

EPA's Volunteer Monitor's Guide to Quality Assurance Project Plans




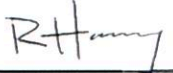
Element 1.

**Long-Term
Five Year: 2020 – 2024
QUALITY CONTROL/QUALITY ASSURANCE PROJECT PLAN
LAY MONITORING PROGRAM FOR VERMONT LAKES**

Prepared by

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Element 2.

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Element 3. Distribution List

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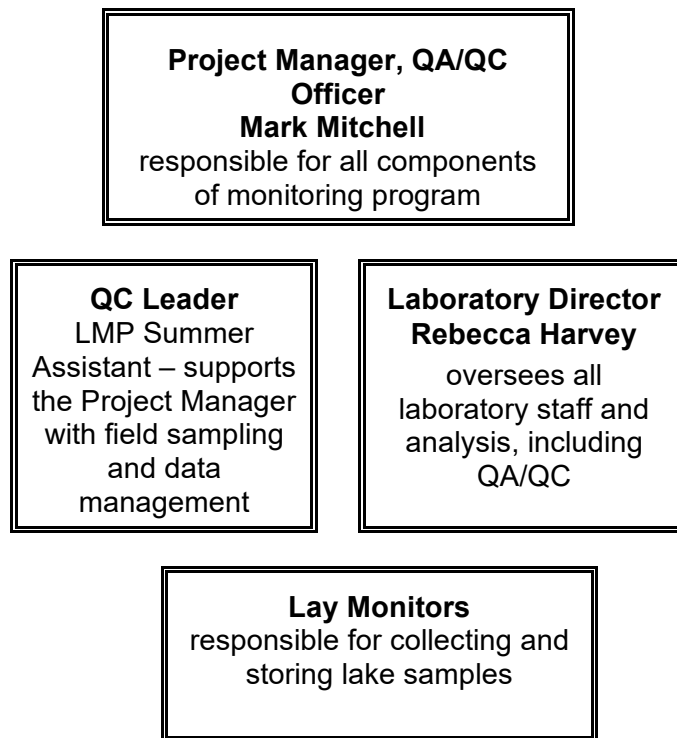
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Element 4. Project /Task Organization

Figure 1. Organizational Chart



The primary data users are the State DEC, lake associations and citizen watershed groups.

Element 5. Problem/Definition/Background

General Description

This project is a continuation of the water quality monitoring on Vermont lakes, which has been conducted under the Vermont Lay Monitoring Program (LMP) since 1979. Under the LMP, citizen volunteers are trained to measure water clarity and to collect water samples for chlorophyll-a and total phosphorus analysis. Through the use of volunteers, essential baseline water quality data is collected, and lake residents and users are better informed regarding lake biology and lake water quality protection.

Project Objectives

The principal objectives of this project are: (1) to collect water quality data and incorporate it into long-term individual lake eutrophication monitoring databases, (2) to use the data for water quality assessment and management decision-making, and (3) to educate and involve lake users in lake protection.

Element 6. Project/ Task Description

Sampling

Sampling is designed to monitor trophic state parameters. Vermont lakes are known to have suffered declines in water quality due to accelerated eutrophication in some regions. The program therefore measures nutrient concentration and primary productivity. Ninety-one lakes have participated in the program for at least one year between 1979 and 2012.

Sampling Parameters

There are two types of sampling schedules, *Supplemental* and *Basic*. Under the *Supplemental* program, the lakes (Appendix A) are sampled weekly from Memorial Day through Labor Day for the following:

- Secchi disk transparency reading
- Chlorophyll-a concentration samples
- Total phosphorus concentration sample

A hose sampling method is used for lake stations deeper than four meters, while sub-surface grab samples are taken at shallower lake stations. The sampling procedure is repeated to collect two chlorophyll-a samples; therefore all chlorophyll-a samples are taken in duplicate at each station and are analyzed separately. Chlorophyll-a water samples are filtered at a lakeside site. Filters are then frozen and stored until program staff pick them up. Total phosphorus water samples are collected in duplicate at least one time during the summer. Monitors take their duplicates during the LMP staff field visits with the monitors. Also at this time, program staff take an extra phosphorus sample for laboratory analysis of spiked samples (part of the internal lab QA/QC plan). All phosphorus samples are stored in glass test tubes. Program staff transport samples bi-weekly to the DEC Laboratory, currently at the University of Vermont in Burlington, for processing.

