2014 Aquatic Vegetation Survey and Water Quality Monitoring Report
Foster's Pond
Andover, Massachusetts

Report Prepared by: Aquatic Control Technology, Inc.
11 John Road
Sutton, MA 01590

Report Prepared for: Foster's Pond Corporation
c/o Stephen Cotton, President
19 Pomeroy Road
Andover, MA 01810

January 15, 2015

INTRODUCTION

Aquatic Control Technology performed an aquatic vegetation survey and collected water samples for analysis of basic water quality parameters. The survey attempted to replicate efforts that were performed in prior years. The primary focus of the survey was to document the distribution and density of fanwort (*Cabomba caroliniana)*. This invasive aquatic plant was first managed in 2005 with a whole-lake fluridone (trade name Sonar) herbicide treatment program. Smaller scale treatments were also performed in 2007 and in 2011. Fanwort growth was suppressed in some portions of Foster's Pond in recent years due to persistent microscopic algal blooms, but it has again returned to nuisance densities.

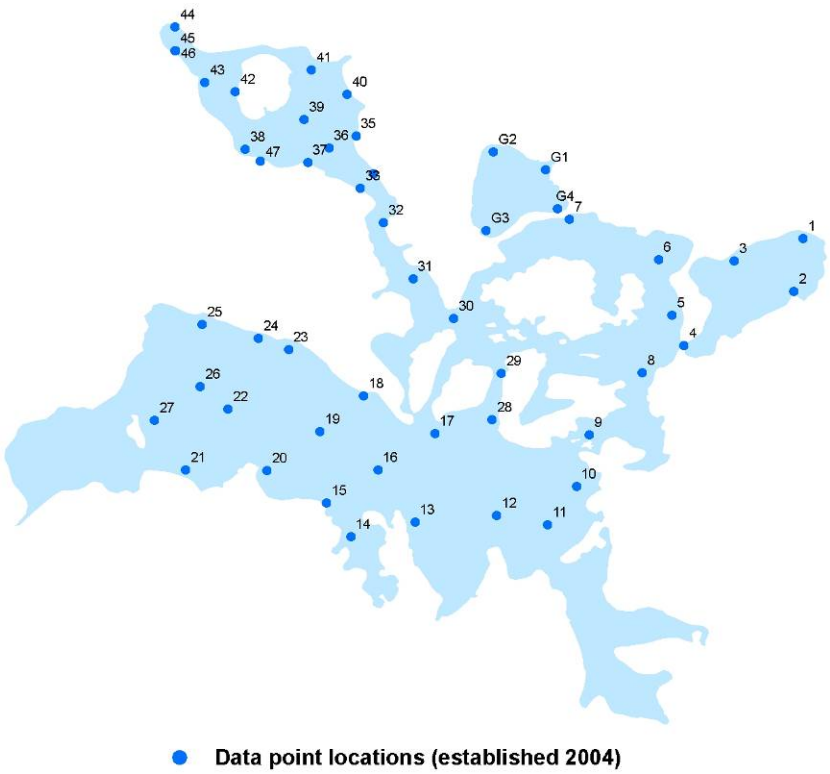
Foster's Pond has a surface area of approximately 125 acres and an average water depth of approximately 4.5 feet. The system has long been plagued by nuisance weed and algae growth due to elevated nutrient levels, shallow water depths, fertile bottom sediments and the introduction of invasive species. The following report discusses aquatic plant growth found during the 2014 survey, compares tested water quality parameters to historic values and provides recommendations for ongoing lake management efforts.

SURVEY METHODS

A comprehensive aquatic plant survey of Foster's Pond was performed on August 28, 2014. The objectives of the survey were to document aquatic plant composition and distribution and specifically to identify the presence of fanwort or other invasive species. The survey methodology used was consistent with surveys performed in prior years and utilized the same transects and data points that were established in 2004. In total 49 data points were surveyed. Plants were identified by visual inspection and by using a throw-rake. At each location the dominant plant was recorded along with all other species present. Plant cover was estimated as a percentage of the bottom covered with plant growth. A biomass index was assigned at each data point and was estimated on a scale ranging from "0"=no plants to "4"=plants filling the water column. A species richness index was assigned at each data point based on the total number of plant species found. Locations where invasive fanwort was encountered were

georeferenced using a handheld GPS unit. A map depicting transect and data point locations follows; the data collected on 8/28/14 is attached to this report.

Figure 1: Aquatic Plant Data Point Locations



VEGETATION SURVEY RESULTS

All parameters measured during the survey indicated that the lake wide aquatic plant distribution and density increased to the highest levels since 2004, prior to the first whole-lake fluridone herbicide treatment.

Table 1: Aquatic Vegetation Data 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

[1]Whole-lake Sonar (fluridone) treatment performed

The Total Plant Cover and Fanwort Cover were still considerably lower than was seen in 2004, largely due to the lack of growth found in the Main Pond. The Channel, Mill Reservoir and the Outlet Cove all supported dense stands of fanwort. Floating-leaf waterlilies were abundant throughout the shallows and wetland areas. Overall plant biomass increased in 2014, which was likely due to the improved water clarity.

A list of the plants observed in 2014 with historical comparison of plant presence and absence follows:

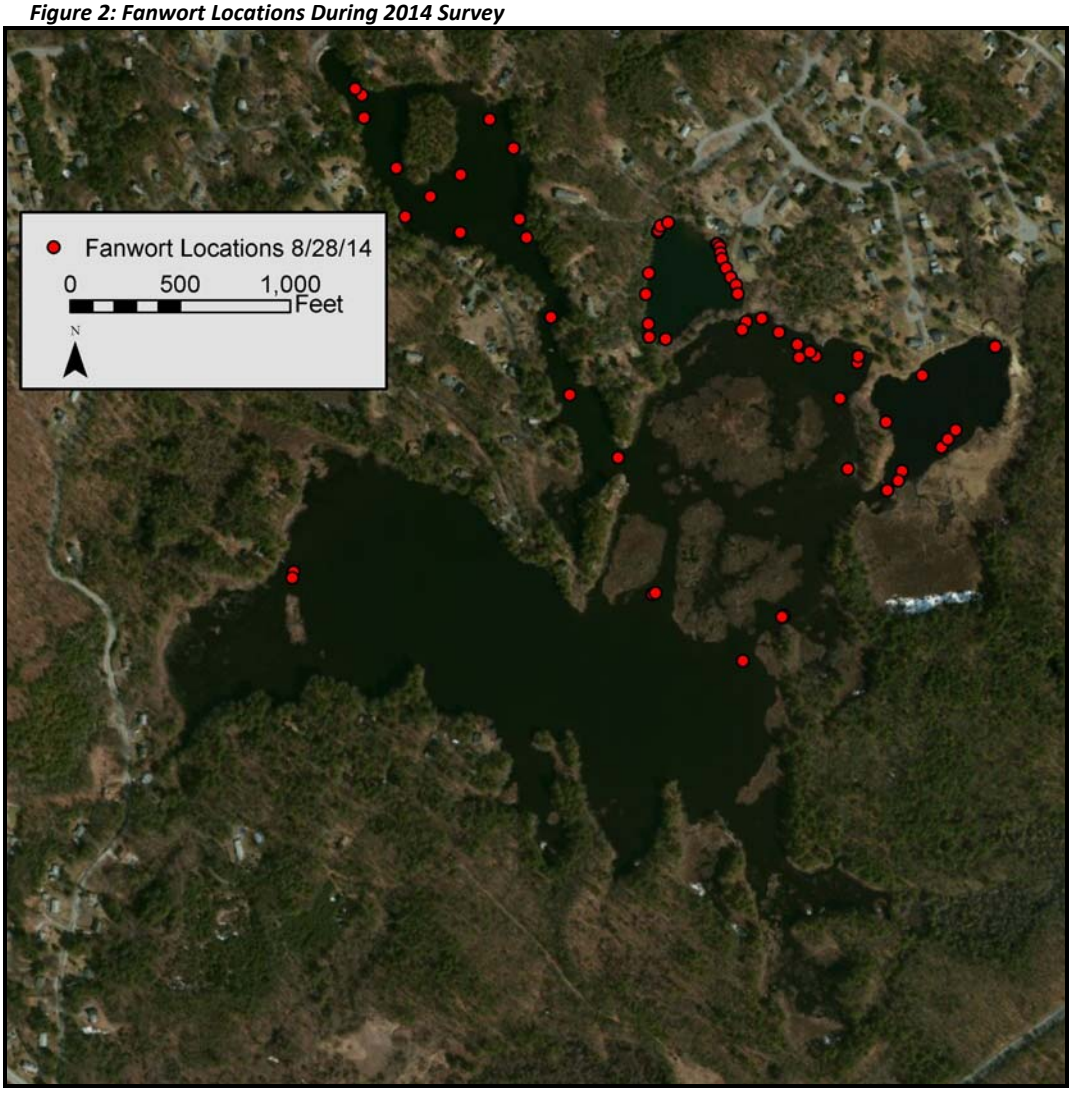
Table 2: Aquatic Species List (2004-2014)

