Post-Treatment Assessment for Aquatic Plant Control ERDC Demonstration Project Wells College Bay, Cayuga Lake 2017

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US Army Corps of Engineers®
Buffalo District
BUILDING STRONG®

Prepared for:

UNITED STATES ARMY CORPS OF ENGINEERS
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List of Abbreviations and Acronyms

APCRP	Aquatic Plant Control Research Program
CSI	Community Science Institute
DOH	Cayuga County Department of Health
E & E	Ecology and Environment, Inc.
EA	environmental assessment
ERDC	Engineer Research and Development Center
GPS	global positioning system
HPLC	high-performance liquid chromatography
Hydrilla	*Hydrilla verticillata*
µg/L	micrograms per liter
mL	milliliter
NYSDEC	New York State Department of Environmental Conservation
ppb	parts per billion
ppm	parts per million
Project	Wells College Bay/Cayuga Lake Hydrilla Demonstration Project
SePro	SePRO Corporation
SLM	SOLitude Lake Management, LLC
SOW	scope of work
TAT	turnaround time
USACE	United States Army Corps of Engineers (Buffalo District)

1 Introduction

The Wells College Bay, Cayuga Lake Hydrilla Demonstration Project (the Project) is a field-scale demonstration of a technology developed under the United States Army Corps of Engineers – Buffalo District's (USACE's) Aquatic Plant Control Research Program to manage monoecious hydrilla (*Hydrilla verticillata;* Hydrilla) in a high water exchange environment.

This report contributes to the Year 1 post-treatment monitoring and assessment of herbicide efficacy on Hydrilla by summarizing field conditions during the treatment; summarizing herbicide treatment methodology and contact time; and identifying lessons learned to benefit future work.

1.1 Background

Hydrilla is a very aggressive, submerged aquatic plant. The Cayuga Lake Floating Classroom first discovered this invasive plant in the Wells College Bay of Cayuga Lake in September 2016. The only other Hydrilla infestation documented in Cayuga Lake was discovered in late summer 2011 near Ithaca, New York. The Hydrilla infestation treated as a part of the Project has been identified within a total area of approximately 59 acres, with patchy distribution from approximately 0- to 18-foot water depths.

Given the ease with which this plant spreads by fragments, proximity to the Erie Canal, and heavy use of the waterway, this infestation has caused urgent concern regarding spread to other areas of Cayuga Lake, the Finger Lakes, the Erie Canal system, and potentially the Great Lakes. These concerns provided the impetus for implementation of the Project.

This year, to control and eradicate Hydrilla, the USACE conducted the first year of treatment for the Project. The treatment was within four treatment areas, totaling approximately 59 acres that focused on application of two aquatic herbicides: fluridone (Sonar ® 4HC), and copper ethylene diamine complex (Komeen® Crystals). The following four areas were treated (see Figure 1-1):

- **Lake treatment block:** an approximately 27-acre area in Wells College Bay along approximately 2,000 linear feet of Cayuga Lake's shoreline between the outlet of Paines Creek to the south and Wells Road to the north. The water depths in this treatment area range from approximately 0 to 18+ feet with an average water depth of 11.5 feet.

- **Spot treatment blocks**: two areas north and south of the lake treatment block that total approximately 31 acres. The depth in these areas ranges from 0 to 18+ feet with an assumed average depth of 11.5 feet.
- **Little Creek treatment block:** an approximately 0.14-acre area in the most downstream section of Little Creek located west of Main Street and the confluence with Cayuga Lake. It is located more than 1,320 linear feet away from the Wells College Potable Water Intake.
- **Paines Creek treatment block:** an approximately 1.21-acre area in the most downstream section of Paines Creek located approximately 750 feet east of Main Street and the confluence with Cayuga Lake. It is located more than 2,000 linear feet away from the Wells College Potable Water Intake.

These treatment blocks were further delineated by the USACE in late June and July 2017 to provide detailed maps for targeting Hydrilla beds in these blocks (see Figure 1-2).

Implementation of the Project was a collaborative effort between the Engineer Research and Development Center (ERDC); USACE; Ecology and Environment, Inc. (E & E); New York State Department of Environmental Conservation (NYSDEC); the Village of Aurora; the Cayuga County Department of Health (DOH); the Wells College water treatment plant; Finger Lakes Partnership for Regional Invasive Species Management, Cayuga Lake Watershed Network, and the applicator, SOLitude Lake Management, LLC (SLM). Although the USACE was not required to obtain an Article 15, New York Code of Rules and Regulations Part 327 aquatic pesticide permit for this project, reasonable measures were taken to meet the intent and conditions that would be associated with such a permit.

1.2 Purpose and Scope

The purpose of the Project is to perform a five-year field-scale demonstration of a technology developed under the Aquatic Plant Control Research Program (APCRP) to evaluate the effectiveness of an aquatic herbicide to manage monoecious hydrilla in high water exchange environments. The USACE is also funding a separate research project titled "Improving Chemical Control in High Water Exchange Environments in Northern Waters," this line of research has been ongoing since 2010. To date, this method and the underlying concepts have not been tested against monoecious hydrilla.

The findings in this program will provide valuable information for developing future guidance on how to manage this invasive aquatic plant that is expanding in high water exchange systems throughout the northeastern United States. In addition, the findings will also be used to evaluate herbicide efficacy in Wells College Bay where monoecious hydrilla has been recently discovered. The sprouting dynamics of Hydrilla tubers and condition of plants were monitored prior to and several weeks post-treatment to determine optimal timing of treatment as well as length of exposure required for effective control of Hydrilla.

02:1009540.0004.04\Figure 1-1 Hydrilla Treatment Areas.ai-1/15/18-GRA

Figure 1-1 Hydrilla Treatment Areas, Summer 2017
Wells College Bay, Cayuga Lake

Figure 1-2 USACE Hydrilla Survey Area
Wells College Bay, Cayuga Lake

This post-treatment report includes a summary of the herbicide treatment methodology, including quantity of herbicide used and total acreage treated; a discussion of herbicide contact time and dispersion through the system; and a discussion of the monitoring that accompanied the herbicide application. Lastly, conclusions are provided, in the form of lessons learned, to help shape future treatment projects.

2 Overview of Herbicide Treatment

Treatment of Hydrilla for this Project focused on the application of the aquatic herbicides fluridone (Sonar® 4HC) and copper (Komeen® Crystal) within Wells College Bay, and fluridone within the Paine and Little creeks. The following sections outline the public notification that preceded treatment; field conditions before, during, and after treatment; herbicide treatment methodology; and quantity of herbicide used. See Appendix A for photos of operations.

