Ohio EPA Drinking Water Laboratory Certification Updates

Lake Erie Water Plant Group Annual Workshop

May 8, 2025

Ohio Environmental Protection Agency

OVERVIEW

- 2025 Rule Package
- Lab Replacement/Remodeling Requirements
- Invoicing and Fee Payments
- PFAS Certification
- 2025 Chem and Micro Manual Updates
- Survey Tips
- HABs/qPCR Certification

2025 RULE PACKAGE

- Rule Package Status:

  -Original File public comment period ends May 9, 2025, with a public hearing.

  -Will then be heard at JCARR and final filed 65 days later if no issues.

  - I will email main laboratory contacts once promulgated.

- Main Changes:

  - Updating references and language

  - Updating reporting limit for Microcystin

  - Adding reporting limits for regulated PFAS compounds

- -Ensure you are signed up for Ohio EPA's electronic mailing list

  -https://public.govdelivery.com/accounts/OHEPA/subscriber/new

LAB REPLACEMENT/REMODELING REQUIREMENTS

- New labs, remodeled labs, and temporary labs
- See Chapter 2 of the Micro and Chem manuals.
- Contact Lab Certification prior to construction
- Plan approval **and** Construction approval
- Methods needed?

    -Check plan approval or other information provided by DDAGW.

INVOICING AND FEE PAYMENTS

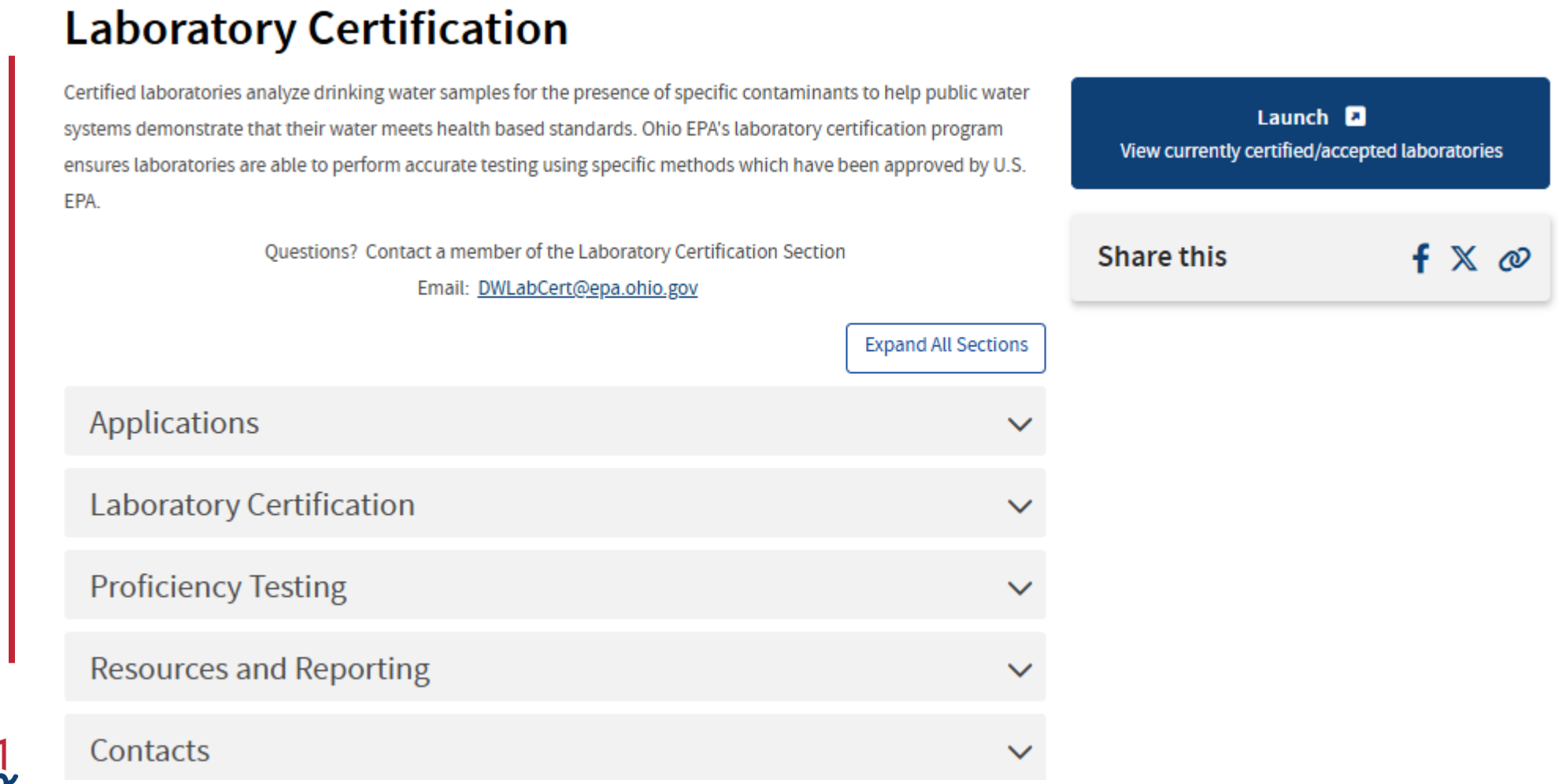
- Ensure payments are made by the deadline given in the invoice
- Reminder emails sent if late
- Electronic payments are preferred

