

**Foster's Pond Annual Report
2024 Aquatic Management Program**

Andover, MA

Prepared for: Foster's Pond Corporation
c/o Stephen Cotton, President
19 Pomeroy Road
Andover, MA 01810
scotton@fosterspond.org

Prepared by: SOLitude Lake Management
590 Lake Street
Shrewsbury, MA 01545

Submitted on: October 28, 2024

Introduction

Invasive aquatic vegetation control, cyanobacteria bloom management and monitoring were again the focus of this year's efforts at Foster's Pond. This year's active management activities included partial pond treatment for fanwort (*Cabomba caroliniana*) in the Main Basin, Channel and Mill Reservoir using Sonar (fluridone) herbicide and one copper algaecide treatment.

This season's fanwort treatment effort was the most extensive since the 2015 whole-pond Sonar (fluridone) herbicide treatment program. Recent fanwort management focused on small, localized areas of fanwort in areas other than the Main Basin (Dug Pond in 2023, Outlet Cove/Azalea Cove in 2022, Mill Reservoir in 2021), but regrowth in the main basin reached substantial levels in 2023 warranting this year's treatment. Again, this season, hydro-raking was conducted in some areas of private shoreline to remove nuisance aquatic vegetation and accumulated organic matter.

The purpose of annually surveying and sampling is to document the pond's invasive and native plant populations, track changes due to management efforts, document the continued biodiversity of aquatic vegetation, and assess water quality. The treatments, survey, and monitoring described in this report were performed by SOLitude Lake Management under contract with the Foster's Pond Corporation. Hydro-raking, which was also performed by SOLitude Lake Management, was coordinated by the Foster's Pond Corporation (FPC) but contracted by individual homeowners.

All work performed at Foster's Pond this season was conducted in accordance with the current Order of Conditions (OOC) issued by the Andover Conservation Commission (DEP #090-535) and



the MA DEP – Office of Watershed Management issued License to Apply Chemicals (#WM04-0001560).

A chronology of this year's management and description of events is as follows:

2024 Program Chronology

- | | |
|---|----------|
| • Hydro-raking of shoreline areas commenced | 04/01/24 |
| • Hydro-raking completed | 04/09/24 |
| • MA DEP License to Apply Chemicals issued | 04/28/24 |
| • Initial fluridone treatment for fanwort control | 05/02/24 |
| • Interim inspection/FasTEST Sampling | 05/22/24 |
| • First herbicide booster treatment | 06/03/24 |
| • Interim inspection/FasTEST Sampling | 06/17/24 |
| • Second herbicide booster treatment | 07/02/24 |
| • Interim inspection/FasTEST Sampling | 07/30/24 |
| • Final herbicide booster treatment | 08/07/24 |
| • Vegetation Survey & WQ Sampling | 08/20/24 |
| • Algaecide Treatment | 09/03/24 |

Hydro-raking

Private shoreline hydro-raking services were provided for various residents of Foster's Pond to remove nuisance aquatic vegetation as well as accumulated organic matter. Approximately fifty-four (54) hours of hydro-raking services were provided between April 1st and April 9th. All removed material was placed on the respective residents' shoreline. Pursuant to the OOC, property owners were responsible for proper upland disposal.

This was the eighth consecutive year when hydro-raking operations were scheduled for the spring/ early summer. Due to the relative certainty of high water, spring/early summer has proved to be the optimal time for hydro-raking in Foster's Pond.

Algae Monitoring

Nuisance algae blooms and corresponding poor water clarity have been exhibited periodically through the years at Foster's Pond. The blooms are commonly dominated by cyanobacteria, or blue-green algae, due to elevated phosphorus concentrations within the various basins. The Foster's Pond Corporation diligently monitors water clarity, with FPC volunteers conducting multiple rounds of Secchi disk readings in different basins. When clarity drops sharply and/or blue-green scum is observed (usually along the shoreline) of any basin, samples are drawn and shipped to Northeast Laboratories in Rocky Hill, CT, to be analyzed for cyanobacteria cell counts.

This year, while water clarity declined over the course of the summer, no blue-green scum was observed. However, a water sample from the Main Pond taken in connection with the annual survey in late August revealed an elevated cyanobacteria count. A copper sulfate treatment



was scheduled immediately following receipt of the laboratory report. The treatment was successful, as indicated by a rapid improvement in water clarity.

Algaecide Treatment

One algaecide treatment was performed this summer. This treatment was conducted on September 3rd at which time half of the pond (60 acres) was treated with copper sulfate. The treatment area consisted of the Main Pond. Copper sulfate was applied at a rate of 0.6 pounds per acre foot which equates to 0.0625 ppm of active copper. A total of 150 pounds of copper sulfate was applied.

Fanwort Herbicide Treatment

Based on 2023 survey data, fanwort growth within the Main Pond basin, the Channel and Mill Reservoir (including the stretch between the Main Pond and Mill Reservoir as well as the area leading up to Azalea Cove) was targeted for treatment with Sonar (fluridone) herbicide this year (See **Figure 2** in the Attachments). This area totaled approximately 42 of the Pond's 120 acres and was treated with the granular formulation of Sonar (fluridone). As was the case last year for Dug Pond, in order to maximize effectiveness and because the location of the fanwort had been mapped previously, the initial treatment was scheduled without waiting for the target plants to fully emerge, thus exposing the plants to herbicide as early in the growth cycle as possible.

All treatment dates for the Sonar applications were coordinated with the FPC. Notification of treatment was submitted to the Conservation Commission, email notifications of the treatment areas and water-use restrictions were provided to shoreline property owners and local residents on the FPC's email list, notice was posted on the FPC's website, and warning posters were posted by the FPC along the shoreline at key access points of prior to treatment. The initial treatment was completed on May 2nd, with follow-up, booster treatments completed on June 3rd, July 2nd and August 7th; all treatments were applied by SŌLitude's licensed aquatic applicators in accordance with conditions of the DEP License to Apply Chemicals, the Sonar ONE herbicide label, the OOC, and the program and protocol approved by the Conservation Commission. The herbicide was applied using a bow mounted, electric spreader.

The target in-water concentration in the treatment area was 8-10 ppb. Fluridone has a relatively short half-life, as it breaks down in sunlight, and it may break down more rapidly in basins with different depths and water clarity. Interim inspections and FasTEST herbicide concentration testing was conducted after each of the first three treatments on May 22nd, June 17th and July 30th. The results of the FasTEST sampling is provided in the below table (Table 1). The concentrations ranged from <1 ppb to 7.2 ppb. Up to 20 ppb is the allowable concentration at the intake point in potable water supplies, with higher concentrations allowed in water bodies that do not serve as reservoirs.

**Table 1.** Fluridone concentrations.

Date	Results (ppb)			
	Main Pond West	Main Pond East	Mill Reservoir	Channel
5/22/2024	2.2	2.2	<1	NS
6/14/2024	6.1	7	2.4	NS
7/30/2024	4.9	NS	4.3	7.2

NS = Not sampled

Spiny Naiad Management

Non-native spiny naiad growth has been observed in various areas of Foster's Pond in past years. Although spiny naiad growth has been minimal the last couple of seasons, the FPC sought approval from the Conservation Commission for a treatment, with the precise locations determined based on pre-treatment observations. No significant growth of spiny naiad was observed this year and therefore no treatments were required.

Annual Late-Season Vegetation Survey

On August 20th, two SOLitude biologists conducted the annual aquatic vegetation survey of Foster's Pond, observing the Main Pond, Outlet Cove, Azalea Drive, Mill Reservoir, the channels connecting these basins, and Dug Pond. A combination of motorized boat and canoe was used for the survey work.

This annual survey documents the aquatic plant composition and distribution utilizing consistent survey methodology, transects and data points established at the time of the first survey in 2004. Supplementary survey points have been added into the survey based on client recommendation and request: fourteen data points including G1-G4 in Dug Pond in 2008, A-E in 2016, and F-J in 2018. A total of 61 data points were surveyed. (See **Map 1**, below, also shown as **Figure 1** in the Attachments.) illustrating the transect and data point locations is included below; the raw data collected is attached in Appendix A.



Map 1: Survey point locations within Foster's Pond.

Overall, the basins supported similar levels of vegetation to those observed over the last few years, with regard to total percent cover, biomass, and species richness (see **Table 2**). White water lilies were the dominant species in the lake, found at 34.4% of the data points, Other species present at over 10 % occurrence included yellow waterlilies, bladderwort, slender naiad, macroalgae (stonewort and chara) and benthic filamentous algae. Other plant species in the lake are fairly sporadic across the basins and include Ludwigia, Eleocharis, Robbins pondweed, watershield, Fontanalis, spotted pondweed and floating filamentous algae.

Table 2: Aquatic vegetation analysis summary.

Year	Estimated % Total Plant Cover	Estimated % Fanwort Cover	Biomass Index	Species Richness Index
2004	78.9	54.5	2.9	3.6
2005 ¹	25.5	0.1	1.4	1.7
2008	15.9	0.9	1.6	1.7
2009	34.2	6.1	1.6	5.5
2011 ¹	19.0	0	1.2	1.4
2012	21.2	0.1	1.3	1.6
2014	53.6	10.9	2.4	2.7
2015 ¹	41.7	0	1.6	0.8
2016	70.3	0.2	2.4	1.3
2017 ²	67.6	17.7	2.2	1.8
2018 ²	59.3	11.7	2.0	1.4



Year	Estimated % Total Plant Cover	Estimated % Fanwort Cover	Biomass Index	Species Richness Index
2019 ²	41.5	1.5	1.8	3.0
2020 ²	49.6	2.1	3.1	2.8
2021 ²	35.5	4.6	3.1	2.4
2022 ²	20.1	7.7	1.4	1.4
2023 ²	28.5	0.22	2.6	1.5
2024 ²	25.0	0.33	2.1	1.5

¹Whole-lake Sonar (fluridone) treatment performed,

²Excludes additional points A-J, compares to 2016 data points

The above table (**Table 2**) displays historical data collected over the years from 2004 to present, and also shows calculations made from this data. The biomass index is a measurement of the height of plants within the water column, and the species richness index is the average number of vegetation species found at each survey point.

Of the 61 data points, only two supported fanwort (which was mostly chlorotic) and spiny naiad was only observed at one location. Referring to last year's report, most of the fanwort in 2023 was coincidentally not present at the fixed data points, but was still widely distributed, especially in the Main Basin. This year's percent cover of <1% is indicative of the pond as a whole and illustrates the success of the treatment program.

