

Maine Department of Marine Resources Bureau of Public Health

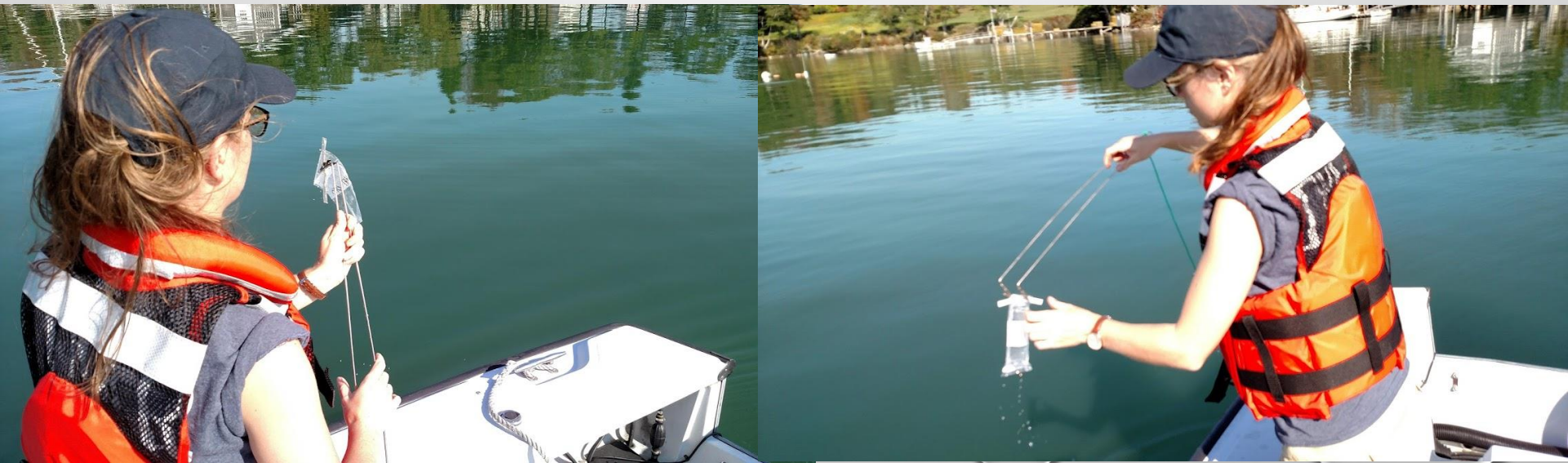


Water Quality Volunteer Program
Quality Assurance Training

Certification Overview

- The items listed to the right are the yearly requirements to water sample for the DMR.

1. **Online** Water Quality Volunteer Application, Documents and Liability Waiver
2. Review the Quality Assurance Training Power Point (this document)
3. Volunteer Standard Operating Procedure (SOP) Site Certification
(to be completed with DMR staff member)



Commercial License Holders

Title 12: CONSERVATION
Part 9: MARINE RESOURCES
Subpart 2: LICENSING
Chapter 623: SHELLFISH, SCALLOPS, WORMS AND MISCELLANEOUS
LICENSES
Subchapter 1: SHELLFISH
Article 6: WATER QUALITY

§6691. Water quality samplers

A commercial shellfish license holder who complies with the shellfish sanitation program's quality assurance and quality control training and certification requirements as administered by the department may serve as a volunteer water quality sampler for the department.

- **Any shellfish license holder who has past water quality volunteer experience (> 1 year) with the DMR WQ Program could immediately begin fulfilling certification requirements;**
- **Any shellfish license holder new to the program will be required to sample in tandem with a non-license holder volunteer for one year before solo trips;**
- **All volunteers will be required to sign an agreement between the DMR that outlines data collection accuracy requirements, training, expectations and professional conduct pertaining to collection of water quality samples as a DMR water quality volunteer.**

Recent Changes

- The Volunteer Application, Liability Waiver, and associated documents are now submitted online.
- No Test Required
 - Replaced by this Power Point
- No In-house Training
 - Covered during Site Certification
- New Data Sheet
 - Wind data no longer collected
- Boat GPS Coordinate Form
 - No longer required if using a pre programmed GPS



Introduction to Quality Assurance

- States in the US that harvest and ship, or receive, shellfish across state lines are required to meet the guidelines described in the current National Shellfish Sanitation Program's (NSSP), *Guide for the Control of Molluscan Shellfish*.

