was performed.

3. An explanation of the significance of the results.

(b) If the system has performed any monitoring for and detected radon in the finished water, the CCR shall include the following:

1. The results of the monitoring.

2. Information on how the monitoring was performed.

3. An explanation of the significance of the results.

(c) The water system shall include in its CCR the results of additional monitoring that indicates the presence of a contaminant in the finished water for which the EPA has issued a health advisory. For such contaminants, the CCR shall include:

1. The results of the monitoring.

2. An explanation of the significance of the results noting the existence of a health advisory.

(d) Each CCR shall identify all violations occurring during the reporting year of the requirements listed below and provide a brief explanation of the violation, potential adverse health effects, steps taken to address the violation, and the date the system returned to compliance.

1. Monitoring and reporting.

2. Treatment techniques.

(i) Filtration and disinfection.

(ii) Lead and copper control requirements.

(iii) Treatment techniques for Acrylamide and Epichlorohydrin.

3. Record keeping.

4. Special monitoring requirements for inorganic and organic contaminants.

5. Violation of the terms of a variance, an exemption, or an administrative or judicial order.

(e) If a system has been granted a variance or an exemption, its CCR shall contain the following:

1. An explanation of the reasons for the variance or exemption.

2. The date on which the variance or exemption was issued.

3. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption.

4. A notice of any opportunity for public input in the review of the variance or exemption.

(6) Additional information.

(a) Each report shall contain a brief explanation regarding contaminants, which can be found in all drinking water including bottled water. This explanation shall include subparagraphs (a)1. and (a)2. of this paragraph. Systems may also use any portion the language of subparagraphs (a)3. or (a)4. of this paragraph to provide additional information to customers.

1. All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

2. The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and it can pick up substances resulting from the presence of animals or from human activity.

3. Contaminants that may be present in source water include the following:

(i) Microbiological contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

(ii) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm run-off, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

(iii) Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water runoff, and residential uses.

(iv) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water run-off and septic systems.

(v) Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

4. To ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water.

(b) Each CCR shall include the name and telephone number of the owner, operator, or designee of the public water system as a source of additional information. In addition, each CCR shall include the names of water board members.

(c) If a community water system determines that there is a large proportion of non-English speaking residents, the CCR shall contain information in the appropriate language regarding the importance of the report. Or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

(d) Each CCR shall include information such as time and place of regularly scheduled board meetings to encourage public participation in decisions that may affect the quality of the water.

(e) Each CCR may include additional information necessary for public education, which is consistent with, but does not detract from, the purpose of the report.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: June 7, 2000.
Amended: May 30, 2003; January 1, 2005; December 12, 2005; January 22, 2008; May 26, 2009, November 25, 2014; August 5, 2016.

335-7-14-.05 Additional Reporting Contents.

(1) The following subparagraphs govern the reporting information regarding the Groundwater Rule contained in rule 335-7-5-.22:

(a) Any ground water system that receives notice from the Department of a significant deficiency or notice from a laboratory of a fecal indicator-positive ground water source sample that is not invalidated by the Department under subparagraph 335-7-5-.22(5)(d) must inform its customers of any significant deficiency that is uncorrected at the time of the next report or of any fecal indicator-positive ground water source sample in the next report. The system must continue to inform the public annually until the Department determines that particular significant deficiency is corrected or the fecal contamination in the ground water source is addressed under subparagraph 335-7-5-.22(6)(a). Each report must include the following elements:

1. The nature of the particular significant deficiency or the source of the fecal contamination (if the source is known) and the date the significant deficiency was identified by the Department or the dates of the fecal indicator-positive ground water source samples.

2. If the fecal contamination in the ground water source has been addressed under subparagraph 335-7-5-.22(6)(a) and the date of such action.

3. For each significant deficiency or fecal contamination in the ground water source that has not been addressed under subparagraph 335-7-5-.22(6)(a), the Department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.

4. If the system receives notice of a fecal indicator-positive ground water source sample that is not invalidated by the Department under subparagraph 335-7-5-.22(5)(d), the potential health effects using the health effects language of Appendix C of this division.

(b) If directed by the Department, a system with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected, and the date of the correction under subparagraph (6)(a) of this rule.

(2) Any system required to comply with the Level 1 assessment requirement or a Level 2 assessment requirement that is not due to an *E. coli* MCL violation must include in the report the text found in subparagraph (a) of this paragraph; the text found in subparagraphs (b) and (c) of this paragraph, as appropriate, filling in the blanks accordingly; and the text found in subparagraph (d)1. and (d)2. of this paragraph, as appropriate.

(a) Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(b) During the past year we were required to conduct [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s). [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s) were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(c) During the past year [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were required to be completed for our water system. [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(d) Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

1. During the past year we failed to conduct all of the required assessment(s).

2. During the past year we failed to correct all identified defects that were found during the assessment.

(3) Any system required to conduct a Level 2 assessment due to an *E. coli* MCL violation must include in the report the text found in subparagraph (a) of this paragraph; the text found in subparagraph (b) of this paragraph, filling in the blanks accordingly; and the text found in paragraphs (c)1. and (c)2. of this paragraph, as appropriate.

(a) *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(b) We were required to complete a Level 2 assessment because we found *E. coli* in our water system. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(c) Any system that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

1. We failed to conduct the required assessment.

2. We failed to correct all sanitary defects that were identified during the assessment that we conducted.

(4) If a system detects *E. coli* and has violated the *E. coli* MCL, in addition to completing the table as required in subparagraphs 335-7-14-.04(3)(d) and (e), the system must include one or more of the following statements to describe any noncompliance, as applicable:

(a) We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(b) We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(c) We failed to take all required repeat samples following an *E. coli*-positive routine sample.

(d) We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

(5) If a system detects *E. coli* and has not violated the *E. coli* MCL, in addition to completing the table as required in subparagraphs 335-7-14-.04(3)(d) and (e), the system may include a statement that explains that although they have detected *E. coli*, they are not in violation of the *E. coli* MCL.

Author: Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: November 25, 2014.
Amended: August 5, 2016.

335-7-14-.06 Required Additional Health Information.

(1) Each CCR shall include and prominently display the following statement: Some people may be more vulnerable to contaminants in drinking water than the general population. People who are immuno-compromised such as cancer patients undergoing chemotherapy, organ transplant recipients, HIV/AIDS positive or other immune system disorders, some elderly, and infants can be particularly at risk from infections. People at risk should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

(2) A system that detects arsenic above 5 μg/l, and up to and including 10 μg/l shall include the following statement: Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations. While your drinking water meets EPA's standard for arsenic, it does contain low levels of

arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

(3) A system that detects nitrate at levels above 5 mg/l, but below the MCL shall include the following statement: Nitrate in drinking water at levels above 10 ppm is a health risk for infants less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

(4) Every report shall contain the following lead-specific information: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF WATER SYSTEM] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

(5) Each CCR shall include the following statement concerning dioxin and asbestos monitoring: Based on a study conducted by the Department with the approval of the EPA a statewide waiver for the monitoring of asbestos and dioxin was issued. Thus, monitoring for any of these contaminants was not required.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: Adopted June 7, 2000.
Amended: May 30, 2003; December 12, 2005; January 22, 2008; May 26, 2009; November 25, 2014.

