



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

Science and Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605-2720

JUN 30 2016

Ms. Elizabeth Dieck
Director of Environmental Quality Control
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Dear Ms. Dieck:

In response to the U.S. Environmental Protection Agency (EPA), Region 4, Quality Assurance Section's (QAS) review of corrective actions mailed April 10, 2016, the South Carolina Department of Health and Environmental Control (DHEC), Bureau of Environmental Health Services (BEHS), Analytical and Radiological Environmental Services Division (ARESD) located at the Environmental Quality Control (EQC) Laboratory in Columbia, South Carolina provided additional corrective actions dated June 10, 2016. These documents provided evidence of corrective action for the findings and recommendations that were detailed in the assessment report of the August 25-28, 2015 laboratory audit.

The staff of the QAS has completed its evaluation of the corrective actions that were submitted and has determined that the findings have been adequately addressed and the corrective actions are acceptable.

In accordance with Chapter III, Section 13 of the Manual for the Certification of Laboratories Analyzing Drinking Water, the SC DHEC ARESD Laboratory will maintain the status of *Certified* for organic chemistry, inorganic chemistry and microbiology drinking water analysis methods, and the laboratory may analyze samples by the methods listed in Tables 2 and 3 of the original assessment report for Safe Drinking Water Act (SDWA) compliance purposes.

For finding numbers 5.2 and 6.1 dealing with the checking of samples for residual chlorine, the ARESD indicated that it may take until August 1, 2016, to implement the new procedures in the ARESD quality program. Please forward a copy of your new procedures for our files by August 15, 2016.

If you have any questions, please don't hesitate to call me, or have your staff contact Sandra Aker, QAS Chief, at (706) 355-8772.

Sincerely,

A large black rectangular redaction box covering the signature area.

Antonio Quinones
Acting Director

cc: Renee Shealy, SC DHEC BEHS Chief
Sandra Flemming, SC DHEC BEHS Assistant Chief
Micheal Mattocks, SC DHEC BEHS ARES Chief
Becky Allenbach, EPA Reg. 4 Water Protection Division
Shawneille Campbell-Dunbar, EPA Reg. 4 Water Protection Division



Catherine E. Heigel, Director

Promoting and protecting the health of the public and the environment

MEMORANDUM

Date: June 8, 2016

To: Mr. Michael V. Peyton, Director
U. S. EPA Region IV

Through: Renee Shealy, Bureau Chief *RSS*
Bureau of Environmental Health Services

Through: Sandra A. Flemming, Asst. Bureau Chief *S. Flemming*
Bureau of Environmental Health Services

From: Mr. Micheal Mattocks, Director *M. Mattocks by [Signature]*
Analytical and Radiological Environmental Services Division

Subject: Second-Response to Drinking Water On-Site SC DHEC Laboratory and
Laboratory Certification Program Audit

This memorandum is a second response to the findings 5.1 and 6.2 for the chemistry labs and 11.1 for the microbiology lab of the EPA audit conducted August 25 - August 28, 2015 at the South Carolina DHEC Laboratory. The SC DHEC lab initial and second responses are listed below and are numbered in accordance with the original audit report. Your findings and response to our initial response have been written verbatim as stated in the audit report. Please let us know if you have questions or concerns regarding any of the responses.

5.0 ORGANIC CHEMISTRY

General Organic Chemistry

The findings described under the General Organic Chemistry category are those that span over multiple methods.

- 5.1 **Finding:** Residual Chlorine checks were not performed for organic analysis to verify that the preservative added to the sample was sufficient to neutralize any chlorine that may have been present.

Corrective Action: The Drinking Water Certification Manual, Chapter IV, Section 6.3, requires that laboratories verify that samples' preservation was sufficient to neutralize residual chlorine. This should be performed for all associated methods, by a chlorine test strip, and documented in the sample preparation logbook or bench sheet.

Initial Response: Item 6.3 of the Drinking Water Certification Manual does not state that residual chlorine checks must be performed. It states that: *Samples must be analyzed within the maximum holding times required by the method and references Table IV-6.* The laboratory is following this requirement as stated and exemplified in Table IV-6 with regard to preservatives, sample holding times, extract holding time and storage conditions, suggested sample size, and type of container for each parameter. The sample collection process is a shared endeavor where the lab provides bottles to the field staff. Samples which require dechlorinating agents are pre-prepared by the laboratory with the appropriate amount of dechlorinating agent already added as required by the methodology. The laboratory verifies appropriate preservation of samples as required by controlling this part of the sample collection process. Additionally, the Federal Register does not require that the residual chlorine be checked with test strips, but only requires that appropriate preservation as required for a given parameter be done. The laboratory has looked at a number of various versions of test strips to perform residual chlorine checks and this would incur a huge cost for the laboratory. The laboratory is of the opinion that since there is no document which clearly states or mandates that residual chlorine be checked, but only that the appropriate preservation be added, this finding should have been a recommendation. Each method in its "Sample Collection, Preservation, and Storage" section states the amount of dechlorinating agent to be added for appropriate elimination of potential chlorine presence.

- 6.2 **Finding:** Residual Chlorine checks were not performed for inorganic analysis by EPA Method 200.7 and 200.8, and SM3112B to verify that the preservative added to the sample was sufficient to neutralize any chlorine that may have been present.

Corrective Action: The Drinking Water Certification Manual, Chapter IV, Section 6.4, requires that laboratories verify that samples' preservation was sufficient to neutralize residual chlorine. This should be performed for all associated methods, by a chlorine test strip, and documented in the sample preparation logbook or bench sheet.