Under the *Basic* program, lakes are sampled weekly from Memorial Day through Labor Day for Secchi disk transparency only.

(See Appendix B, Vermont Department of Environmental Conservation, Vermont Lay Monitoring Program Manual, 2000.)

Timeline

Table 1. Timeline

Date	Task
May – June	Monitor training
June – September	Sample collection
June – August	Monitor quality checks
December	All lab analyses completed and submitted to Project Manager
January	Data entry into project database
March	Final project report

Element 7. Data Quality Objectives for Measurement Data

Quantitative QA Objectives

Lab QA Protocol

Table 2. QA Objectives for Precision, Accuracy, and Quantitation Limit

Parameter	Sample Matrix	Minimum Reporting Level	Method Accuracy (%Recovery)	Estimated Precision (RPD) ^c	Analytical Precision (RPD)
TP ^a	water	5.0 µg P/L	±10%	14%	±15%
Chlorophyll-a ^b	water	0.5 µg/l	-	17%	±10%
Secchi Disk	water	n/a	n/a	2.5%	n/a

^a VAEI Standard Operating Procedure (SOP) for Determination of Phosphorus by Flow Injection Analysis (Acid Persulfate Digestion Method) Rev 8, Ref SM 4500-P H and Lachat QuikChem 10-115-01-1-F

^b VAEI Standard Operating Procedure (SOP) for Determination of Chlorophyll a Rev 9, Ref EPA Method 445.0,

^c Estimated from average relative percent difference of Lay Monitor field duplicates.

Qualitative QA Objectives

Field QA Protocol

Program staff will accompany each monitor on one normal sampling day and observe monitor technique for error. At this time the sampling procedure is replicated and duplicates are taken by the monitor. Due to weather, boat problems or monitor scheduling needs, seldom, but occasionally, a trained monitor cannot be revisited on the lake as part of the annual check system. If this occurs, visiting these monitors will be prioritized for the following season.

A total of approximately 10% of the field samples will be replicated to validate the accuracy of lay monitoring. Monitors are asked to collect a minimum of nine samples (not including the duplicates) during June, July and August, which is approximately 60% of the maximum number of weekly samples possible to collect during these three summer months. A minimum of eight samples is required to calculate a summer mean for the Vermont Lay Monitoring Program (Vermont Lay Monitoring Field Method Manual, 2000).

Completeness: The weekly sampling frequency allows for adequate characterization of the productivity conditions in each lake.

Comparability: The Vermont Department of Environmental Conservation Laboratory Quality Assurance Plan, including the standard operating procedures, is consistent with current EPA methods. Lake stations are the same ones sampled since 1979, or since the year when lay monitoring first started on a lake.

Representativeness: Lake sampling stations are selected to give a representative sample of the lake.

Performance and System Audits

The LMP staff will inform monitors of any technique errors during quality assurance visits. Staff will review with and demonstrate to monitors the proper technique when necessary. Staff will read monitor comments on data sheets bi-weekly and monitor questions will be answered and assistance given when needed. Monitors will be encouraged to call staff with any problems they have with any aspect of the program.

Performance and system audits for laboratory analytical centers are detailed in the Laboratory Quality System Manual (VAEL, 2016) and are the responsibility of all laboratory staff, but overseen by the Laboratory Quality Assurance Officer.

Element 8. Training Requirements and Certification

The LMP Summer Assistant is trained in all aspects of the program by the Project Manager of the program. Typically a new LMP Assistant will spend two weeks shadowing the Project Manager in all aspects of the program. Additionally, the Assistant is given a copy of the Lay Monitoring Program Assistant Guide (Picotte, 2002) to read through and to have on hand in the field.