2.1 Public Notification

Public awareness and understanding of the Project were important to its successful implementation. The USACE and its interagency partners conducted outreach activities to potentially affected users in advance of treatment. The outreach and notification activities included the following:

- The USACE coordinated with NYSDEC to apply aquatic herbicides in the summer of 2017 to control Hydrilla in an area of Cayuga Lake adjacent to the village of Aurora;
- Dates for the initial treatments were provided to NYSDEC, the Cayuga County DOH, the Village of Aurora, and the Wells College water treatment plant;
- The USACE sent out written notifications to all riparian owners/users within the half-mile buffer (north and south) of the treatment area and all municipal water supply customers including those that receive water delivery by truck;
- The USACE utilized press releases to notify the public of the potential treatment options being evaluated. A draft environmental Assessment (EA) was sent out on July 10, 2017, for a five-business day public review period which ended on July 17, 2017;
- The USACE addressed comments to the EA, and issued a final EA and Finding Of no Significant Impact on July 18, 2017;
- A stakeholder meeting was conducted by USACE on June 21, 2017, at the Aurora Fire Hall; and
- E & E deployed and maintained yellow warning signs at public access points along the lakeshore and creeks prior to the commencement of each treatment. The signs indicated applicable water use restrictions regarding irrigation and drinking, culinary, or food processing purposes. The signs also displayed

water use restrictions that were in effect for the duration of the treatment and until the times listed were reached, or until testing determined that the threshold concentration had been met.

E & E posted and maintained the yellow warning signs (as described above) to meet the intent of permit requirements. The signs were posted at the following areas: along the lake shore within primary treatment areas as well as up to a half-mile buffer both north and south of the planned treatment areas; and along both the east and west sides of Main Street adjacent to the north and south banks of Little Creek and Paines Creek. The signs were placed at all potential public access points (parking areas off the side of Main Street; the dock, bath house, and beach at Wells College), as well as open areas that could potentially be used by the public (kayakers, swimmers, and hikers) as points of entry to the lake or the two creeks. Application dates and times were updated on the signs prior to each of the seven treatments. NYSDEC did not require any newspaper notifications of the treatment activities.

Additionally, NYSDEC, Cayuga County DOH, Village of Aurora, and Wells College were notified of each treatment by email at least 48 hours in advance. All drinking water samples were analyzed with a 24-hour turnaround time (TAT), and E & E reported the findings to the USACE, Cayuga County DOH, and the Village of Aurora upon receipt of sample results.

2.2 Herbicide Treatment Methodology

The aquatic herbicide Sonar® H4C was applied in designated sections of Wells College Bay during seven treatment events that occurred between July and September 2017 (see Table 2-1). Komeen® Crystal was applied during three of the seven events. The herbicide applications were completed by SLM in accordance with the *Architect-Engineer Scope of Work (SOW) Aquatic Plant Control ERDC Demonstration Project Wells College Bay, Cayuga Lake, Aurora, NY,* dated June 2017 and the project-specific Field Sampling and Analysis Plan (USACE 2017; E & E 2017).

One boat was used for the herbicide applications. A work skiff powered by conventional outboard motors was used for the treatment effort in all areas. The skiff was an 18-foot aluminum boat powered by a 40-horsepower four-stroke outboard engine (see Photolog in Appendix A).

Table 2-1 In-lake Sonar® H4C Herbicide Application Summary, by Treatment

Date	Treatment	Acres	Target Concentration (ppb)	Total Pounds of Sonar® H4C
7/20/2017	1	27	20	606
7/27/2017	2	27	20	566[1]
8/3/2017	3	27	20	580[1]
8/10/2017	4	27	20	606
8/17/2017	5	27	20	606
9/1/2017	6	27	20	606
9/14/2017	7	27	20	606
			Total Pounds	**4,176**

Note:
[1] Less Sonar® H4C was used on the second and third applications to ensure that the permitted dosage rate would not be exceeded (i.e., only the differences between the fast test results [in-lake sampling] and the 20 ppb permitted rate were applied). After obtaining several rounds of fast test results that were extremely low, the full amount was applied during the remaining four application events.

Key
ppb = parts per billion

2.2.1 Herbicide Transfer

An in-line herbicide injection system and an SR 430 Stihl backpack blower was used for the Sonar® H4C treatments. An SR 430 Stihl backpack blower or an Agri-Fab granular spreader was used for the Komeen® Crystal treatments. An 18-foot skiff was outfitted with a polyethylene tank, venturi adaptation, and granular spreaders. Herbicide transfer occurred at the Long Point State Park Boat Launch, where the chemical delivery truck was able to park so that other users maintained access to the boat launch during the herbicide transfer process. The Sonar® H4C was delivered in 106 44-pound buckets and the Komeen® Crystal was delivered in 20 20-pound bags. The empty buckets and bags were triple rinsed and recycled at the MOSA Oneonta Transfer Station. Personal protective equipment was worn by SLM staff during the transfer from the truck to the treatment system.

2.2.2 Herbicide Application

The work skiff was outfitted with a 2-inch gasoline-powered water pump. The tanks and lines were fitted with ball valves used to meter the rate of flow. The Sonar® H4C herbicide was mixed with clean water from the lake and then distributed into the lake subsurface through hoses located at the stern of the skiff. The injection rate was approximately 10 pounds per minute. The Komeen® Crystal herbicide was poured into the backpack blower or granular spreader and evenly distributed over the surface at the bow of the skiff. The work skiff had a global positioning system (GPS) navigation system with all of the treatment sectors preloaded. Treatment passes were made parallel to the shorelines. The quantity of herbicide needed for each section was determined by the total acreage and volume of the treatment areas and was modified by the USACE prior to the start of each application. All of the product was applied to each section before moving to the next adjacent section.

Following the in-lake application, the treatment vessel pulled to the shoreline adjacent to Little Creek and Paines Creek. The quantity of the herbicide was loaded into a Stihl backpack sprayer. The applicator opened the valve to the second click and walked up stream, evenly distributing the product into submerged sections of the stream.

SLM staff arrived at the Long Park State Park Boat Launch between at 9:00 and 10:00 AM of each scheduled treatment day, launched the 18-foot skiff, and began assembling treatment systems. After the staff had their on-site meetings, the herbicide transfer began. The treatment crew on the skiff consisted of a lead applicator and an assistant/technician. Treatment started between 10:00 and 11:30 AM and, aside from brief breaks when the boats stopped to re-load herbicide, the treatments continued uninterrupted until the lake treatment areas were completed at approximately 12:30 PM. Immediately following treatment of the lake, streams were treated. Treatment efforts deviated from schedule only once. The third treatment scheduled for August 31 was postponed a day due to poor weather conditions. All necessary parties (USACE, Cayuga County DOH, Village of Aurora, and Wells College water treatment plant) were notified of the delay.

2.3 Quantity of Herbicide Used and Total Area Treated

In-lake and creek Sonar® H4C applications were split into treatments not to exceed 20 parts per billion (ppb), over seven treatment dates in each treatment block (see Table 2-1). The first five treatment dates occurred seven days apart, and the final two treatments were spread 14 days apart.

In-lake Komeen® Crystal spot treatment application co-occurred with three Sonar® H4C treatment events between July and August 2017 (see Table 2-2) at concentrations not to exceed 1 part per million (ppm). Spot treatment areas consisted of 11 individual, predetermined treatment areas and totaled 9 acres over the three treatment dates (see Figure 2-1).