National Shellfish Sanitation Program (NSSP)

Guide for the Control of Molluscan Shellfish 2019 Revision



Click [here](#) for the full NSSP Guide



Dedicated to assuring shellfish are a safe food.



**U.S. FOOD & DRUG
ADMINISTRATION**

This training guide covers sample collection and transportation.

After reading this guide, you will be able to:

- Find all necessary sampling documents
- Record raw data and field observations as described in the QA Manual
- Learn with a trainer how to collect, transport, and store samples for water quality analysis as stipulated in the NSSP guide.



Quality Assurance Training Elements

1. **Water Quality: SOP 2, WQ Lab Form 1**
 - Purpose, Responsibilities, Equipment and Supplies, and Sampling procedure
 2. **Water Quality – Seawater Samples: Microbiology Checklist Part II Section 2.1**
 - Collection and transportation of samples
 3. **Temperature Monitoring: QA Manual Appendix D Section 16**
 - Requirements for thermometers and temperature monitoring.
 4. **Chain of Custody: QA Manual Section 3.3**
 - Requirements for documenting personnel, transportation and storage of samples
 5. **Documentation: QA Manual Section 4**
 - Requirements for recording data on datasheet.
 6. **Sampling Sites: Run Maps/Directions**
 - Requirements for run maps and directions
- Following each training element is a knowledge check that consists of questions reviewing the training element.
 - After reviewing this document return to the online volunteer application and acknowledge that you reviewed each section by checking YES in the box.

SOP 2.0 Continued

2.5.3.1 Collect sample 'upstream' to prevent sampling water with suspended sediments.

2.5.4 Remove perforated flap from top of Whirl-pak bag while taking care to not touch the top of the bag to prevent contamination.

2.5.5 With the bag closed, submerge the bag 8 to 10" below the surface then open the bag with the tongs. Draw the bag through the water upstream to fill to just above the line on the bag.

2.5.5.1 Leave enough head space in the bag to allow for thorough homogenization by the lab staff prior to analysis.

2.5.6 Twirl the bag closed by holding the wire ends and spinning. Secure by crossing the wire tabs into an "X."

2.5.6.1 If there are any leaks, resample with a new, unopened bag.

2.5.7 Label the bag with the area letter, station number, time of collection (military), date, and initials.

2.5.8 Place filled bags in a rack to hold them upright in the cooler.

2.5.9 Ensure cooler maintains a temperature between **0 and 10° C**.

2.5.9.1 If samples are transferred to another individual, the Chain of Custody section of the data sheet is initialed by the person relinquishing custody as well as the person receiving custody, with date, time, temperature, and number of samples verified upon exchange.

2.5.9.2 If a temperature-controlled satellite location is used for temporary storage, the location is noted and upon retrieval of the sample the temperature of the refrigerator at that location is recorded with the date, time, number of samples, and the initials of the person receiving custody. This is recorded in the Chain of Custody section of the data sheet (*ME BPH WQ Lab Form 1, 2*).

2.5.10 Once back at the lab, place samples in the refrigerator and record total number of samples, temperature of the cooler at time of delivery to the lab, designated run number, time, and initials in the Samples Received log. Complete Chain of Custody on the data sheets.

