



SCDHEC Office of Environmental Laboratory Certification Certification Updates – December 2016

New Program Manager over the Environmental Laboratory Certification Program

Carol Smith has retired after 35 years with the South Carolina Department of Health and Environmental Control. Susan Jackson has been selected as the Program Manager for the Laboratory Certification Program within the Bureau of Environmental Health Services. Susan has been with SCDHEC for over 18 years. She began her career in the SCDHEC Environmental Affairs Organic Laboratory, and has been a laboratory certification officer with the Environmental Laboratory Certification Program for 11 years. She is a graduate of the University of South Carolina with a B.S. in Chemistry and a Master's Degree in Business.

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Low Level Metals (MERCURY) Sampling Reminders

Laboratories are reminded that when Low Level Mercury NPDES samples are collected, these samples must be collected by a certified laboratory using EPA Method 1669. For a list of laboratories certified for EPA Method 1669, e-mail labcerthelp@dhec.sc.gov.

The EPA Method 1669 certified laboratories are reminded that the sampling procedure requires, at a minimum, 2 people (Dirty Hands and Clean Hands) to collect these samples. These individuals must be employed and trained by the certified laboratory and training records must be maintained by the laboratory.

SW-846 Update V Implementation

On August 13, 2015, the Environmental Protection Agency (EPA) provided notice of the availability of "Final Update V" to the Third Edition of the manual, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA publication SW-846. Final Update V contains analytical methods which may be used in monitoring or complying with the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations.

The South Carolina Certification Program is incorporating these new and revised methods into the Solid and Hazardous Waste Certification. The new and revised analytical methods can be found at <https://www.epa.gov/hw-sw846/sw-846-compendium>. Also be advised that Chapters One through Five of SW-846 have been revised.

A memo was sent to all laboratories certified for SW-846 methodology requesting updated SOPs reflecting the changes made in SW-846 Update V by November 1, 2016. Our Office is in the process of reviewing these SOPs. Any certificates requiring updates to method revisions will be issued starting in January.

Standard Methods Revision Updates of Safe Drinking Water Act (SDWA) Certifications

Beginning January 1, 2017, the certificates for laboratories certified for SDWA parameters using Standard Methods will be updated to reflect the most recent approved version of Standard Methods. The method references for Standard Methods will no longer be reflected by edition, but will now reflect the year of approval by Standard Methods to provide consistency with the Clean Water Act methodology. For example, if your laboratory is currently certified for SDWA residual chlorine using Standard Methods 4500 Cl G (18th Edition), certification will be updated to Standard Methods 4500 Cl G-2011. Updated certificates with the new SDWA Standard Methods reference(s) will be mailed to the affected laboratories starting in January.

Laboratories are required to update their Standard Operating Procedures (SOPs) and associated records to document the necessary changes. Additional quality control practices may need to be incorporated in the SOPs.

There have been several questions regarding this update, so we have addressed some common frequently asked questions below specifically regarding Standard Methods 22nd Edition:

Where is the required QC for each method found?

The required QC for all methods is listed at the beginning of each chapter, e.g. SM 1020B, 2020B, 3020B, 4020B, 5020B etc. Chapters 2, 4 and 5, which include the majority of the methods required for the drinking water laboratories, include a table that lists each method and the required QC.

What are the QC requirements for Calcium Hardness by SM 3500CaB-2011?

This method is located in Chapter 3 which addresses metals analyses. SM 3500CaB is a titration method and does not include the digestion sample preparation that other metals methods require. To alleviate some confusion, you may use the QC requirements specified in SM 2020B for Total Hardness by SM 2340C. Therefore, a laboratory fortified matrix (LFM) and LFM duplicate will not be required for Calcium Hardness by SM 3500CaB-2011.

Are Method Detection Limit (MDL) Studies required for Turbidity?

An MDL study is required for turbidity if you are using SM 2130B-2011. You may use your daily 0.5 NTU standard analysis results to calculate an MDL. EPA Method 180.1 is also approved under the SDWA for turbidity and does not require an MDL study. Laboratories have the option to request their certification to be changed to reflect EPA Method 180.1 instead of SM 2130B-2011.

Are Method Detection Limit (MDL) Studies required for Residual Chlorine?

If you are using a meter with an internally stored manufacturer's calibration, e.g. Pocket Colorimeter, and you are not reporting below your reporting limit, you may analyze a reporting limit check standard each day of sample analysis in lieu of performing an MDL study.

How do you perform an MDL study?

Refer to SM 1020B Section 4 for the procedures on how to perform an MDL study. At least seven replicates over 3 days are analyzed and we recommend spiking the MDL samples at your reporting limit. MDLs are analyzed at least annually, when significant instrument maintenance has taken place, or when the instrument response changes.

If you have a question about whether MDL studies are required for a specific method, please contact our office at labcerthelp@dhec.sc.gov.

How do you perform a Laboratory Fortified Blank (LFB) and Laboratory Fortified Matrix (LFM)?

The Laboratory Fortified Blank (LFB) and the Laboratory Fortified Matrix samples are additional quality control samples required for several methods from the 22nd Edition of Standard Methods. An LFB is a reagent water sample to which a known concentration of the analyte(s) of interest has been added. The LFB is used to evaluate laboratory performance and analyte recovery in a blank matrix. The LFM is an actual sample to which a known concentration of the analyte(s) of interest has been added. The LFM is used to evaluate the analyte recovery in a real sample matrix. Both the LFB and LFM are processed through all sample preparation and analysis steps. Unless there are method specific requirements, typically an LFB and an LFM are prepared and analyzed with each sample batch. The concentration levels for the LFB and LFM are usually set near or equal to the midpoint of the calibration curve, but can be adjusted accordingly based on sample background levels. The percent recovery for the LFB is evaluated against method specific limits which are typically 90-110 % ($\pm 15\%$ for second source). The LFM percent recovery is evaluated using method specific limits or statistically established control limits. To calculate the percent recoveries of the LFB and LFM, use the following formulas:

For LFB:

$$\frac{\text{found value}}{\text{true value}} \times 100 = \% \text{ recovery}$$

For LFM:

$$\frac{(C_s \times f) - C}{S} \times 100 = \% \text{ recovery}$$

where:

C_s = LFM concentration determined experimentally,

f = spike dilution correction,

For example, if a matrix spike sample is prepared by adding 5 mL of spike solution to a 100-mL volumetric flask and diluting up to the 100-mL mark with sample, the spike dilution correction would be equal to 0.95 because the sample was diluted by 5%.

C = concentration of unspiked sample, and

S = concentration of spike.

Note: f should be greater than 0.95. More than 5% dilution due to spiking changes the matrix significantly. Ideally, keep f to above 0.99 (equivalent to 1% dilution of sample due to spike addition), in which case f can be ignored and the equation simplified to eliminate f .

For further questions regarding updating to the most recent approved version of Standard Methods, please email labcerthelp@dhec.sc.gov.