Table 2-2 In-lake Komeen® Crystal (Copper) Herbicide Application Summary, by Treatment

Date	Treatment	Acres	Target Concentration (ppm)	Total Pounds of Komeen® Crystal
7/20/2017	1	3.1	1	186
7/27/2017	2	0	0	0
8/3/2017	3	0	0	0
8/10/2017	4	0	0	0
8/17/2017	5	3.0	1	214
9/1/2017	6	0	0	0
9/14/2017	7	2.9	1	270
			Total Pounds	**670**

Key
ppm = parts per million

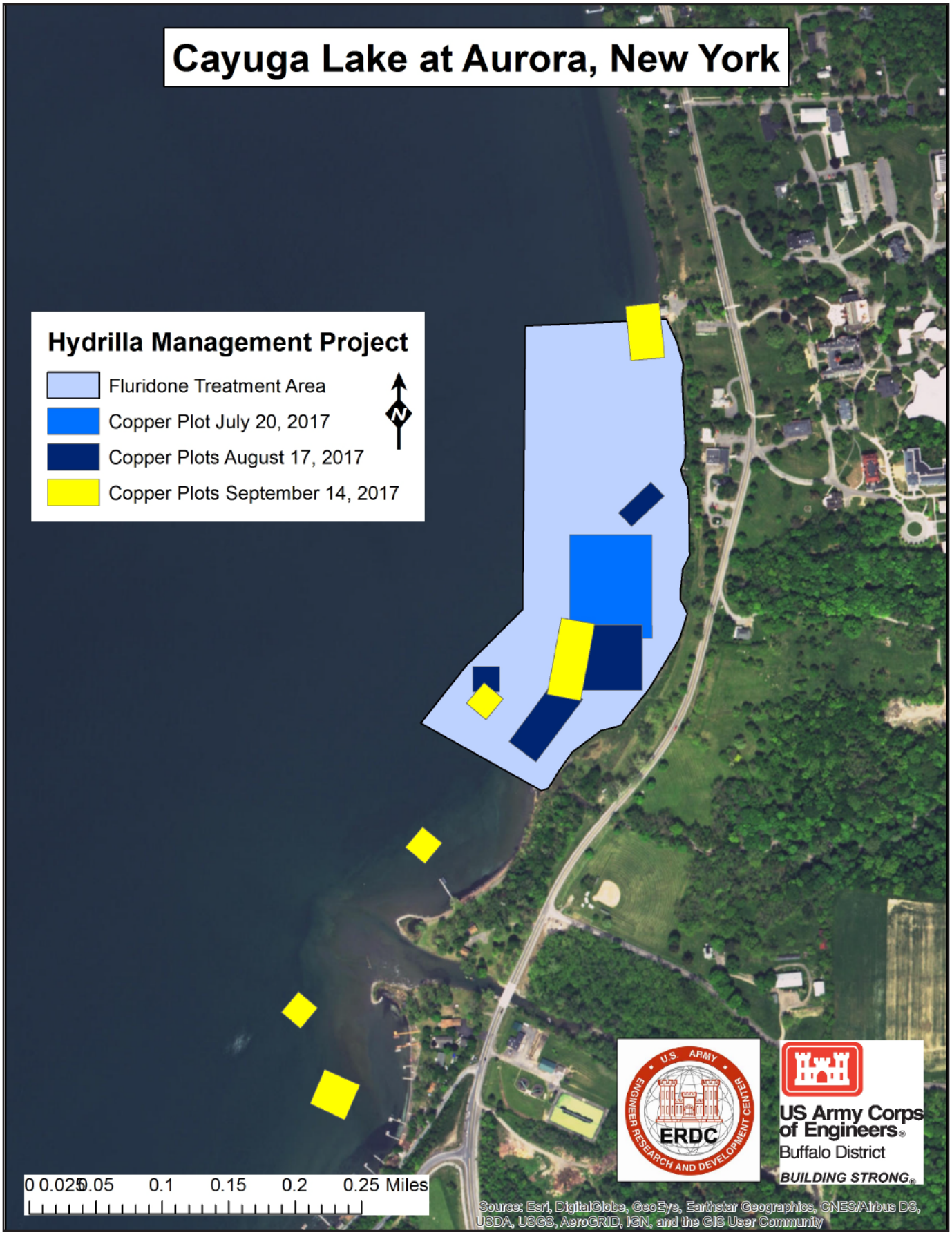

Figure 2-1 Treatment Plots
Wells College Bay, Cayuga Lake

In addition to Sonar® H4C in Little Creek and Paines Creek, a drip application of Nautique® liquid was planned as an additional recommended treatment. However, due to heavy rains in July 2017, most of the Hydrilla and native plant species were washed out of the creeks into the lake, thus alleviating the need for additional treatments.

A total of 4,223.4 pounds of Sonar® H4C were applied in the lake and the creeks over the course of the seven treatments (see Figure 1-1 for the treatment areas and Tables 2-1 and 2-3 for treatment dosages). The original plan included seven applications of 606 pounds of Sonar® H4C. However, after the first application, SLM used slightly less Sonar® H4C on the second and third applications (566 and 580 pounds, respectively) to ensure that the permitted dosage rate would not be exceeded (i.e., only the differences between the fast test results [in-lake sampling] and the 20 ppb permitted rate were applied). After obtaining several rounds of fast test results that were extremely low, the full amount was applied during the remaining four application events. Six hundred seventy pounds of Komeen® Crystal were applied in predetermined sections of Wells College Bay during Treatments 1, 5, and 7 (see Figure 2-1 for the treatment areas and Table 2-2 for treatment dosages).

Table 2-3 Summary Table of Treatment Areas, Volumes, Target Concentrations of Sonar® H4C for Little and Paines Creeks

Date	Treatment	Area to be Treated	Acres	Target Concentration (ppb)	Total Pounds of Sonar® H4C
7/20/2017	1	Little Creek	0.14	0	0
		Paines Creek	1.21	0	0
7/27/2017	2	Little Creek	0.14	20	0.6
		Paines Creek	1.21	20	7.3
8/3/2017	3	Little Creek	0.14	20	0.6
		Paines Creek	1.21	20	7.3
8/10/2017	4	Little Creek	0.14	20	0.6
		Paines Creek	1.21	20	7.3
8/17/2017	5	Little Creek	0.14	20	0.6
		Paines Creek	1.21	20	7.3
9/1/2017	6	Little Creek	0.14	20	0.6
		Paines Creek	1.21	20	7.3
9/14/2017	7	Little Creek	0.14	20	0.6
		Paines Creek	1.21	20	7.3
				Total Pounds	**47.4**

Key
ppb = parts per billion

2.4 Water Quality Sampling

Herbicide was applied during seven treatment events, between July 20, 2017, and September 14, 2017. E & E and the Cayuga County DOH performed drinking water quality sampling and in-lake water quality sampling to determine the fluridone concentrations and dispersion of herbicide between July 21, 2017, and September 21, 2017.