335-7-14-.07 Report Delivery and Recordkeeping.

(1) Each system shall deliver a copy of its CCR and certification form to the Department no later than July 1 of each year for the previous calendar year's information.

(2) A system serving a population of at least 100,000 (~ 33,333 customers) shall mail a copy to each customer, make a good faith effort to reach consumers who do not receive bills, and post the CCR on a publicly accessible site on the internet.

(3) A system serving a population of at least 10,000 (~3,333 customers) shall mail a copy to each customer and make a good faith effort to reach consumers who do not receive a bill.

(4) A system serving a population of at least 500 (~167 customers) but less than 10,000 (~3,333 customers) may choose to mail the CCR; publish it in one or more local newspapers provided customers are informed in writing the CCR will not be mailed; or post the CCR on a publically accessible site on the internet and meet the requirements of paragraph (10) of this rule. The CCR shall be published in full in a size readable by the average consumer.

(5) If a system serving a population of less than 500 (~167 customers) chooses not to mail a copy of its CCR to each customer it, shall provide written notice to each customer that the CCR is available upon request. In addition, a copy of the CCR shall be displayed in a prominent place easily accessible to consumers.

(6) All systems shall provide a copy of its CCR to the health department of the county in which the system or a majority of the system is located.

(7) If a public library is located within five miles of the system office, a copy shall be provided to that library.

(8) If a system's rates are regulated by the Public Service Commission (PSC), a copy of the system's CCR shall be provided to the PSC.

(9) Water systems shall maintain copies of its CCR for a minimum of five (5) years, provide copies at no charge to customers, and make the reports available to the public when requested, at cost if necessary.

(10) A water system may post its CCR on a publically accessible site on the internet instead of mailing a copy to each customer if the following conditions are met:

(a) The water system shall provide a direct link or URL to the CCR to allow customers to navigate directly to the CCR;

(b) The water system shall provide customers the opportunity to elect to continue receiving a paper copy of the CCR. This option shall be made available on each bill sent to the customer, similar to a change in address or pay by credit card option;

(c) The water system shall assess the customers' preferred delivery method each year prior to certification of delivery. The previous year's delivery preference can be used if the customer has not communicated a change in the preference. Completion of this assessment shall be documented on the CCR certification form;

(d) The water system shall still make a good faith effort to provide a paper copy of the CCR to customers who do not receive a bill or are known not to have access to the internet and/or electronic delivery of the CCR;

(e) The water system shall display the direct link or URL to the CCR on each billing statement in a typeface that is at least as large as the largest type on the billing statement. The water system shall include the direct link or URL to the CCR on all correspondence or notifications to the customers;

(f) The water system shall include a short message to encourage readership of the CCR above or near the direct link or URL to the CCR when the most recent CCR includes a violation. If no violation is included in the most recent CCR, the short message to encourage readership is strongly recommended; and

(g) The water system shall send an email with a CCR related subject line to inform customers of the availability of the CCR each year. A copy of the email shall be sent to the Department.

(11) A water system may send an electronic copy of their CCR to their customers via email instead of mail as long as the email list is kept up to date. If a water system sends the CCR via email and it receives a message that the email failed to reach the customer (i.e., it bounced back), the water system shall provide a paper copy of the CCR via mail to that customer.

Author: Joe Alan Power, Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-22A-5, 22-22A-6.
History: June 7, 2000.
Amended: December 12, 2005; January 22, 2008; November 25, 2014; August 5, 2016.

Appendix A

Standard List Of Primary Drinking Water Contaminants For CCR

Contaminant	MCL	Amount Detected
Bacteriological		
Total Coliform Bacteria	< 5%	
Turbidity	TT	
Fecal coliform and *E. coli*	0	
Fecal Indicators (enterococci or coliphage)	TT	
Radiological		
Beta/photon emitters (mrem/yr)	4	
Alpha emitters (pCi/l)	15	
Combined radium (pCi/l)	5	
Uranium	30 ppb	
Inorganic Chemicals		
Antimony	6 ppb	
Arsenic	10 ppb	
Asbestos (MFL)	7	
Barium	2 ppm	
Beryllium	4 ppb	
Bromate	10 ppb	
Cadmium	5 ppb	
Chloramines	4 ppm	
Chlorine	4 ppm	
Chlorine dioxide	800 ppb	
Chlorite	1 ppm	
Chromium	100 ppb	

Appendix A

Standard List Of Primary Drinking Water Contaminants For CCR

Contaminant	MCL	Amount Detected
Copper	AL=1.3 ppm	
Cyanide	200 ppb	
Fluoride	4 ppm	
Lead	AL=15 ppb	
Mercury	2 ppb	
Nitrate	10 ppm	
Nitrite	1 ppm	
Total Nitrate and Nitrite	10 ppm	
Selenium	50 ppb	
Thallium	2 ppb	
Organic Chemicals		
Acrylamide	TT	
Alachlor	2 ppb	
Atrazine	3 ppb	
Benzene	5 ppb	
Benzo(a)pyrene [PAHs]	200 ppt	
Carbofuran	40 ppb	
Carbon tetrachloride	5 ppb	
Chlordane	2 ppb	
Chlorobenzene	100 ppb	
2,4-D	70 ppb	
Dalapon	200 ppb	
Dibromochloropropane	200 ppt	

Appendix A

Standard List Of Primary Drinking Water Contaminants For CCR

Contaminant	MCL	Amount Detected
o-Dichlorobenzene	600 ppb	
p-Dichlorobenzene	75 ppb	
1,2-Dichloroethane	5 ppb	
1,1-Dichloroethylene	7 ppb	
cis-1,2-Dichloroethylene	70 ppb	
trans-1,2-Dichloroethylene	100 ppb	
Dichloromethane	5 ppb	
1,2-Dichloropropane	5 ppb	
Di (2-ethylhexyl) adipate	400 ppb	
Di (2-ethylhexyl) phthalates	6 ppb	
Dinoseb	7 ppb	
Dioxin [2,3,7,8-TCDD]	30 ppq	
Diquat	20 ppb	
Endothall	100 ppb	
Endrin	2 ppb	
Epichlorohydrin	TT	
Ethylbenzene	700 ppb	
Ethylene dibromide	50 ppt	
Glyphosate	700 ppb	
HAA5 (haloacetic acids 5)	60 ppb	
Heptachlor	400 ppt	
Heptachlor epoxide	200 ppt	
Hexachlorobenzene	1 ppb	