A series of vegetation maps are attached,

- **Figure 3** - Fanwort Locations
- **Figure 4** - Spiny naiad location
- **Figure 5** - Purple Loosestrife Observations
- **Figure 6** - Native Plant Assemblage

Table 3 (below) catalogs the species observed over the past years during surveys, and this is helpful to track the observances of the documented species. In this table, an x denotes the presence of the species, but does not indicate the density. Species considered invasive are highlighted in red.

Table 5 attached contains the raw data from this year's vegetation survey. In Table 5, T indicates trace presence of a species, S indicates sparse presence, M indicates moderate presence, and x indicates presence only.



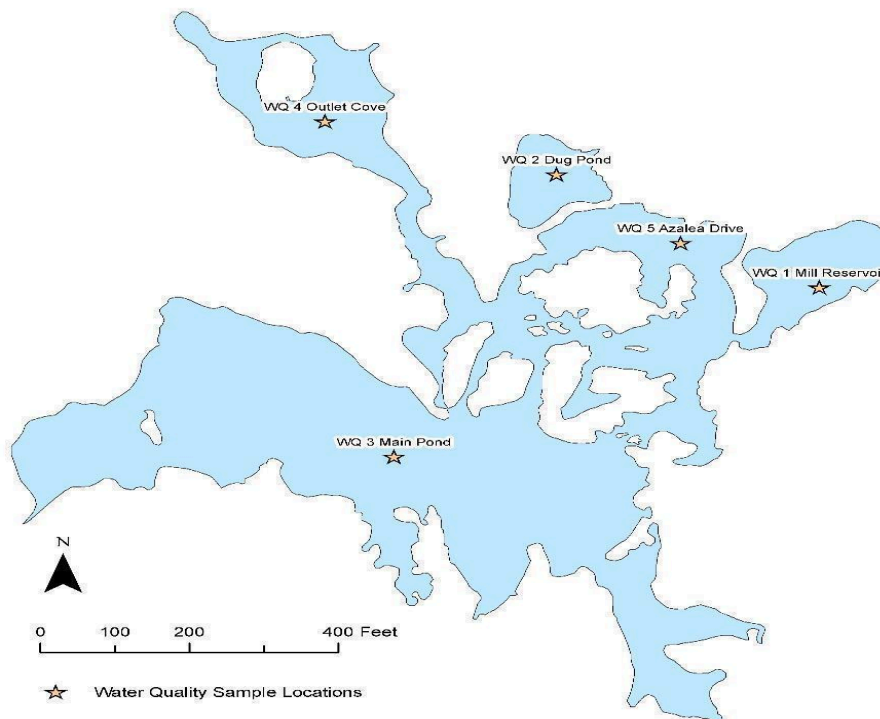
Table 3: Aquatic species list with historical comparison from years 2005-present

Type	Macrophyte Species	Common Name	2005	2008	2009	2011	2012	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Submersed	<i>Eidens beckii</i>	Water marigold			x														
	<i>Cabomba caroliniana</i>	Fanwort	x	x	x		x	x		x	x	x	x	x	x	x	x	x	
	<i>Callitriche sp.</i>	Water starwort			x					x		x		x					
	<i>Ceratophyllum demersum</i>	Coontail	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	<i>Chara sp.</i>	Muskgrass			x	x													
	<i>Chlorophyta sp.</i>	Filamentous algae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Egeria densa</i>	Brazilian elodea	x	x	x														
	<i>Elodea canadensis</i>	Common waterweed			x								x				x	x	
	<i>Hypericum boreale</i>	Northern St. John's wort			x														
	<i>Isoetes sp.</i>	Quillwort	x	x	x	x	x												
	<i>Ludwigia palustris</i>	Water purslane			x	x	x										x		x
	<i>Musci/Fontinalis sp.</i>	Aquatic moss	x	x	x		x	x	x			x	x			x			x
	<i>Myriophyllum humile</i>	Low watermilfoil	x	x	x	x		x				x	x	x		x	x		
	<i>Najas flexilis</i>	Slender naiad	x	x	x		x	x							x	x			x
	<i>Najas guadalupensis</i>	Southern naiad											x		x				
	<i>Najas minor</i>	Spiny naiad			x				x		x	x	x	x	x	x	x	x	x
	<i>Nitella sp.</i>	Stonewort	x	x	x	x	x	x	x	x	x					x	x	x	x
	<i>Potamogeton amplifolius</i>	Big-leaf pondweed											x	x			x		
	<i>Potamogeton epihydrus</i>	Ribbon-leaf pondweed		x	x	x	x	x	x	x	x	x	x	x	x	x	x		
	<i>Potamogeton gramineus</i>	Variable-leaf pondweed			x		x					x	x						
	<i>Potamogeton natans</i>	Floating leaf pondweed		x	x				x					x	x	x			
	<i>Potamogeton pulcher</i>	Spotted pondweed																x	x
	<i>Potamogeton pusillus</i>	Thin-leaf pondweed							x		x		x	x	x	x	x		
	<i>Potamogeton robbinsii</i>	Robbins' pondweed									x	x		x		x	x		x
	<i>Sagittaria sp.</i>	Arrowhead		x	x		x												
	<i>Schoenoplectus subterminalis</i>	Grassy bulrush											x	x					
	<i>Utricularia spp.</i>	Bladderwort	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Vallisneria americana</i>	Tapegrass			x							x								
Floating Leaf	<i>Erasenia schreberi</i>	Watershield		x	x		x	x	x		x		x	x	x			x	
	<i>Lemna minor</i>	Lesser duckweed			x														
	<i>Nuphar variegata</i>	Yellow waterlily	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	<i>Nymphaea odorata</i>	White waterlily	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	<i>Nymphoides cordata</i>	Little floating heart											x						
	<i>Spirodela polyrhiza</i>	Big duckweed			x														
Emergent	<i>Decodon verticillatus</i>	Water willow	x	x	x	x	x		x	x	x	x	x	x	x				
	<i>Eleocharis sp.</i>	Spikerush			x										x	x	x		
	<i>Enicocaulon sp.</i>	Pipewort	x	x															
	<i>Lythrum salicaria</i>	Purple loosestrife	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	<i>Peltandra virginica</i>	Arrow arum			x								x	x					
	<i>Pondetia cordata</i>	Pickereelweed	x	x	x	x	x					x	x	x	x	x	x	x	
	<i>Scirpus sp.</i>	Rushes	x	x									x	x	x				
	<i>Sparganium sp.</i>	Bur-reed		x	x	x	x	x	x	x	x	x	x		x	x	x		
<i>Typha sp.</i>	Cattail	x	x	x	x	x			x	x	x	x	x	x	x	x	x		

Water Quality Monitoring

Water quality sampling was performed at Foster's Pond in 2024 consistent with prior year's efforts and locations. Surface grab water samples were collected from five locations, shown on **Map 2**, below, on August 20th. Laboratory analysis was performed for the following parameters: pH, total alkalinity, total phosphorus, turbidity, true and apparent color, and fecal and total coliform.

Tables for temperature and dissolved oxygen readings are attached, as are lab reports on the microbiological analysis and general chemistry of samples taken at each location. The water quality results are set out in **Table 4**, below.



Map 2: Water quality sample locations.

Table 4: Water quality results collected on August 20th, 2024.

Parameter	Units	Desirable Thresholds	Mill Reservoir (WQ1)	Dug Pond (WQ2)	Main Basin (WQ3)	Outlet Cove (WQ4)	Azalea Drive (WQ5)
pH	S.U.	6.0-8.0	7.09	7.05	6.97	7.07	6.89
Alkalinity, Total	mg/L CaCO ₃	>50	32	21	31	29.5	28.6
Phosphorus, Total	mg/L	0.030	0.016	<0.010	0.043	0.025	0.013
True Color	Pt-Co	-	26	6	34	37	27
Apparent Color	Pt-Co	-	32	10	39	41	32
Turbidity	NTU	<5	1.9	1	5.4	3.2	0.83
Fecal Coliform	col/100mL	<235	210	31	33	5	82
Total Coliform	MPN/100mL	<1000	1553	8088	1299	6127	3839

ND = None Detected

Water Quality Explanations

Total Alkalinity is the measure of the water's capacity to neutralize acids. A higher alkalinity can buffer the water against rapid pH changes, which in turn prevents undue stress on aquatic biota due to fluctuating pH levels. The alkalinity of a lake is primarily a function of the watershed's soil and rock composition. Limestone, dolomite and calcite are all a source of alkalinity. High levels of precipitation in a short amount of time can decrease the water's alkalinity. A typical freshwater lake has an alkalinity of 20-200 mg/L. A lake with a low alkalinity typically also has a



low pH, which can limit the diversity of aquatic biota. **Total alkalinity values varied between locations, but all are generally considered low yet characteristic for waterbodies in the region.**

pH is a measurement of alkalinity or acidity of a water body. The pH scale ranges from 0 (acidic) to 14 (basic) with 7 being neutral. Natural pH values of most freshwater systems range between 6 and 8. Extreme pH values (less than 5.5 and greater than 9) have detrimental effects on organism physiology and can result in the direct loss of sensitive species. Diurnal fluctuations in pH are common in freshwater ponds and lakes. The extent to which the pH fluctuates depends on how well the freshwater system is buffered. If the pH remains between 5.0-9.0, adverse impacts to fish and other aquatic biota are generally not observed. **The pH values of all locations were very close to neutral and within desirable ranges for northeast freshwater systems.**

Total Phosphorus is considered the limiting nutrient for aquatic plant growth in freshwater environments. The amount of phosphorus present in the water column determines the amount of phytoplankton and, to a lesser degree, aquatic plants that will grow in the water body. Generally, TP over 30 parts per billion (ppb), or 0.03 mg/l, is the threshold at which algal growth can become problematic. Increased total phosphorus levels in the hypolimnion can most likely be attributed to the biomass accumulation of dead algae cells and release from the bottom sediments. For total phosphorus, levels over 0.03 mg/l are high enough to support nuisance algae blooms and ideally the concentration would be < 0.02 mg/l. The higher total phosphorus levels in the Main Basin was evidenced by high cyanobacteria levels in the pond this year. **Total phosphorus levels at each sampling location fell within the desirable threshold during the sample collection, with the exception of the Main Basin at 0.043mg/L. Last year, the TP observed in Mill Reservoir was elevated (0.08 mg/l), but that was not the case this year.**