PFAS CERTIFICATION

- Certifying laboratories for EPA Methods 533 and/or 537.1, rev 2.0.
- The six regulated compounds are PFOA, PFOS, GenX, PFBS, PFHxS, PFNA.
- Reporting limit for each of the six regulated compounds is 2.0 ppt
- Certification issued to two laboratories.
- Acceptance issued 16 laboratories.
- Proficiency Testing Requirements

LABORATORY CERTIFICATION WEBSITE

https://epa.ohio.gov/divisions-and-offices/drinking-and-ground-waters/public-water-systems/laboratory-certification



2025 CHEMISTRY MANUAL EDITS

Monthly Fluoride QC Sample Record

Laboratory _____

Analyst	Date	Results (mg/L)	Certified Value Range per PT Provider (mg/L)	Results Within Range (Y/N)	QC Sample Provider Name	Sample Lot #

2025 CHEMISTRY MANUAL EDITS

Monthly Alkalinity Titrant Standardization Record

Laboratory _____

Standard Concentration _____

Analyst	Date	Reagent Water Volume (mL)	Blank Verification Result * (mL/drops)	Standard Volume (mL)	Titration #1	Titration #2	Titrant Lot Number/Date Prepared	Corrective Action Taken If Out of Range

*Blank verification must be <0.2 mL or 4 drops.

2025 CHEMISTRY MANUAL EDITS

Analytical Methods Removed:

- Chlorine Analysis by DPD/FAS Titration
- Chlorine Dioxide Analysis by DPD/ Spectrophotometric
- Chlorine Dioxide Analysis by DPD/FAS Titration
- Copper Analysis by Bathocuproine/ Spectrophotometric
- Nitrate Analysis by Cadmium Reduction/ Spectrophotometric
- Nitrite Analysis by Spectrophotometric

Analytical Methods Added:

- Fluoride Analysis by SPADNS 2 (Arsenic-Free) Method 10225
- Nitrate Analysis by Hach TNTplus 835/836 Method 10206
- Orthophosphate Analysis by Hach Method 8048 (EPA 365.1)

APPROVED DRINKING WATER ANALYTICAL METHODS

https://www.epa.gov/dwanalyticalmethods/approved-drinking-water-analytical-methods