Type	Macrophyte Species	Common Name	2004	2005	2008	2009	2011	2012	2014
Submersed	*Bidens beckii*	Water marigold	X			X			
	Cabomba caroliniana	Fanwort	X	X	X	X		X	X
	Callitriche palustris	Water starwort				X			
	Ceratophyllum demersum	Coontail	X	X	X	X	X	X	X
	Chara vulgaris	Musk grass				X	X		
	Chlorophyta	Filamentous algae	X	X	X	X	X	X	X
	Egeria densa	Brazilian elodea		X	X	X			
	Elodea canadensis	Common waterweed				X			
	Hypericum boreale	Northern St. John's wort				X			
	Isoetes	Quillwort		X	X	X	X	X	
	Ludwigia palustris	Water purslane				X	X	X	
	Musci	Water moss		X	X	X		X	X
	Myriophyllum humile.	Lowly Milfoil		X	X	X	X		X
	Najas flexilis	Bushy pondweed		X	X	X		X	X
	Najas minor	Spiny naiad				X			X
	Nitella sp.	Stonewort		X	X	X	X	X	X
	Potamogeton amplifolius	Largeleaf pondweed	X						
	Potamogeton epihydrus	Ribbonleaf pondweed	X		X	X	X	X	X
	Potamogeton gramineus	Variable-leaf pondweed	X			X		X	
	Potamogeton natans	Floating leaf pondweed			X	X			X
	Potamogeton perfoliatus	Clasping-leaf pondweed	X						
	Potamogeton pusillus	Thin-leaf Pondweed							X
	Sagittaria sp.	Arrowhead			X	X		X	
	Utricularia	Bladderwort	X	X	X	X	X	X	X
	Valliseria americana	Wild celery	X			X			
Floating Leaf	*Brasenia schreberi*	Watershield	X		X	X		X	X
	Lemna minor	Lesser duckweed				X			
	Nuphar variegatum	Yellow waterlily		X	X	X	X	X	X
	Nymphaea odorata	White waterlily	X	X	X	X	X	X	X
	Spirodela polyrhiza	Big duckweed				X			
Emergent	*Decodon verticillatus*	Water willow	X	X	X	X	X	X	
	Eleocharis sp.	Spikerush				X			
	Eriocaulon sp	Pipewort	X	X	X				
	Lythrum salicaria	Purple loosestrife	X	X	X	X	X	X	X
	Peltandra viginica	Arrow arum				X			
	Pontederia cordata	Pickerelweed	X	X	X	X	X	X	
	Scirpus sp.	Rushes	X	X	X				
	Sparganium sp.	Burreed	X		X	X	X	X	X
	Typha sp.	Cattail	X	X	X	X	X	X	X

A total of 15 submersed and floating-leaf plant species were documented during the 2014 survey. There have been significant changes in the submersed and floating-leaf plant community over the past decade due to impacts following the fluridone treatments and persistent cyanobacteria blooms. Mill Reservoir, the Channel, the Outlet Cove and Dug Pond support the greatest plant diversity. Main Pond did not support much plant diversity except for the shallow adjacent wetland cove areas. No significant rooted plant growth was found in water depths greater than 6 feet.

Fanwort growth was most abundant in the Channel and portions of the Outlet Cove. Patches were also developing in Mill Reservoir and on the western edge of the Main Pond. Fanwort recovery has been prevalent in all of these areas following all of the past fluridone treatments and is most likely attributable to the shallow water depths and soft sediments. There were also several fanwort plants found along the shoreline margins in Dug Pond, which has not been the case in recent years.

Figure 2: Fanwort Locations During 2014 Survey



WATER QUALITY MONITORING

Water samples were collected from five locations as shown in Figure 3. Laboratory analysis of the samples was performed for the following parameters: pH, Alkalinity, Total Phosphorus, Turbidity, True Color, Apparent Color, and E. coli bacteria. Samples were transported to Microbac/Premier Laboratory in Worcester, MA for analysis. In addition, measurements of Secchi Disk water clarity, temperature and dissolved oxygen were recorded at each sampling location.

Figure 3: Water Quality Sampling Locations

Table 3: Water Quality Sampling Results

Parameter	Units	Mill Reservoir (WQ1)	Dug Pond (WQ2)	Main Pond (WQ3)	Outlet Cove (WQ4)	Azalea Drive (WQ5)
pH	S.U.	6.9	6.8	7	6.9	6.7
Alkalinity	mg/L CaC03	25	23	23	23	23
Phosphorus	mg/L	0.016	0.005	0.025	0.016	0.01
Turbidity	NTU	1	0.56	2.8	0.71	0.67
True Color	Pt-Co	0	0	0	10	10
Apparent Color	Pt-Co	20	20	30	20	30
E. coli	CFU/100 ml	<10	<10	<10	140	<10
Secchi Disk	Feet	8.9	>12 to bottom	6.3	>6 to bottom	>9 to bottom

ND = non-detect or below the laboratory detection limit

The water quality results were more favorable than what had been reported in 2012. The pH values were near neutral (7.0 S.U.). Alkalinity was similar to past values and nearly the same at all tested locations. The most noteworthy change was the lower phosphorus values. Only Main Pond had phosphorus values above 0.02 mg/l, which is usually the level needed to support noxious algae blooms. In 2012, phosphorus concentrations were double or triple these levels at all locations. Turbidity and true and apparent color values were also much higher. Turbidity values less than 5 NTU generally do not impact recreational uses. True color is a measure of filtered

water and apparent color is a measure of the raw water. Values were lower than prior years. In situ water clarity as measured with a Secchi disk readings were to the bottom in all locations except Main Pond. The only location where E.coli was detected was in the Outlet Cove. This was still a fairly low concentration as the Massachusetts standard for accredited bathing beaches is <235 CFU/100 ml.

The temperature and dissolved oxygen profiles measured at each station are shown in Table 4.