Appendix A

Standard List Of Primary Drinking Water Contaminants For CCR

Contaminant	MCL	Amount Detected
Hexachlorocyclopentadiene	50 ppb	
Lindane	200 ppt	
Methoxychlor	40 ppb	
Oxamyl [Vydate]	200 ppb	
Pentachlorophenol	1 ppb	
Picloram	500 ppb	
Polychlorinated biphenyls (PCBs)	500 ppt	
Simazine	4 ppb	
Styrene	100 ppb	
Tetrachloroethylene	5 ppb	
Toluene	1 ppm	
TOC (Total Organic Carbon)	TT	
TTHMs [Total trihalomethanes]	80 ppb	
Toxaphene	3 ppb	
2,4,5-TP (Silvex)	50 ppb	
1,2,4-Trichlorobenzene	70 ppb	
1,1,1-Trichloroethane	200 ppb	
1,1,2-Trichloroethane	5 ppb	
Trichloroethylene	5 ppb	
Vinyl Chloride	2 ppb	
Xylenes	10 ppm	

Appendix B

Regulated Contaminants for CCR

Contaminant (units)	MCLG	MCL	Major Sources
Total Coliform Bacteria	N/A	TT	Naturally present in the environment
E. coli	MCLG = 0 MCL - Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli.*		Human and animal fecal waste
Fecal Indicators (enterococci or coliphage)	N/A	TT	Human and animal fecal waste
Fecal Indicators (GWR)			Human and animal fecal waste
i. *E. coli*	0	TT	
ii. Enterococci	None	TT	
iii. coliphage	None	TT	
GWR TT Violations	None	TT	Human and animal fecal waste
Viruses, *Giardia*	0	TT	Human and animal fecal waste
Legionella	0	TT	Found naturally in water, multiplies in heating systems
Beta/photon emitters (mrem/yr)	0	4	Decay of natural and man-made deposits
Alpha emitters (pCi/l)	0	15	Erosion of natural deposits
Combined radium (pCi/l)	0	5	Erosion of natural deposits
Uranium	0	30 ppb	Erosion of natural deposits
Antimony	6 ppb	6 ppb	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder

Appendix B

Contaminant (units)	MCLG	MCL	Major Sources
Arsenic	0	10 ppb	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes
Asbestos (MFL)	7	7	Decay of asbestos cement water mains; Erosion of natural deposits
Barium	2	2 ppm	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Beryllium	4 ppb	4 ppb	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries
Cadmium	5 ppb	5 ppb	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; runoff from waste batteries and paints
Chromium	100 ppb	100 ppb	Discharge from steel and pulp mills; Erosion of natural deposits
Copper	1.3	AL = 1.3 ppm	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Cyanide	200 ppb	200 ppb	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories
Fluoride	4	4 ppm	Water additive which promotes strong teeth; Erosion of natural deposits; Discharge from fertilizer and aluminum factories
Lead	0	AL = 15 ppb	Corrosion of household plumbing systems; Erosion of natural deposits
Mercury	2 ppb	2 ppb	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland

Contaminant (units)	MCLG	MCL	Major Sources
Nitrate	10	10 ppm	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Nitrite	1	1 ppm	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium	50 ppb	50 ppb	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines
Thallium	0.5 ppb	2 ppb	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories
Turbidity	n/a	TT	Soil runoff
2,4-D	70 ppb	70 ppb	Runoff from herbicide used on row crops
2,4,5-TP(Silvex)	50 ppb	50 ppb	Residue of banned herbicide
Acrylamide	0	TT	Added to water during sewage/wastewater treatment
Alachlor	0	2 ppb	Runoff from herbicide used on row crops
Atrazine	3 ppb	3 ppb	Runoff from herbicide used on row crops
Benzo(a)pyrene [PAHs]	0	200 ppt	Leaching from linings of water storage tanks and distribution lines
Carbofuran	40 ppb	40 ppb	Leaching of soil fumigant used on rice and alfalfa
Chlordane	0	2 ppb	Residue of banned termiticide
Dalapon	200 ppb	200 ppb	Runoff from herbicide used on rights of way
Di (2-ethylhexyl)adipate	400 ppb	400 ppb	Discharge from chemical factories
Di (2-ethylhexyl) phthalate	0	6 ppb	Discharge from rubber and chemical factories
Dinoseb	7 ppb	7 ppb	Runoff from herbicide used on soybeans and vegetables
Diquat	20 ppb	20 ppb	Runoff from herbicide use

Appendix B

Contaminant (units)	MCLG	MCL	Major Sources
Dioxin [2,3,7,8-TCDD]	0	30 ppq	Emissions from waste incineration and other combustion; Discharge from chemical factories
Endothall	100 ppb	100 ppb	Runoff from herbicide use
Endrin	2 ppb	2 ppb	Residue of banned insecticide
Epichlorohydrin	0	TT	Discharge from industrial chemical factories; Added to water during treatment process; An impurity of some water treatment chemicals
Glyphosate	700 ppb	700 ppb	Runoff from herbicide use
Heptachlor	0	400 ppt	Residue of banned pesticide
Heptachlor epoxide	0	200 ppt	Breakdown of heptachlor
Hexachlorobenzene	0	1 ppb	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclopentadiene	50 ppb	50 ppb	Discharge from chemical factories
Lindane	200 ppt	200 ppt	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	40 ppb	40 ppb	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl [Vydate]	200 ppb	200 ppb	Runoff/leaching from insecticide used on apples, potatoes and tomatoes
PCBs [Polychlorinated biphenyls]	0	500 ppt	Runoff from landfills; Discharge of waste chemicals
Pentachlorophenol	0	1 ppb	Discharge from wood preserving factories
Picloram	500 ppb	500 ppb	Herbicide runoff
Simazine	4 ppb	4 ppb	Herbicide runoff
Toxaphene	0	3 ppb	Runoff/leaching from insecticide used on cotton and cattle
Benzene	0	5 ppb	Discharge from factories; Leaching from gas storage tanks and landfills
Carbon tetrachloride	0	5 ppb	Discharge from chemical plants and other industrial activities

Contaminant (units)	MCLG	MCL	Major Sources
Chlorobenzene	100 ppb	100 ppb	Discharge from chemical and agricultural chemical factories
Dibromochloropropane	0	200 ppt	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
o-Dichlorobenzene	600 ppb	600 ppb	Discharge from industrial chemical factories
p-Dichlorobenzene	75 ppb	75 ppb	Discharge from industrial chemical factories
1,2-Dichloroethane	0	5 ppb	Discharge from industrial chemical factories
1,1-Dichloroethylene	7 ppb	7 ppb	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	70 ppb	70 ppb	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	100 ppb	100 ppb	Discharge from industrial chemical factories
Dichloromethane	0	5 ppb	Discharge from pharmaceutical and chemical factories
1,2-Dichloropropane	0	5 ppb	Discharge from industrial chemical factories
Ethylbenzene	700 ppb	700 ppb	Discharge from petroleum refineries
Ethylene dibromide	0	50 ppt	Discharge from petroleum refineries
Styrene	100 ppb	100 ppb	Discharge from rubber and plastic factories; Leaching from landfills
Tetrachloroethylene	0	5 ppb	Leaching from PVC pipes; Discharge from factories and dry cleaners
1,2,4-Trichlorobenzene	70 ppb	70 ppb	Discharge from textile-finishing factories
1,1,1-Trichloroethane	200 ppb	200 ppb	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	3 ppb	5 ppb	Discharge from industrial chemical factories
Trichloroethylene	0	5 ppb	Discharge from metal degreasing sites and other factories
TTHM [Total trihalomethanes]	N/A	80 ppb	By-product of drinking water chlorination