All Vermont lay monitors are trained in the sampling procedures on their lake by the LMP staff, and a list of trained monitors is maintained by the Project Manager. During training all parts of the sampling procedure are explained in detail and demonstrated. The LMP staff and the monitor take turns performing each part of the sampling procedure. Sections which present difficulties for the monitors are repeated several times until they are comfortable sampling on their own. Monitors are given the data sheet to fill out and to use as a guide for the sampling steps. All sampling steps are written on a laminated card given to each monitor, and monitors are reminded to refer to these steps when sampling. Monitors are encouraged to take notes on procedures and follow along in the LMP Manual as well. Trainings typically take two to four hours for monitors, depending on the size of their lake and the sampling program.

Element 9. Documentation and Records

Monitors are trained to use the program's data sheets and equipment when sampling. Data sheets and samples are properly stored until program staff picks them up once every two weeks (Vermont Department of Environmental Conservation, Lay Monitoring Program Manual, 2000).

Sample Custody Procedures

Samples will be collected from monitors by program staff and brought to the lab bi-weekly in labeled containers. Program staff is responsible for logging the samples into the lab information management system where a unique identification number is assigned to each sample. Lab analysts are responsible for retrieving samples from the storage areas. Samples will not be used for enforcement purposes. All data results are maintained in the VTDEC Watershed Management Division database.

Element 10. Sampling Process Design

Sampling Site Distribution

Lake sampling stations are located to give a representative sample of the lake. Except for Lake Champlain, station one is located at the deepest point in the lake and is the location from which all supplemental samples are collected (see Appendices A and B). Depending on the size of the lake, a second station is located usually half way between station one and the lake outlet. If station one is located near the outlet, station two is located half way from station one to the further end of the lake. For unusually shaped lakes, a third station will be located in opposite directions from station one and two. For inland lakes, only Secchi disk readings are taken at stations other than station one.

Element 11. Sampling Methods Requirements

Sampling methods are covered in Element 6 of this QA/QC plan and described in the Vermont Department of Environmental Conservation, Lay Monitoring Program Manual (2000).

Table 3. Sampling Method and Quantity Requirements

Location of Weekly Sampling	Sampling Method	Analysis Parameter	Sample Volume (ml)	Sample Container	Field Procedures
Lake Stations < 4 Meters Deep	Secchi Disk	Transparency	-	-	observation
	Sub-Surface Grab	TP	50	Glass tube	none
		Chlorophyll-a	100	Filter paper (Glass Microfiber particular retention 1.6um)	filtration
Lake Stations > 4 Meters Deep	Secchi Disk	Transparency	-	-	observation
	Hose Sample	TP	50	Glass tube	none
		Chlorophyll-a	100	Filter paper (Glass Microfiber particular retention 1.6um)	filtration

Element 12. Sample Handle and Custody Requirements

Reference – Element 9 of this QA/QC Plan.

Element 13. Analytical Methods Requirements

Sample Analysis

Table 4. Parameter Table

Parameter	Number of Samples ^a	Sample Matrix	Sample Preservation	Holding Time
TP	897	water	none	28 days
Chlorophyll-a	1794	water	-20°C, dark	21 days

^a Includes field QC samples from Program Staff.

Element 14. Quality Control Requirements

Laboratory Analytical Procedures

Reference Vermont Agriculture and Environmental Laboratory Quality Systems Manual (2016) and VAEL SOPs

Field Samples

Most Vermont lakes, with the exception of Lake Champlain, have two sampling stations. The lakes have a centrally located, deepwater station (station #1) and a second station (station #2) located between the shores, towards the outlet of the lake (see Element 10 of this QA/QC Plan).

Monitors are required to collect two different water samples, sample A and sample B each from a separate sampling at station #1. (All other stations are sampled for Secchi water clarity only.)

Collecting chlorophyll-a samples

The two samples (A and B) are filtered (100 mls each) and are assigned a unique laboratory identification number upon arrival at the lab. The samples are analyzed as individual chlorophyll-a samples and two separate results are reported.