- Disinfection Byproduct Rules (pdf) (558.6 KB, January 2024, 815-B-24-001)
- Expedited Approval of Alternative Test Procedures (Appendix A to Subpart C of Part 141)
- Ground Water Rule (pdf) (314.95 KB, January 2024, 815-B-24-007)
- Inorganic contaminants and other inorganic constituents (pdf) (1005.35 KB, January 2024, 815-B-24-002)
- Long Term 2 Enhanced Surface Water Treatment Rule (PDF) (205 KB, February 2017, 821-F-17-001)
- Organic contaminants (pdf) (689.59 KB, January 2024, 815-B-24-003)
- Radionuclides (pdf) (544.3 KB, January 2024, 815-B-24-004)
- Revised Total Coliform Rule (pdf) (372.95 KB, January 2024, 815-B-24-008)
- Secondary contaminants (pdf) (600.82 KB, January 2024, 815-B-24-005)
- Surface Water Treatment Rule (pdf) (524.08 KB, January 2024, 815-B-24-006)
- Unregulated contaminants (EPA developed methods)
  - Technical Advisory for Perfluorooctanoic Acid (PFOA) using EPA Method 537 Rev. 1.1 (PDF) (114 KB, September 2016, 815-B-16-021)

2025 CHEMISTRY MANUAL ADDITIONS

- Fluoride by SPADNS 2 (Arsenic-Free) Method 10225
- Nitrate by Hach TNT plus 835/836 Method 10206
- Orthophosphate by Hach Method 8048 (EPA 365.1)

Fluoride Analysis by SPADNS 2 (Arsenic-Free) Method 10225

Quick Reference	**Standard/Reagent/Equipment**	**Requirements**
Standard/Reagent Storage	SPADNS 2 Reagent	Manufacturer's Recommendations
	0.5/1.0/1.5 mg/L Standards	Manufacturer's Recommendations
	100 mg/L Stock Standard	Manufacturer's Recommendations
Standard/Reagent Expiration	**Standard/Reagent**	**Expiration**
	SPADNS 2 Reagent	1 Year After Opening/ Manufacturer's Expiration Date
	0.5/1.0/1.5 mg/L Standards	1 Year After Opening/ Manufacturer's Expiration Date
	100 mg/L Stock Standard	1 Year After Opening/ Manufacturer's Expiration Date
Required Quality Control	**QC Procedure**	**Frequency**
	Meter Calibration Verification	Once Every Three Months
	Blank, QCS	Once Per Batch
	QC Sample Analysis	Once Per Month
Sample Collection	**Preservation**	**Maximum Hold Time**
	None	48 Hours [See OAC rule 3745-83-01(F)(4)(b)] **or** 1 Month [See OAC rule 3745-81-23(J)]

INITIAL DEMONSTRATION OF CAPABILITY (IDC)

- Used to determine the analyst's ability to perform the method with acceptable precision and recovery
- Method specific
- Often is a variation of a blank and 4 LFBs within a recovery of ±10%
- Ensure all lab SOPs are updated to reflect this requirement

METHOD DETECTION LIMITS (MDLS)

EPA 821-R-16-006 – Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, December 2016

- Applies to all drinking water MDLs **with few exceptions.**
- Ensure all lab standard operating procedures are updated to reflect this revision.

Annual MDLs should be submitted to dwlabcert@epa.ohio.gov for review.

METHOD DETECTION LIMITS (MDLS)

MDL Procedure: epa.gov/sites/default/files/2016-12/documents/mdl-procedure_rev2_12-13-2016.pdf

MDL Frequently Asked Questions: epa.gov/cwa-methods/method-detection-limit-frequent-questions

Expanded Student t Value Table: itl.nist.gov/div898/handbook/eda/section3/eda3672.htm

INITIAL DEMONSTRATION OF CAPABILITY FOR ADDED METHODS

Initial Method Detection Limit (MDL) study

Initial Precision and Recovery (IPR) study

Method Detection Limit (MDL) Study

*To be performed in a single run

Laboratory:		**Analyst:**		
Instrument:				
			(number)	(unit)
Date:		**True Value:**		

Replicate	Value (mg/L)
1	
2	
3	
4	
5	
6	
7	
Average	#DIV/0!
Std Deviation	#DIV/0!
MDL Result	#DIV/0!
MDL Acceptable	**#DIV/0!**

Initial Precision and Recovery Study

*To be performed in a single run

Laboratory:		**Analyst:**		
Insrument:				
			(number)	(unit)
Date:		**True Value:**		

Replicate	Value (mg/L)	% Recovery
1		#DIV/0!
2		#DIV/0!
3		#DIV/0!
4		#DIV/0!
Average	#DIV/0!	#DIV/0!
Std Deviation	#DIV/0!	
%RSD	#DIV/0!	