Initial Response: Residual Chlorine checks are not required for these methods and Section 6.4 does not state that residual chlorine checks must be performed. Section 6.4 states: *There must be strict adherence to correct sampling procedures, sample handling, complete identification of the sample, and prompt transfer of the sample to the laboratory when required by the method. When the laboratory is not responsible for sample collection and transport, it must verify that the paperwork, preservatives, containers, and holding times are correct as required by the methods or reject the sample. The rejection criteria should (EPA Order 5360.1) be documented in writing.* Methods 200.7, 200.8, and SM3112B are preserved with the appropriate acid in the field and the pH of the sample is checked once the sample is received by the laboratory verifying the sample has been acidified accordingly. The laboratory does not feel this should have been a finding as residual chlorine does not apply to any of the inorganic parameters as such.

EPA Response: These findings dealt with the absence of residual chlorine checks by SC ARES D for organic and metals analysis. The Drinking Water Certification Manual states the following in chapter 4 Sect. 6.4:

Sample Collection and Transport

There must be strict adherence to correct sampling procedures, sample handling, complete identification of the sample, and prompt transfer of the sample to the laboratory when required by the method. When the laboratory is not responsible for sample collection and transport, it must verify that the paperwork, preservatives, containers and holding times are correct as required by the methods or reject the sample. The rejection criteria should (EPA Order 5360.1) be documented in writing.

Residual chlorine has an effect on all organic compound and metals analyses. It is imperative that the neutralization of residual chlorine is verified at the laboratory. For volatile samples this must take place after the sample has been analyzed to maintain integrity. The use of test strips, ribbons, tabs, etc. is an economical means for this determination, as long as the sensitivity is sufficient. Regardless, it cannot be assumed that the preservative used to neutralize chlorine is effective. It must be demonstrated. This is identical to checking sample pH and temperature to verify that the samples were properly preserved.

SC DHEC Lab Second Response: While the laboratory does not agree with EPA Region 4 regarding this finding, it will implement use of test strips for organic and metals analysis. The laboratory has purchased and tested a number of strips and has selected the LaMotte total and free chlorine test strip. All organic samples will be checked prior to analysis with the exception of volatile organic samples, which will be tested post analysis. It should be noted that volatile organic samples have always been checked in the field for chlorine during collection and are evaluated as an acceptable sample for analysis based on the field chlorine reading. However per the request of EPA Region 4, an additional check of these samples will be completed. All inorganic samples will be checked post acid preservation. The laboratory feels it is important to mention that there is no de-chlorinating agent added to inorganic samples; so the residual chlorine test on these samples does not seem relevant. However, as aforementioned, the laboratory will comply. Analyst will document the residual chlorine test for organic samples on the associated batch sheets and inorganic samples will be documented in the pH logbook. The laboratory will implement the chlorine checks by August 1, 2016. This will allow the laboratory adequate time to purchase the necessary supplies, update SOPs, and provide training to staff regarding the implementation of this procedural step.

11.0 FINDINGS AND RECOMMENDATIONS - MICROBIOLOGY

11.1 Finding: There was no record of contents or analyst's initials each time the autoclave was used.

Corrective Action: The following information should be recorded each time the autoclave is used: date, contents, sterilization time and temperature, total time in the autoclave, and analyst's initials. Refer to Chapter 5, Section 3.5.3 of the Certification Manual.

Initial Response: Autoclave services for the microbiology laboratory are provided by the Media, Reagent, and Glassware section in the Bureau of Laboratories. The Media, Reagent, and Glassware section has updated their records to reflect autoclave operator initials, process date, and who services were provided to. Each autoclave strip will reflect this information (see Attachment XIII).

EPA Response: The laboratory also needs to document items placed in the autoclave as "contents" on the autoclave tape. For example waste, DI water, or EC-MUG broth.

SC DHEC Second Response: The autoclave tape at the top is labeled waste. The media laboratory has added a sticker describing the material autoclaved, lab the material originated from, and the initials of the person who autoclaved the material. See Attachment I. as an example.

Attachment 1

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===== WASTE =====
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CYCLE START AT 8:32:01A
ON 5/25/16
  
```

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CYCLE COUNT      766
OPERATOR
STERILIZER: GRA31
CYCLE TYPE GRAVITY
CYCLE NO. 1
  
```

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STER TEMP = 124.0C
CONTROL TEMP = 125.5C
STER TIME = 0:30:00
DRY TIME = 0:05:00
  
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TIME	Temp	U=inhg	T= C	P=psig
C 8:36:36A	64.1	0.1P		
C 8:37:57A	98.1	6.5P		
S 8:39:35A	124.1	20.7P		
S 8:41:35A	125.5	20.5P		
S 8:43:36A	125.7	19.9P		
S 8:45:36A	125.8	20.7P		
S 8:47:36A	125.8	19.6P		
S 8:49:36A	125.8	19.7P		
S 8:51:36A	125.8	20.2P		
S 8:53:36A	125.5	20.3P		
S 8:55:36A	125.5	20.5P		
S 8:57:36A	125.6	20.1P		
S 8:59:36A	125.2	19.3P		
S 9:01:36A	125.4	19.7P		
S 9:03:36A	125.6	20.2P		
S 9:05:36A	125.8	19.8P		
S 9:07:36A	125.5	19.5P		
E 9:09:35A	125.5	19.5P		
E 9:10:59A	105.2	3.0P		
E 9:11:00A	105.0	3.0P		
E 9:16:01A	92.9	17.5V		
Z 9:16:25A	90.7	2.1U		

LOAD 052661

CHAMBER TEMP MAX=125.9C
CHAMBER TEMP MIN=124.1C

CONDITION = 2:39
STERILIZE = 30:30
EXHAUST = 6:50
TOTAL CYCLE = 39:29

WASTE ENVIRON MICRO

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= READY TO UNLOAD =

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* NOT READY 9:23:58A
DOOR OPEN

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