Collecting phosphorus samples

A 50 ml portion of sample B, stored in a glass test tube, is analyzed for total phosphorus. Total phosphorus water samples are collected in duplicate at least one time during the summer (approximately 10% of all phosphorus samples). Field duplicate phosphorus samples are collected from a 50 ml portion of sample bottle A and a 50 ml portion from sample bottle B, with the sample from bottle A being labeled as the duplicate. The phosphorus duplicates are collected by the monitors during the LMP staff field visits with the monitors. During the annual LMP staff visits with the Lay Monitors, additional duplicate samples (minimum of 10 %) are taken for the laboratory staff to use as part of their quality assurance program, which includes a sample for analyzing spiked samples. The LMP staff will fill two 50 ml test tubes, one with lake water from sample bottle A to be used by the lab for spikes, and the other with lake water from sample bottle B, also for lab use.

RPD of Monitor Duplicate Samples:

$$RPD = \frac{(C^1 - C^2) \times 100\%}{(C^1 + C^2)/2}$$

RPD = relative percent difference

C1 = larger of the two observed values

C2 = smaller of the two observed values

Reference – Vermont Department of Environmental Conservation, Lay Monitoring Program Manual, 2000.

Due to logistical constraints in picking up and delivering samples to the laboratory, it is not always possible to analyze all Chl-a and TP samples within the prescribed 21- and 28-day hold times, although every effort will be made to do so. These samples will be properly stored throughout this time. A remark field in the database will be used to identify samples analyzed in the laboratory past their hold times so that appropriate data screening may be applied if deemed necessary at the time the data are statistically analyzed and reported.

Corrective Action

Upon joining the Lay Monitoring Program, all monitors are given a copy of the Vermont Lay Monitoring Program Manual, which contains explanations, graphics, and check lists for proper sampling techniques. Monitors will be asked to review this manual and also be reminded that step by step sampling procedures are listed on the laminated card to provide guidance while sampling in the field. Monitors are required to follow the LMP sampling procedures to participate in the LMP program and are visited (checked) annually by program staff.

For laboratory use, corrective actions are defined in section 15 of the Vermont Department of Environmental Conservation Laboratory Quality Assurance Plan, 2013.

Element 15. Instrument/Equipment Testing, Inspection and Maintenance Requirements

Laboratory Analysis QA/QC – Calibration Procedures, Analytical Procedures and Preventive Maintenance

Reference – VAEL Quality Systems Manual and VAEL Method SOPs

Field Sampling Equipment

The Vermont DEC supplies all the equipment except for a boat and anchor to the volunteer monitors. Before any equipment is supplied to a volunteer, it is carefully checked by LMP staff. Secchi disk lines are measured and marked off in meters. Hoses are also marked off in meter increments. All Nalgene 500 ml sample bottles (each monitor is given a sample bottle “A” and “B”), hand filtering apparatuses, graduated cylinders, five-gallon buckets, and hoses are acid washed (10% solution of sulfuric acid) and thoroughly rinsed before being given to monitors. The 50 ml glass test tubes are disposable and provided clean and new from VAEL. All equipment is checked during the annual LMP staff field visits with monitors. On a rotational basis, hoses are collected from the monitors and acid washed by LMP staff before being returned to monitors. The monitors who plan to return to the program for the next season are asked to store the equipment during the winter months. Monitors are given written directions on properly storing equipment during the winter months. New filter papers, glass test tubes, and data sheets are provided at the start of each sampling season.

Reference – Vermont Department of Environmental Conservation, Lay Monitoring Program Manual, 2000.

Element 16. Instrument Calibration and Frequency

Reference – Element 15 of this QA/QC Plan.

Element 17. Inspection and Acceptance Requirements for Supplies

All monitoring supplies used are either the exact same make as equipment used in past years or are comparable replacement products. Most of the sampling equipment used is purchased through the laboratory supplier, VWR Scientific, to ensure consistent use of the exact same filter paper, sample bottles, graduated cylinders, and other field supplies needed. The hoses and rope purchased are non-stretch. Annual records of all equipment purchased and used by the LMP are kept to ensure consistency in selecting new sampling equipment.