Appendix B

Contaminant (units)	MCLG	MCL	Major Sources
Toluene	1	1 ppm	Discharge from petroleum factories
Vinyl Chloride	0	2 ppb	Leaching from PVC piping; Discharge from plastics factories
Xylenes	10	10 ppm	Discharge from petroleum factories; Discharge from chemical factories
Total organic carbon	N/A	TT	Naturally present in the environment
Bromate	0	10 ppb	By-product of drinking water chlorination
Chloramines	MRDLG = 4	MRDL = 4 ppm	Water additive used to control microbes
Chlorine	MRDLG = 4	MRDL = 4 ppm	Water additive used to control microbes
Chlorite	800 ppb	1 ppm	By-product of drinking water chlorination
Chlorine Dioxide	MRDLG = 800	MRDL = 800 ppb	Water additive used to control microbes
Haloacetic Acids (HAA5)	N/A	60 ppb	By-product of drinking water disinfection

Key

AL =Action Level
GWR = Ground Water Rule
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MFL = million fibers per liter
mg/l = milligrams per liter, or parts per million
mrem/year = millirems per year (a measure of radiation absorbed by the body)
pCi/l = picocuries per liter (a measure of radioactivity)
ppb = parts per billion or micrograms per liter
ppm = parts per million or milligrams per liter
ppq = parts per quadrillion or picograms per liter
ppt = parts per trillion or nanograms per liter
TT = Treatment Technique

APPENDIX C

Health Affects and Required Language for Specific Contaminants

Required language to be used in Public Notifications when drinking water standards or treatment requirements are not maintained.

(1) **Fecal Indicators (GWR – *E. coli*, enterococci, coliphage)** Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

(2) **Ground Water Rule (GWR) TT Violations** Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.

(3) **Coliform Assessment and/or Corrective Action Violations (rule 335-7-2-.22)** Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found.

[THE SYSTEM MUST USE THE FOLLOWING APPLICABLE SENTENCES.]

We failed to conduct the required assessment.
We failed to correct all identified sanitary defects that were found during the assessment(s).

(4) ***E. coli*. Assessment and/or Corrective Action Violations (rule 335-7-2-.22)** *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for *E. coli*, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found.

[THE SYSTEM MUST USE THE FOLLOWING APPLICABLE SENTENCES.]

We failed to conduct the required assessment.

We failed to correct all identified sanitary defects that were found during the assessment that we conducted.

(5) ***E. coli* (rule 335-7-2-.07)** *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.

(6) **Seasonal System TT Violations (rule 335-7-2-.07(7)** When this violation includes the failure to monitor for total coliforms or *E. coli* prior to serving water to the public, the mandatory language found at 141.205(d)(2) must be used.

When this violation includes failure to complete other actions, the appropriate elements found in 141.205(a) to describe the violation must be used.

(7) **Turbidity (MCL)** Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

(8) **Turbidity (SWTR TT)** Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

(9) **Turbidity (IESWTR TT)** Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

(10) **Giardia lamblia (SWTR/IESWTR/LT1ESWTR), Viruses (SWTR/IESWTR/LT1ESWTR), Heterotrophic plate count (HPC) bacteria (SWTR/IESWTR/LT1ESWTR), Legionella (SWTR/IESWTR/LT1ESWTR), and *Cryptosporidium* (IESWTR/FBRR/LT1ESWTR)** Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

(11) **Antimony** Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

(12) **Arsenic** Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

(13) **Asbestos** Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.

(14) **Barium** Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

(15) **Beryllium** Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

(16) **Cadmium** Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

(17) **Chromium** Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

(18) **Cyanide** Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.

(19) **Fluoride** Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth, before they erupt from the gums.

(20) **Mercury** Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

(21) **Nitrate** Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

(22) **Nitrite** Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

(23) **Total Nitrate and Nitrite** Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become

seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

(24) **Selenium** Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.

(25) **Thallium** Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

(26) **Lead** Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

(27) **Copper** Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

(28) **2,4-D** Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.

(29) **2,4,5-TP (Silvex)** Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.

(30) **Alachlor** Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

(31) **Atrazine** Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.

(32) **Benzo(a)pyrene** (PAHs) Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.

(33) **Carbofuran** Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.

(34) **Chlordane** Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver, or nervous system, and may have an increased risk of getting cancer.

(35) **Dalapon** Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

(36) **Di (2-ethylhexyl) adipate** Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.

(37) **Di(2-ethylhexyl) phthalate** Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.

(38) **Dibromochloropropane (DBCP)** Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(39) **Dinoseb** Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

(40) **Dioxin** Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

(41) **Diquat** Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

(42) **Endothall** Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

(43) **Endrin** Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

(44) **Ethylene dibromide** Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.

(45) **Glyphosate** Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.

(46) **Heptachlor** Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.

(47) **Heptachlor epoxide** Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

(48) **Hexachlorobenzene** Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.

(49) **Hexachlorocyclo-pentadiene** Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.

(50) **Lindane** Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.

(51) **Methoxychlor** Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

(52) **Oxamyl (Vydate)** Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

(53) **Pentachlorophenol** Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.

(54) **Picloram** Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.

(55) **Polychlorinated biphenyls (PCBs)** Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.

(56) **Simazine** Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

(57) **Toxaphene** Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.

(58) **Benzene** Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.

(59) **Carbon tetrachloride** Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

(60) **Chlorobenzene (monochlorobenzene)** Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.

(61) **o-Dichlorobenzene** Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.

(62) **p-Dichlorobenzene** Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.

(63) **1,2-Dichloroethane** Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

(64) **1,1-Dichloroethylene** Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(65) **cis-1,2-Dichloroethylene** Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(66) **trans-1,2-Dichloroethylene** Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.

(67) **Dichloromethane** Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

(68) **1,2-Dichloropropane** Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.

(69) **Ethylbenzene** Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.

(70) **Styrene** Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.

(71) **Tetrachloroethylene** Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.

(72) **Toluene** Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.

(73) **1,2,4-Trichlorobenzene** Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

(74) **1,1,1-Trichloroethane** Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.

(75) **1,1,2-Trichloroethane** Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.

(76) **Trichloroethylene** Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

(77) **Vinyl chloride** Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.

(78) **Xylenes (total**) Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

(79) **Beta/photon emitters** Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(80) **Alpha emitters**(Gross alpha) Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(81) **Combined radium (226 & 228)** Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

(82) **Uranium** Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

(83) **Total trihalomethanes (TTHMs)** Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

(84) **Haloacetic Acids (HAA)** Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

(85) **Bromate** Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.

(86) **Chlorite** Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

(87) **Chlorine** Some people who use drinking water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

(88) **Chloramines** Some people who use drinking water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.

(89) **Chlorine dioxide** (where any 2 consecutive daily samples taken at the entrance to the distribution system are above the MRDL)

Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.

