



STANDARD OPERATING PROCEDURE

VOLUNTEER RIVER MONITORING PROGRAM (VRMP)

METHODS FOR USING THE IDEXX COLILERT® TEST KIT AND IDEXX QUANTI-TRAY/2000



Note: The mention of brand names does not constitute recommendation of a specific company.

Volunteer River Monitoring Program

Standard Operating Procedure Methods for Using the IDEXX Colilert® Test Kit and the IDEXX Quanti-Tray/2000 (for use with the IDEXX Quanti-Tray Sealer)

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1. Applicability. This standard operating procedure (SOP) is used by the Volunteer River Monitoring Program (VRMP) of the Maine Department of Environmental Protection's Division of Watershed Management. It applies to the collection of total coliform and *Escherichia coli* (*E. coli*) from rivers and stream in Maine using the IDEXX Colilert Test Kit and the IDEXX Quanti-Tray/2000 (for use with the IDEXX Quanti-Tray Sealer).

2. Purpose. The purpose of this SOP is to provide standardized methods for volunteer groups to determine total coliform and *Escherichia coli* of rivers and streams as an instantaneous reading using the IDEXX Colilert Test Kit and the IDEXX Quanti-Tray/2000 (for use with the IDEXX Quanti-Tray Sealer).

3. Definitions

- A. IDEXX.** Manufacturer of technology-based products and services for veterinary, food and water applications including IDEXX Colilert® Test Kit and IDEXX Quanti-Tray/2000.
- B. Fecal Coliform.** A type of bacteria that lives in the intestines of warm blooded animals and is associated with human or animal wastes.
- C. *Escherichia coli* (*E. coli*).** A type of fecal coliform bacteria that is commonly found in the intestines of animals and humans.

4. Responsibilities

A. *Volunteer Monitors & Volunteer Groups*

- **Certification.** It is the responsibility of the individual obtaining this data to maintain current certification for the parameter(s) they collect if they wish their data to be entered into the VRMP database. Training will be provided to volunteers on an

annual basis by VRMP/DEP staff, and certification will last for one year from the date of training.

- **Data Recording.** It is the responsibility of the individual obtaining this data to record the results and additional qualifying information on current VRMP field sheets obtained from their affiliated watershed association or through the VRMP program of the DEP.
- **Data Quality Checks and Data Submission.** The data manager for the volunteer group will collect and enter volunteer field sheet data into the appropriate computer file, perform quality assurance checks (Refer to Section 5.10 of the VRMP's Quality Assurance Project Plan [MDEP, 2009]), and submit data to the VRMP following protocols outlined in the volunteer group's latest sampling and analysis plan (SAP) that has been approved by the VRMP.

B. Volunteer River Monitoring Program (VRMP) Staff

- **Oversight of Volunteer Groups and Volunteers.** VRMP staff will oversee volunteer groups and volunteers through a variety of ways including maintaining an up-to-date VRMP quality assurance program plan (QAPP); reviewing sampling and analysis plans (SAPs) of the volunteer groups; providing annual training/certification sessions for volunteers; conducting quality assurance checks on data submitted by volunteer groups and laboratories; and uploading data into the DEP's EGAD database. These tasks are described in greater detail in the VRMP's latest QAPP.

5. Guidelines and procedures

A. Safety.

- Volunteers shall wear gloves and safety glasses while using the reagents. In addition, volunteers shall wash hands after use.

B. IDEXX Colilert® Test Kit and IDEXX Quanti-Tray/2000 Preparation.

- **First time use, beginning of field season, and prior to field sampling.** Conduct a full inspection of the kit to ensure completeness and valid chemical expiration dates. Follow manufacturer's instructions for setting up the IDEXX Quanti-Tray Sealer (Appendix C, Section, "Setting Up"). If any problems are detected, contact your group's coordinator or the VRMP for recommendations on how to resolve them.

C. Fecal Coliform and E. coli Measurements.

- **Sampling Period and Location.** Sampling period and site location information will be documented in SAPs (that require approval by the VRMP) that are submitted by the volunteer groups prior to the beginning of a sampling season. Detailed

information regarding how volunteer groups are to obtain and document site location information can be found in DEP VRMP SOP-02 [Documenting Site Location].