2.4.1 In-Lake Sampling

E & E collected five in-lake water samples following each of the seven treatment events (see Figure 2-2 and Table 2-4 for sample locations). The purpose of the sampling was to determine the fluridone concentrations just prior to the next planned treatment event so that herbicide application could be refined, if necessary, to maintain the proper concentrations throughout each event (i.e., to ensure follow-up applications would not exceed approved rates/concentrations). The sampling events were weather dependent and scheduled so that results from each event were available for review by the project team prior to the next application (i.e., there was a 48-hour TAT for sample analyses that factored into planning each sampling event). The initial sampling event occurred two days after the first application to determine if the initial application concentrations were adequate and as planned. The next three sampling events occurred four to seven days following each application when the applications were spaced seven days apart (applications 2 through 5). When the applications were spaced 14 days apart (applications 6 and 7), the sampling occurred seven to 10 days following the application.

Table 2-4 In-Lake Water Sample Collection Sites
Wells College Bay, Cayuga Lake Hydrilla
Demonstration Project

Sample Collection Site	Latitude[1]	Longitude[a]
LakeN	42.74424	-76.7014
LakeS	42.74217	-76.7013
TreatS	42.73435	-76.7087
TreatN	42.75207	-76.7044
Raw	42.74347	-76.7039

Note
[a] Latitude and Longitude are provided in decimal degrees (WGS84)

Figure 2-2 In-Lake Sampling Location
Wells College Bay, Cayuga Lake

The samples were collected with either a polyvinyl chloride Van Dorn sampler or a stainless-steel Kemmerer bottle sampler. The five in-lake sampling locations consisted of the following (see Figure 2-2):

- Two sample locations in the lake treatment block;
- One sample approximately a half mile north of the lake treatment block;
- One sample approximately a half mile south of the lake treatment block; and
- One sample at the potable water intake.

Samples from each of the first four sample locations listed above were collected approximately 2 feet from the lake bottom to be representative of the fluridone concentrations where the plants were actively growing. Samples collected at the final sample location listed above were collected close to the finished drinking water intake, which is 1.5 feet above the lake bottom. The depth at each sample location was determined from the boat using a sounding tape, to confirm the depth at each location.

Prior to sample collection, the Van Dorn or Kemmerer sampler was locked in the "open" position and completely submerged and rinsed in the surface water at each sample location. For samples taken with a Van Dorn sampler, the sampler was lowered so that the cylinder was centered at approximately 2 feet above the lake bottom for sample collection. For samples taken with a Kemmerer sampler, the Kemmerer was lowered so that the bottom edge of the cylinder was approximately 2 feet above the lake bottom for sample collection. After the messenger was sent down to "close" the Van Dorn or Kemmerer sampler, each sample was retrieved and transferred into brown high-density polyethylene 30 milliliter (mL) sample bottles provided by the laboratory. Samples were stored protected from light and shipped in coolers to SePRO Corporation (SePRO) in Whitakers, North Carolina, for analysis.

In-lake water samples were analyzed using a high-performance liquid chromatography (HPLC) method specific for fluridone. The standard operating procedure for measuring fluridone is a proprietary HPLC method developed by SePRO Research and Technology. The laboratory reported results for fluridone at a reporting limit of 1 part per billion (micrograms per liter [µg/L]). Quality control samples were collected in the field during the post-application sampling period and consisted of field duplicate sample pairs collected at the same location at the rate of 5%.

Samples collected a half mile to the north and south of the lake treatment block were not significantly different from samples collected within the lake treatment block (see Table 2-5). This indicated that the fluridone did not remain concentrated at the application site at the end of a week. However, one sample taken on August 15, 2017, at the LakeN sample site, was an order of magnitude higher than other in-lake water samples collected that day. This was determined

to have been a result of the sampler touching the lake bed, and contaminating the sample sediment and herbicide product.

Table 2-5 In-Lake Water Sampling Results for Fluridone (µg/L)

Date	Sample Location	Time	Sample Depth (feet)	Fluridone Concentration (µg/L)
7/22/2017[a]	TreatN	1022	17.00	**1.6**
7/22/2017[a]	LakeN	1055	11.75	**1.8**
7/22/2017[a]	Intake	1110	19.00	**1.4**
7/22/2017[a]	LakeS	1120	5.00	**1.1**
7/22/2017[a]	TreatS	1143	14.50	**1.6**
7/31/2017[b]	TreatN	1224	17.25	**1.0**
7/31/2017[b]	LakeN	1242	12.00	**1.2**
7/31/2017[b]	Intake	1249	20.00	**1.4/1.5**
7/31/2017[b]	LakeS	1300	5.50	**1.3**
7/31/2017[b]	TreatS	1345	14.50	**1.2**
8/7/2017[b]	TreatN	1134	19.50[c]	<1.0
8/7/2017[b]	LakeN	1152	11.83	<1.0
8/7/2017[b]	Intake	1200	19.83	<1.0
8/7/2017[b]	LakeS	1208	4.00	<1.0
8/7/2017[b]	TreatS	1220	13.50	<1.0
8/15/2017[b]	TreatN	1136	19.50	**1.2**
8/15/2017[b]	LakeN	1147	13.00	**11.1**[d]
8/15/2017[b]	Intake	1156	20.50	<1.0
8/15/2017[b]	LakeS	1205	6.50	**1.6**
8/15/2017[b]	TreatS	1217	14.75	<1.0
8/24/2017[b]	TreatN	1202	16.50	<1
8/24/2017[b]	LakeN	1216	11.00	**1**
8/24/2017[b]	Intake	1224	19.00	**2.8**
8/24/2017[b]	LakeS	1234	5.00	<1
8/24/2017[b]	TreatS	1248	13.00	<1
9/11/2017[b]	TreatN	1225	18.00	<1
9/11/2017[b]	LakeN	1234	11.00	<1
9/11/2017[b]	Intake	1241	19.50	<1
9/11/2017[b]	LakeS	1248	4.17	<1/<1
9/11/2017[b]	TreatS	1300	13.50	<1
9/21/2017[b]	TreatN	1455	18.00	<1
9/21/2017[b]	LakeN	1504	11.00	<1

Table 2-5 In-Lake Water Sampling Results for Fluridone (µg/L)

Date	Sample Location	Time	Sample Depth (feet)	Fluridone Concentration (µg/L)
9/21/2017[b]	Intake	1510	19.50	<1
9/21/2017[b]	LakeS	1517	4.17	<1
9/21/2017[b]	TreatS	1525	13.50	<1

Notes
[a] Samples taken with polyvinyl chloride Van Dorn sampler
[b] Samples taken with stainless steel Kemmerer sampler
[c] Experienced drift to the north during sampling due to wind and waves at this sample location
[d] Result likely biased by sampler unintentionally touching bottom, picking up sediment/herbicide product.

Key
µg/L = micrograms per liter

Bold values denote positive detections
Two reported results in a single cell indicate an instance where a field duplicate sample was collected.

2.4.2 Drinking/Beach Water Sampling

The Wells College water treatment plant shut down operations during each treatment application until each application was complete. The Cayuga County DOH collected finished drinking water samples at the Wells College treatment plant and the Wells College bathhouse, as well as lake water at the Wells College beach on the day of the application and several days following each treatment. The Wells College drinking water sample from the treatment plant was the only sample planned for this project, but the results from the bathhouse and beach are also presented in this report. The Cayuga County DOH collected samples on the day of treatment and three separate days following the first treatment to determine if the treatment had an impact on drinking water. Once results were obtained and it was determined that there were no detectable levels of fluridone in the drinking water, the Cayuga County DOH reduced their sampling interval. The interval included the day of treatment and one additional sample per treatment event except Treatment 5, where samples were collected on three separate days (one on the day of treatment, and two days following the treatment because the interval between treatments 4 and 5 was increased from seven days to 14 days) (see Table 2-6). The spacing between DOH sampling was two to six days per event.