Add for public notification only: The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.

(90) **Chlorine dioxide** (where one or more distribution system samples are above the MRDL)

Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects.

Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.

Add for public notification only: The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.

(91) **Control of DBP precursors (TOC)** Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

(92) **Acrylamide** Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.

(93) **Epichlorohydrin** Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

(94) **Fluoride (SMCL)** This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/l) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/l. Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water. Drinking water containing more than 4 mg/L of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/l of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/l because of this cosmetic dental problem. For more information, please call [name of water system contact] of [name of community water system] at [phone number]. Some home water treatment units are also available to remove fluoride from drinking

water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP."

(95) **Standard Monitoring Violation Language** We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we "did not monitor or test" or "did not complete all monitoring or testing" for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time.

(96) **Standard Distribution Language** Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

(97) **Lead Public Education for Community Water Systems** The following information must be provided as required by this chapter:

The Alabama Department of Environmental Management (ADEM) and (insert name of water supplier) are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your system). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace each lead service line that we control if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert water system's phone number). This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

Health effects of lead. Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery, porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that will not hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination such as dirt and dust that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

Lead in Drinking Water. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead

exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 per cent or more of a person's total exposure to lead. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipe made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

Steps You Can Take in the Home To Reduce Exposure To Lead in Drinking Water. Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call (insert phone number of water system and attach a list of ADEM certified laboratories in your area).

If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:

Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or two gallons of water and costs less than (insert a cost estimate based on flushing two times a day for 30 days) per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask

your landlord for help in locating the source of the lead and for advice on reducing the lead level.

Try not to cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the Water Supply Branch of ADEM about the violation.

Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting the plumbing contractor who installed the line. You may be able to identify the plumbing contractor by checking the record of building permits which should be maintained in the files of the (insert name of department that issues building permits). A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the portion of the line we own. If the line is only partially controlled by the (insert name of the city, county, or water system that controls owns the line, we are required to provide you the owner of the privately-owned portion of the line with information on how to replace your the privately-owned portion of the service line, and offer to replace that portion of the line at you're the owner's expense and take a follow-up tap water sample within 14 days of the replacement. If we replace only the portion of the line that we own, we also are required to notify you in advance and provide you with information on the steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of that sample within three business days of receiving the results. Acceptable replacement alternatives include copper, steel, iron, and plastic pipes.

Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your

wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis systems or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

Purchase bottled water for drinking and cooking.

You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

(insert the name of city or county department of public utilities) at (insert phone number) can provide you with information about your community's water supply, and a list of local laboratories that have been certified by ADEM for testing water quality;

(insert the name of city or county department that issues building permits) at (insert phone number) can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and

(insert the name of the State Department of Public Health) at (insert phone number) or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health effects of lead and how you can have your child's blood tested.

The following is a list of some State approved laboratories in your area that you can call to have your water tested for lead. (Insert names and phone numbers of at least two laboratories).

(98) **Lead Public Education for NTNC Water Systems.** The following information must be provided as required by this chapter:

The Alabama Department of Environmental Management (ADEM) and (insert name of water supplier) are concerned about lead in your drinking

water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your system). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace each lead service line that we control if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert water system's phone number). This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

Health effects of lead. Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery, porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that will not hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination such as dirt and dust that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

Lead in Drinking Water. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 per cent or more of a person's total exposure to lead.

Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipe made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used at all, can contain fairly high levels of lead.

Steps You Can Take To Reduce Exposure To Lead in Drinking Water:

Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in the plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

Try not to cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may want to use bottled water for drinking and cooking.

You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

(insert the name or title of the appropriate facility official) at (insert phone number) can provide you with information about your facility's water supply, and;
home; and

(insert the name of the State Department of Public Health) at (insert phone number) or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health effects of lead and how you can have your child's blood tested.

(99) ***Cryptosporidium*** **Monitoring Violation** We are required to monitor the source of your drinking water for *Cryptosporidium*. Results of the monitoring are to be used to determine whether water treatment at the (treatment plant name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We "did not monitor or test" or "did not complete all monitoring or testing" on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate *Cryptosporidium* removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date). For more information, please call (name of water system contact) of (name of water system) at (phone number).

(100) **Failure to determine *Cryptosporidium* bin classification** We are required to monitor the source of your drinking water for *Cryptosporidium* in order to determine by (date) whether water treatment at the (treatment plant

name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of (date). For more information, please call (name of water system contact) of (name of water system) at (phone number).

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT WATER DIVISION - WATER SUPPLY PROGRAM

CHAPTER 335-7-15
SOURCE WATER ASSESSMENT PROGRAM

TABLE OF CONTENTS

335-7-15-.01 Applicability. This chapter is applicable to all water systems within the state using or proposing to use a groundwater source or a surface water source for water supply, unless specifically exempted by a part of these regulations.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005.

335-7-15-.02 Definitions. The following words and phrases, unless a different meaning is plainly required by the context, shall have the following meaning:

(a) Analytical methods--the delineation of a Source Water Assessment Area based on the use of uniform flow equations to define the zone of contribution to a pumping well.

(b) Aquifer--a geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of groundwater to wells and springs.

(c) Conduit flow--the flow of groundwater in karst (carbonate) aquifers through integrated systems of openings ranging from solutionally widened joints and bedding plane partings to pipe-like passages. Conduit flow is groundwater flow through a system of irregular conduits and open cave stream channels.

(d) Confined Aquifer--An aquifer overlain by low or impermeable stratigraphy, which puts the aquifer under artesian head conditions.

(e) Contaminant--matter which renders water unfit to use due to its physical, chemical, biological, or radiological properties.

(f) Contaminant source--origin of a known or potential contaminant.

(g) Contaminant source inventory--the synthetic identification, location, and recording of contaminant sources existing within a watershed.

(h) Contamination--matter present which renders water unfit for use by causing a change in its physical, chemical, biological or radiological properties.

(i) Fixed Radius--A circle of specified radius around a well.

(j) Flow boundaries--zones of higher or lower transmissivity, recharge zones, impermeable boundaries, groundwater divides and saddles, and discharge zones that influence flow direction and velocity in an aquifer.

(k) Fracture flow--the groundwater flow along openings produced by the breaking or shattering of rock.

(l) Geologic mapping--the delineation of Source Water Assessment Areas by mapping time-of-travel and flow boundary criteria using geological observations, geophysical data, and dye-tracing methods.

(m) Geologist--a geologist licensed by the State of Alabama.

(n) Geographic Information System (GIS)--a computer based method of depicting various types of geographic information on a map.

(o) GPS method--determination of latitude and longitude at a point using Global Positioning System (GPS) collected, differentially corrected data to an EPA accepted accuracy of 25 meters at a specified datum (i.e. NAD 83).

(p) Groundwater source--well or spring permitted as a public water supply source by the Department.

(q) Intake--the structure where raw water is removed from source water for the purpose of transferring it to a water treatment plant.