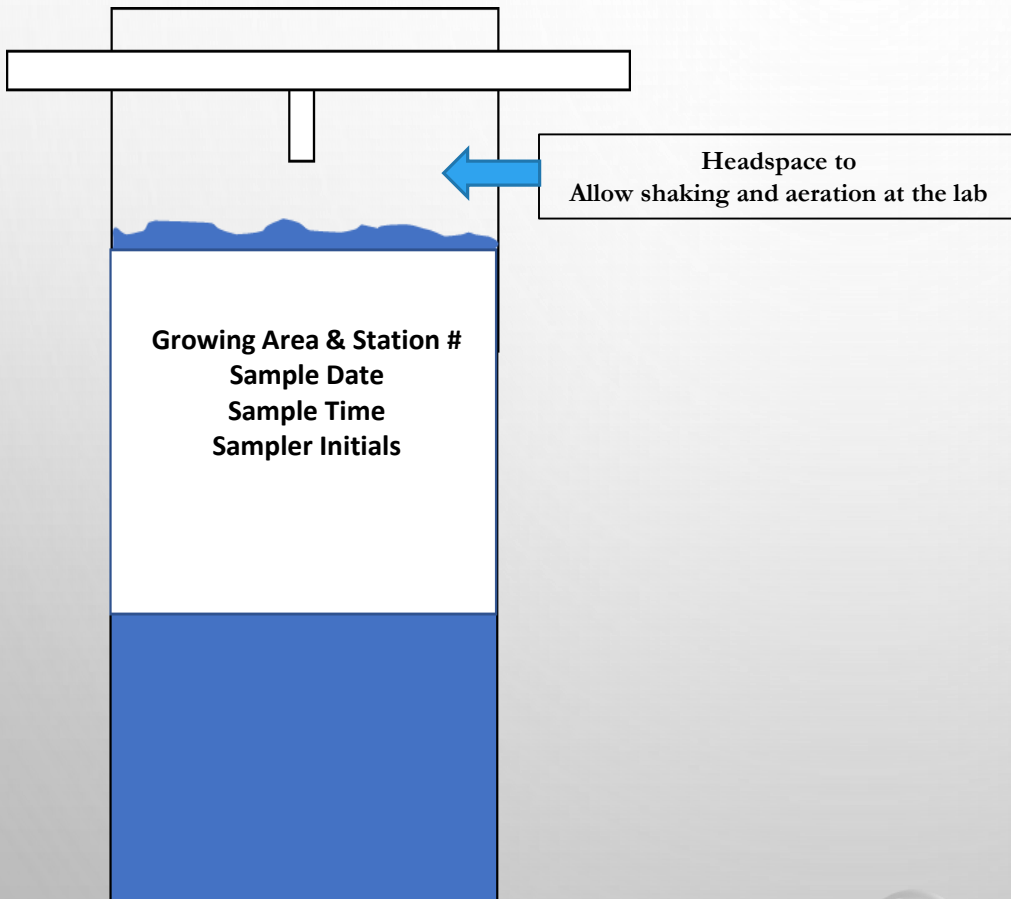
2.6 References

- ME BPH Lab QA Manual*
- ME BPH WQ Lab Forms 1, 2, and 3*
- NSSP Checklists

2.7 Change History

SOP No. and Version	Effective Date	Significant Changes	Previous SOP No.
SOP2V1	12/12/2018	Integrated into QA system	Archive

Sample Bags



Training Element #1

Knowledge Check

1. Who is responsible for ensuring proper sample location and the recording of accurate data?
2. Within how many feet of the plotted station location must a sample be collected?
3. What is the minimum water depth required to take a sample?
4. What is the minimum sample depth?
5. Is it required to use a DMR cooler for sample transportation?
6. What writing utensils are required for sampling?
7. What should you do if your sample bag is leaking?
8. If samples are being dropped off at a temperature-controlled satellite location, what information must be on the Chain of Custody form?
9. Why is it important **not** to touch the top or mouth of the bag when removing the perforated flap?
10. What is an adversity and why is it important to record adversities on the data sheet?