Table 4: Temperature/Dissolved Oxygen Profile

Depth (M)	Mill Reservoir (WQ1)		Dug Pond (WQ2)		Main Pond (WQ3)		Outlet Cove (WQ4)		Azalea Drive (WQ5)	
	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)
Surface	25.9	8.21	25.6	8.77	25.6	9.56	25.6	9.27	25.6	7.20
1	24.9	7.73	25.5	8.56	25.5	9.68	24.5	8.87	25.2	7.03
2	21.8	8.18	25.2	8.46	23.6	8.44	24.1	4.64	23.7	5.88
3	16.5	1.48	24.6	8.30	22.4	2.32			21.7	2.32
4			24.3	6.82	21.9	0.49				
5			23.9	5.09						

In most locations, the water supported sufficient dissolved oxygen concentrations to support warm water fish and other aquatic organisms. There were drops in dissolved oxygen concentrations near the bottom, which is typical as bacteria is consuming oxygen to decompose organic debris. There was a more pronounced loss of oxygen in Main Pond at the 3 meter depth, which was likely due to the elevated algal densities. Dug Pond was well oxygenated throughout the water column.

In addition to the water quality sampling performed during the 8/28/14 survey, FPC collected surface water samples from five locations on 8/5/14 and sent them to Northeast Laboratories in Berlin, CT for analysis of microscopic algae. This sampling was conducted to determine if a copper sulfate algaecide treatment was needed to control cyanobacteria. The two samples collected from the Main Pond had elevated cyanobacteria (West 25,000 cells/ml, East 31,000 cells/ml). Mill Pond had cyanobacteria counts of 11,000 cells/ml, while Dug Pond only had 800 cells/ml and the Outlet Cove/Channel had no cyanobacteria reported. The standard used by the World Health Organization and the State of Massachusetts for swimming advisories are counts above 70,000 cells/ml. The counts in the Main Pond were close to warranting a treatment, but a change in the weather pattern caused some of the floating cells to sink and FPC decided to not to proceed with a treatment. In 2013, cyanobacteria counts exceeded 70,000 cells/ml at all locations sampled in mid-July, warranting treatment.

SUMMARY AND ONGOING RECOMMENDATIONS

Invasive fanwort has recovered since the 2011 fluridone treatment and plants were reaching nuisance densities in the Channel, the Outlet Cove and portions of Mill Reservoir. There were also notable patches of fanwort seen in the western edge of the Main Pond and in Dug Pond. Active management of the fanwort is recommended in 2015 to preserve open-water conditions and to prevent further recovery and spread.

Algal densities, specifically cyanobacteria were lower in 2014 resulting in improved water clarity. The available phosphorus concentrations were lower, which probably helped to limit algae growth, but it is also likely that some of the phosphorus was being utilized by the increased aquatic plant growth.

Specific recommendations for in-lake fanwort and algae management are provided below.

<u>Fanwort Management</u>

There are still only two herbicides registered for aquatic use in Massachusetts that control fanwort. Fluridone (Sonar), which was used for the 2005, 2007 and 2011 treatments, and flumioxazin (Clipper), which was not

registered until 2013. Fluridone is a system-acting herbicide that controls the entire plant including the root structures. Successful fluridone treatments usually provide multiple years of nuisance-level plant control. Flumioxazin is a contact-acting herbicide that only targets the actively growing stem and foliage tissue. There is usually regrowth the year after treatment with flumioxazin. It's only advantage over fluridone is that it is effective for spot or partial-lake treatments. There are several restrictions on the use of flumioxazin in Massachusetts, which limit its utility as a fanwort management tool. Therefore, fluridone is probably still the most effective herbicide for fanwort control in Foster's Pond.

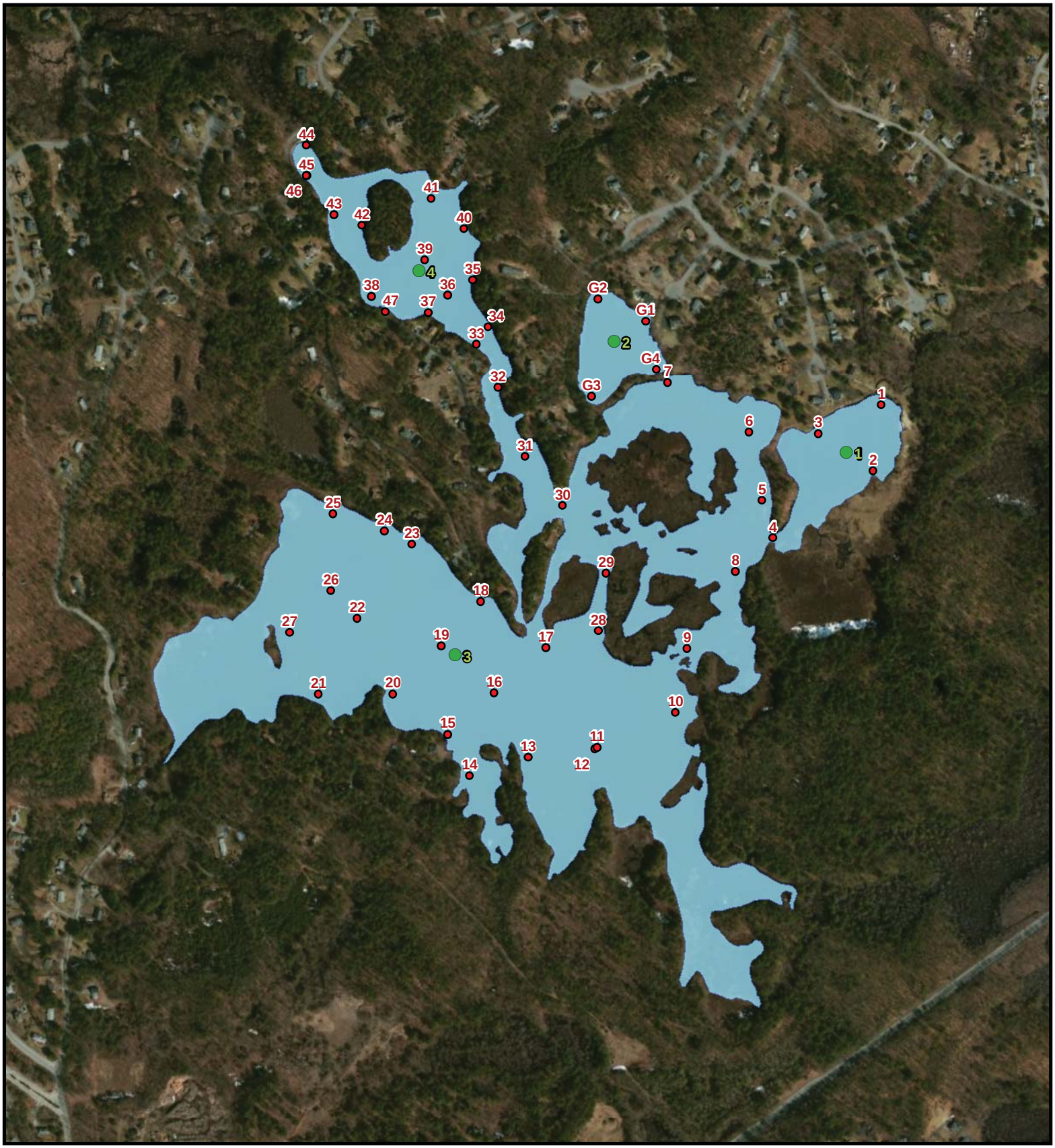
The recommended treatment program at Foster's Pond in 2015 follows what was performed in 2011 and will involve the use of the time-release pellet formulations and liquid formulations. The pellets will allow for the herbicide to be placed directly on areas of fanwort growth and will provide for localized elevated concentrations where the fanwort is growing and will help to limit impacts to non-target native plants. The only recommended change from the 2011 treatment program will be to initiate the treatment even earlier in the growing season. Having fluridone in the water as the plants are beginning to actively grow should provide for faster response and will result in less plant biomass dying back. The 2011 program was initiated in mid-May. Initiating the treatment in mid-late April is recommended in 2015. A series of 3-4 applications spaced 3-4 weeks apart is recommended. Dug Pond should also be included in the 2015 treatment program since fanwort plants are becoming reestablished in that basin.