(r) Known contaminant source--contaminant source which has lead to the detection of a regulated or unregulated chemical contaminant, bacteriological contaminant or physical contaminant in the ground or surface source's raw water quality.

(s) Licensed well driller--a driller licensed by the Department, who has direct responsibility and supervision over water supply wells drilled by them and their company.

(t) Numerical modeling method--the delineation of a Source Water Assessment Area using computer models that approximate groundwater flow and/or transport using numerical equations.

(u) Physiographic province--a region of which all parts are similar in geologic structures and climate and which has consequently had a unified geomorphic history; a region whose pattern of relief features or landforms differ significantly from that of adjacent regions.

(v) Porous flow--the flow of groundwater through the connected interstices of unconsolidated sediments.

(w) Potential contaminant source--contaminant source which houses regulated or unregulated chemical contaminants, bacteriological contaminants or physical contaminants which may lead to the detection of these substances in the ground or surface source's raw water.

(x) Public Awareness--the requirement of a water system to notify the public of the susceptibility to contaminant source located in its watershed.

(y) Raw water--water within a watershed used to supply an intake structure.

(z) Significant tributary--a tributary, or subtributary, within a watershed that, due to its location, has the potential to transport contaminant sources and potential contaminant sources into the main raw water source for a surface water treatment plant. Their "significance" can be determined only after a preliminary study of their relative location to known or potential contaminant sources.

(aa) Sinkhole--a funnel shaped depression caused by subterranean drainage.

(bb) Source Water Assessment Area (SWAA)--the surface and subsurface area surrounding a spring, water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield or the systematic identification of contaminant sources within a watershed area and the relative susceptibility to these contamination sources.

(cc) Source Water Protection Area (SWPA)--the critical, or special, area

in the immediate vicinity of a surface water plant intake that is closely scrutinized for contaminant sources.

(dd) State boundary--the boundary between two or more States which share a common watershed. It is the upper limit for a watershed that exists in more than one State.

(ee) Stratigraphic pinch-out--the termination or end of a stratum, vein, or other body of rock that narrows or thins progressively in a given horizontal direction until it disappears and the rocks it once separated are in contact.

(ff) Susceptibility analysis--the determination of the relative impact a contaminant source in a watershed has on the quality of a raw water source used for a public water supply system.

(gg) Susceptibility determination--the evaluation of a known or potential source of contamination to degrade the quality of a drinking water source. Contaminant sources shall be listed as low, moderate, or highly likely to impact a drinking water source.

(hh) Time-of-Travel (TOT)--the analytical time-of-travel is based on the maximum time for a contaminant to reach a well according to regional groundwater patterns and velocities. Time periods of 180 days and 10 years are used for determining the time-related capture zones or source water assessment areas.

(ii) Tributary--a side stream that discharges flow to the main stream of a watershed.

(jj) Unconfined aquifer--an aquifer in which there are no confining beds between the zone of saturation and the surface. An aquifer in which there is a saturated and unsaturated zone.

(kk) Watershed--the entire land area drained by a stream or system of streams such that all streams originating in the area are discharged through a single outlet at an intake. It is usually identified by the hydrologic boundary or surface topography.

(ll) Watershed delineation--the identification of a watershed's topographic boundary.

(mm) Watershed map--a map which depicts the location of the intake of a water system, the boundary of the watershed serving the intake, the location of the Source Water Protection Area, and locations of contaminant sources within the watershed.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.03 Source Water Assessment Program for a Groundwater Source.

(1) All public water supply systems using a groundwater source for its drinking water must have a completed and approved Source Water Assessment Program (SWAP) meeting the requirements of rules 335-7-15-.03 through 335-7-15-.10 and 335-7-15-.16 no later than February 6, 2003.

(2) A completed SWAP must include the following: Source Water Assessment Area (SWAA) delineation, contaminant inventory within the SWAA, a susceptibility analysis of each contaminant source in the inventory and completion of the public awareness requirements.

(3) Written notification that the delineation, contaminant inventory, and the susceptibility analysis have been updated and the public awareness requirements have been met must be received at the time a water system applies for renewal of its general operating permit.

(4) Wells constructed after the effective date of these regulations must meet all requirements of the program before placing the source into service.

(5) Groundwater sources that have been designated as groundwater under the direct influence of surface water must meet the Source Water Assessment Requirements for both groundwater and surface water sources unless a surface source water assessment is deemed unnecessary by the Department.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.04 SWAA Delineation for a Groundwater Community Water Source. All community groundwater systems shall delineate appropriate SWAA I and II in accordance with the requirements of this section.

(a) The delineated SWAA shall be drawn on a 24" X 36" US Geological Survey (USGS) 7.5 minutes topographic quadrangle (more than one sheet may be used if necessary). Color photos or color print copies shall be used. The delineation may utilize natural or man made structures to define the SWAA as long as these structures are located in close proximity to the calculated or mapped SWAA boundary.

(b) A geologist licensed in Alabama shall perform all SWAA area delineations, other than the fixed radius method.

(c) To identify aquifer flow characteristics, a potentiometric map shall be constructed using local water level measurements and show gradient and flow direction.

(d) The degree of confinement shall be determined by geologic or hydrologic approaches and using the documents listed in 335-7-15-.04. Geologic, graphical and drilling logs, geologic descriptions of local stratigraphy, and cross-sections derived from local stratigraphy shall be included and used to determine confinement.

(e) Geologic, geophysical, graphical and drilling logs, geologic descriptions of local stratigraphy, physiographic description, description of the hydrogeology and cross-sections derived from local stratigraphy shall be included in the report.

(f) Construction of the SWAA shall be according to Table 1. All data and calculations used to determine the SWAA shall be included in the report. One of the following methods should be used.

1. Fixed radius (400 feet or 1000 feet radius).

2. Analytical methods or numerical modeling for Time of Travel (TOT) with hydrogeological mapping of flow boundaries.

3. Conduit flow. SWAA for wells in karst or conduit flow aquifers should be established using hydrogeological mapping of flow boundaries and karst features such as sinkholes and sinking stream, lineament analyses and dye tracer tests.

4. Special Conditions.

(i) Confined aquifers.

(ii) The SWAA I for public water supply wells in coastal plain confined aquifers, with the top of the first screened interval at 600 feet below ground surface or greater, may be established by a 400 foot fixed radius. A SWAA II is not required.

(iii) A waiver from the full TOT SWAA delineation requirement may be requested of the Department by systems that have wells with the first screened interval less than 600 feet below ground surface. If the aquifer is under confined conditions waivers may be considered based on site-specific considerations such as degree of confinement.

(g) Gulf Coast aquifers. Wells that have been identified as being in the coastal zone of Alabama shall comply with the Alabama Coastal Area Management Program Regulations (Division 335-8) as well as this chapter.

(h) Wellfields. Systems with large wellfields, where wellhead areas may overlap, may define a SWAA I and II that encompasses all of the wells to create a composite SWAA I and II. This area shall be based on cumulative drawdown and interference of all the wells in the wellfield.