True Color is the color of filtered pond water, free of particulates; it represents only dissolved organic matter (DOM) in the water. This value can be subtracted from the Apparent Color to determine the quality of water inputs. Apparent Color is the color of the unfiltered pond water, caused by suspended and dissolved matter. This value can change drastically depending on weather conditions: increase with storm events, decrease with drought. There are four approximate categories for Color: 0-25 is clear, 25-40 is light tea-color, 40-80 is tea color, >80 is dark tea color. **True and apparent color measurements were categorized this year mostly between clear and light tea color.**

Turbidity is a relative measurement of suspended material in the water, through a process involving light diffraction of the pond sample as compared to a series of prepared samples. Turbidity values in most waterbodies rarely rise above 5 NTU. Values greater than 10 NTU indicate high suspended solids, often due to increased runoff, high inflow, construction activity, or severe microscopic algae blooms. Suspended solids include soil particles (clay, silt and sand), algae, and plankton. **Turbidity in the Main Basin was somewhat high, possibly indicative of a slight algae bloom or water turnover due to recent rainfall around the time of the sampling event. All other samples were at a desirable turbidity level.**

Total and fecal coliform bacteria can be understood as a series of concentric circles: the outermost ring of total coliform bacteria encompasses all forms; the next ring is fecal coliform



which is a sub-group of total coliform and is composed of many strains of bacteria commonly found in the intestines and feces of people and animals; the innermost ring is that of *E. coli* which is a specific strain of fecal coliform linked to causing illness in humans. Measuring fecal coliform allows for an indicator to the presence of human or animal waste inputs. Acceptable values for “swimmable waters” for fecal coliform bacteria is less than 235 organisms per 100 mL. Total coliform amounts are recommended to be zero for drinking water, but it is unclear at which amount they can be safely present in recreational lakes and ponds. The sources of coliform bacteria include: animal waste, wastewater runoff, agricultural runoff, soil, leaking septic tanks, and bacteria blooms. **All sampling stations had relatively high total coliform counts, but this is not unusual for Foster's Pond. All of the fecal coliform levels were within desirable thresholds with the highest value observed in Mill Reservoir. The extremely high fecal coliform levels observed in Mill Reservoir in 2023 did not reoccur this year.**

Dissolved Oxygen (DO) is very important in pond systems. Fish and other aquatic biota require adequate levels of oxygen, and DO affect many aspects of the water chemistry. Values below 3.0-5.0 mg/l are undesirable for most aquatic life; however, lower values are not uncommon near the sediment layer where oxygen demand is great and oxygen influx is at a minimum. Under extreme anoxic conditions (<1.0 mg/l), phosphorus can be released from the sediment and stimulate algal blooms. Under stratified conditions, which occur in deeper water bodies, anoxia can occur in a significant portion of the water column, possibly endangering fish populations, especially cold-water species. **Dissolved oxygen levels remained at typical levels and also showed an anoxic bottom of some of the sampling locations. This is typical of many water bodies.**

Conclusions and Recommendations

The native vegetation in Foster's Pond has reached a relatively stable state since the last whole pond treatment with fluridone in 2015. Based on the history of conditions and management at Foster's Pond, as well as the presence of invasive aquatic species, specifically fanwort, it is likely that problematic aquatic plant growth will continue in the future. Timely management will be required to maintain control of non-native species, fanwort and spiny naiad. It is highly recommended that the Foster's Pond Corporation continue early and late-season annual monitoring efforts to assess fanwort distribution and watch for potential new infestations of other invasive species, as many other invasive species are in nearby water bodies.

The herbicide treatments were very successful this season and only two locations (outside of the treatment areas) exhibited trace fanwort growth and were also showing signs of chlorosis. Due to the limited extent of fanwort at the end of the season, no herbicides treatments will be required in 2025. It may, however, be prudent to budget for some hand pulling as a contingency.

Fanwort control: We recommend to continue a balanced approach to managing fanwort: attempting with non-chemical controls where economically and logistically feasible and targeting with spot treatments specific infestations that are too large or too dense to be effectively controlled by other means. Eradicating small infestations as they emerge and are identified is the best way to minimize the need for whole-lake treatments.



Fanwort alternatives analysis: The Massachusetts Department of Conservation and Recreation (MA DCR) has provided guidance that considers alternative methods of controlling fanwort. MA DCR reviewed eradication and control options, including hand harvesting, suction harvesting, benthic barriers, water level drawdown, and herbicides. The Foster's Pond Corporation has experience with all of these methods, having long used drawdowns and having deployed divers for hand harvesting over the course of several years. The Corporation has also experimented with suction harvesting and benthic barriers. The Corporation's experience to date is consistent with the MA DCR alternatives analysis.

The Corporation has used winter drawdowns primarily to protect the Foster's Pond Dam from overtopping in potential spring-time flood events but secondarily to control nuisance vegetation. Due to the physical limitations of the 165-year-old dam, the Pond can only be lowered about 18 inches below the lip of the spillway. As a consequence, only the shallowest coves are exposed to freezing temperatures over the winter. While nuisance vegetation appears to be controlled in these coves, the geographic reach of the drawdown, as a weed management technique, is limited and is anticipated to continue to be. Moreover, with climate change, milder winters result in shorter and less severe intervals of freezing, which may render drawdowns a less effective control technique.

In 2019, the Corporation experimented for the first time with both diver-assisted suction harvesting (DASH) and hand harvesting by divers. DASH proved to be impractical in the conditions presented by Foster's Pond. There are no launch points to accommodate the large craft typically used for the necessary equipment. Even a small raft proved difficult to maneuver into position through the Pond's shallow channels. Moreover, as predicted by the MA DCR analysis, the Pond's thick and silty sediments instantly turned the water opaque, blinding the diver and making it impossible to see the target plants. The operation also resulted in a great deal of fragmentation, which could not be effectively controlled as the fragments interspersed with non-target vegetation. The 2019 DASH experiment was terminated, and divers were instead deployed to engage in hand-pulling.

Hand-pulling yielded mixed results in 2019 but proved more effective in 2020, perhaps due to the deployment of more experienced divers, greater selectivity in the target areas, and scheduling repetitive dives in the same areas on successive days. Diver hand-pulling was utilized again in 2021-2023, but mostly after the annual vegetation survey had been conducted, so the hand-pulling results could not be evaluated by the survey. A less systematic observation by the FPC concluded that divers had markedly reduced the concentration of fanwort in the areas they targeted (Dug Pond, Main Pond), but left behind significant numbers of plants. Moreover, the work proceeded more slowly than anticipated, and the divers exhausted their budget before clearing all the targeted areas. Hand-pulling, like DASH, increases the turbidity of the water, making it challenging for the diver to distinguish between target and non-target plants; diving in the same area on a later date allows sediments to settle, revealing plants that were missed on the first dive. Additionally, if fanwort is interspersed with lilies, the delicate fanwort stems entwine around the sturdier lily stems, making it impossible for divers to remove the fanwort root balls or stems without extensive fragmentation. The Foster's Pond Corporation's experience



has been consistent with the MA DCR alternatives analysis, which indicated that areas of more than a few hundred square feet, with more than 10 fanwort stems per 100 square feet, are not susceptible to effective control through hand-pulling.

Diver hand pulling may well be a viable technique, in Foster's Pond, to control small infestations and prevent at least some of them from spreading to the point that herbicidal treatment becomes necessary. Divers should consider deploying booms or other barriers to prevent fragments from dispersing.

Based on the MA DCR analysis, the Foster's Pond Corporation has determined not to attempt the use of large benthic barriers. Large barriers require significant time and effort to install, relocate and remove over the course of a season and have additional, negative impacts to other aquatic species present within the immediate area. The use of large barriers is not permitted under the current OOC.

The Foster's Pond Corporation has experimented over the course of three years with smaller scale benthic barriers, which are authorized by the OOC. During the 2018 season, the FPC and SOLitude coordinated the use of nine (9), small scale (5' x 5') benthic barriers within Foster's Pond on individual and/or small areas of fanwort growth that were observed later in the season outside of any treatment areas. The barriers proved difficult for the volunteers to install, as fanwort was detected in locations that were too deep and heavily silted for the volunteers to stand. The installation caused some fragmentation. The barriers were likewise difficult to remove, clean, and store in the fall. The results of this experiment could not conclusively be evaluated in 2019, as the barriers had been emplaced in areas that were treated in 2019 with Sonar (based on the 2018 vegetation survey) before fanwort emerged anywhere in the Pond. However, because it was evident when the barriers were positioned that they did not completely cover the infested areas, it was obvious that fanwort control would be unsatisfactory.

In 2019 and 2020, an effort was made to continue experimenting with the small barriers. It was time-consuming and difficult to locate suitable locations at which to deploy the barriers. The infestation needed to (1) be accessible from the shoreline, so that the barrier could be assembled on dry ground; (2) consist of just one or two plants that could be completely covered by the barrier; (3) be growing in water shallow enough for a volunteer to stand while carefully guiding the barrier into position; and (4) not be interspersed with lilies or other plants which would interfere with proper placement. Only two such locations were identified in 2019, and one in 2020. The barriers were successful at all sites but eliminated only a very small number of plants. Diving would likely have been quicker and as effective.

With respect to chemical alternatives, only two herbicides are currently approved for use in Massachusetts to manage fanwort infestations. Fluridone and Clipper (flumioxazin) are both registered by the Massachusetts Department of Agricultural Resources and authorized by the current OOC for Foster's Pond. Clipper has proven effective in spot-treating fanwort growth in Massachusetts lakes and ponds; however, the Department of Environmental Protection limits treatment to less than 25% of the total water body's acreage in one year, and a treated area may not be retreated for 3 years. Since Clipper is a contact herbicide, regrowth can be



expected in the year after treatment. Experience in other jurisdictions indicates that at least several years of consecutive treatment followed by periodic re-treatment are usually required to manage an infestation with Clipper. Given the current restrictions on the use of Clipper in Massachusetts and the past success of treatments with fluridone in Foster's Pond, addressing the re-growth using Clipper is not likely to provide a substantial benefit to Foster's Pond. We will continue to evaluate new technologies as they become available or re-visit options should regulatory restrictions change.

In the meantime, spot-treatment with granular or liquid Sonar remains the best alternative for controlling regrowth in future years. Based on this year's and past experience in Foster's Pond, it is anticipated that, if necessary, treating a limited number of acres on an ongoing basis will minimize the need for a whole-lake treatment in the immediate future. This allows less herbicide to be used at any one given time and provides a more financially feasible approach for the FPC.