Algae Management

Cyanobacteria did not reach levels that required treatment in 2014. Hopefully, treatment will not be required in 2015, but copper sulfate should be included on the annual DEP License to Apply Chemicals in the event that bloom conditions develop and warrant treatment. A cyanobacteria bloom did develop in August 2011 following the fluridone treatment program. Algae blooms appear to be common in Foster's Pond, but are clearly linked to nutrient availability and weather conditions.

Attachments

- Figures
- Aquatic Plant survey field data table
- Water quality laboratory reports
- Algae count data



Fosters Pond

Andover, MA

Data Points and Water Quality Sampling Locations

FIGURE:	SURVEY DATE:	MAP DATE:
1	08/28/14	01/15/15

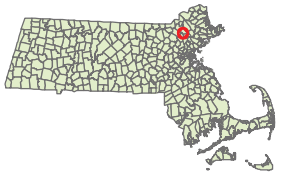
Legend:

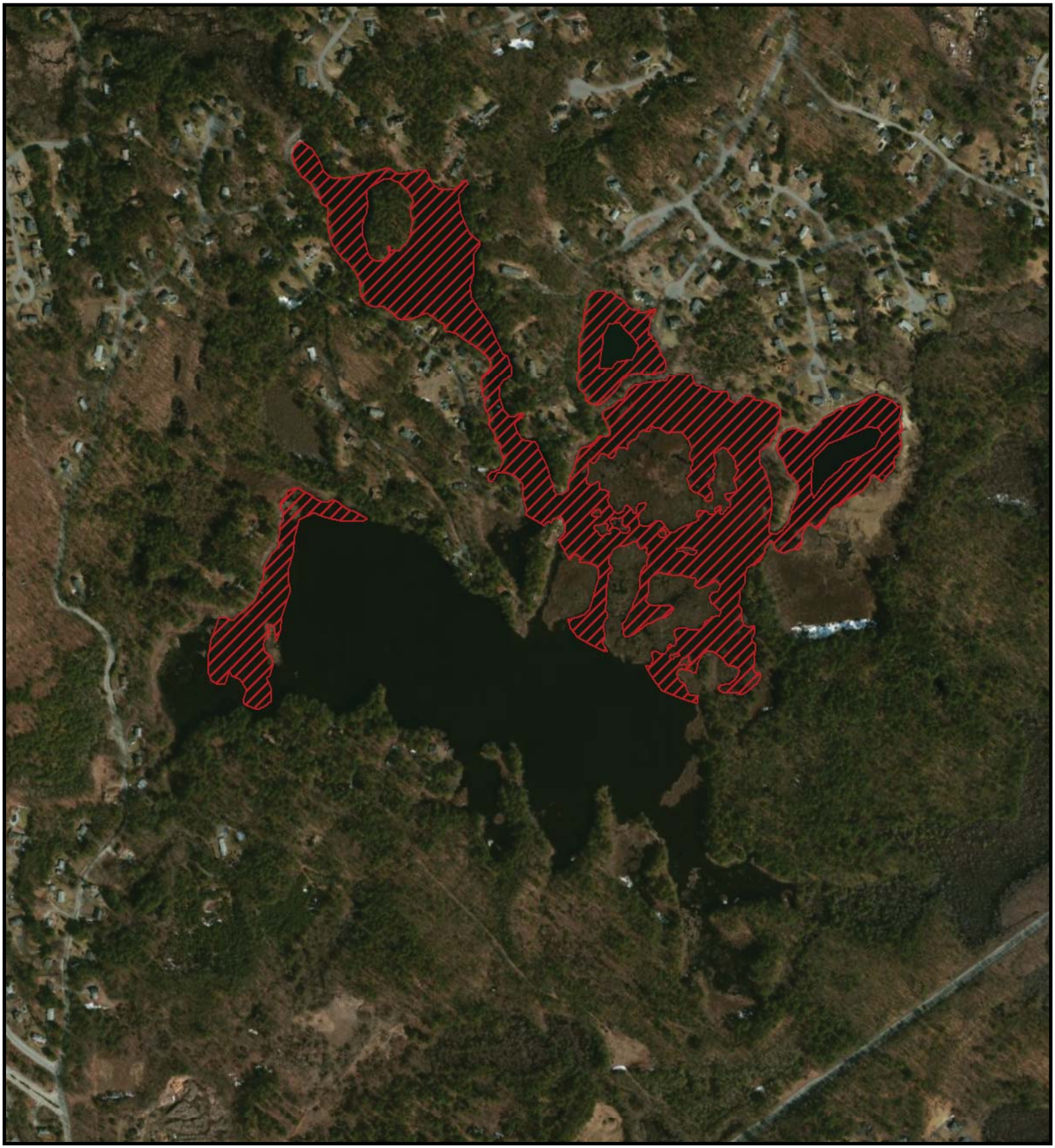
- Data Point Locations
- Water Quality Sample Locations

N

0 500 1,000 1,500 Feet

AQUATIC CONTROL TECHNOLOGY, INC.
11 JOHN ROAD
SUTTON, MASSACHUSETTS 01590
PHONE: (508) 865-1000
FAX: (508) 865-1220
WEB: WWW.AQUATICCONTROLTECH.COM





Fosters Pond

Andover, MA

Fanwort Distribution

FIGURE:	SURVEY DATE:	MAP DATE:
2	08/28/14	01/15/15

Legend:

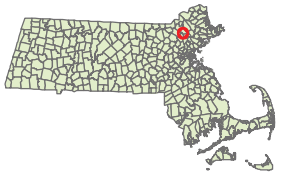
N

Sparse to dense fanwort growth

0 500 1,000 1,500 Feet

AQUATIC CONTROL TECHNOLOGY, INC.