***Answers in the appendix**

Training Element #2: Water Quality – Water

Microbiology Checklist Section 2.1

Items which do not conform are noted by:		Conformity is noted by a “√”	
C- Critical K - Key O - Other NA- Not Applicable			
PART II - SEAWATER SAMPLES			
Code	Ref.	2.1 Collection and Transportation of Samples	
C	11	<input type="checkbox"/>	2.1.1 Sample containers are of a suitable size to contain at least 110 mL of sample and to allow adequate headspace for proper shaking. Seawater samples are collected in clean, sterile, watertight, properly labeled sample containers.
K	1	<input type="checkbox"/>	2.1.2 Samples are identified with collector's name, harvest area, sampling station, time and date of collection.
C	9	<input type="checkbox"/>	2.1.3 Immediately after collection, seawater samples are placed in dry storage (ice chest or equivalent) capable of maintaining a temperature of 0 to 10°C with ice or cold packs for transport to the laboratory. Once received, the samples are placed in the refrigerator unless processed immediately.
O	1	<input type="checkbox"/>	2.1.4 A temperature blank is used to represent the temperature of samples upon receipt at the laboratory. Temperature should be equivalent or less than that of the growing area waters. Results are recorded and maintained.
C	9	<input type="checkbox"/>	2.1.5 Analysis of the sample is initiated as soon as possible after collection. Seawater samples are not tested if they have been held for more than 30 hours from the time of collection.

**Excerpt from the FDA Audit Checklist. When the FDA audits the DMR lab, this is a portion of the review.*

Training Element #2

Knowledge Check

1. What critical pieces of information must be written on the sample bag?
2. What is the acceptable temperature range for coolers?
3. Samples must be processed within how many hours of collection?
4. Why is it important to leave a little air or “headspace” in the bag when collecting a sample?

***Answers in the appendix**

Training Element #3: Temperature Monitoring



- Temperature monitoring is required at all times for samples throughout collection, transportation, and post-processing before analysis.
- All thermometers used in lab activities must have a calibration check date within one year of the use date.
- DMR supplied sampling thermometers and calibrated cooler thermometers are given to volunteers at the beginning of the sampling season.
- Section 16 in Appendix D of the Lab QA Manual describes thermometer use in more detail.

QA Manual Appendix D Section 16

16.0 Thermometers

Appropriately ranged thermometers are used for the target equipment and are calibrated at temperature of use. Calibration Certificates are kept on file and thermometers are tracked by the imprinted serial number. Calibration certificates are retained for three consecutive calibration cycles. Yearly, the accuracy of thermometers is determined by comparison with a National Institute of Standards and Technology (NIST) traceable reference thermometer at the temperature of use and results are recorded and retained (SOP *Thermometer Calibration Verification*).

Alternatively, temperature logging devices are sent to a third party for calibration verification. Dates of calibration verifications are recorded and kept on file and identified by the temperature monitoring device's serial number. All in-use thermometers are properly immersed and labeled with the date of the last calibration verification. The BBH lab does not use correction factors, however Lamoine has 2 standard thermometers that require correction factors. Any correction factors are indicated in the thermometer log with the calibration verification. Since these thermometers are used only by the Microbiologist II, these values are linked through the thermometer serial number and kept in the Lab Equipment File.

Alternatively, thermometers are sent to a third party for calibration verification. Performance is verified through use in the target equipment by comparison to the current working thermometer in that equipment. If the newly introduced thermometer does not match the temperature of the official working thermometer, the new thermometer is not placed in use.

Data loggers are used for the BBH Water Quality laboratory and are set to save and email temperature recordings from the refrigerators, incubator, and water baths twice a day (see Sections 11, 14 and 17 of this appendix). Data logger probes/sensors are uniquely labeled with the serial number and placement within unit follows manufacturer's instructions to ensure accurate readings.

In case of changes to State-wide wireless security, temperatures are captured with the logging software and a screen shot of the temperature table for all monitored equipment is emailed staff. Biotoxin refrigerator temperatures are checked and recorded once daily. Coolers are equipped with thermometers for transportation temperature monitoring. If a thermometer is broken or found out of tolerance (see SOP *Thermometer Calibration Verification*), the unit is marked as out of service and is replaced.