- **Measurements.**
 - (1) Record site location on data sheet.
 - (2) See DEP VRMP Standard Operating Procedure, “Methods for Collecting Water Grab Samples in Rivers and Streams” (VRMP SOP-01; see footnote ^A below) for proper sampling technique for collecting a water grab sample.
 - (3) Samples shall be stored at <10°C until analysis. The maximum holding time is 6 hours. Samples must be processed within 2 hr of arriving at laboratory. (Refer to Table 3d of the latest VRMP QAPP [MDEP, 2009]).

- **Sample Preparation Procedure. (For complete instructions refer to Appendix B)**
 - (1) Prepare reagent/sample mixture by adding contents of 1 snap pack to a 100 ml water sample in a sterile container (Refer to Appendix A, Section “Quanti-Tray® Enumeration Procedure”).
 - (2) Prepare Quanti-Tray/2000 for reagent/sample mixture (Refer to Appendix B, Section “User Instructions”, Steps #1 – 3).
 - (3) Pour the reagent/sample mixture directly into the Quanti-Tray/2000. Be sure to avoid any contact with the foil tab. Tap the small wells 2-3 times to release any air bubbles. Allow foam to settle.
 - (4) Place the sample-filled Quanti-Tray onto the Quanti-Tray/2000 rubber insert of the Quanti-Tray Sealer with the well side (plastic) of the Quanti-Tray facing down.

- **Quanti-Tray Sealer Procedure and Incubation.**
 - (1) Follow manufacturer’s instructions for first time use (Refer to Appendix C, Section, “Setting Up”).
 - (2) After the Quanti-Tray has been filled with a sample, seal tray according to manufacturer’s instructions (Refer to Appendix C, Section, “Operating Directions”).

- **Incubation and Result Analysis**
 - (1) After Quanti-tray has been sealed, place the sealed tray in a 35°C ± 0.5°C incubator for 24 hours.
 - (2) Read results according to the Result Interpretation table found in Appendix A, Section, “Quanti-Tray Enumeration Procedure.
 - (3) Count the number of positive wells and refer to the Most Probable Number (MPN) table provided with the trays to obtain a MPN. (Refer to Appendix B for IDEXX Quanti-Tray/2000 MPN Table).
 - (4) Dispose of media in accordance with good laboratory practice.

^A See: Maine Department of Environmental Protection (MDEP), Maine Volunteer River Monitoring Program (VRMP). 2009. Standard Operating Procedure: Methods for Collecting Water Grab Samples in Rivers and Streams. SOP-01. Portland, ME. <http://www.maine.gov/dep/blwq/docstream/vrmp/index.htm>

C. *Quality Control.*

- (1) At the beginning of each field season, all VRMP staff and VRMP volunteers who will collect Fecal Coliform and *E. coli* data will have a training/refresher session to (re)familiarize themselves with the contents of this SOP.
- (2) For every volunteer, a field duplicate shall be obtained for all parameters for at least 10% of their own sampling efforts. A field duplicate will be collected for every 10 samples monitored.
- (3) Refer to the VRMP quality assurance project plan (QAPP) for more QA/QC details.

6. Equipment Care

A. *Start of field season.*

- (1) A full inspection and inventory of the Colilert Test kit including expiration dates of snap packs.

B. *During field season.*

- (1) Keep kit out of direct sunlight as much as possible.
- (2) Store kit indoors in a cool, dry place out of direct sun. Keep out of the reach of children and pets.
- (3) Keep close track of snap pack expiration dates and replace as necessary.

C. *End of field season.*

- (1) Store kit indoors in a cool, dry place out of direct sun. Keep out of the reach of children and pets.

7. Appendices

A: IDEXX Laboratories, Inc. 2007. Coli-ert® Test Kit Instructions. Westbrook, ME.

B. IDEXX Laboratories, Inc. 2007. IDEXX Quanti-Tray/2000, Insert and Most Probable Number (MPN) Table. Westbrook, ME.

C. IDEXX Laboratories, Inc. 2002. IDEXX Quanti-Tray Sealer Model 2X User Manual. Westbrook, ME.

8. References

A. *Maine VRMP QAPP:*

- Maine Department of Environmental Protection (MDEP). 2009. Maine Volunteer River Monitoring Program (VRMP) Quality Assurance Program Plan (QAPP). Portland, ME. DEPLW-0984.

- Maine Department of Environmental Protection (MDEP), Maine Volunteer River Monitoring Program (VRMP). 2009. Standard Operating Procedure: Methods for Collecting Water Grab Samples in Rivers and Streams. SOP-01. Portland, ME.