Spiny naiad control: Spiny naiad is a late germinating species which spreads via seed production. Plants typically emerge in mid to late July from seeds dropped by plants in the previous year or two. A mid-July survey is necessary to assess growth and determine the extent requiring a spot-treatment. Multiple years of successful treatment can effectively reduce the viable seed bank. Small amounts of spiny naiad were observed in Foster's Pond in 2024. This hopefully is a result of continued management, however we cannot rule out other environmental conditions and so it will be important to remain vigilant and see if the trend continues.

As with past years, we again recommend that in 2025 the FPC conduct a survey focusing on the presence of spiny naiad and, to the extent treatable infestations are observed, proceed with a spot-treatment of those areas with diquat. Timely application would require securing Conservation Commission approval, and a DEP license, in advance for this contingency, as was done since 2017 (whether treatment ends up being necessary or not).

Spiny naiad alternatives analysis: According to NOAA's Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS), use of aquatic herbicides is the most effective method of controlling spiny naiad growth, especially as it relates to the infestation within Foster's Pond. Diquat and fluridone herbicides are two of the recommended aquatic herbicides that provide control of spiny naiad and are also included in the current OOC for Foster's Pond. Mechanical removal of spiny naiad is also possible (but not recommended), using a mechanical harvester or hydro-rake. However, spiny naiad is an incredibly brittle plant which spreads via fragmentation and thus mechanical removal may provide short-term relief but would likely increase the infestation within the pond overall. Benthic barriers are also a viable option, but as mentioned previously in regard to fanwort control, these are time consuming to manage while having non-target impacts. However, a smaller scale option may be more feasible within isolated areas of growth. The FPC and SOLitude will continue to assess the feasibility each year of utilizing smaller barriers where appropriate for spiny naiad growth and do so accordingly, if possible. To date, no spiny naiad growth has been applicable for this approach.



Algae control: Continued algal composition and density monitoring through the summer months is recommended as it allows for appropriately timed algaecide treatment(s) when necessary.

Based on the Watershed-Based Plan developed by Geosyntec for the FPC, we understand that overall phosphorus remains an extensive challenge within the surrounding watershed. To better understand the phosphorus loading, we recommend conducting in-pond sediment sampling to be analyzed for available phosphorus. By gaining this information, and utilizing the Watershed-Based Plan, we can develop the most effective in-water nutrient management plan to correlate with the watershed plan.

Based on the in-lake sediment phosphorus analysis, SOLitude can work with the FPC to align nutrient management techniques with their goals. Management of phosphorus within the pond, among other nutrients, will likely limit algal growth. Using various management techniques together can prevent excessive algae growth, potential health hazards and associated waterbody closures from state agencies.

Copper-based algaecides effectively manage an active algae bloom; however, an algaecide treatment is merely controlling the symptom of excessive nutrients present within Foster's Pond. Low-dose alum treatments have proven to be effective in reduction of nutrients, specifically phosphorus, while limiting the need for conducting copper-algaecide treatments. Ultimately, by reducing the phosphorus readily available for uptake by algae, the frequency and severity of algal blooms is also reduced. Annual, low-dose alum treatments have been found to have cumulative effects on reducing iron-bound phosphorus released from sediments during anoxic times. Prior to any alum treatment implementation, a detailed plan would need to be established. Higher dose alum treatments are also available as an option for Foster's Pond; however, we recommend conducting more in-lake phosphorus sampling before proceeding with any alum treatments.

SeClear is another available product that combines algaecide properties with a phosphorus reducing agent. SeClear will not reduce the available phosphorus levels as significantly as alum would, but it could be a viable alternative to conducting copper sulfate treatments. A SeClear treatment would carry a cost in between that of traditional copper sulfate treatments and a low-dose alum treatment, while potentially reducing phosphorus levels enough to minimize the potential for subsequent blooms later in the season.

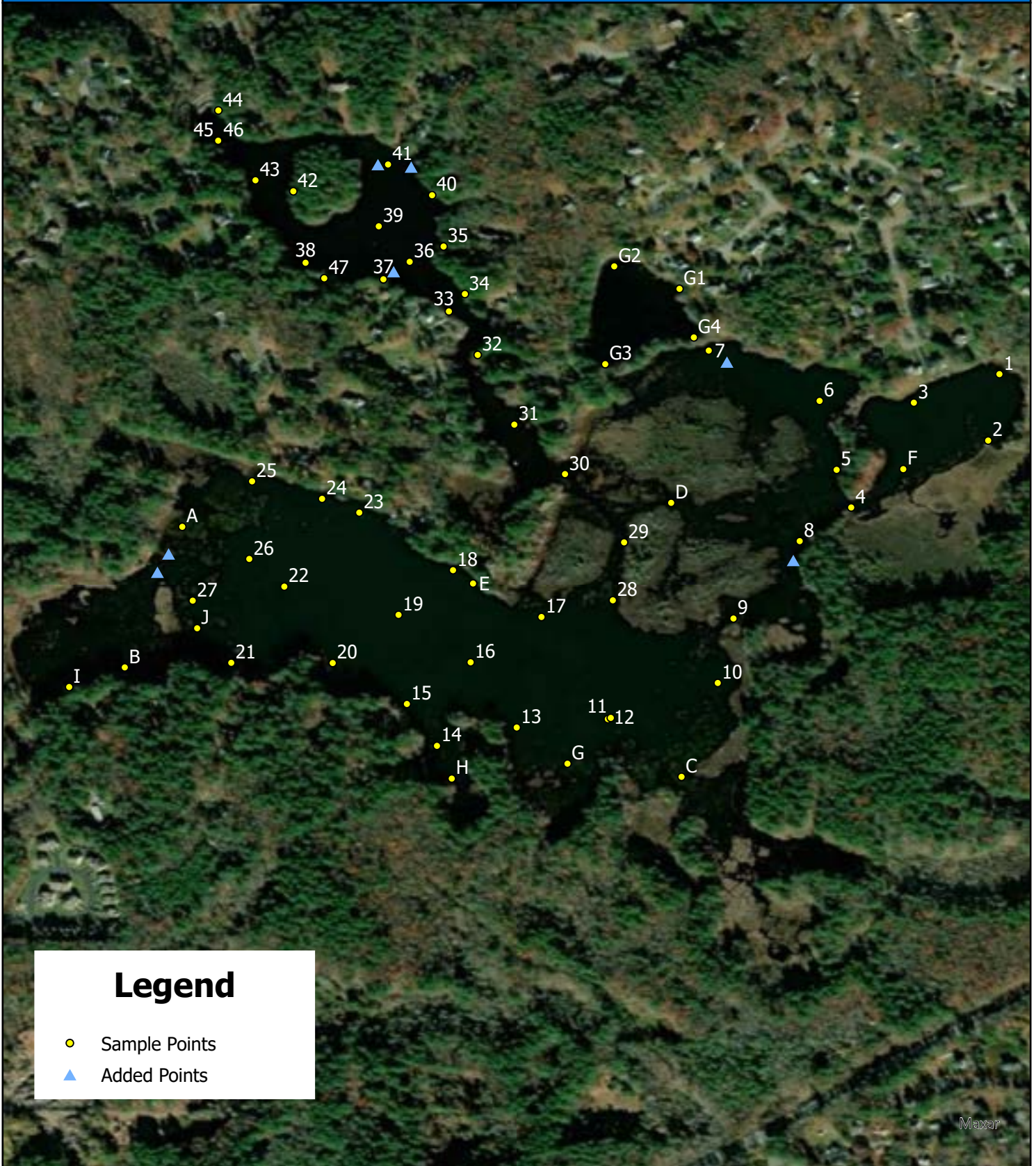
Thank you for your continued collaboration with SOLitude Lake Management. We look forward to working with you again in 2025.



Attachments

- Figure 1: Survey Data Points
- Figure 2: 2024 Fanwort Treatment Areas Map
- Figure 3: Fanwort Observation Map (August 2024)
- Figure 4: Spiny Naiad Observation Map (August 2024)
- Figure 5: Purple Loosestrife Observations (August 2024)
- Figure 6: Native Plant Assemblage (August 2024)
- Table 5: 2024 Aquatic Plant Survey Field Data Table
- Temperature and Dissolved Oxygen Readings Table
- Water Quality Laboratory Reports
- Northeast Laboratories Algae and Cyanobacteria Reports
- FasTEST Lab Reports