Table 2-6 Drinking Water/Beach Sampling Results for Fluridone (µg/L)

Date	Sample Site	Fluridone Concentration (µg/L) DOH	E & E
7/21/2017	AUD1	<0.5	**2.7**
7/21/2017	AUD2	<0.5	NS
7/21/2017	AUB	<0.5	NS
7/22/2017	AUD1	<0.5	NS
7/22/2017	AUD2	<0.5	NS
7/22/2017	AUB	<0.5	NS
7/24/2017	AUD1	<0.5	NS

Table 2-6 Drinking Water/Beach Sampling Results for Fluridone (µg/L)

Date	Sample Site	Fluridone Concentration (µg/L) DOH	E & E
7/24/2017	AUD2	**1.2**	NS
7/24/2017	AUB	**1.0**	NS
7/25/2017	AUD1	<0.5	NS
7/25/2017	AUD2	<0.5	NS
7/25/2017	AUB	<0.5	NS
7/27/2017	AUD1	<0.5	NS
7/27/2017	AUD2	<0.5	NS
7/27/2017	AUB	<0.5	NS
7/31/2017	AUD1	<0.5	NS
7/31/2017	AUD2	NS	NS
7/31/2017	AUB	<0.5	NS
8/3/2017	AUD1	<0.5	**1.3/1.4**
8/3/2017	AUD2	NS	NS
8/3/2017	AUB	**0.6**	NS
8/7/2017	AUD1	<0.5	NS
8/7/2017	AUD2	NS	NS
8/7/2017	AUB	**2.4**	NS
8/10/2017	AUD1	<0.5	NS
8/10/2017	AUD2	NS	NS
8/10/2017	AUB	<0.5	NS
8/14/2017	AUD1	<0.5	NS
8/14/2017	AUD2	NS	NS
8/14/2017	AUB	**3.5**	NS
8/17/2017	AUD1	<0.5	NS
8/17/2017	AUD2	NS	NS
8/17/2017	AUB	**0.8**	NS
8/21/2017	AUD1	<0.5	NS
8/21/2017	AUD2	NS	NS
8/21/2017	AUB	NS	NS
8/23/2017	AUD1	<0.5	<1
8/23/2017	AUD2	NS	NS
8/23/2017	AUB	NS	NS
9/5/2017	AUD1	<0.5	NS
9/5/2017	AUD2	NS	NS
9/5/2017	AUB	NS	NS
9/7/2017	AUD1	<0.5	<1
9/7/2017	AUD2	NS	NS
9/7/2017	AUB	NS	NS
9/15/2017	AUD1	<0.5	NS
9/15/2017	AUD2	NS	NS
9/15/2017	AUB	NS	NS
9/21/2017	AUD1	<0.5	<1

Table 2-6 Drinking Water/Beach Sampling Results for Fluridone (µg/L)

Date	Sample Site	Fluridone Concentration (µg/L) DOH	E & E
9/21/2017	AUD2	NS	NS
9/21/2017	AUB	NS	NS

Note
[a] Bathing beach closed for the season on August 20, 2017.

Key
AUD1 = Water treatment plant finished water
AUD2 = Wells College dock bathroom
AUB = Wells College dock bathing beach
DOH = Cayuga County Department of Health
E & E = Ecology and Environment, Inc.
µg/L = micrograms per liter
NS = Not Sampled

Bold values denote positive detections
Two reported results in a single cell indicate an instance where a field duplicate sample was collected.

Finished drinking water samples were collected from a sink tap within the Wells College treatment facility by a Cayuga County DOH staff member. The staff member collected the sample by filling a clean high-density polyethylene container with the tap water, then the tap water was transferred into separate brown high-density polyethylene 30-mL sample bottles (including split samples). The Cayuga County DOH hand delivered their sample to the Community Science Institute (CSI) in Ithaca, New York, for fluridone analysis using the RaPID assay (enzyme-linked immunosorbent assay) method (RaPID Assay Fluridone Test Kit). The laboratory reported results for fluridone to a lower reporting limit of 0.5 part per billion (µg/L) and an upper reporting limit of 10.0 ppb (µg/L). E & E collected finished drinking water split samples of the Cayuga County DOH samples at a rate of 10% (i.e., one sample during each week following Events 1, 3, 5, 6, and 7). The split samples were stored, protected from light, and shipped via FedEx Priority Overnight in coolers to SePRO for analysis. SePRO utilized a propriety HPLC to determine fluridone concentrations to a method detection limit of 1 µg/L. The purpose of the split samples was to compare the fluridone concentrations in samples collected using the two different test methods (the RaPID Assay method, and the SePRO proprietary HPLC method). The RaPID assay is considered a screening method whereas the HPLC method is considered a definitive method. Any significant detection by RaPID assay would require confirmation by HPLC. There were no significant differences in detections between the DOH finished drinking water samples and the E & E split samples (see Table 2-6).

3 Study Improvements

The study improvements, summarized below, were based on lessons learned from this first year of herbicide application effort, coordination with the study partners work plan development, and activities conducted during the 2017 herbicide application.

3.1 Herbicide Application and Analysis

Herbicide Application

Transfer of the herbicide from the shore-based areas to the skiffs and application of the herbicide in 2017 was smooth and efficient. The staging area adequately supported operations for the in-lake and creek treatments. Public access to the boat ramps during used by the applicators was uninterrupted. Although inclement weather can significantly affect the application and subsequent in-lake sampling schedule, weather delayed application by one day for only one event. The project team needs to continue to look at long-range weather forecasts when planning future applications/sampling, and build in schedule flexibility for each event.

Analysis

Two different types of analytical tests were performed to determine fluridone concentrations during the study. SePRO's proprietary HPLC method was used for analysis of fluridone in the in-lake samples and the finished drinking water split samples, and CSI analyzed the finished drinking water samples using the RaPID assay to determine fluridone concentrations. The RaPID assay is considered a screening method whereas the HPLC method is considered a definitive method. The split samples did not show any discernible differences between the results; therefore, both methods met the project goals. For future work, either method could be employed; however, elevated detections using the RaPID assay would require confirmation via a definitive method.

3.2 2017 Lessons Learned

Treatment Areas

Due to the consistency with scheduling and the fluridone treatment, the application operations proceeded smoothly. When working on waterbodies of this scale, it is critical to continue to maintain proper contact through E & E or the USACE to communicate needs, especially concerning the water intake facility adjacent to the treatment area.

Communication

At the start-up of the application, the Cayuga County DOH informed the Wells College water treatment plant of the application schedule. There was a misunderstanding at the Plant regarding the magnitude of the treatment applications (i.e., the Plant was under the impression that there was only one treatment planned, rather than seven). E & E rectified that situation by meeting with Plant personnel the day of the first application.