Reference – Element 15 of this QA/QC Plan and the Vermont Lay Monitoring Program Manual, 2000.

Element 18. Data Acquisition Requirements

Monitors are provided with Vermont Watershed Management Division Lake Maps that show the locations of the sampling stations. Monitors are trained how to locate their sampling stations using these maps during their training session with the LMP staff.

Element 19. Data Management

All data results are maintained in the VTDEC Watershed Management Division database.

Reference – Element 9 of this QA/QC Plan.

Element 20. Assessments and Response Actions

Reference – Element 7 and Element 14 of this QA/QC Plan.

Element 21. Reports

Data for each monitoring station will be summarized and compiled into an annual report for distribution to volunteer monitors, state agencies, and organizations and individuals interested in Vermont water quality. This annual report is the responsibility of Mark Mitchell, Project Manager.

Element 22. Data Review, Validation and Verification Requirements

Data Reduction

Reference – VAEL Quality Systems Manual (2016)

Element 23. Validation and Verification Methods

The validation of laboratory data is the primary responsibility of the Lab Supervisor utilizing methods documented the VAEL Quality Systems Manual (2016).

At the program level, the Project Manager validates the data according to the following process: Secchi disk readings and total phosphorus concentrations from each lake are reviewed and compared to previous years' data. If any samples seem unusually high or low, then the monitor data sheets are checked for that day's sampling comments (monitors might be called as well) and the Laboratory Staff is consulted about possible errors. All samples where monitors used questionable techniques, or where they noted problems with sampling or sample storage, and where chemists noted problems are not validated and the data not used.

In order to average both the chlorophyll-a duplicates for a single concentration value, the two samples must be evaluated according the following:

If $H/L < 2.5$, then both values are kept.

If $H/L > 2.5$ lab and data sheets are checked for an explanation,

- If the lake is eutrophic or if algal blooms were present, both values are kept.
- If there is no written reason, then both values are tossed.
- If only one value is questionable, that value will be tossed and the other used.

**H = high concentration, L = low concentration

Element 24. Reconciliation with Data Quality Objectives

The LMP is a cooperative effort between the Vermont DEC and lake users to collect essential baseline water quality data on Vermont lakes. Monitors are asked to collect a minimum of nine samples during June, July and August – a minimum of eight samples are used to calculate summer means. If less than eight samples are collected during the summer months, no annual mean can be calculated for that year and the data is used to describe only current water quality conditions, and not for long term trend analysis. Monitors on nearly 100 lakes in Vermont have participated in the LMP and have contributed substantially to the understanding of water quality conditions in Vermont lakes.

Reference – Element 14 of this QA/QC Plan.

Reference – Vermont Lay Monitoring Program Manual, 2000.

References

Vermont Agriculture and Environmental Laboratory Standard Operating Procedure (SOP) for Determination of Phosphorus by Flow Injection Analysis (Acid Persulfate Digestion Method), Rev 8

Vermont Agriculture and Environmental Laboratory Standard Operating Procedure (SOP) for Determination of Chlorophyll a Method 445.0, Rev 9

Environmental Protection Agency. 1996. The Volunteer Monitor's Guide to Quality Assurance Project Plans

Vermont Agriculture and Environmental Laboratory Quality Systems Manual 2016. Randolph Ctr, VT.

Vermont Department of Environmental Conservation, Vermont Lay Monitoring Program Manual, 2000. Waterbury, VT.

Vermont Department of Environmental Conservation, Vermont Lay Monitoring Assistant Guide, 2002. Waterbury, VT.

Vermont Department of Environmental Conservation, Annual Vermont LMP Reports.