Accuracy (% Recovery) Passing?	**#DIV/0!**
Precision (%RSD) Passing?	**#DIV/0!**

2025 CHEMISTRY EDITS

Inorganic Analytical Methods

Analysis of inorganic constituents in drinking water must be performed following Ohio EPA accepted analytical methods referenced in OAC rule 3745-81-27(A). Unless otherwise specified below, quality control (QC) acceptance limits listed in the individual method must be followed. In addition to individual method's QC requirements, **at a minimum**, the following program specific inorganic analysis QC must be met. Refer to Chapter 2, Section B of this manual for Quality Assurance Plan requirements.

- Laboratory analyte reporting limits must meet reporting limit concentrations referenced in the appendix to OAC rule 3745-89-03.
- An Initial Demonstration of Capability (IDC) study must be completed and documented for each analyst certified for drinking water method analysis. If not specified in the method, use a blank and four LRBs for the IDC study.
- For methods not included in this manual, certified analysts must generate a curve at least once annually for all analytical methods which they are certified.
- Curve generation is limited to 1st or 2nd order. Calibration curves must result in a Correlation Coefficient (R) greater than 0.995 or a Coefficient of Determination (R^2) greater than 0.990 to be acceptable for drinking water analysis. It is recommended that curves not be forced through zero. (Calibration curves must be at least 3 standards and a blank, unless otherwise specified in the method.)
- Any concentrations above the highest standard in the calibration curve must be diluted to fall within the calibration range.
- At least once every three months, a drinking water sample must be analyzed using the inorganic analytical methods for which each analyst is certified.
- An annual Method Detection Limit (MDL) study must be performed using the most recent version of U.S. EPA's "Definition and Procedure for the Determination of the Method Detection Limit" in accordance with the 40 Code of Federal Regulations (C.F.R.).

Initial Demonstration of Capability study must be documented for each analyst certified for drinking water methods (for methods not included in the manual).

Method Detection Limit study must be calculated annually for each lab.

2025 MICRO MANUAL EDITS

a. Reagent Grade Water: Only satisfactory reagent water from deionization units may be used to prepare media, reagents and dilution/rinse water for performing microbial analyses.

- If a resistivity indicator light is used, sensitivity of the light must be set at > 0.5 megohms resistance or < 2 micromhos/cm.
- Prior to use, the quality of the reagent water should be tested and meet the criteria as listed in Table 1.

Table 1: Required Reagent Grade Water Criteria

Parameter	Limits	Frequency[1]
Conductivity	> 0.5 megohms resistance or < 2 micromhos/cm (microsiemens/cm) at 25°C	Monthly[2,3]
Total Chlorine Residual[2]	< 0.1 mg/L	Monthly[2,3]
Pb, Cd, Cr, Cu, Ni, Zn	Per Contaminant < 0.05 mg/L Collectively < 0.1 mg/L	Annually[4]

[1] If the laboratory purchases bottled reagent grade water, Table 1 does not apply.
[2] If the meter has a resistivity indicator light (i.e., green/red light), record color of light on the Microbiological Laboratory Reagent Grade Water Record. The water should only be used if the light is green at the time of use. No conductivity or chlorine residuals are necessary.
[3] If no resistivity light, must analyze with each new batch of reagent water.
[4] Must be analyzed by an Ohio EPA drinking water certified or accepted laboratory.

Microbiological Laboratory Reagent Grade Water Record

See Table 1 for criteria.

Laboratory _____

Date of Annual Trace Metals Analysis _____

Analyst	Date	Resistivity Indicator Light (Green or Red)	Conductivity (microsiemens/cm)	Total Chlorine Residual (mg/L)	Comments/Corrective Actions Taken

2025 MICRO MANUAL EDITS

MMO-MUG Reagent Quality Control Record

To be recorded for each new lot or annually. If performed by a different laboratory, results must be retained.