Due to unpredictable weather conditions and the open nature of the lake, inclement weather can stir up on short notice and cause delays or cancellations in applications or sampling events. One such delay occurred on August 31, resulting in a one-day delay in application of Event 6. Since the water treatment plant was instructed by the Cayuga County DOH to shut down operations just prior to each treatment, the Plant filled their reserve tanks the day/night before each application. Thus, any delays in schedule directly affects the treatment plant, as they need to have sufficient volumes in storage to accommodate community needs. If there are significant or multiple delays, the treatment plant needs to be notified in a timely matter so that they can fill their reserve tanks in a timely manner. Therefore, consideration of the Plant's schedule must be taken into account (weekend/holidays) prior to making schedule changes. An email notification to all appropriate parties (USACE, Cayuga County DOH, NYSDEC, Village of Aurora, Wells College water treatment plant, and the applicator) was implemented midway through the 2017 treatment program to provide advanced notice of upcoming planned treatments, and also act as an early warning system should there be any changes in schedule. This type of communication needs to continue in future treatment programs.

Water Sampling

The Cayuga County DOH performed drinking water sampling at the Wells College water treatment plant to ensure the treatments did not have an impact on drinking water. The following suggestions provide ways to minimize redundancies and improve efficiency of the sampling program:

Frequency of Drinking Water Sampling and Logistics.

- Based on finished water sample results, as well as results from in-lake sampling, the treatments did not have an impact on drinking water quality (i.e., there were only three fluridone detections in the 17 drinking water samples collected, and all were below 2.7 ppb, well below the action level of 50 ppb). In addition, concentrations in the lake water were also very low (all below 2.8 ppb, except for a biased high detection [11.1 ppb] when the sampler accidently touched bottom). Thus, in-lake levels were similar to drinking water levels, even for in-lake samples collected directly from treatment areas. If there are no significant changes to future treatments (herbicide product[s], dosage, and frequency), a reduction in the number of finished

water samples collected by Cayuga County DOH should be considered to reduce project costs.

- On days of the treatment, the treatment plant would start pumping earlier in the morning to have the required amount of water in storage before the pumps were turned off prior to treatment (around 10:00 AM). The pumps would remain off until the following day until around 6:00 AM. The sampling conducted by Cayuga County DOH at the treatment plant took place in the afternoon on the day of the treatment and a few days following the treatment. Since the tanks were filled prior to sampling, and the pumps were shut down during treatment, the sampling of drinking water in the afternoon on the day of treatment was actually representative of the tail end of the previous treatment, not the current treatment. Given the half-life of the fluridone (20 days), and the one-to-two week spacing between treatments, the sample on the day of treatment was still valid. However, if there are no significant changes to future treatments (herbicide product[s], dosage, and frequency), a reduction in the number of finished water samples collected by Cayuga County DOH should be considered to reduce project costs. In addition, for future sampling events, it would be beneficial to sample finished water a few days after the treatment to allow time for the fluridone to mix thoroughly in the open water lake system.

Frequency of In-Lake Sampling and Logistics.

- In-lake sampling was performed following each treatment event. The initial purpose was to monitor water quality as it related to the drinking water intake, and to determine if adjustments to the dosage of the subsequent treatments were necessary. As stated above, the in-lake sample results indicated no significant impacts on lake water quality. If there are no significant changes to future treatments (herbicide product[s], dosage, and frequency), a reduction in the number of in-lake water samples should be considered to reduce project costs.
- Samples should continue to be collected between day 2 and day 5 of each application so that results can be obtained before the next treatment (assuming a 48-hour TAT). This will enable SLM to back-calculate dosage to maintain the 20 ppm, if necessary. SLM back-calculated between treatments 1 and 2 and 2 and 3, but later stopped back-calculating based on in-lake results and discussions with the USACE and NYSDEC. However, the in-lake sampling should be performed no later than day 5 (weather permitting) to allow time for back-calculations if deemed necessary.

Biased Sample. During one of the in-lake sampling events (following Treatment 4), the sampler inadvertently touched bottom. This resulted in a biased-high fluridone concentration as the sampler likely picked up sediment containing herbicide product. If this occurs during future sampling events, the sampler must be raised to the surface and thoroughly rinsed with lake water to prevent any contamination from entering the laboratory sample.

Analytical Turnaround Times.

- Drinking water samples: samples were analyzed with a 24-hour TAT. However, since it was determined that the treatments did not have an impact on drinking water quality, the TAT is not as critical as it was prior to the commencement of this project. If all parties agree that the TAT is not critical, then drinking water samples could be sent to SePRO along with the in-lake samples. SePRO can analyze the samples at a much reduced cost (38% with a 48-hour TAT) than CSI. Furthermore, if the number of drinking water samples is reduced (as suggested above), the CSI laboratory costs will be higher, thus the savings will be greater.
- In-lake sampling: samples are analyzed on a 48-hour TAT. There are no apparent needs to change this TAT at this time, as long as samples can be collected at least two days prior to the next event to allow enough time for back-calculating dosage for the next event. If weather significantly affects sampling, it may be necessary to implement a 24-hour TAT, if deemed necessary.

Herbicide Volumes

As the program includes more reactive smaller-scale spot-treatments, the applicator will need to have greater flexibility to accommodate last minute changes to the SOW. The applicator will need to have enough herbicide on-hand to be able to target all areas that require treatment, but have the flexibility to return unused product to inventory. Improvements with preliminary estimates of the anticipated and potential maximum quantities of herbicide to be applied will be needed, to arrange for product delivery.

4 References

Ecology and Environment, Inc. (E & E). 2017. *Field Sampling and Analysis Plan*, Wells College Bay, Cayuga Lake Hydrilla Demonstration Project, Lancaster, NY, July 2017.

United States Army Corps of Engineers (USACE). 2017. *Architect-Engineer Scope of Work Aquatic Plant Control ERDC Demonstration Project Wells College Bay, Cayuga Lake, Aurora, NY.* June 2017.

A Photolog

Date:	06/05/2017	**Direction of View:**	W
Subject:	Hydrilla Surveying		
Description:	USACE Buffalo District Biologists conducting a rake toss survey to delineate hydrilla beds.		

Date:	06/05/2017	**Direction of View:**	W
Subject:	Hydrilla Surveying		
Description:	USACE Buffalo District Biologists identifying plants during a rake toss survey to delineate hydrilla beds.		

Date:	07/20/2017 **Direction of View:** E
Subject:	SOLitude Lake Management herbicide application boat
Description:	Sonar®H4C (fluridone) was placed in the tank and dispensed into the lake through hoses off of the stern of the skiff . Komeem® Crystals (copper) was placed in the granular spreader on the bow of the skiff.

Date:	07/20/2017 **Direction of View:** SSW
Subject:	Herbicide application
Description:	Treatment 1: Sonar®H4C application in Wells College Bay, Cayuga Lake

Date:	09/14/2017	**Direction of View:**	E
Subject:	In-lake water sampling		
Description:	View to east from the northern-most in-lake water sampling location (TreatN), 0.5 mile north of the northern spot treatment area		

Date:	09/14/2017	**Direction of View:**	E
Subject:	In-lake water sampling		
Description:	View to east from the north treatment block sample location (LakeN)		

Date:	09/14/2017	**Direction of View:**	E
Subject:	In-lake water sampling		
Description:	View to east from the "Intake" sampling location		

Date:	07/20/2017	**Direction of View:**	NA
Subject:	Drinking Water Intake		
Description:	Wells College Water Treatment Plant "intake" cone that is mounted to the intake pipe in Cayuga Lake. The cone is approximately 18-inches high.		