Figure 1. 2024 Survey Data Points



Legend

- Sample Points
- ▲ Added Points

Fosters Pond
Andover, Massachusetts

Center: 71°8'13"W 42°36'25"N
Scale: 1:8,236

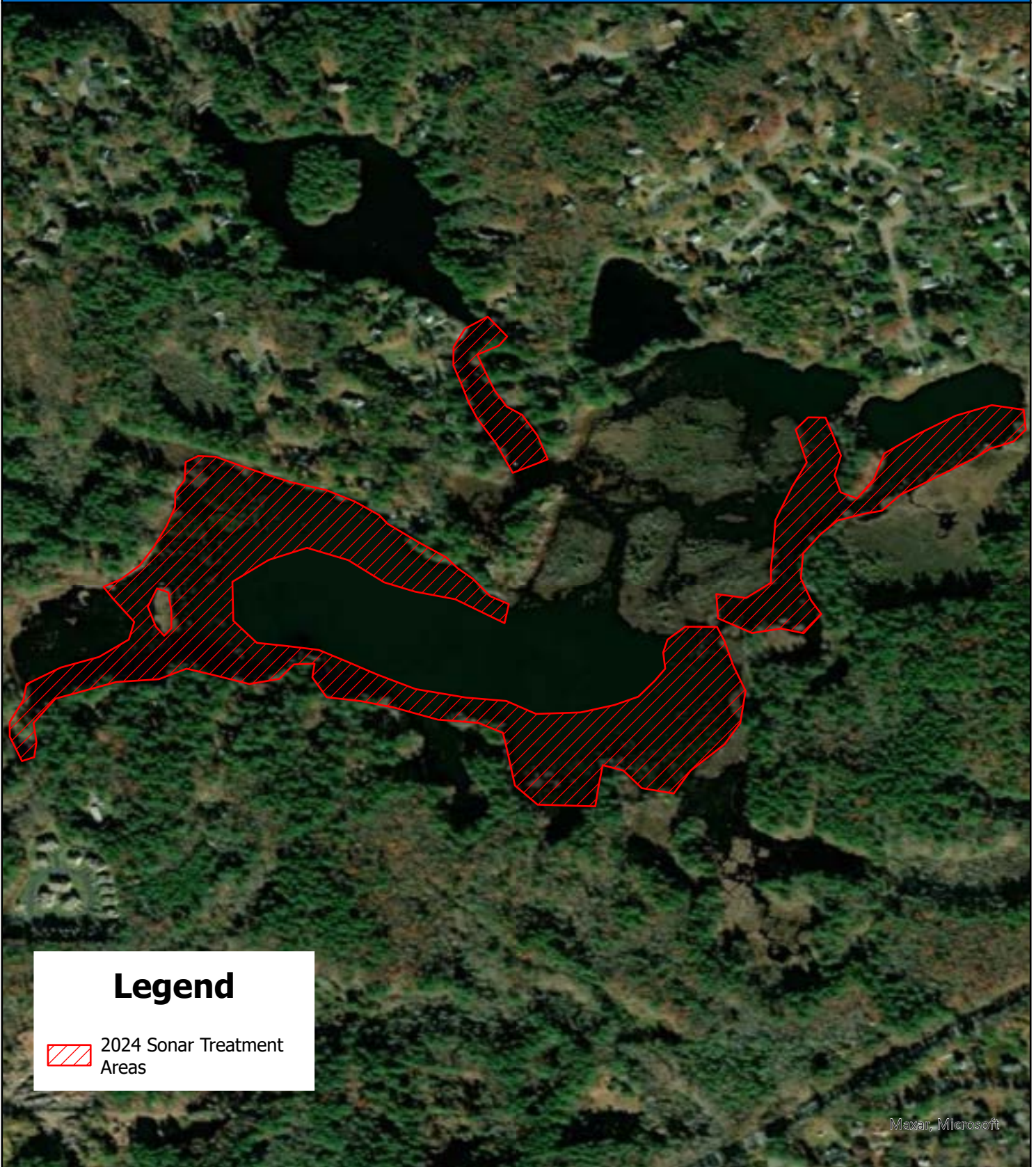


FOSTER'S POND


0 250 500 1,000
Feet

Survey Date: 08/20/24
Map Date: 08/27/24
Prepared by: E. Vulgamore
Office: SHREWSBURY, MA

Figure 2. 2024 Fanwort Treatment Areas




Legend


 2024 Sonar Treatment Areas

Fosters Pond
Andover, Massachusetts

Center: 71°8'13"W 42°36'25"N
Scale: 1:8,236

N


FOSTER'S POND


0 250 500 1,000
 Feet

Survey Date: 08/20/24
Map Date: 08/27/24
Prepared by: E. Vulgamore
Office: SHREWSBURY, MA



Legend


Fanwort Density

 Trace


Maxar, Microsoft

Fosters Pond
Andover, Massachusetts

Center: 71°8'13"W 42°36'25"N
Scale: 1:8,236

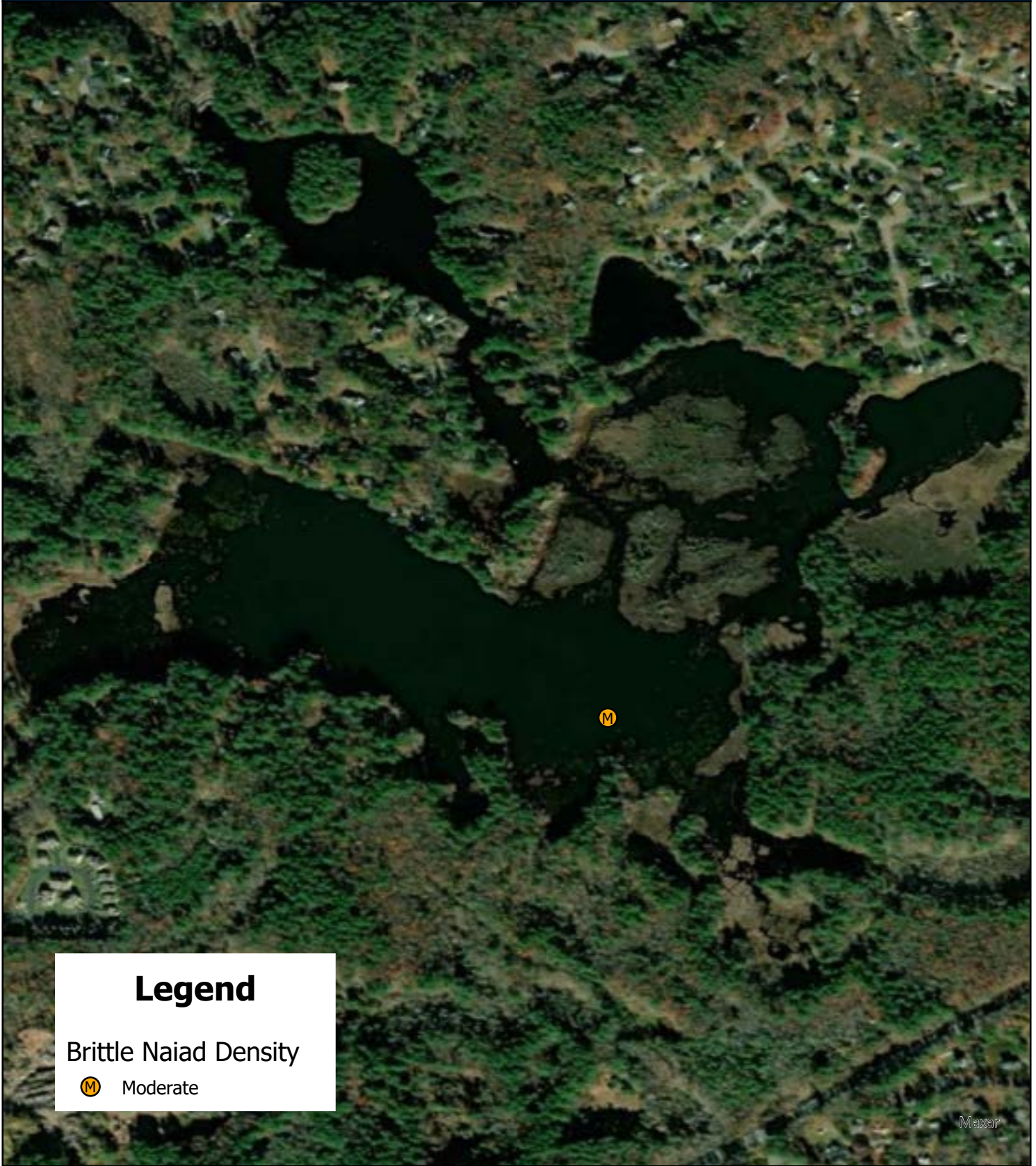


FOSTER'S POND

0 250 500 1,000
 Feet


Survey Date: 08/20/24
Map Date: 08/27/24
Prepared by: E. Vulgamore
Office: SHREWSBURY, MA

Figure 4. 2024 Vegetation Survey - Brittle Naiad Density and Distribution




Legend

Brittle Naiad Density


 Moderate

Fosters Pond
Andover, Massachusetts

Center: 71°8'13"W 42°36'25"N
Scale: 1:8,236

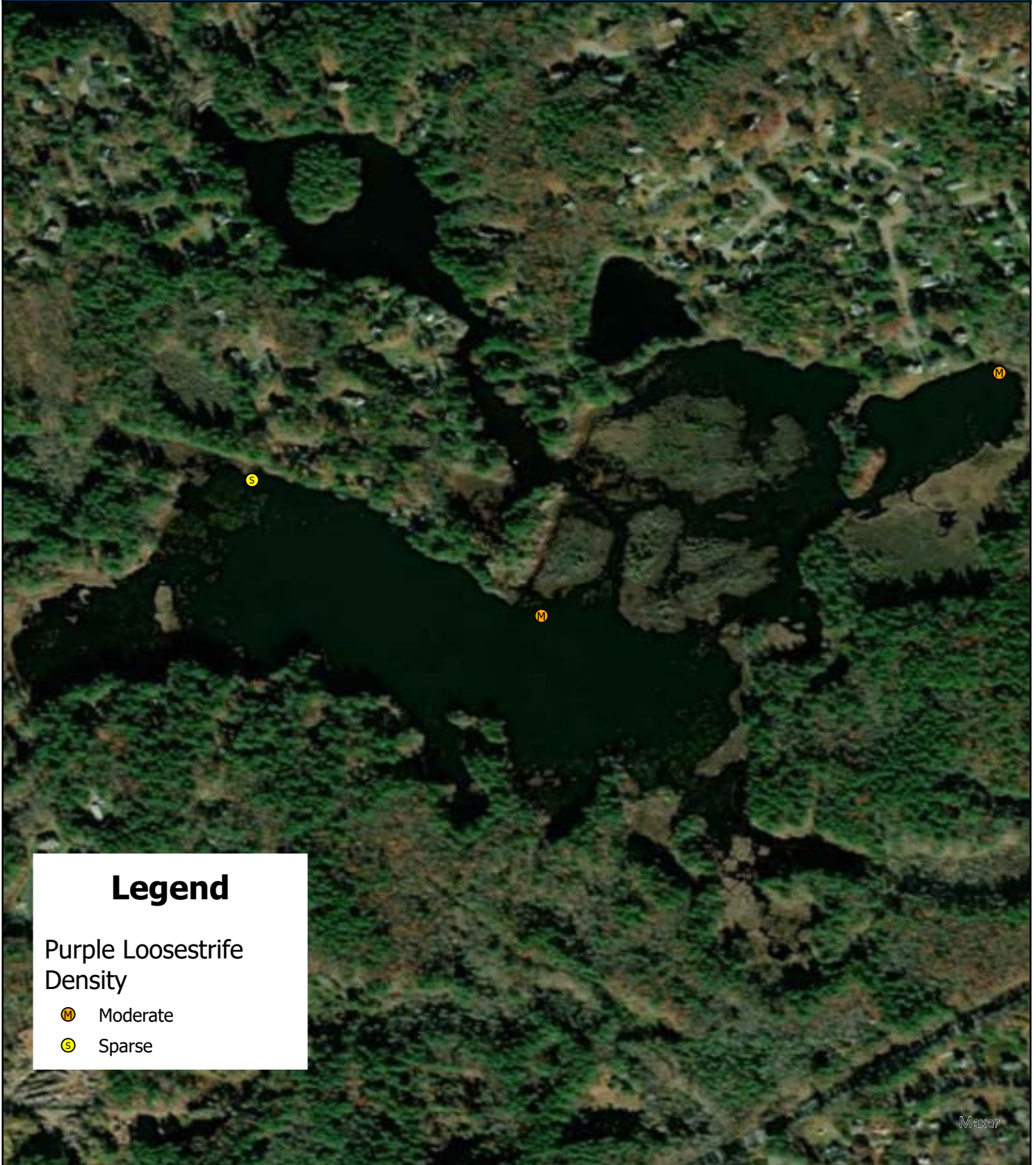


FOSTER'S POND

0 250 500 1,000
 Feet

Survey Date: 08/20/24
Map Date: 08/27/24
Prepared by: E. Vulgamore
Office: SHREWSBURY, MA