Thermometers are immersed to the immersion line or to a level that allows reading of the target range without parallax.

Temperatures from data loggers are taken twice daily and emailed to staff, with 6 readings per day recorded and archived in electronic files.

Training Element #3

Knowledge Check

1. Who supplies the thermometer for cooler temperature monitoring?
2. How often must cooler thermometer calibrations be checked?

***Answers in the appendix**

QA Manual; Section 3.3

3.3 Traceability and Chain of Custody

Each sample is uniquely identified through date, location identification, and for shellfish samples, species. This combination follows the sample from the field to result and entry into the database. Each data sheet (see *ME BPH BTX Lab Forms 1, 2, and 3*; *ME BPH WQ Lab Forms 1, 2, and 4*) has designated locations for noting the chain of custody as the batch of samples travel from collection to analysis. Each person transporting samples notes her/his initials, date, time, temperature of holding vessel, number of samples and location for when custody of the samples is received and when it is relinquished.

For shellfish samples targeted for biotoxin analysis, an electronic data collection application (iForm) is utilized to capture field collection data. Samples prepared for PSP, ASP, or DSP analysis are labeled with a unique identifier consisting of the date, location ID, and first 3 letters of the shellfish species name. This string is further differentiated by an A or D prefix to differentiate ASP or DSP from PSP samples.

In Boothbay, the electronic chain of custody form used for collection trips includes an element that captures the signatures of the collectors. These images are embedded into a spreadsheet including the unique sample identifier, date, time, temperature of holding vessel, number of samples and location for when custody of the samples was received and when it was relinquished. For further transportation of extracted or processed samples, this sheet is printed and the date and time of extraction and extractor's initials (if applicable) are noted. The list of samples and the corresponding chain of custody information and a location for writing information for the final disposition of samples are included.

The information for the final relinquishment of samples with hand-written collection data sheets follows the samples to the final location and serves as records of the transportation of samples. Since the iForm data collection app is still in its piloting phase and not used in Lamoine nor is it used for Water Quality sampling as of this date, information regarding sample delivery to the lab is transcribed from the data sheets onto *ME BPH BTX Lab Form 3* or *ME BPH WQ Lab Form 5*, "Samples Received Log."

Training Element #4

Knowledge Check

1. What pieces of information does the chain of custody form document?
2. What are the acceptable ways to correct errors on the datasheet?
3. What 2 pieces of information uniquely identify water quality samples?
4. Does the “# Samples” column indicate the total number of samples collected or the number of samples recorded on the data sheet?

***Answers in the appendix**

Training Element #5: Documentation

4.0 Documentation

Proficiency tests are completed and documented as noted in Section 3.1.

Data sheets contain spaces for sample collection location id, date, time, collector's initials, and for ocean water samples, temperature of the water at time of collection. Each sheet also has designated areas to identify the technician performing processing and/or analysis, and spaces to indicate the filter lot number and autoclave batch information for media (if applicable) and PBS. The analyst writes her/his initials, the date, time initiated, time read, and the PBS and media autoclave load numbers and/or preparation date (mEndo), and the filter lot number. Samples recorded on separate data sheets that are processed by one analyst are linked to the processing material identification through the analyst's initials and the date. Autoclave load numbers of media and other autoclaved reagents are tracked through the preparation lab forms which include productivity and sterility data for the autoclave load number (see Appendix H and *ME BPH WQ Lab Forms 7 to 20*) and are traceable by the lot number on the preparation forms to the yearly lot tests performed (*ME BPH WQ Lot Tests*). For disposables such as pipette tips, one lot is used exclusively or sterilized for use thus restricting use of untested items. The tests for sterility of disposables sterilized in batches in our lab are recorded in the lot test spreadsheet.