Date:	09/14/2017	**Direction of View:**	E
Subject:	In-lake water sampling		
Description:	View to east from the south treatment block sample location (LakeS)		

Date:	09/14/2017	**Direction of View:**	E
Subject:	In-lake water sampling		
Description:	View to east from the southern-most in-lake water sampling location (TreatS), 0.5 mile south of the southern spot treatment area		

Date:	09/11/2017	**Direction of View:**	E
Subject:	Lake water depth measurements		
Description:	Ecology and Environment, Inc. (E & E) biologist determining depth at LakeS sample site.		

Date:	09/11/2017	**Direction of View:**	E
Subject:	Lake Water Sampling		
Description:	E & E biologist rinsing Kemmerer Bottle prior to collecting an in-lake water sample at LakeS sample site.		

Date:	09/11/2017	**Direction of View:**	Down
Subject:	Lake water sampling		
Description:	E & E biologist lowering the Kemmerer bottle sampling device at the LakeS sample site.		

Date:	09/11/2017	**Direction of View:**	Down
Subject:	Lake water sampling		
Description:	E & E biologists transferring in-lake water sample from Kemmerer Bottle to a brown high-density polyethylene 30 milliliter sample bottle.		

B Analytical Data

Community Science Institute, Inc.
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Aurora Fluridone Monitoring Report Revised

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 7/21/17 Test Date: 7/21/17

Report ID: Aurora 072117 Number of Samples: 3
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	7/21/17
AUD2	Wells College dock bathroom	<0.5	7/21/17
AUB	Wells College dock bathing beach	<0.5	7/21/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 7/24/17
Stephen M. Penningroth, Technical Director

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Aurora Fluridone Monitoring Report Revised

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 7/22/17 Test Date: 7/22/17

Report ID: Aurora 072217 Number of Samples: 3
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	7/22/17
AUD2	Wells College dock bathroom	<0.5	7/22/17
AUB	Wells College dock bathing beach	<0.5	7/22/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 7/24/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 7/24/17 Test Date: 7/24/17

Report ID: Aurora 072417 Number of Samples: 3
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	7/24/17
AUD2	Wells College dock bathroom	1.2	7/24/17
AUB	Wells College dock bathing beach	1.0	7/24/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 7/24/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 7/25/17 Test Date: 7/26/17

Report ID: Aurora 072517 Number of Samples: 3
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	7/26/17
AUD2	Wells College dock bathroom	<0.5	7/26/17
AUB	Wells College dock bathing beach	<0.5	7/26/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 7/26/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 7/27/17 Test Date: 7/28/17

Report ID: Aurora 072717 Number of Samples: 3
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	7/28/17
AUD2	Wells College dock bathroom	<0.5	7/28/17
AUB	Wells College dock bathing beach	<0.5	7/28/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 7/28/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 7/31/17 Test Date: 8/1/17

Report ID: Aurora 073117 Number of Samples: 2
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/1/17
AUB	Wells College dock bathing beach	<0.5	8/1/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/1/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/3/17 Test Date: 8/4/17

Report ID: Aurora 073117 Number of Samples: 2
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/4/17
AUB	Wells College dock bathing beach	0.6	8/4/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/4/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/7/17 Test Date: 8/8/17

Report ID: Aurora 080717 Number of Samples: 2
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/8/17
AUB	Wells College dock bathing beach	2.4	8/8/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/8/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/10/17 Test Date: 8/11/17

Report ID: Aurora 080717 Number of Samples: 2
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/11/17
AUB	Wells College dock bathing beach	<0.5	8/11/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/11/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/14/17 Test Date: 8/15/17

Report ID: Aurora 080717 Number of Samples: 2
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/15/17
AUB	Wells College dock bathing beach	3.5	8/15/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/15/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/17/17 Test Date: 8/18/17

Report ID: Aurora 080717 Number of Samples: 2
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/18/17
AUB	Wells College dock bathing beach	0.8	8/18/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/18/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/21/17 Test Date: 8/22/17

Report ID: Aurora 082117 Number of Samples: 1
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	8/22/17
AUB	Wells College dock bathing beach		

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth Date: 8/22/17
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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 8/23/17 Test Date: 8/25/17

Report ID: Aurora 082317 Number of Samples: 1
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	0.3	8/25/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth, Technical Director Date: 8/25/17

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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 9/5/17 Test Date: 9/6/17

Report ID: Aurora 082317 Number of Samples: 1
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	9/6/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth, Technical Director Date: 9/6/17

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Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 9/7/17 Test Date: 9/8/17

Report ID: Aurora 090717 Number of Samples: 1
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	9/8/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth, Technical Director Date: 9/8/17

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NYSDOH ELAP #11790 www.communityscience.org EPA Lab Code NY01518

Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 9/15/17 Test Date: 9/18/17

Report ID: Aurora 091517 Number of Samples: 1
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	9/18/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth, Technical Director Date: 9/18/17

Copy to: Tompkins County Health Department

283 Langmuir Lab/Box 1044 95 Brown Road Ithaca NY 14850 Voice/Fax 607 257 6606
2080 Cayuga View Road Trumansburg NY 14886 Voice/Fax 607 387 3820
director@communityscience.org

Community Science Institute, Inc.
NYSDOH ELAP #11790 www.communityscience.org EPA Lab Code NY01518

Aurora Fluridone Monitoring Report

Client: Cayuga County Health Department 8 Dill St. Auburn, NY 13021	Sampling Date: 9/21/17 Test Date: 9/22/17

Report ID: Aurora 091517 Number of Samples: 1
Test Methods: Modern Water, RaPID Assay® Fluridone Test Kit A00250 (ELISA)

Site	Location	Fluridone, ppb	Test Date
AUD1	Water treatment plant entry point	<0.5	9/22/17

Results apply only to samples listed above and not to any other samples.
Samples were not acidified unless otherwise stated.
The analytical method is based on ELISA technology and is not certifiable by NYSDOH.

Report prepared by: Stephen M. Penningroth, Technical Director Date: 9/22/17

Copy to: Tompkins County Health Department

283 Langmuir Lab/Box 1044 95 Brown Road Ithaca NY 14850 Voice/Fax 607 257 6606
2080 Cayuga View Road Trumansburg NY 14886 Voice/Fax 607 387 3820
director@communityscience.org

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC1923 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM6363-1	DW Finished 0721	Sonar/Fluridone (ug/L)	FAST 10	2.7	07/21/2017

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: 07/24/17 10:00 AM
Date Results Sent: 07/25/2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

Quality Control Data Report

Chain of Custody:	COC1923	Contact Name:	Lynne Parker
Sample Date/Time:	07/21/2017 11:05am	Contact Email:	lparker@ene.com

Active Ingredient: Sonar (Fluridone)

QC ID	Target (ppb)	Relative Percent Difference (%)	Pass/Fail
QCS1-1	50	5	PASS
QCS2-1	10	5.5	PASS
QCS3-1	5	2	PASS
QCS4-1	0 (Blank)	< 0.5ppb*	PASS
Spike	10	17	PASS

* Relative Percent Difference cannot be calculated using a 0 value, so the ppb is used.