Table 1 Alabama Source Water Assessment Area (SWAA) Delineation Criteria & Threshold					
	Porous: porous flow	**Karst: porous flow**	**Karst: conduit flow**	**Fractured: porous flow**	**Fractured: conduit flow**
SWAA I	180-day TOT or 400 ft radius*	180-day TOT or 400 ft radius*	1000 ft radius	180-day TOT or 400 ft radius*	1000 ft radius
SWAA II	10-year TOT with hydrogeologic flow boundaries	Hydrogeologic flow boundaries and TOT (where appropriate)	Hydrogeologic flow boundaries and dye tracing	10-year TOT with hydrogeologic flow boundaries	Hydrogeologic flow boundaries and dye tracing (where appropriate)

* Whichever is greater

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, § 22-23-1 through 22-24-12.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.05 SWAA Delineation for a Groundwater Transient Non- Community Water Source.

(1) All public water systems designated by the Department as Transient Non-Community water systems utilizing a groundwater source shall use a fixed 400-foot radius extending from the groundwater source as the SWAA I.

(2) A SWAA II is not required for these systems.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.

335-7-15-.06 SWAA Delineation for a Groundwater Non-Transient Non-Community Water Source.

(1) All water systems designated by the Department as Non-Transient Non-Community water systems utilizing a groundwater source shall use a fixed 1,000-foot radius extending from the groundwater source as the SWAA I.

(2) A SWAA II is not required for these systems.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.

335-7-15-.07 Contaminant Inventory Development for a Groundwater Source.

(1) All known and potential contaminant sources shall be located in SWAA I.

(2) Known and potential contaminant sources shall be located in SWAA II.

(3) A chart listing all contaminant sources indicated in the inventory shall be developed and include contaminant source identification number, type of source, owner's name, owner's address, owner's telephone number, names of the contaminants which can be released from the source, and latitude and longitude of the source using the GPS method.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.08 Susceptibility Analysis for a Groundwater Source. A representative of the water system and a representative of the Department shall perform the susceptibility analysis. Contaminant sources shall be classified as high, moderate or non-susceptible to contaminating the water source. Contaminant sources shall be ranked according to a comparative analysis procedure using information such as:

(a) Distance of potential contaminant source from the groundwater source.

(b) Depth and construction characteristics of the well or spring.

(c) Contaminant type.

(d) Potential for contamination event.

(e) Concentration of contaminant(s) in the source water.

(f) Upon completion of the Susceptibility Analysis, the contaminant source inventory shall be revised according the Analyses. Each contaminant source shall be located on the SWAA maps using its identification number, with the following color codes: red for highly susceptible, yellow for moderately susceptible, and green for non-susceptible.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.

History: December 12, 2005.

335-7-15-.09 Observation Wells. For community water systems an observation well/wells shall be constructed at an appropriate distance from the production well, to facilitate determination of the storage coefficient and transmissivity during the aquifer test.

(a) A temporary or test well may be used as the observation well if satisfactory information can be obtained.

(b) If the temporary well is converted to the production well, an observation well must be installed at an appropriate distance from the production well or at an alternate distance approved by the Department.

(c) The observation well shall be a minimum of two inches in diameter and shall penetrate the strata utilized by the production well or wells.

(d) The observation well screen shall be placed at approximately the same depth as the central portion of the screened zone or zones in the production well.

(e) Construction of the observation well shall be according to the latest edition of the ASTM Subcommittee D18.21 Design and Installation of Groundwater Monitoring Wells in Aquifers.

(f) Storage coefficient and other aquifer characteristics determined for existing wells in a Coastal Plain Province well field, may be used for delineating the SWAA areas for an additional well in the well field if constructed similar to others in the well field.

(g) If the SWAA can be determined without constructing an observation well, a request for an exemption from constructing an observation well may be requested after submittal of all supporting information.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.10 Aquifer Test. An aquifer test of a finished community system production well shall be conducted to determine the aquifer storage coefficient and transmissivity. The test method shall be clearly outlined in the engineering specifications for the project and the test procedure shall be continuous with adequate provisions taken to prevent disruption of the test. The calculated storage coefficient and transmissivity values shall be used to determine the SWAA.

(a) Several days before initiating the aquifer test, the well shall be pumped for several hours to determine the following:

1. The maximum anticipated drawdown,

2. The approximate capacity of the well, and

3. If the pump discharge will affect recharge to the well during the anticipated period of the aquifer test.

(b) Steps shall be taken to assure accuracy of the drawdown during the aquifer test.

1. Accurate drawdown readings shall be taken in both the production and observation wells simultaneously. Readings will be taken every 2 minutes for the first hour, every 5 minutes for the next hour, every 10 minutes for the next 2 hours, every 30 minutes for the next 2 hours and then hourly until the end of the test.

2. Drawdown data collected during the period of testing shall be corrected for changes in barometric pressure and tidal oscillations.

3. Recovery water level data shall be determined and recorded simultaneously for both the observation well and production well.

4. The aquifer test shall be conducted for the continuous period required to stabilize the water level at the design capacity.

5. If the aquifer test cannot be conducted according to requirements of this paragraph, a written request shall be submitted to the Department supporting a waiver of this method.

(c) An aquifer test exemption may be granted for wells completed in karst formations under conduit flow conditions and for confined wells with sources of water greater than 600 feet deep. Waivers from the aquifer test can be considered by the Department after receipt of well logs, documented confining layers, proposed construction standards and a waiver request from the applicant.

(d) A public water system with a proposed well exempted from the aquifer test must conduct a capacity test in accordance with 335-7-5-.09.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.

335-7-15-.11 Source Water Assessment for a Surface Source.

(1) Source water assessment for a surface water source consists of: delineation of watershed, contaminant source inventory, susceptibility analysis, contingency plans and public awareness, as required by this chapter.

(2) Assessments of proposed new water supply sources must be completed and approved by the Department prior to issuance of a construction

permit for the intake.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.12 Delineation of Watersheds. Watersheds for all surface water intakes shall be delineated using the Hydrologic Unit Code (HUC), or other approved methods. Delineated watersheds shall extend upstream and laterally from intakes to the watershed topographic boundary, the next upstream dam (where applicable), and to the adjacent state boundary. Watersheds shall be depicted on US Geological Survey (USGS) topographic maps using a suitable scale between 1:100,000 and 1:24,000. Map overlays and the Geographical Information System (GIS), or other approved methods, may be used to depict various types of information such as large land areas, for the watershed and the Source Water Protection Area (SWPA). Maps of watershed delineations must show the location of intakes and known and potential contaminant sources, using the Global Positioning System (GPS) coordinates. The SWPA is the area designated for close scrutiny by the contaminant source inventory and protection, and shall be shown on the watershed map, or overlay, in accordance with the following:

(a) For river runs, creeks, and streams: The SWPA area shall extend from ¼ mile downstream of an intake (where practicable) to:

1. Fifteen (15) miles upstream of the intake,

2. One-quarter mile below the next upstream intake,

3. The next upstream dam, or

4. The state boundary.

5. The SWPA shall extend laterally from the intake for a minimum distance of 500 feet beyond the edge of the body of water at summer pool elevation serving the intake. Special conditions, such as an area of known potential or suspected contaminant sources, may require the width of the SWPA to exceed 500 feet. Significant tributaries (tributaries draining an area of known, potential, or suspected contaminants) entering the SWPA shall be included as a part of the SWPA for a minimum of one mile upstream of the tributary and laterally to each side of the tributary for a minimum of 500 feet.