Appendix A. Inland Lakes Lay Monitoring Primary Station Locations

LAKE/POND NAME	Latitude	Longitude	Total Depth of Station #1 (meters)
ADAMANT	44.3313	-72.50345	2
ADAMS (WOODFORD)	42.8869	-73.0394	5
AMHERST	43.4861	-72.7053	27
ARROWHEAD MOUNTAIN	44.66126	-73.10833	7.6
BEEBE (HUBARDTON)	43.7344	-73.1833	12
BERLIN	44.1839	-72.5872	18
BLISS	44.3528	-72.5025	4.5
BOMOSEEN	43.6494	-73.2083	18.2
BROWNINGTON	44.8794	-72.1478	9.2
BUCK	44.46248	-72.39824	9.2
BURR (SUDBURY)	43.7656	-73.1844	4.6
CARMI	44.97393	-72.87549	11
CASPIAN	44.5866	-72.31001	30
CEDAR	44.2506	-73.1342	3.8
CHIPMAN	43.4089	-73.0317	3.4
CHITTENDEN	43.72673	-72.90371	14
COLE	43.1478	-72.8056	3
COLES	44.5058	-72.215	6.4
CRYSTAL (BARTON)	44.7328	-72.1533	30.5
CURTIS	44.3881	-72.4939	7.6
DANBY	43.3656	-73.0522	2
DERBY	44.9556	-72.0383	5.2
DUNMORE	43.9122	-73.0764	30
EAST LONG	44.4475	-72.3525	30
ECHO (CHARLESTON)	44.86	-71.9928	39
ECHO (HUBARDTON)	43.7475	-73.1828	12.2
ECHO (PLYMOUTH)	43.4775	-72.7014	28
EDEN	44.7228	-72.5014	11.9
ELFIN	43.4694	-72.9881	11
ELLIGO	44.59381	-72.3556	30.3
ELMORE	44.5347	-72.5256	5.2
EMERALD	43.2742	-73.0069	12
FAIRFIELD	44.8453	-72.9967	13
FAIRLEE	43.8847	-72.2408	15
FERN	43.8628	-73.0706	12.7
FOSTERS	44.32873	-72.21048	4
GILLETT	44.3525	-72.9661	2
GLEN	43.6664	-73.2417	18.3
GREAT HOSMER	44.6858	-72.3644	13
GREEN RIVER RESERVOIR	44.6544	-72.5231	28

GREENWOOD	44.4578	-72.4258	9
GROTON	44.2789	-72.2672	13
HALLS	44.0861	-72.1239	9
HARVEYS	44.2939	-72.1375	40
HIGH (SUDBURY)	43.75332	-73.15336	17
HOLLAND	44.98588	-71.92928	11.5
HORTONIA	43.7553	-73.2022	18
INDIAN BROOK RESERVOIR	44.5328	-73.0972	7.6
IROQUOIS	44.3658	-73.0833	10
ISLAND	44.8075	-71.8733	12
JOES (DANVILLE)	44.4081	-72.2208	15
LITTLE (WELLS)	43.43384	-73.20497	2
LONG (WESTMORE)	44.7517	-72.0175	23
LOWELL	43.2272	-72.7642	7.3
LYFORD	44.4397	-72.2511	6.1
MAIDSTONE	44.6522	-71.6469	30
MARTINS	44.3083	-72.2167	5.5
MEMPHREMAGOG	44.9628	-72.2228	8.3
MEMPHREMAGOG - SOUTH BAY	44.9203	-72.2097	5
MILES	44.4472	-71.8139	16.7
MIRROR	44.3961	-72.4439	32
MOLLEYS FALLS	44.3625	-72.2961	11
MOREY	43.9247	-72.1533	11
MUCKROSS/GOULDS	43.276	-72.45808	3
NELSON/FORREST (CALAIS)	44.4075	-72.4389	29
NEWARK	44.7175	-71.9822	9
NICHOLS	44.4567	-72.3383	24
NINEVAH	43.4689	-72.7533	3.5
NORTH MONTPELIER	44.3047	-72.4478	3.6
NORTON (Station 2)	44.9403	-71.8619	9.1
PARAN	42.9328	-73.2353	7
PARKER	44.71926	-72.23425	12
PEACHAM	44.3306	-72.26	15
PENSIONER	44.8783	-72.0567	12
PERCH (BENSON)	43.7503	-73.2808	9.1
PINNEO	43.6517	-72.4314	3
RAPONDA	42.8733	-72.82	4.8
RESCUE	43.4494	-72.7008	27
RICKER	44.2456	-72.2436	9
RUNNEMEDE	43.48467	-72.38874	2.9
SABIN/WOODBURY	44.4031	-72.4186	5.2
SALEM	44.93	-72.1044	18
SEYMOUR	44.8856	-71.9797	48
SHADOW (GLOVER)	44.6675	-72.2258	42.4