11 JOHN ROAD
SUTTON, MASSACHUSETTS 01590
PHONE: (508) 865-1000
FAX: (508) 865-1220
WEB: WWW.AQUATICCONTROLTECH.COM



Foster's Pond - Aquatic Plant Survey Data Table

survey date: 8/28/14

Data Point	Water Depth (ft.)	Cc	Mu	Pe	Pp	Pn	U	Cd	Nm	Mhu	Ni	Fa	Nu	B	Ny	Sp	Nf	% Total Plant Cover	%Fanwort Cover	Biomass index		Species Richness index
1	13	X		X				X			X				X	X	X	30	5	3	8	7
2	11	X									X				X			20	5	2	12	3
3	4	X									X				X			50	15	3	12	3
4	2	XX												X	X		X	90	50	4	11	4
5	2	X							X						X			100	30	4	12	3
6	11	X					X								X			20	10	3	12	3
7	4	X					X				X		X		X		X	80	15	3	9	6
8	2	X									X	X			X			70	25	3.5	12	3
9	2	X						X			X	X			X			75	20	3	11	4
10	4											X			X			25	0	2.5	14	1
11	5											X			X			15	0	2	14	1
12	7											X						10	0	1	15	0
13	7											X						10	0	1	15	0
14	2											X			X			25	0	2.5	14	1
15	7											X			X			10	0	2	14	1
16	9																	0	0	0	15	0
17	6											X			X			25	0	2.5	14	1
18	6											X			X			10	0	1	14	1
19	10																	0	0	0	15	0
20	8											X			X			40	0	1.5	14	1
21	4											X	X		X			50	0	2	13	2
22	9								X		X	X			X			0	0	0	12	3
23	7																	60	0	1.5	15	0
24	5											X			X			80	0	2.5	14	1
25	4											X			X			50	0	2	14	1
26	7																	0	0	0	15	0
27	4											X			X			50	0	1.5	14	1
28	3	X							X			X	X		X			90	25	3	11	4
29	3	X							X				X		X			100	30	3.5	11	4
30	3	X							X		XX							100	5	3.5	12	3
31	2	X						X	X		XX		X					100	5	3.5	10	5
32	2	X							X		X	X						100	10	3.5	12	3
33	4								X		X	X						70	0	3	13	2
34	3	X							X		X							60	10	2.5	12	3
35	3	X							X		X	X			X			60	10	2.5	11	4
36	4								X		X	X			X			70	0	3	12	3
37	2	X							X		X	X	X		X			80	10	3	10	5
38	6	X							X		X	X			X			70	10	3	11	4
39	6	X				X			X		X	X			X			60	5	3	10	5
40	6	X										X			X			60	15	3	13	2
41	3	X							X			X			X			90	25	3.5	12	3
42	5	X							X		X				X			60	30	3	11	4
43	7	X							X		X				X			80	20	3	11	4
44	3	X							X									60	30	2.5	13	2
45	6	X					X		X									60	30	2.5	12	3
G1	5	X		X			X			X					X			80	50	3	10	5
G2	6	X		X			X								X			80	10	2.5	11	4
G3	5		X		X		X								X			20	0	2	11	4
G4	4	X	X	X											X			80	30	3	11	4
	#X	27	2	4	1	1	6	3	19	1	17	26	6	1	36	1	3					
	#D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	total #	27	2	4	1	1	6	3	19	1	17	26	6	1	36	1	3					
	% FOC	55.1%	4.1%	8.2%	2.0%	2.0%	12.2%	6.1%	38.8%	2.0%	34.7%	53.1%	12.2%	2.0%	73.5%	2.0%	6.1%					
																		53.6	10.9	2.4		2.7

PREMIER LABORATORY
A MICROBAC LABORATORY

61 Louisa Viens Drive
Dayville, CT 06241
Fax: 860-774-2689
Phone: 860-774-6814
Toll-Free: 800-334-0103

ANALYTICAL DATA REPORT

prepared for:

Aquatic Control Technology
11 John Road
Sutton, MA 01590
Marc Bellaud

Report Number: E408S99
Project: Foster's Pond

Received Date: 08/29/2014
Report Date: 09/03/2014

Premier Laboratory, Inc
Authorized Signature

ACCREDITED IN ACCORDANCE WITH nelac

CT DPH #PH-0465 | EPA #CT00008 | MA DEP #M-CT008 | ME DHHS #CT0050 | NH ELAP #2020
NJ DEP #CT007 | NY ELAP #11549 | PA DEP #68-04413 | RI DOH #LAO00300 | VT DOH #VT11549

101-0000000432435

PREMIER LABORATORY
A MICROBAC LABORATORY

61 Louisa Viens Drive
Dayville, CT 06241
Fax: 860-774-2689
Phone: 860-774-6814
Toll-Free: 800-334-0103

Report No: E408S99
Client: Aquatic Controls Technology
Project: Foster's Pond

CASE NARRATIVE / METHOD CONFORMANCE SUMMARY

This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included, along with a copy of the chain of custody and any subcontracted analyses reports, if applicable, for the sample(s) in this report. Subcontractor results are identified by 'SUB' next to the analysis.

Premier Laboratory received five samples from Aquatic Controls Technology on 08/29/2014. The samples were analyzed for the following list of analyses in accordance with MA DEP regulations unless otherwise indicated:

Alkalinity, Total by SM2320B in DW/WW
SM2320B
E. coli by EPA Modified 1603 mTEC
1603[1603]
Turbidity by SM2130B in DW
SM2130B
Apparent and True Color
SM2120B
Phosphorus, Total as P by 365.1 in DW/WW
365.1[365.1]
pH by SM 4500-H+B
SM 4500-H+B

Non-Conformances:

Work Order:

None

Sample:

None

Analysis:

None

Premier Laboratory
Analytical Data Report

Report No: E408S99
Date Received: 08/29/2014 10:45

Customer: Aquatic Controls Technology
Project: Foster's Pond

Parameter	Result	DL	Units	Completed	By	Dilution
(1) Foster's Pond - WQ1						
Date Collected: 08/28/2014	**Matrix: Aqueous**					
Color by SM2120B	20		Color Units	08/29/2014 21:20	M_B	
True Color	0		Color Units	08/29/2014 21:20	M_B	
Alkalinity by SM2320B	25	1.0	mg/L	09/02/2014 15:47	PED	
Phosphorus as P by 365.1	0.016	0.0050	mg/L	09/02/2014 15:26	DCH	
Turbidity by SM2130B	1.0	0.10	NTU	08/29/2014 21:19	M_B	
pH by SM 4500-H+B	6.9		pH Units	08/29/2014 21:18	M_B	
E. coli by EPA Modified 1603 (mTEC)	<10		col/100ml	08/29/2014 16:11	AM	
(2) Foster's Pond - WQ2						
Date Collected: 08/28/2014	**Matrix: Aqueous**					
Color by SM2120B	20		Color Units	08/29/2014 21:20	M_B	
True Color	0		Color Units	08/29/2014 21:20	M_B	
Alkalinity by SM2320B	23	1.0	mg/L	09/02/2014 15:47	PED	
Phosphorus as P by 365.1	0.0050	0.0050	mg/L	09/02/2014 15:27	DCH	
Turbidity by SM2130B	0.56	0.10	NTU	08/29/2014 21:19	M_B	
pH by SM 4500-H+B	6.8		pH Units	08/29/2014 21:18	M_B	
E. coli by EPA Modified 1603 (mTEC)	<10		col/100ml	08/29/2014 16:11	AM	
(3) Foster's Pond - WQ3						
Date Collected: 08/28/2014	**Matrix: Aqueous**					
Color by SM2120B	30		Color Units	08/29/2014 21:20	M_B	
True Color	0		Color Units	08/29/2014 21:20	M_B	
Alkalinity by SM2320B	23	1.0	mg/L	09/02/2014 15:47	PED	
Phosphorus as P by 365.1	0.025	0.0050	mg/L	09/02/2014 15:28	DCH	
Turbidity by SM2130B	2.8	0.10	NTU	08/29/2014 21:19	M_B	
pH by SM 4500-H+B	7.0		pH Units	08/29/2014 21:18	M_B	
E. coli by EPA Modified 1603 (mTEC)	<10		col/100ml	08/29/2014 16:11	AM	
(4) Foster's Pond - WQ4						
Date Collected: 08/28/2014	**Matrix: Aqueous**					
Color by SM2120B	20		Color Units	08/29/2014 21:20	M_B	
True Color	10		Color Units	08/29/2014 21:20	M_B	
Alkalinity by SM2320B	23	1.0	mg/L	09/02/2014 15:47	PED	
Phosphorus as P by 365.1	0.016	0.0050	mg/L	09/02/2014 15:28	DCH	
Turbidity by SM2130B	0.71	0.10	NTU	08/29/2014 21:19	M_B	
pH by SM 4500-H+B	6.9		pH Units	08/29/2014 21:18	M_B	
E. coli by EPA Modified 1603 (mTEC)	140		col/100ml	08/29/2014 16:11	AM	