Laboratory _____

Analyst	Reagent Type	Brand/Lot Number	Incubation Start Date/Time	Incubation End Date/Time	Test Results					
					E. coli		*Klebsiella/Variicola*		*Pseudomonas*	
					Color Change	UV	Color Change	UV	Color Change	UV

Sample Bottle Sterility/Fluorescence Record

To be recorded for each lot received or batch sterilized

Laboratory _____

Analyst	Date Received/ Sterilized	Brand/Lot Number	Number of Bottles Received/ Sterilized	Growth Incubation Start Date/Time	Growth Incubation End Date/Time	Growth Results Interpretation		UV Results		Comments
						Number Positive	Number Negative	Number Positive	Number Negative	

Media Quality Control Record

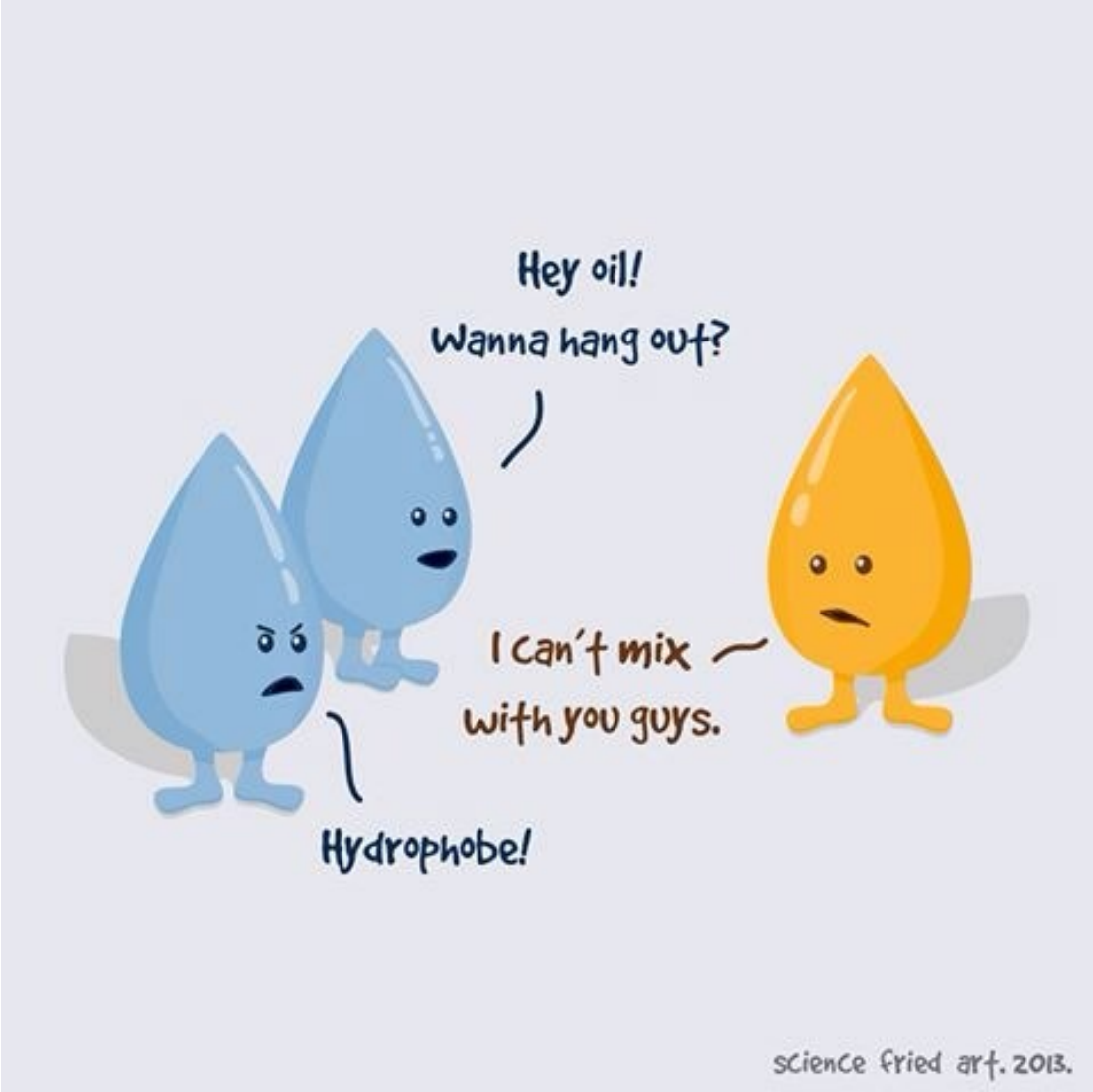
To be checked and recorded for each new prepared batch and annually