SHELBURNE	44.3922	-73.1608	7.6
SILVER (BARNARD)	43.7289	-72.6089	9.5
SOUTH (EDEN)	44.6833	-72.5275	20
SOUTH (MARLBORO)	42.9178	-72.6833	11
SPRING (SHREWSBURY)	4330	7255	26
ST. CATHERINE	43.4758	-73.2153	20
STAR	43.4169	-72.8183	2
STRATTON	43.1047	-72.9694	5
SUNRISE	43.7606	-73.2611	13
SUNSET (BENSON)	43.75516	-73.27256	32
SUNSET (MARLBORO)	42.9178	-72.6833	11
SUNSET (BROOKFIELD)	44.0436	-72.6039	8.5
TICKLENAKED	44.19067	-72.0989	15.4
VALLEY	44.4478	-72.4407	21
WAPANACKI	44.55868	-72.39961	2
WATERBURY	44.3858	-72.7636	30
WILLOUGHBY	44.7517	-72.0622	94
WINONA	44.1747	-73.0897	2
WOODFORD/BIG	42.89072	-73.06953	7.6
WOODWARD	43.565	-72.7597	14

Note: Highlighted stations were sampled through the LMP in 2017 and/or are expected to be sampled in 2018. (<http://dec.vermont.gov/watershed/lakes-ponds/monitor/lay-monitoring>)

Appendix B. Lake Champlain Lay Monitoring Station Locations

Station	Latitude (deg min)	Longitude (deg min)	Total Depth (m)
01	43 34.26	73 25.57	3
02	43 51.21	73 22.58	3
03	43 57.06	73 24.28	3
04	44 11.03	73 22.52	53
05	44 16.06	73 18.44	107
06	44 25.33	73 13.55	22
07	44 27.59	73 16.38	40
08	44 28.10	73 22.34	50
09	44 32.46	73 19.39	10
10	44 34.55	73 16.52	32
11	44 33.54	73 12.30	23
12	44 40.19	73 14.01	30
13	44 40.48	73 25.00	10
14	44 45.22	73 22.15	14
15	44 45.18	73 18.40	4.5
16	44 45.30	73 13.16	27
17	44 47.07	73 09.44	6
18	44 51.44	73 12.55	15
19	44 56.54	73 20.24	6
20	44 00.48	73 10.26	4
21	44 39.53	73 18.12	9
22	44 55.04	73 11.11	8
23	44 53.09	73 16.28	3.5
24	44 00.01	73 07.33	3
25	44 50.12	73 18.06	4.5
26	44 13.18	73 19.32	2
29	44 50.23	73 17.48	7.5
30	44 58.33	73 12.54	4.5
31	44 38.16	73 15.17	7.5
32	44 38.32	73 22.56	58
33	44 28.49	73 13.90	15
34	44 07.34	73 24.46	45
35	44 39.40	73 24.46	6
36	43 34.91	73 25.33	6
37	44 50.74	73 18.67	15
38	44 15.78	73 17.22	8

39	44 16.02	73 17.94	7
40	44 29.19	73 14.37	12
41	44 25.46	73 16.43	68
42	44 00.38	73 24.38	4

Note: Highlighted stations were sampled through the LMP in 2017 and/or are expected to be sampled in 2018. (<http://dec.vermont.gov/watershed/lakes-ponds/monitor/lay-monitoring>)