Figure 5. 2024 Vegetation Survey - Purple Loosestrife Distribution and Density



Legend


Purple Loosestrife
Density

- M Moderate
- S Sparse

Maxar


Fosters Pond
Andover, Massachusetts

Center: 71°8'13"W 42°36'25"N
Scale: 1:8,236



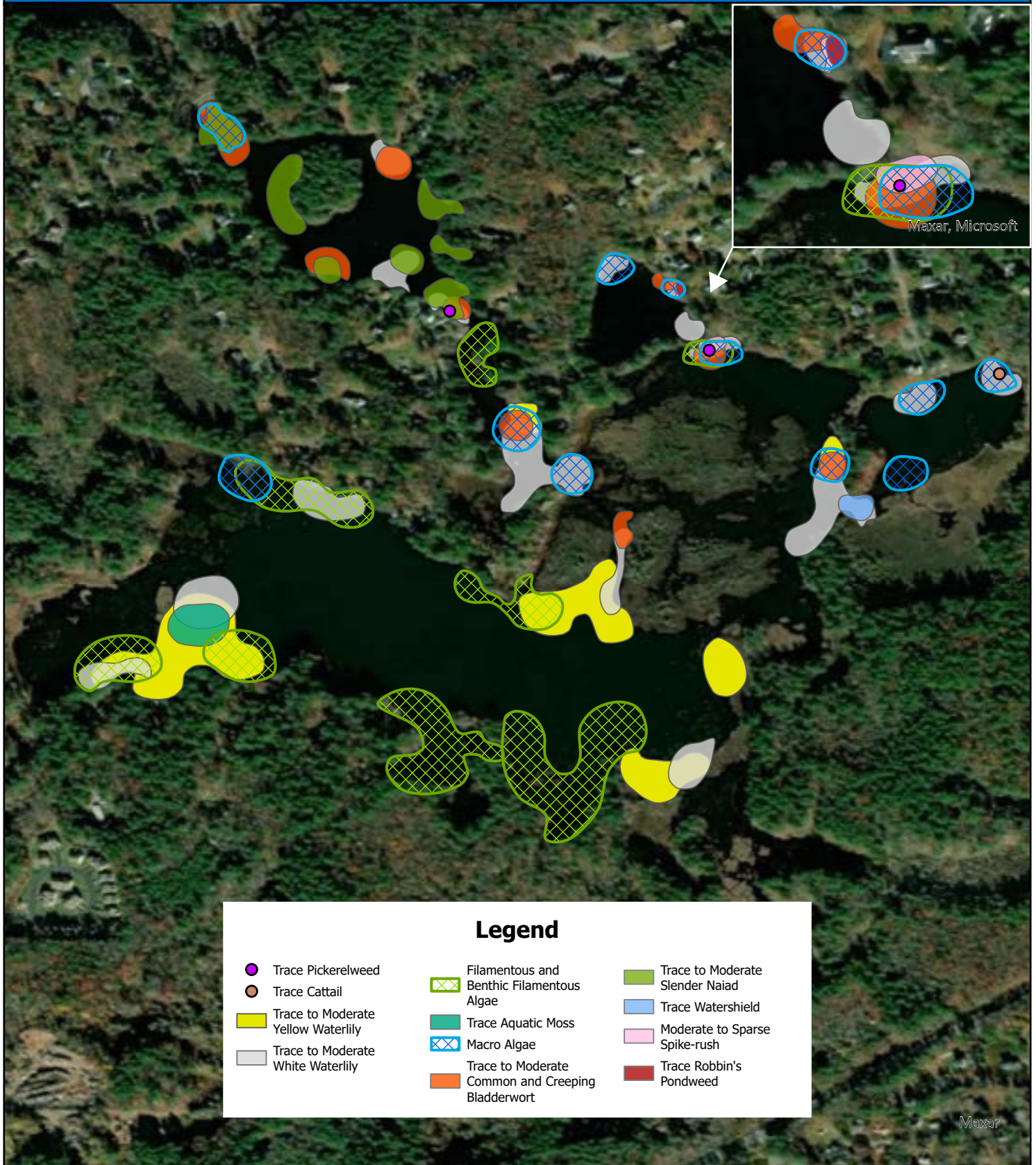
FOSTER'S POND

0 250 500 1,000
Feet



Survey Date: 08/20/24
Map Date: 10/16/24
Prepared by: E. Vulgamore
Office: SHREWSBURY, MA

Figure 6. 2024 Vegetation Survey - Native Vegetation



Fosters Pond
Andover, Massachusetts
Center: 71°8'13"W 42°36'25"N
Scale: 1:8,236



FOSTER'S POND
0 250 500 1,000
Feet

Survey Date: 08/20/24
Map Date: 10/16/24
Prepared by: E. Vulgamore
Office: SHREWSBURY, MA

Table 5: 2024 Aquatic Plant Survey Field Data Table

Data Point	% Total Plant Cover	% Fanwort Cover	Biomass index	Species Richness index	<i>Cabomba caroliniana</i> (Fanwort)	<i>Nymphaea odorata</i> (White waterlily)	<i>Nuphar variegata</i> (Yellow waterlily)	<i>Utricularia</i> sp. (Bladderwort)	<i>Najas minor</i> (Spiny naiad)	<i>Najas flexilis</i> (Slender naiad)	Benthic filamentous algae	Filamentous algae	Macroalgae (<i>Nitella</i> sp. & <i>Chara</i> sp.)	<i>Ludwigia</i> sp. (Water primrose)	<i>Eleocharis</i> sp. (Spikerush)	<i>Potamogeton robbinsii</i> (Robbins's pondweed)	<i>Brasenia schreberii</i> (Watershield)	<i>Fontinalis</i> sp. (water moss)	<i>Potamogeton pulcher</i> (Spotted pondweed)
1	40	0	4	2		T							S						
2	0	0	0	0															
3	15	0	4	2		T							T						
4	30	0	4	2		S											T		
5	80	0	4	4		S	S	S					D						
6	0	0	0	0															
7	80	10	4	7	T	S		M				X	M	T	M				
8	20	0	4	1			S												
9	0	0	0	0															
10	20	0	4	1			T												
11	0	0	0	1							X								
12	0	0	0	1							X								
13	0	0	0	1							X								
14	0	0	0	1							X								
15	0	0	0	1							X								
16	0	0	0	0															
17	15	0	4	2			S				X								
18	0	0	0	1							X								
19	0	0	0	0															
20	0	0	0	0															
21	10	0	4	2			S				X								
22	0	0	0	0															
23	0	0	0	1							X								
24	5	0	4	2		T					X								
25	15	0	4	2							X		S						
26	0	0	0	0															
27	15	0	4	1		S													
28	25	0	4	2		T	T												
29	25	0	4	2		T		T											
30	50	0	4	2		M							S						
31	50	0	4	5		M	S	S			X		M						
32	0	0	0	1							X								
33	65	0	4	3		T		T		M									
34	10	0	1	1						T									
35	70	0	2	2				T		M									
36	30	0	4	2		S				T									
37	75	0	4	1		M													
38	0	0	0	0															
39	0	0	0	0															
40	70	0	3	1						M									
41	80	0	4	3		S		T											S
42	60	0	1	1						M									
43	0	0	0	0															
44	30	5	3	3	T			T		S									
45	65	0	3	3				M		M			S						
46				0															
47	100	0	4	3		S		S		M									
A	0	0	0	0															
B	40	0	4	3		S	M				X								
C	30	0	4	2		S	T												
D	0	0	0	0															
E	0	0	0	1							X								
F	0	0	0	1									T						

LEGEND
T = Trace
S = Sparse
M = Moderate
D = Dense
X = Present

Azalea			Dug Pond		
Depth	Temp (c)	DO (mg/L)	Depth	Temp (c)	DO (mg/L)
SW	22.50	6.76	SW	24.00	8.30
1	22.83	6.32	1	24.10	8.25
2	22.88	6.25	2	24.16	8.21
3	22.88	6.21	3	24.22	8.21
4	22.94	6.19	4	24.22	8.18
5	22.88	6.18	5	24.22	8.19
6	22.83	6.01	6	24.22	8.18
7	22.27	4.10	7	24.16	8.12
8	21.22	1.84	8	24.16	8.08
9	20.05	0.63	9	24.16	8.03
Time: 3:00pm	Secchi: 7' 3"		10	24.11	7.84
			11	24.11	7.72
			12	24.11	7.62
			13	24.05	7.55
			14	24.00	6.01
			Time: 2:40pm	Secchi: 8' 9"	
Outlet			Main Basin		
Depth	Temp (c)	DO (mg/L)	Depth	Temp (c)	DO (mg/L)
SW	22.61	4.91	SW	23.16	5.91
1	22.61	4.87	1	23.16	5.88
2	22.61	4.8	2	23.16	5.85
3	22.55	4.64	3	23.16	5.81
4	22.55	4.35	4	23.16	5.79
5	22.50	4.28	5	23.16	5.75
6	22.50	4.01	6	23.16	5.70
Time: 12:25pm	Secchi: 4' 7"		7	23.16	5.68
			8	23.16	5.67
			9	23.16	5.65
			10	22.22	4.05
			Time: 11:30am	Secchi: 3' 11"	
Mill Reservoir					
Depth	Temp (c)	DO (mg/L)			
SW	23.00	8.93			
1	23.11	8.89			
2	22.94	8.98			
3	22.77	9.03			
4	22.38	8.01			
5	22.05	7.21			
6	21.66	5.12			
7	20.72	3.02			
8	18.94	1.33			
9	17.44	1.18			
10	15.27	0.81			
Time: 1:15pm	Secchi: 5' 6"				



ANALYTICAL REPORT

Lab Number:	L2447486
Client:	Solitude Lake Management, LLC 590 Lake Street Shrewsbury, MA 01545
ATTN:	Serena Bet
Phone:	(508) 865-1000
Project Name:	FOSTER'S POND
Project Number:	Not Specified
Report Date:	08/27/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930A1).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2447486-01	OUTLET	WATER	ANDOVER, MA	08/20/24 12:25	08/20/24
L2447486-02	MILL RES	WATER	ANDOVER, MA	08/20/24 13:15	08/20/24
L2447486-03	DUG POND	WATER	ANDOVER, MA	08/20/24 14:40	08/20/24
L2447486-04	MAIN POND	WATER	ANDOVER, MA	08/20/24 11:30	08/20/24
L2447486-05	AZALEA DRIVE	WATER	ANDOVER, MA	08/20/24 15:00	08/20/24

Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments and solids are reported on a dry weight basis unless otherwise noted. Tissues are reported "as received" or on a wet weight basis, unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

Case Narrative (continued)

Sample Receipt

The samples were received at the laboratory above the required temperature range. The samples were delivered directly from the sampling site but were not on ice.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Melissa Sturgis

Title: Technical Director/Representative

Date: 08/27/24

INORGANICS & MISCELLANEOUS

Project Name: FOSTER'S POND

Project Number: Not Specified

Lab Number: L2447486

Report Date: 08/27/24

SAMPLE RESULTS

Lab ID: L2447486-01
 Client ID: OUTLET
 Sample Location: ANDOVER, MA

Date Collected: 08/20/24 12:25
 Date Received: 08/20/24
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Total (MPN)	6127		MPN/100ml	100	NA	100	-	08/20/24 18:51	121,9223B	JRG
Coliform, Fecal (MF)	5.0		col/100ml	2.0	NA	2	-	08/20/24 18:58	121,9222D	MEF
General Chemistry - Westborough Lab										
Turbidity	3.2		NTU	0.20	--	1	-	08/21/24 04:00	44,180.1	CAR
Color, True	37		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Color, Apparent	41		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Alkalinity, Total	29.5		mg CaCO3/L	2.00	NA	1	-	08/23/24 15:35	121,2320B	MRM
pH (H)	7.07		SU	-	NA	1	-	08/20/24 22:42	121,4500H+-B	AAS
Phosphorus, Total	0.025		mg/l	0.010	--	1	08/26/24 11:53	08/26/24 15:06	121,4500P-E	MEF



Project Name: FOSTER'S POND

Lab Number: L2447486

Project Number: Not Specified

Report Date: 08/27/24

SAMPLE RESULTS

Lab ID: L2447486-02

Date Collected: 08/20/24 13:15

Client ID: MILL RES

Date Received: 08/20/24

Sample Location: ANDOVER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Total (MPN)	13344		MPN/100ml	100	NA	100	-	08/20/24 18:51	121,9223B	JRG
Coliform, Fecal (MF)	210		col/100ml	10	NA	10	-	08/20/24 18:58	121,9222D	MEF
General Chemistry - Westborough Lab										
Turbidity	1.9		NTU	0.20	--	1	-	08/21/24 04:00	44,180.1	CAR
Color, True	26		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Color, Apparent	32		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Alkalinity, Total	32.0		mg CaCO3/L	2.00	NA	1	-	08/23/24 15:37	121,2320B	MRM
pH (H)	7.09		SU	-	NA	1	-	08/20/24 22:42	121,4500H+-B	AAS
Phosphorus, Total	0.016		mg/l	0.010	--	1	08/26/24 11:53	08/26/24 15:07	121,4500P-E	MEF



Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

SAMPLE RESULTS

Lab ID: L2447486-03
Client ID: DUG POND
Sample Location: ANDOVER, MA

Date Collected: 08/20/24 14:40
Date Received: 08/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Total (MPN)	1553.12		MPN/100ml	1	NA	1	-	08/20/24 18:51	121,9223B	JRG
Coliform, Fecal (MF)	31		col/100ml	2.0	NA	2	-	08/20/24 18:58	121,9222D	MEF
General Chemistry - Westborough Lab										
Turbidity	1.0		NTU	0.20	--	1	-	08/21/24 04:00	44,180.1	CAR
Color, True	6.0		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Color, Apparent	10		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Alkalinity, Total	21.0		mg CaCO3/L	2.00	NA	1	-	08/23/24 15:38	121,2320B	MRM
pH (H)	7.05		SU	-	NA	1	-	08/20/24 22:42	121,4500H+-B	AAS
Phosphorus, Total	ND		mg/l	0.010	--	1	08/26/24 11:53	08/26/24 15:08	121,4500P-E	MEF



Project Name: FOSTER'S POND

Lab Number: L2447486

Project Number: Not Specified

Report Date: 08/27/24

SAMPLE RESULTS

Lab ID: L2447486-04

Date Collected: 08/20/24 11:30

Client ID: MAIN POND

Date Received: 08/20/24

Sample Location: ANDOVER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Total (MPN)	1299.65		MPN/100ml	1	NA	1	-	08/20/24 18:51	121,9223B	JRG
Coliform, Fecal (MF)	33		col/100ml	2.0	NA	2	-	08/20/24 18:58	121,9222D	MEF
General Chemistry - Westborough Lab										
Turbidity	5.4		NTU	0.20	--	1	-	08/21/24 04:00	44,180.1	CAR
Color, True	34		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Color, Apparent	39		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Alkalinity, Total	31.0		mg CaCO3/L	2.00	NA	1	-	08/23/24 15:40	121,2320B	MRM
pH (H)	6.97		SU	-	NA	1	-	08/20/24 22:42	121,4500H+-B	AAS
Phosphorus, Total	0.043		mg/l	0.010	--	1	08/26/24 11:53	08/26/24 15:11	121,4500P-E	MEF

Project Name: FOSTER'S POND

Lab Number: L2447486

Project Number: Not Specified

Report Date: 08/27/24

SAMPLE RESULTS

Lab ID: L2447486-05
 Client ID: AZALEA DRIVE
 Sample Location: ANDOVER, MA

Date Collected: 08/20/24 15:00
 Date Received: 08/20/24
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Total (MPN)	3839		MPN/100ml	100	NA	100	-	08/20/24 18:51	121,9223B	JRG
Coliform, Fecal (MF)	82		col/100ml	2.0	NA	2	-	08/20/24 18:58	121,9222D	MEF
General Chemistry - Westborough Lab										
Turbidity	0.83		NTU	0.20	--	1	-	08/21/24 04:00	44,180.1	CAR
Color, True	27		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Color, Apparent	32		A.P.C.U.	5.0	--	1	-	08/20/24 23:36	121,2120B	AAS
Alkalinity, Total	28.6		mg CaCO3/L	2.00	NA	1	-	08/23/24 15:42	121,2320B	MRM
pH (H)	6.89		SU	-	NA	1	-	08/20/24 22:42	121,4500H+-B	AAS
Phosphorus, Total	0.013		mg/l	0.010	--	1	08/26/24 11:53	08/26/24 15:12	121,4500P-E	MEF



Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-05 Batch: WG1961716-1										
Coliform, Total (MPN)	<1		MPN/100ml	1	NA	1	-	08/20/24 18:51	121,9223B	JRG
Microbiological Analysis - Westborough Lab for sample(s): 01-05 Batch: WG1961719-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	08/20/24 18:58	121,9222D	MEF
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1961828-1										
Turbidity	ND		NTU	0.20	--	1	-	08/21/24 04:00	44,180.1	CAR
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1963169-1										
Alkalinity, Total	ND		mg CaCO3/L	2.00	NA	1	-	08/23/24 14:12	121,2320B	MRM
General Chemistry - Westborough Lab for sample(s): 01-05 Batch: WG1963720-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	08/26/24 11:53	08/26/24 14:48	121,4500P-E	MEF

Lab Control Sample Analysis

Batch Quality Control

Project Name: FOSTER'S POND

Lab Number: L2447486

Project Number: Not Specified

Report Date: 08/27/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1961779-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1961828-2								
Turbidity	104		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1963169-2								
Alkalinity, Total	103		-		90-110	-		10
General Chemistry - Westborough Lab Associated sample(s): 01-05 Batch: WG1963720-2								
Phosphorus, Total	96		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: FOSTER'S POND

Lab Number: L2447486

Project Number: Not Specified

Report Date: 08/27/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1963169-4 QC Sample: L2447388-01 Client ID: MS Sample												
Alkalinity, Total	325	500	949	125	Q	-	-		86-116	-		10
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1963720-4 QC Sample: L2447275-01 Client ID: MS Sample												
Phosphorus, Total	ND	0.5	0.491	98		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: FOSTER'S POND

Project Number: Not Specified

Lab Number: L2447486

Report Date: 08/27/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1961779-2 QC Sample: L2447121-01 Client ID: DUP Sample						
pH	6.39	6.27	SU	2		5
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1961795-1 QC Sample: L2447486-05 Client ID: AZALEA DRIVE						
Color, Apparent	32	33	A.P.C.U.	3		
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1961796-1 QC Sample: L2447486-05 Client ID: AZALEA DRIVE						
Color, True	27	27	A.P.C.U.	0		
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1961828-3 QC Sample: L2447486-01 Client ID: OUTLET						
Turbidity	3.2	3.5	NTU	9		13
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1963169-3 QC Sample: L2447388-01 Client ID: DUP Sample						
Alkalinity, Total	325	327	mg CaCO3/L	1		10
General Chemistry - Westborough Lab Associated sample(s): 01-05 QC Batch ID: WG1963720-3 QC Sample: L2447275-01 Client ID: DUP Sample						
Phosphorus, Total	ND	ND	mg/l	NC		20

Project Name: FOSTER'S POND**Lab Number:** L2447486**Project Number:** Not Specified**Report Date:** 08/27/24**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2447486-01A	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-01B	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-01C	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-01D	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-01E	Plastic 250ml unpreserved	A	7	7	10.5	Y	Absent		TURB-180(2),PH-4500(.01)
L2447486-01F	Plastic 250ml unpreserved/No Headspace	A	NA		10.5	Y	Absent		ALK-T-2320(14)
L2447486-01G	Amber 500ml unpreserved	A	7	7	10.5	Y	Absent		COLOR-T-2120(2),COLOR-A-2120(2)
L2447486-01H	Plastic 250ml H2SO4 preserved	A	<2	<2	10.5	Y	Absent		TPHOS-4500(28)
L2447486-02A	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		T-COLI-QT(.33),F-COLI-MF(.33)
L2447486-02B	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		T-COLI-QT(.33),F-COLI-MF(.33)
L2447486-02C	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		T-COLI-QT(.33),F-COLI-MF(.33)
L2447486-02D	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		T-COLI-QT(.33),F-COLI-MF(.33)
L2447486-02E	Plastic 250ml unpreserved	A	7	7	10.5	Y	Absent		TURB-180(2),PH-4500(.01)
L2447486-02F	Plastic 250ml unpreserved/No Headspace	A	NA		10.5	Y	Absent		ALK-T-2320(14)
L2447486-02G	Amber 500ml unpreserved	A	7	7	10.5	Y	Absent		COLOR-T-2120(2),COLOR-A-2120(2)
L2447486-02H	Plastic 500ml H2SO4 preserved	A	<2	<2	10.5	Y	Absent		TPHOS-4500(28)
L2447486-03A	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-03B	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-03C	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-03D	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-03E	Plastic 250ml unpreserved	A	7	7	10.5	Y	Absent		TURB-180(2),PH-4500(.01)
L2447486-03F	Plastic 250ml unpreserved/No Headspace	A	NA		10.5	Y	Absent		ALK-T-2320(14)
L2447486-03G	Amber 500ml unpreserved	A	7	7	10.5	Y	Absent		COLOR-T-2120(2),COLOR-A-2120(2)