Laboratory _____

Analyst	Media	Brand/Lot Number	pH	Growth Incubation Start Date/Time	Growth Incubation End Date/Time	Growth Results Interpretation		Comments
						Positive	Negative	

SURVEY TIPS - GENERAL

- Update bench sheets to most recent version available.
- Ensure all laboratory records are recorded **<u>using ink</u>** and are printed legibly.
- Scribbling/ writing over is unacceptable.
- Errors? Cross out with 1 line, initial, add correct information. **No White Out!!**
- **Include results to the 10th** (e.g., 121 is 121.0)
- Avoid eating or drinking in the lab.
- **<u>Annual review of manual(s) - REQUIRED</u>**



ANNUAL REQUIREMENT

Annual Laboratory Manual Review Record

Laboratory _____ Methods Reviewed _____

Analyst No.	Analyst Signature	Date of Review	Analyst No.	Analyst Signature	Date of Review

SURVEY TIPS - GENERAL

- Data request prior to survey
  - Recommend scanning bench sheets at the end of every month
- Remote surveys for Interim Authorization, HAB and qPCR surveys
- If violations are issued that require a response, labs are generally given 30 days to respond

SURVEY TIPS - GENERAL

- Switching to electronic records
  - Contact Lab Certification **prior** to the switch.
  - Ensure all required data is included.
  - Choose an appropriate format:
    - Tracks edits with name, date and details of changes made.
    - Ensure data is not recorded in multiple places (duplication of records).
    - Recoverable format or print at end of each month.

SURVEY TIPS - CHEMISTRY

- Turbidity
  - 1.0 NTU Verification
  - Low Turbidity Water
- Fluoride
  - 1.0 mg/L verification
- pH and Fluoride
  - May use manufacturer’s recommended slope for meters

SURVEY TIPS - MICRO

- Incubator temperatures must be recorded daily, a.m. and p.m., at least four hours apart – including weekends*
- Autoclave timer must be checked only at times used (e.g., 15, 30, 45); use proper procedure
- Balance verification must be done prior to use
- Sampling instructions for micro samples requires analyzing for chlorine residual after disinfection of sample tap