Premier Laboratory
Analytical Data Report

Report No: E408S99
Date Received: 08/29/2014 10:45

Customer: Aquatic Controls Technology
Project: Foster's Pond

Parameter	Result	DL	Units	Completed	By	Dilution
(5) Foster's Pond - WQ5						
Date Collected: 08/28/2014 **Matrix: Aqueous**						
Color by SM2120B	30		Color Units	08/29/2014 21:20	M_B	
True Color	10		Color Units	08/29/2014 21:20	M_B	
Alkalinity by SM2320B	23	1.0	mg/L	09/02/2014 15:47	PED	
Phosphorus as P by 365.1	0.010	0.0050	mg/L	09/02/2014 15:29	DCH	
Turbidity by SM2130B	0.67	0.10	NTU	08/29/2014 21:19	M_B	
pH by SM 4500-H+B	6.7		pH Units	08/29/2014 21:18	M_B	
E. coli by EPA Modified 1603 (mTEC)	<10		col/100ml	08/29/2014 16:11	AM	

AQUATIC CONTROL TECHNOLOGY, INC

E408599 el

Microbac Laboratories, Inc. 100 Barber Avenue Worcester, MA 01606 **Phn:** 508-595-0010 **Fax:** 508-595-0008

PARAMETERS REQUESTED	WQ 1	WQ 2	WQ3	WQ 4	WQ 5			
pH	•	•	•	•	•			
TOTAL ALKALINITY	•	•	•	•	•			
SUSPENDED SOLIDS								
DISSOLVED SOLIDS								
TURBIDITY	•	•	•	•	•			
CONDUCTIVITY								
CHLORIDE								
KJELDAHL NITROGEN								
AMMONIA NITROGEN								
NITRATE NITROGEN								
TOTAL PHOSPHORUS	•	•	•	•	•			
TOTAL DISSOLVED PHOSPHORUS								
TRUE COLOR	•	•	•	•	•			
APPARENT COLOR	•	•	•	•	•			
TOTAL COLIFORM BACTERIA								
FECAL COLIFORM BACTERIA								
E. COLI BACTERIA	•	•	•	•	•			
CHLOROPHYLL-A								

Preserved Upon Receipt at Lab
Initials MN 11:15
Date 8/29/14

A.C.T. JOB# _____

TITLE: Foster's Pond

TASK: Water Chemistry

DATE SAMPLED: 8/28/14

SAMPLED BY: M Bellaud

MICROBAC LAB _____ _____

REC"D BY: Michael Noble

DATE & TIME: 8/29/14 10:45

Received on ice 3.9°C

NOTE: *Aquatic Control requires the following minimum detection limits for all samples: Nitrate (<0.1 mg/l); Ammonia (<0.1 mg/l); Total and Dissolved Phosphorus (<0.01 mg/l) and Alkalinity (<5 mg/l). Total and dissolved phosphorus detection limits of <0.001 mg/l are only to be performed upon Aquatic Control's request and at an additional charge.*

ANALYTICAL REPORT

Report To: AQUATIC CONTROL TECHNOLOGY
Attn: Mark Bellaud, President
11 John Rd
Sutton MA 01590

EMAIL ADDRESS:
info@aquaticcontroltech.com

Report Date:	8/11/2014	**Date Sampled:**	8/05/2014 15:20
Laboratory ID#:	N1459988 – 01	**Date Received:**	8/07/2014 09:00
		Date Tested:	8/08/2014

Sample Site: SURFACE WATER: FOSTERS POND, ANDOVER MA
#1 = COVE / CHANNEL

MICROSCOPIC EXAMINATION == Natural Units Count & Blue/Green Cell Counts

ORGANISM	# / ml
Diatomaceae	
Amphora	
Asterionella*	
Amphiprora	
Cocinodiscus	
Cyclotella*	
Cymbella	
Diatoma*	
Frustulia	
Fragilaria	
Gyrosigma	
Gomphonema	
Melosira	
Meridion*	
Navicula	
Nitzschia	
Pleurosigma	
Stephanodiscus	
Stephanodiscus	
Surirella	
Synedra	
Tabellaria*	80
Rotifera	
Anuraea	
Asplanchna	
Brachionus	
Conochilus	
Euchlanis	
Keratella	
Notholca	
Polyarthra	
Rotifer	
Synchaeta	

ORGANISM	# / ml
Chlorophyceae	
Actinastrum	
Arthrodesmus	
Ankistrodesmus	
Chorella	
Closterium	
Coelastrum	
Cosmarium	
Dictyosphaerium*	
Eudorina*	
Elakatothrix	
Gleocystis	
Micrasterias	
Mougeotia	
Pandorina*	
Pediastrum	
Protococcus	
Quadrigula	
Scenedesmus	
Sphaerocystis	
Sphaerozosma	
Spirogyra	
Staurastrum	120
Tetraspora	
Westella	
Ulothrix	
Volvox*	
Xanthidium	
Zygnema	
Xenococcus	
Add'l Organisms:	
Phacus	

ORGANISM	# / ml
Cyanophyceae	
Anabaena*	
Anabaenopsis	
Aphanocapsa	
Aphanizomenon*	
Aphanothece	
Aulosira	
Arthrospira	
Chroococcus	
Clathrocystis*	
Coelosphaerium*	
Cylindrospermum	
Cuspidothrix	
Dactylococcopsis	
Eucapsis	
Gleocapsa	
Galucocystis	
Gloeothece	
Gomphosphaeria	
Hydrocoleum	
Microcystis	
Merismopedia	
Nostoc	
Nodularia	
Oscillaria	
Pseudanabaena	
Spirulina	
Rivularia*	
Xenococcus	
Miscellaneous	
Acarina	
Anguillula	
Bosmina	
Canthocamptus	
Cyclops	
Daphnia	
Diaptomus	

ORGANISM	# / ml
Protozoa	
Actinophrys	
Amoeba	
Arcella	
Bursaria*	
Ceratium	40
Cercomonas	
Chilomonas	
Chlamydomonas	
Codonella	
Cryptomonas*	
Difflugia	
Dinobryon*	
Euglena	
Glenodinium*	
Gonium	
Halteria	
Mallomonas*	120
Monas	
Peridinium*	
Synura*	20
Trachelomonas	
Uroglenopsis*	
Vorticella	
Schizomycetes	
Crenothrix	
* Odor Producing	

NATURAL UNITS COUNT TOTAL: 380 per mL

CELL COUNT Total: ---- per mL

MICROCYSTINS TOXIN: <1 ppb

Comments: **Results are based on sample, as submitted to Northeast Laboratories, Inc. on: 8/07/2014**

Approved by: Alan C. Shaw
Laboratory Director

Report To: AQUATIC CONTROL TECHNOLOGY
Attn: Mark Bellaud, President
11 John Rd
Sutton MA 01590