Project Name: FOSTER'S POND**Lab Number:** L2447486**Project Number:** Not Specified**Report Date:** 08/27/24**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2447486-03H	Plastic 500ml H2SO4 preserved	A	<2	<2	10.5	Y	Absent		TPHOS-4500(28)
L2447486-04A	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-04B	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-04C	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-04D	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-04E	Plastic 250ml unpreserved	A	7	7	10.5	Y	Absent		TURB-180(2),PH-4500(.01)
L2447486-04F	Plastic 250ml unpreserved/No Headspace	A	NA		10.5	Y	Absent		ALK-T-2320(14)
L2447486-04G	Amber 500ml unpreserved	A	7	7	10.5	Y	Absent		COLOR-T-2120(2),COLOR-A-2120(2)
L2447486-04H	Plastic 500ml H2SO4 preserved	A	<2	<2	10.5	Y	Absent		TPHOS-4500(28)
L2447486-05A	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-05B	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-05C	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-05D	Bacteria Cup Na2S2O3 preserved	A	NA		10.5	Y	Absent		F-COLI-MF(.33),T-COLI-QT(.33)
L2447486-05E	Plastic 250ml unpreserved	A	7	7	10.5	Y	Absent		TURB-180(2),PH-4500(.01)
L2447486-05F	Plastic 250ml unpreserved/No Headspace	A	NA		10.5	Y	Absent		ALK-T-2320(14)
L2447486-05G	Amber 500ml unpreserved	A	7	7	10.5	Y	Absent		COLOR-T-2120(2),COLOR-A-2120(2)
L2447486-05H	Plastic 500ml H2SO4 preserved	A	<2	<2	10.5	Y	Absent		TPHOS-4500(28)

Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report



Project Name: FOSTER'S POND
Project Number: Not Specified

Lab Number: L2447486
Report Date: 08/27/24

Data Qualifiers

- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: FOSTER'S POND

Lab Number: L2447486

Project Number: Not Specified

Report Date: 08/27/24

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625.1: alpha-Terpineol

EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol, Azobenzene; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Nonpotable Water: EPA RSK-175 Dissolved Gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables).

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE _____ OF _____

Date Rec'd in Lab: 8/20/24

8 Walkup Drive
 Westboro, MA 01581
 Tel: 508-898-9220

320 Forbes Blvd
 Mansfield, MA 02048
 Tel: 508-822-9300

Project Information

Project Name: Foster's Pond

Project Location: Andover MA

Project #:

Project Manager:

ALPHA Quote #:

Report Information - Data Deliverable

ADEX EMAIL

Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

- Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program _____ Criteria _____

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Client Information

Client: Solitude Lake Mgmt

Address: 590 Lake Street
Shrewsbury MA

Phone:

Email: Serena.Det@SolitudeLake.com

Additional Project Information:

ANALYSIS	SAMPLE INFO
VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	Filtration
SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	<input type="checkbox"/> Field
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	<input type="checkbox"/> Lab to do
METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8	Preservation
EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> Lab to do
VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	
<input type="checkbox"/> PCB <input type="checkbox"/> PEST	
TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	
<u>TPHs-4500</u>	
<u>T Coli-CF - Coli-MF</u>	
<u>AKT</u>	
<u>PH TMB</u>	
<u>Color A Color-T</u>	
	Sample Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
47486-01	Outlet	8/20/24	12:25	SW	KF/SB
02	Mill Res	8/20/24	1:15	SW	KF/SB
03	Dug Pond	8/20/24	2:40	SW	KF/SB
04	Main Pond	8/20/24	11:30	SW	KF/SB
05	AZALEA DRIVE	8/20/24	3:00	SW	KF/SB

Container Type

- P= Plastic
- A= Amber glass
- V= Vial
- G= Glass
- B= Bacteria cup
- C= Cube
- O= Other
- E= Encore
- D= BOD Bottle

Preservative

- A= None
- B= HCl
- C= HNO₃
- D= H₂SO₄
- E= NaOH
- F= MeOH
- G= NaHSO₄
- H= Na₂S₂O₅
- I= Ascorbic Acid
- J= NH₄Cl
- K= Zn Acetate
- O= Other

Container Type

Preservative

-Relinquished By:

Kristi Van

Date/Time

8/20/24 5:00

Received By:

lyli

Date/Time

8/20/24 1700

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

SOLitude Lake Management
590 Lake Street
Shrewsbury, MA 01545

Date Received: 08/26/2024

Laboratory ID#: N2494508-01

Date Tested: 08/29/2024

Report Date: 08/29/2024

Cyanobacteria and Expanded Algae Species Identification

Sample Site: Fosters Pond– Main Pond, Andover, MA

Date and Time Collected: 08/20/2024 10:45

Commonly Noted Cyanobacteria:	
Anabaena	5,100
Aphanizomenon	
Aphanocapsa	190
Aphanothece	
Cuspidothrix	
Microcystis	
Oscillatoria	
Pseudanabaena	55,000
Snowella	
Spirulina	
Synechococcus	17,000

Commonly Noted Algae Species	
Asterionella	120
Ceratrium	
Diatoma	
Dinobryon	790
Fragilaria	
Navicula	
Nitzchia	29
Pediastrum	
Selenastrum	
Staurastrum	
Staurodesmus	38
Synedra	190
Tabellaria	

Additional Cyanobacteria Observed (if any):	

Additional Algae Species Observed (if any):	
Monoraphidium	96
Scenedesmus	58
Tetrastrum	19

Cyanobacteria Cell Count (/mL)	77,000
Other Algae Species Cell Count (/mL)	1,300
Total Cell Count (/mL)	78,000

Comments:

- Results are based on the sample as received by Northeast Laboratories, Inc. on 08/26/2024.
- Due to the nature of the test procedure, all total cell counts are estimates rounded to the nearest two numerical, non-zero digits (two significant figures). The total cell count is determined by the addition of all individual species, not the addition of the rounded cyanobacteria and other species totals.

Approved by: 

Alan C. Johnson, Laboratory Director

30 Cold Spring Rd. Rocky Hill, CT 06067

www.nelabsct.com Telephone: 860-828-9787

CT Cert. #PH-0404 EPA Cert. #CT-024 FDA Reg. #086650488 ACTL.0000004



SePRO Lab

Water Diagnostics for Lakes & Ponds

FastEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC13258

Customer Contact Information

Company Name: SOLitude Lake Management	Contact Person: Serena Bet
Address: 1320 Brookwood Drive, Ste. H Little Rock, AR 72202	E-mail Address: serena.bet@solitudelake.com
	Phone: 508.885.0101

Waterbody Information

Waterbody:	Fosters Pond - MA
Waterbody size:	120
Depth Average:	4.5

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM52708-1	West	Sonar/fluridone (ug/L)	FAST 10	2.2	05/22/2024
CTM52709-1	Mid	Sonar/fluridone (ug/L)	FAST 10	<1	05/22/2024
CTM52710-1	East	Sonar/fluridone (ug/L)	FAST 10	2.2	05/22/2024

ANALYSIS STATEMENTS:

SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Laboratory Information

Date / Time Received: 05/30/24 12:00 PM

Date Results Sent: Friday, May 31, 2024

Disclaimer: The results listed within this Laboratory Report relate only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its

client. This report shall not be reproduced, except in full, without written permission from SRTC Laboratory. The Chain of Custody is included and is an essential component of this report.

This entire report was reviewed and approved for release.

A handwritten signature in black ink, appearing to be 'J. Scott'.

Reviewed By: Laboratory Supervisor

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SePRO Lab

Water Diagnostics for Lakes & Ponds

FastEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC13562

Customer Contact Information

Company Name: SOLitude Lake Management	Contact Person: Serena Bet
Address: 1320 Brookwood Drive, Ste. H Little Rock, AR 72202	E-mail Address: serena.bet@solitudelake.com
	Phone: 508.885.0101

Waterbody Information

Waterbody:	Fosters Pond - MA
Waterbody size:	120
Depth Average:	4.5

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM53646-1	North	Sonar/fluridone (ug/L)	FAST 10	2.4	06/17/2024
CTM53647-1	West	Sonar/fluridone (ug/L)	FAST 10	6.1	06/17/2024
CTM53648-1	East	Sonar/fluridone (ug/L)	FAST 10	7.0	06/17/2024

ANALYSIS STATEMENTS:

SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Laboratory Information

Date / Time Received: 06/20/24 12:00 PM

Date Results Sent: Friday, June 21, 2024

Disclaimer: The results listed within this Laboratory Report relate only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its

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This entire report was reviewed and approved for release.

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Reviewed By: Laboratory Supervisor

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SePRO Lab

Water Diagnostics for Lakes & Ponds

FastEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

LABORATORY REPORT

Chain of Custody: eCOC14226

Customer Contact Information

Company Name: SOLitude Lake Management	Contact Person: Serena Bet
Address: 1320 Brookwood Drive, Ste. H Little Rock, AR 72202	E-mail Address: serena.bet@solitudelake.com
	Phone: 508.885.0101

Waterbody Information

Waterbody:	Fosters Pond - MA
Waterbody size:	120
Depth Average:	4.5

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM55640-1	Foster's West	Sonar/fluridone (ug/L)	FAST 10	4.9	07/30/2024
CTM55641-1	Foster's Outlet	Sonar/fluridone (ug/L)	FAST 10	7.2	07/30/2024
CTM55642-1	Mill Reservoir Fosters	Sonar/fluridone (ug/L)	FAST 10	4.3	07/30/2024

ANALYSIS STATEMENTS:

SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.

COMMENTS: No significant observations were made unless noted in the report.

MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been determined and is available upon request.

Laboratory Information

Date / Time Received: 08/01/24 12:00 PM

Date Results Sent: Friday, August 2, 2024

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This entire report was reviewed and approved for release.

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Reviewed By: Laboratory Supervisor

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