MMO-MUG Analysis for Total Coliform and E. coli by Colilert and Colisure

Quick Reference	**Standard/Reagent/Equipment**	**Requirements**
Standard/Reagent/ Equipment Storage	MMO-MUG Reagent	Dark Environment and Manufacturer's Recommendations
	Chemical Reagents	Manufacturer's Recommendations
	Dehydrated Media	Manufacturer's Recommendations
	Media Performance Check Cultures	Manufacturer's Storage Requirements
	Prepared Media	Refrigerated/Room Temperature
	pH Electrodes	Manufacturer's Recommendations
	pH Buffers	Room Temperature
Standard/ Reagent Expiration	**Standard/Reagent**	**Maximum Storage Time**
	MMO-MUG Reagent	Manufacturer's Expiration Date
	Chemical Reagents	Manufacturer's Expiration Date
	Dehydrated Media	6 Months After Opening **or** 1 Year After Opening if Stored in Desiccator
	10% Sodium Thiosulfate	1 Year After Opening/Manufacturer's Expiration Date
	Media Performance Check Cultures	Manufacturer's Expiration Date
	Prepared Media	3 Months Refrigerated (screw-capped containers) **or** 1 Week Room Temperature (sealed/covered)
	Purchased, Pre-Made TSB	Unopened: Manufacturer's Expiration Date Opened: Follow Prepared Media Requirements
	pH Buffers	6 Months After Opening/Manufacturer's Expiration Date
Required Quality Control	**QC Procedure**	**Frequency**
	Sample/Test Bottle Sterility Check	One Per Batch Prepared **or** 1% Per Lot Received *(maximum of 4 per lot)*
	Sample/Test Bottle Fluorescence Check	Every Sample/Test Bottle Prepared **or** 1% Per Lot Received *(maximum of 4 per lot)*
	Media Performance Check	One Positive Control and One Negative Control Per Batch
	MMO-MUG Reagent Check	Once Per Lot and Annually
	Glass/Digital Thermometer/Data Logger Calibration	Annually
	Autoclave Sterility Check	Once Every Three Months
	Equipment Timers	Once Every Three Months
	pH Meter Calibration	Prior to Use
	pH Linearity/Slope/pH 4 Buffer	Prior to Use
	Balance Calibration Check	Prior to Use
	Refrigerator Temperature	Daily
	Incubator Temperature	Twice Daily, a.m./p.m., at least 4 hours apart
Sample Collection	**Preservation**	**Maximum Holding Time**
	10% Sodium Thiosulfate	30 Hours

SURVEY TIPS - MICRO

Media Preparation(e.g., TSB, BHI)

- Multiple bottles of dry media
  - Label these, such as -A, -B, etc., or -1, -2, etc., on Reagent Log.
- Balance Calibration Record
- pH Meter Slope/Linearity Verification
- Media Quality Control Record
- Autoclave Sterilization Record
  - TSB or BHI at temperature 12-15 min
  - Autoclave door must be opened no later than 45 min after closing

SURVEY TIPS - MICRO

Pre-Made Purchased TSB

- Use manufacturer's expiration date prior to opening.
- Maintain certificate of analysis for each lot purchased.
- Record lot number used for sample bottle and Quanti-Tray sterility checks.

Microbiological Test Data Sheets

- All data from our bench sheets must be recorded to avoid invalidation of sample results.

SURVEY TIPS - MICRO

Autoclave Sterility Check

- Required once every three months, per autoclave
- May use biological indicator ampules following manufacturer's instructions
- May use TSB or BHI, inoculated with a known coliform culture
- Ensure recorded on Autoclave Sterilization Record

Thermometer Calibration Record

- Must first include the NIST thermometer's temperature at ice point
- Recommend including each thermometers serial number
- MRTs are not calibrated with NIST
- Autoclave Dial (Display) Thermometers are not required to be calibrated unless fast exhaust is used.

SURVEY TIPS - MICRO

Maximum Registering Thermometers (MRTs)

- Calibrated by Lab Certification staff at the renewal survey
- Ohio Revised Code 3734.63, Sale of mercury-containing thermometer for promotional purposes.
    - If required to comply with federal law, these can be sold and distributed.
- MRTs must be graduated in increments of 0.1°C.
- Dial autoclave thermometers are not permitted by Ohio EPA Laboratory Certification.

CYANOTOXIN & CYANOBACTERIA CERTIFICATION

- Annual HAB MDLs and biannual qPCR curves as well as associated test data are to be sent to the dwlabcert@epa.ohio.gov email.
- Adding new analysts between renewal periods:

  -HABs (MDL study, associated test data and calibration curve)

  -qPCR (application, calibration curve, associated data and sample results), survey
- SOPs for microcystin and qPCR are available on our Lab Certification website.
- Review MDLs and curves prior to submitting; don’t send if clearly failed.

Thank You

Krystie Perry
614.644.4067
614.867.6612 (cell)
Krystie.Perry@epa.ohio.gov
Krystie.Perry@epa.ohio.gov

Hilary Speelman
614.644.4259
740.899.6088 (cell)
Hilary.Speelman@epa.ohio.gov

Daniel Langton
614.728.5323
614.981.5213 (cell)
Daniel.Langton@epa.ohio.gov

Julie Spangler
614.644.4222
614.935.5147 (cell)
Julie.Spangler@epa.ohio.gov

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