EMAIL ADDRESS: info@aquaticcontroltech.com

Report Date:	8/11/2014	**Date Sampled:**	8/05/2014 15:42
Laboratory ID#:	N1459988 – 02	**Date Received:**	8/07/2014 09:00
		Date Tested:	8/08/2014

Sample Site: SURFACE WATER: FOSTERS POND, ANDOVER MA
#2 = MAIN POND – WEST

MICROSCOPIC EXAMINATION == Natural Units Count & Blue/Green Cell Counts

ORGANISM	# / ml
Diatomaceae	
Amphora	
Asterionella*	
Amphiprora	
Cocinodiscus	
Cyclotella*	
Cymbella	
Diatoma*	
Frustulia	
Fragilaria	
Gyrosigma	
Gomphonema	
Melosira	
Meridion*	
Navicula	
Nitzschia	
Pleurosigma	
Stephanodiscus	
Stephanodiscus	
Surirella	
Synedra	
Tabellaria*	600
Rotifera	
Anuraea	
Asplanchna	
Brachionus	
Conochilus	
Euchlanis	
Keratella	
Notholca	
Polyarthra	
Rotifer	
Synchaeta	

ORGANISM	# / ml
Chlorophyceae	
Actinastrum	
Arthrodesmus	
Ankistrodesmus	
Chorella	
Closterium	
Coelastrum	
Cosmarium	
Dictyosphaerium*	
Eudorina*	
Elakatothrix	
Gleocystis	
Micrasterias	
Mougeotia	
Pandorina*	
Pediastrum	
Protococcus	
Quadrigula	
Scenedesmus	
Sphaerocystis	
Sphaerozosma	
Spirogyra	
Staurastrum	
Tetraspora	
Westella	
Ulothrix	
Volvox*	
Xanthidium	
Zygnema	
Xenococcus	
Add'l Organisms:	
Phacus	

ORGANISM	Cell # / ml	(Nat'l Units #)
Cyanophyceae		
Anabaena*	**13,000**	(520)
Anabaenopsis		
Aphanocapsa		
Aphanizomenon*	**8,800**	(160)
Aphanothece		
Aulosira		
Arthrospira		
Chroococcus		
Clathrocystis*		
Coelosphaerium*	**3,000**	(40)
Cylindrospermum		
Cuspidothrix		
Dactylococcopsis		
Eucapsis		
Gleocapsa		
Galucocystis		
Gloeothece		
Gomphosphaeria		
Hydrocoleum		
Microcystis		
Merismopedia		
Nostoc		
Nodularia		
Oscillaria		
Pseudanabaena		
Spirulina		
Rivularia*		
Xenococcus		
Miscellaneous		
Acarina		
Anguillula		
Bosmina		
Canthocamptus		
Cyclops		
Daphnia		
Diaptomus		

ORGANISM	# / ml
Protozoa	
Actinophrys	
Amoeba	
Arcella	
Bursaria*	
Ceratium	
Cercomonas	
Chilomonas	
Chlamydomonas	
Codonella	
Cryptomonas*	
Difflugia	
Dinobryon*	
Euglena	
Glenodinium*	
Gonium	
Halteria	
Mallomonas*	
Monas	
Peridinium*	
Synura*	
Trachelomonas	
Uroglenopsis*	
Vorticella	
Schizomycetes	
Crenothrix	
* Odor Producing	

NATURAL UNITS COUNT TOTAL: 1,300 per mL

CELL COUNT Total: 25,000 per mL

MICROCYSTINS TOXIN: <1 ppb

Comments: **Results are based on sample, as submitted to Northeast Laboratories, Inc. on: 8/07/2014**

Approved by: Laboratory Director

Report To: AQUATIC CONTROL TECHNOLOGY
Attn: Mark Bellaud, President
11 John Rd
Sutton MA 01590

EMAIL ADDRESS: info@aquaticcontroltech.com

Report Date:	8/11/2014	**Date Sampled:**	8/05/2014 15:52
Laboratory ID#:	N1459988 – 03	**Date Received:**	8/07/2014 09:00
		Date Tested:	8/08/2014

Sample Site: SURFACE WATER: FOSTERS POND, ANDOVER MA
#2 = MAIN POND – EAST

MICROSCOPIC EXAMINATION == Natural Units Count & Blue/Green Cell Counts

ORGANISM	# / ml
Diatomaceae	
Amphora	
Asterionella*	
Amphiprora	
Cocinodiscus	
Cyclotella*	
Cymbella	
Diatoma*	
Frustulia	
Fragilaria	
Gyrosigma	
Gomphonema	
Melosira	
Meridion*	
Navicula	
Nitzschia	
Pleurosigma	
Stephanodiscus	
Stephanodiscus	
Surirella	
Synedra	
Tabellaria*	280
Rotifera	
Anuraea	
Asplanchna	
Brachionus	
Conochilus	
Euchlanis	
Keratella	
Notholca	
Polyarthra	
Rotifer	
Synchaeta	

ORGANISM	# / ml
Chlorophyceae	
Actinastrum	
Arthrodesmus	
Ankistrodesmus	
Chorella	
Closterium	
Coelastrum	
Cosmarium	
Dictyosphaerium*	
Eudorina*	
Elakatothrix	
Gleocystis	
Micrasterias	
Mougeotia	
Pandorina*	
Pediastrum	
Protococcus	
Quadrigula	
Scenedesmus	
Sphaerocystis	
Sphaerozosma	
Spirogyra	
Staurastrum	
Tetraspora	
Westella	
Ulothrix	
Volvox*	
Xanthidium	
Zygnema	
Xenococcus	
Add'l Organisms:	
Phacus	

ORGANISM	Cell # / ml	(Nat'l Units #)
Cyanophyceae		
Anabaena*	6,000	(240)
Anabaenopsis		
Aphanocapsa		
Aphanizomenon*	8,800	(160)
Aphanothece		
Aulosira		
Arthrospira		
Chroococcus		
Clathrocystis*		
Coelosphaerium*	6,000	(80)
Cylindrospermum		
Cuspidothrix		
Dactylococcopsis		
Eucapsis		
Gleocapsa		
Galucocystis		
Gloeothece		
Gomphosphaeria		
Hydrocoleum		
Microcystis	10,000	(90)
Merismopedia		
Nostoc		
Nodularia		
Oscillaria		
Pseudanabaena		
Spirulina		
Rivularia*		
Xenococcus		
Miscellaneous		
Acarina		
Anguillula		
Bosmina		
Canthocamptus		
Cyclops		
Daphnia		
Diaptomus		

ORGANISM	# / ml
Protozoa	
Actinophrys	
Amoeba	
Arcella	
Bursaria*	
Ceratium	
Cercomonas	
Chilomonas	
Chlamydomonas	
Codonella	
Cryptomonas*	
Difflugia	
Dinobryon*	
Euglena	
Glenodinium*	
Gonium	
Halteria	
Mallomonas*	
Monas	
Peridinium*	
Synura*	
Trachelomonas	
Uroglenopsis*	
Vorticella	
Schizomycetes	
Crenothrix	
* Odor Producing	

NATURAL UNITS COUNT TOTAL: 800 per mL

CELL COUNT Total: 31,000 per mL

MICROCYSTINS TOXIN: <1 ppb

Comments: **Results are based on sample, as submitted to Northeast Laboratories, Inc. on: 8/07/2014**