Observations/raw data are written in ink on all lab forms. Corrections to lab forms are performed by drawing a single line through the incorrect information, and the new information is written clearly next to the mistake, or a footnote is made linking the crossed-out information with the new. The person correcting the information writes her/his initials and the month, day, and year the correction is made. If the reason for the correction is unclear an explanation is written.

Given the multiple locations of operation for ME BPH monitoring work, the corrections on raw data sheets are not always performed by the person that created the error. Raw data observations and chain of custody errors are confirmed through comparison to concurrent forms or contact with the appropriate sampler/transporter and noted by the data sheet reviewer.

Electronic data collection is currently used for biotoxin phytoplankton and shellfish samples in the Boothbay Harbor laboratory. Record creation and modification date, time, and location are captured for any entries or corrections made in the electronic database. Sections are included for text comments for specific sample information. Data automatically is retrieved from the database on Friday mornings and saved on the network drive. In addition, records of signatures are backed up weekly as described in Section 3.3.

Electronic records in the Department of Marine Resources database are automatically tagged with user ID and date of change as indicated in Section 3.5. Excel files are annotated with the initials of the user and the date, and the reason for the notation. The old information is replaced; however it is kept in the annotation for small corrections. New files are created when there are more pervasive errors, and the archived file is renamed by adding a numerical identifier to the filename for the first archived file and subsequent files numbered in sequence if more than one archive is required.

Records are retained and archived in accordance with Department of the Secretary of State, Maine State Archives (29/255) Chapter 1: State Agency Records Programs per Maine State Revised Statutes, Title 5, Chapter 6.



Training Element #5

Knowledge Check

1. What columns on the data sheet are to be filled out by the sampler during sample collections?
2. What utensil is used for filling out data sheets?
3. Can DMR contact the sampler with questions about the sampling data sheets?

Training Element #6: Sampling Sites

- Run maps and directions are given to the volunteer at the beginning of the sampling season.
- Volunteers will receive updated documents if any changes are made to a run during the sampling season



Congratulations! At this point, you have read the QA Manual, the pertinent SOPs, and know where to find more information about the procedures performed in our program.

You should now finish completing the online volunteer application by clicking the tab at the top of your screen labeled "Water Quality & Biotoxin Volunteer Application, Documents, and Waiver".

Once approved, you will go into the field on your scheduled site certification date with a DMR staff member, and they will guide you in performing the tasks according to protocol.

Visit the DMR [website](https://www.maine.gov/dmr/shellfish-sanitation-management/index.html)* for more information on Shellfish Sanitation and Management, as well as an interactive classification map for shellfish growing areas.



*<https://www.maine.gov/dmr/shellfish-sanitation-management/index.html>

The background of the slide is a light gray gradient. It is decorated with several realistic water droplets of various sizes, scattered primarily in the top-left and bottom-right corners. The droplets have highlights and shadows, giving them a three-dimensional appearance.

APPENDIX: Knowledge Check Answers

Training Element #1 Answers

1. The staff member or volunteer collecting the sample.
2. 300'
3. 18" minimum water depth
4. 8" minimum sample depth
5. Yes
6. Pen and permanent marker
7. Resample with a new, unopened bag.
8. Initials, date, time, temperature, # samples, relinquished to
9. To prevent contamination
10. An adversity is a negative condition observed in the area of the station at the time of sample. It is important to record any adversity that could potentially negatively influence the water quality score.

Training Element #2 Answers

1. Growing area & Station #, date, time (24 hour time), and sampler initials
2. 0-10° Celsius
3. 30 hours
4. To allow for proper shaking of sample

Training Element #3 Answers

1. DMR
2. Once per year

Training Element #4 Answers

1. Initials, date, time, temperature, # of samples, location or person relinquished to
2. A single line through the error with new information written next to the crossed out information OR new information in a footnote at the bottom of the page.
3. Growing area with station number and date
4. The number of samples recorded on that data sheet

Training Element #5 Answers

1. The white columns OR run #, Collected by, date collected, area letter, station #, military time, boat/land, temp, condition/adversity
2. Pen or ink
3. Yes