(b) For lakes and reservoirs with water surface areas exceeding 1000 acres the SWPA shall extend from ¼ mile downstream of the intake (where practicable) to:

1. Five (5) miles upstream of the intake in all directions of potential flow toward the intake,

2. A minimum of 500 feet inland for land falling within the above five mile distance of potential flow towards the intake.

3. A minimum of one mile upstream and a minimum of 500 feet to each side of significant tributaries falling within the above five mile distance of flow towards the intake.

(c) For lakes and reservoirs with water surface areas equal to or less than 1000 acres the SWPA shall extend from ¼ mile downstream of the intake (where practicable) to:

1. A minimum of 500 feet inland for the entire body of water or waters;

2. A minimum of one mile upstream and a minimum of 500 feet to each side of significant tributaries to the body of water.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005.

335-7-15-.13 Contaminant Source Inventory Development for a Surface Source. Source water protection areas (SWPA) shall be inventoried for known and potential contaminant sources. Information on existing contaminants sources shall be obtained by reviewing records available from Local, State, and Federal permitting and monitoring agencies plus on-site field surveys conducted by water system personnel. Information on non-permitted contaminant sources shall be obtained by on-site field surveys conducted by water system personnel their or designees.

(a) Information on all contaminant sources identified from records and by water systems shall be recorded in tabular form and include:

1. Contaminant source identification.

2. Contaminant source nature, specific contaminate present at the site, and relative amount.

3. Contaminant source location by longitude and latitude as determined by GPS units of activity, such as crops or pasture (animals grazing) can be located by one point indicate most probable entry of runoff to the water source.

4. Name, address, and telephone number of owner or generator of the contaminant source.

5. Name of the regulatory agency that permitted and monitors the contaminant source.

6. Identify contaminant sources as to whether or not they are regulated.

(b) Contaminant sources identified above shall be plotted on an overlay of the watershed map. Contaminant sources associated with large areas of land shall be plotted using GIS information, when available. Otherwise, the approximate area and location shall be shown on the watershed map.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005.

335-7-15-.14 Susceptibility Analysis for a Surface Source. Upon completion of the contaminant source inventory, a representative of the water system and a representative of the Department shall jointly perform a susceptibility analysis of all contaminant sources identified in the contaminant source inventory.

(a) Contaminant sources shall be analyzed for their susceptibility to impact raw water quality. Contaminant sources shall be classed as highly susceptible, moderately susceptible, or not susceptible to impacting raw water quality after consideration of, but not limited to, the following factors:

1. Contaminant source nature, location, type, and source.

2. Concentration and volume of contaminant source after consideration of time of travel to the intake, and dilution.

3. Likelihood the contaminant source can be removed or diverted from the intake by emergency operations measures.

(b) All contaminants shall be plotted on the watershed map by using latitudes and longitudes based on GPS methods. The contaminants sources shall be identified by name and by legend on the map, using color codes to identify their susceptibility classification. The susceptibility codes to be used are:

1. Red: Highly susceptible

2. Yellow: Moderately susceptible

3. Green: Low susceptible.

Author: Edgar K. Hughes
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005.

335-7-15-.15 Contingency Plans for a Surface Source. The water system shall submit to the Department for approval contingency activities for potential contaminant sources rated highly susceptible to entering the intake which may rapidly cause the raw water to be difficult to properly treat. Upon approval of their contingency plans, water systems shall implement them immediately and incorporate them into their Standard Operating Procedure (SOP). Contingency actions may include, but not be limited to the following items, individually, and in combination:

(a) Temporarily closing of the treatment plant,

(b) Obtaining raw water from another approved source,

(c) Obtaining finished water from another public water system,

(d) Developing adequate distribution storage for the expected duration of the contamination event,

(e) Using emergency containment devices to exclude contaminant sources from intakes.

(f) During periods when a treatment plant is closed due to the presence of excessive contaminants, it shall remain out of service until monitoring by the water system indicates the contaminant is no longer a threat to the treatment process or quality of finished water. The water system shall keep the Department informed of the status of its raw water quality whenever a contamination event results in the closure of a plant and shall furnish monitoring results to the Department. Treatment plants shall not be returned to service until approval has been received from the Department.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: Adopted: December 8, 1998; effective January 25, 1999.
Amended: January 22, 2008.

335-7-15-.16 Public Awareness. Source water assessment is complete when the water system makes the public aware of the condition of its raw water supply, including its susceptibility to contamination. This can be accomplished by performing all of the following:

(a) Presenting an oral report to the consumers of the system's water at a public meeting within 90 days after receiving notification from the Department that the susceptibility analysis has been completed and contingency plans have been approved. The report must include a list of all contaminant sources to which the water system's source water is susceptible, the susceptibility rating of the contaminant source, and a map showing the location of contaminant sources identified in the contaminant inventory. For groundwater sources, the map must indicate the SWAA I and SWAA II and the location of the contaminant

sources identified in the contaminant inventory. Water system management should attempt to answer reasonable questions asked by the public relating to source water quality and should make the public aware of other options available for reviewing assessment results.

(b) Allowing individual members of the public to review all assessment documents during normal business hours of operation at the water system's office. Assessment documents must be maintained on display at the system's water office for easy access by the public.

(c) Providing copies of the assessment documents to members of the public upon request after payment of a nominal reproduction fee.

(d) Including an abbreviated report in the system's annual consumer confidence report. The report must include the information contained in paragraph (a) above and must inform the public of the other options available for reviewing the assessment results.

(e) Responding within 45 days to reasonable written questions by the public relating to the quality of its source water. The water system must maintain a file of questions asked by the public and the water system's response to such inquiries.

(f) In lieu of 335-7-15-.16(a), NTNC and Non-community water systems may post a copy of the SWPA contaminant inventory, susceptibility analysis, and contingency plan in a location convenient to the consuming public.

Author: Edgar K. Hughes, Dennis D. Harrison.
Statutory Authority: Code of Alabama 1975, §§ 22-23-1 through 22-24-12.
History: December 12, 2005.
Amended: January 22, 2008.

335-7-15-.17 Updating of Assessments. After the initial approval by the Department, the assessment must be updated by the water system when there is a significant change to any portion of the assessment. These changes shall be included in the source water assessment review performed at the time the water system is completing the application for a renewal of the facility's operating permit.

Author: Edgar K. Hughes.
Statutory Authority: Code of Alabama 1975, §§ 22-23-33, 22-23-49, 22-22A-5, 22-22A-6.
History: December 12, 2005.