Approved by: Adam C. Drake

Laboratory Director

ANALYTICAL REPORT

Report To: AQUATIC CONTROL TECHNOLOGY
Attn: Mark Bellaud, President
11 John Rd
Sutton MA 01590

EMAIL ADDRESS:
info@aquaticcontroltech.com

Report Date:	8/11/2014	**Date Sampled:**	8/05/2014 16:12
Laboratory ID#:	N1459988 – 04	**Date Received:**	8/07/2014 09:00
		Date Tested:	8/08/2014

Sample Site: SURFACE WATER: FOSTERS POND, ANDOVER MA
#4 = MILL POND

MICROSCOPIC EXAMINATION == Natural Units Count & Blue/Green Cell Counts

ORGANISM	# / ml
Diatomaceae	
Amphora	
Asterionella*	
Amphiprora	
Cocinodiscus	
Cyclotella*	
Cymbella	
Diatoma*	
Frustulia	
Fragilaria	
Gyrosigma	
Gomphonema	
Melosira	
Meridion*	
Navicula	
Nitzschia	
Pleurosigma	
Stephanodiscus	
Stephanodiscus	
Surirella	
Synedra	
Tabellaria*	
Rotifera	
Anuraea	
Asplanchna	
Brachionus	
Conochilus	
Euchlanis	
Keratella	
Notholca	
Polyarthra	
Rotifer	
Synchaeta	

ORGANISM	# / ml
Chlorophyceae	
Actinastrum	
Arthrodesmus	
Ankistrodesmus	
Chorella	
Closterium	
Coelastrum	
Cosmarium	
Dictyosphaerium*	
Eudorina*	
Elakatothrix	
Gleocystis	
Micrasterias	
Mougeotia	
Pandorina*	
Pediastrum	
Protococcus	
Quadrigula	
Scenedesmus	
Sphaerocystis	
Sphaerozosma	
Spirogyra	
Staurastrum	**40**
Tetraspora	
Westella	
Ulothrix	
Volvox*	
Xanthidium	
Zygnema	
Xenococcus	
Add'l Organisms:	
Phacus	

ORGANISM	Cell # / ml	(Nat'l Units #)
Cyanophyceae		
Anabaena*		
Anabaenopsis		
Aphanocapsa		
Aphanizomenon*	**11,000**	(200)
Aphanothece		
Aulosira		
Arthrospira		
Chroococcus		
Clathrocystis*		
Coelosphaerium*		
Cylindrospermum		
Cuspidothrix		
Dactylococcopsis		
Eucapsis		
Gleocapsa		
Galucocystis		
Gloeothece		
Gomphosphaeria		
Hydrocoleum		
Microcystis		
Merismopedia		
Nostoc		
Nodularia		
Oscillaria		
Pseudanabaena		
Spirulina		
Rivularia*		
Xenococcus		
Miscellaneous		
Acarina		
Anguillula		
Bosmina		
Canthocamptus		
Cyclops		
Daphnia		
Diaptomus		

ORGANISM	# / ml
Protozoa	
Actinophrys	
Amoeba	
Arcella	
Bursaria*	
Ceratium	
Cercomonas	
Chilomonas	
Chlamydomonas	
Codonella	
Cryptomonas*	
Difflugia	
Dinobryon*	
Euglena	
Glenodinium*	
Gonium	
Halteria	
Mallomonas*	
Monas	
Peridinium*	
Synura*	
Trachelomonas	
Uroglenopsis*	
Vorticella	
Schizomycetes	
Crenothrix	
* Odor Producing	

NATURAL UNITS COUNT TOTAL: 240 per mL

CELL COUNT Total: 11,000 per mL

MICROCYSTINS TOXIN: <1 ppb

Comments: **Results are based on sample, as submitted to Northeast Laboratories, Inc. on: 8/07/2014**

Approved by: Laboratory Director

ANALYTICAL REPORT

Report To: AQUATIC CONTROL TECHNOLOGY
Attn: Mark Bellaud, President
11 John Rd
Sutton MA 01590

EMAIL ADDRESS:
info@aquaticcontroltech.com

Report Date:	8/11/2014	**Date Sampled:**	8/05/2014 15:55
Laboratory ID#:	N1459988 – 03	**Date Received:**	8/07/2014 09:00
		Date Tested:	8/08/2014

Sample Site: SURFACE WATER: FOSTERS POND, ANDOVER MA
#5 = DUG POND

MICROSCOPIC EXAMINATION == Natural Units Count & Blue/Green Cell Counts

ORGANISM	# / ml
Diatomaceae	
Amphora	
Asterionella*	
Amphiprora	
Cocinodiscus	
Cyclotella*	
Cymbella	
Diatoma*	**80**
Frustulia	
Fragilaria	
Gyrosigma	
Gomphonema	
Melosira	
Meridion*	
Navicula	
Nitzschia	
Pleurosigma	
Stephanodiscus	
Stephanodiscus	
Surirella	
Synedra	
Tabellaria*	
Rotifera	
Anuraea	
Asplanchna	
Brachionus	
Conochilus	
Euchlanis	
Keratella	
Notholca	
Polyarthra	
Rotifer	
Synchaeta	

ORGANISM	# / ml
Chlorophyceae	
Actinastrum	
Arthrodesmus	
Ankistrodesmus	**80**
Chorella	
Closterium	
Coelastrum	
Cosmarium	
Dictyosphaerium*	
Eudorina*	
Elakatothrix	
Gleocystis	
Micrasterias	
Mougeotia	
Pandorina*	
Pediastrum	
Protococcus	
Quadrigula	
Scenedesmus	
Sphaerocystis	
Sphaerozosma	
Spirogyra	
Staurastrum	
Tetraspora	
Westella	
Ulothrix	
Volvox*	
Xanthidium	
Zygnema	
Xenococcus	
Add'l Organisms:	
Phacus	

ORGANISM	Cell # / ml	(Nat'l Units #)
Cyanophyceae		
Anabaena*		
Anabaenopsis		
Aphanocapsa		
Aphanizomenon*		
Aphanothece		
Aulosira		
Arthrospira		
Chroococcus		
Clathrocystis*		
Coelosphaerium*		
Cylindrospermum		
Cuspidothrix		
Dactylococcopsis		
Eucapsis		
Gleocapsa		
Galucocystis		
Gloeothece		
Gomphosphaeria		
Hydrocoleum		
Microcystis		
Merismopedia		
Nostoc		
Nodularia		
Oscillaria		
Pseudanabaena	**800**	(40)
Spirulina		
Rivularia*		
Xenococcus		
Miscellaneous		
Acarina		
Anguillula		
Bosmina		
Canthocamptus		
Cyclops		
Daphnia		
Diaptomus		

ORGANISM	# / ml
Protozoa	
Actinophrys	
Amoeba	
Arcella	
Bursaria*	
Ceratium	
Cercomonas	
Chilomonas	
Chlamydomonas	**100**
Codonella	
Cryptomonas*	
Difflugia	
Dinobryon*	
Euglena	
Glenodinium*	
Gonium	
Halteria	
Mallomonas*	
Monas	
Peridinium*	
Synura*	
Trachelomonas	
Uroglenopsis*	
Vorticella	
Schizomycetes	
Crenothrix	
* Odor Producing	

NATURAL UNITS COUNT TOTAL: 300 per mL

CELL COUNT Total: 800 per mL

MICROCYSTINS TOXIN: <1 ppb

Comments: **Results are based on sample, as submitted to Northeast Laboratories, Inc. on: 8/07/2014**

Approved by:

Laboratory Director