Laboratory Information

Date/Time Received: 7/24/2017 10:00am

Analyst Name: Connie Lutz

This entire report was reviewed and approved for release.

Zoe Shaner

Signature

7/25/2017

Date

Reviewed By: Zoe Shaner, Quality Assurance Officer

SePRO Research & Technology Campus 16013 Watson Seed Farm Road, Whitakers, NC 27891
Laboratory Email: srtclab@sepro.com Laboratory Phone: (252) 391-8375

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC1935 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM6413-1	Lakes-722	Sonar/Fluridone (ug/L)	FAST 10	1.1	07/22/2017
CTM6414-1	Treats-0722	Sonar/Fluridone (ug/L)	FAST 10	1.6	07/22/2017
CTM6415-1	Raw-722	Sonar/Fluridone (ug/L)	FAST 10	1.4	07/22/2017
CTM6416-1	Lake N-0722	Sonar/Fluridone (ug/L)	FAST 10	1.8	07/22/2017
CTM6417-1	Treat N	Sonar/Fluridone (ug/L)	FAST 10	1.6	07/22/2017

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: 07/25/17 11:00 AM
Date Results Sent: 07/26/2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

Quality Control Data Report

Chain of Custody:	COC1935	Contact Name:	Lynne Parker
Sample Date/Time:	7/22/2017	Contact Email:	lparker@ene.com

Active Ingredient: Sonar (Fluridone)

QC ID	Target (ppb)	Relative Percent Difference (%)	Pass/Fail
QCS1-1	50	0.4	PASS
QCS2-1	10	7	PASS
QCS3-1	5	8	PASS
QCS4-1	0 (Blank)	< 0.5ppb*	PASS
Spike	10	6	PASS

* Relative Percent Difference cannot be calculated using a 0 value, so the ppb is used.

Laboratory Information

Date/Time Received: 7/25/2017 10:00am

Analyst Name: Connie Lutz

This entire report was reviewed and approved for release.

Zoe Shaner

Signature

7/26/2017

Date

Reviewed By: Zoe Shaner, Quality Assurance Officer

SePRO Research & Technology Campus 16013 Watson Seed Farm Road, Whitakers, NC 27891

Laboratory Email: srtclab@sepro.com Laboratory Phone: (252) 391-8375

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2008 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Inlet - NY
Waterbody size:	166
Depth Average:	7.5

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM6650-1	LAKEN-073117	Sonar/Fluridone (ug/L)	FAST 10	1.2	07/31/2017
CTM6649-1	INTAKE-073117-Q	Sonar/Fluridone (ug/L)	FAST 10	1.4	07/31/2017
CTM6648-1	TREATN-073117	Sonar/Fluridone (ug/L)	FAST 10	1	07/31/2017
CTM6647-1	INTAKE-073117	Sonar/Fluridone (ug/L)	FAST 10	1.5	07/31/2017
CTM6646-1	TREATS-073117	Sonar/Fluridone (ug/L)	FAST 10	1.2	07/31/2017
CTM6645-1	LAKES -073117	Sonar/Fluridone (ug/L)	FAST 10	1.3	07/31/2017

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: 08/01/17 11:00 AM
Date Results Sent: 08/02/2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2041 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Inlet - NY
Waterbody size:	166
Depth Average:	7.5

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM6735-1	DW- Finished-080317	Sonar/Fluridone (ug/L)	FAST 10	1.3	08/03/2017
CTM6736-1	DW-Finished-080317-DUPE	Sonar/Fluridone (ug/L)	FAST 10	1.4	08/03/2017

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: 08/04/17 12:00 AM
Date Results Sent: 08/04/2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2060 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM6792-1	LAKEN-080717	Sonar/Fluridone (ug/L)	FAST 10	<1	08/07/2017
CTM6791-1	TREATN-080717	Sonar/Fluridone (ug/L)	FAST 10	<1	08/07/2017
CTM6790-1	TREATS-080717	Sonar/Fluridone (ug/L)	FAST 10	<1	08/07/2017
CTM6789-1	INTAKE-080717	Sonar/Fluridone (ug/L)	FAST 10	<1	08/07/2017
CTM6788-1	LAKES-080717	Sonar/Fluridone (ug/L)	FAST 10	<1	08/07/2017

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: 08/08/17 12:00 AM
Date Results Sent: 08/09/2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2109 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM6944-1	TREATN-081517	Sonar/Fluridone (ug/L)	FAST 10	1.2	08/15/2017
CTM6943-1	LAKES-081517	Sonar/Fluridone (ug/L)	FAST 10	1.6	08/15/2017
CTM6942-1	LAKEN-081517	Sonar/Fluridone (ug/L)	FAST 10	11.1	08/15/2017
CTM6941-1	TREATS-081517	Sonar/Fluridone (ug/L)	FAST 10	<1	08/15/2017
CTM6940-1	INTAKE-081517	Sonar/Fluridone (ug/L)	FAST 10	<1	08/15/2017

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: 08/16/17 10:30 AM
Date Results Sent: Thursday, August 17, 2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2169 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM7106-1	DW-FINSIHED-082317	Sonar/Fluridone (ug/L)	FAST 10	<1	08/23/2017
CTM7107-1	TREATN-082417	Sonar/Fluridone (ug/L)	FAST 10	<1	08/24/2017
CTM7108-1	LAKEN-082417	Sonar/Fluridone (ug/L)	FAST 10	1	08/24/2017
CTM7109-1	DW-INTAKE-082417	Sonar/Fluridone (ug/L)	FAST 10	2.8	08/24/2017
CTM7123-1	TREATS-082417	Sonar/Fluridone (ug/L)	FAST 10	<1	08/24/2017
CTM7110-1	LAKES-082417	Sonar/Fluridone (ug/L)	FAST 10	<1	08/24/2017

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.
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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: 08/25/17 10:30 AM
Date Results Sent: Monday, August 28, 2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2252 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM7390-1	DW-Finished-090717	Sonar/Fluridone (ug/L)	FAST 10	<1	09/07/2017

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: 09/11/17 09:30 AM
Date Results Sent: Tuesday, September 12, 2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2265 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM7415-1	TREATS-091117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/11/2017
CTM7416-1	LAKEN-091117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/11/2017
CTM7417-1	INTAKE-091117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/11/2017
CTM7418-1	LAKES-091117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/11/2017
CTM7419-1	TREATN-091117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/11/2017
CTM7420-1	DUPE-LAKES-091117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/11/2017

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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: 09/12/17 12:00 AM
Date Results Sent: Wednesday, September 13, 2017

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.

Reviewed By: Quality Assurance Officer

SePRO Research & Technology Campus

FasTEST*

16013 Watson Seed Farm Road, Whitakers, NC 27891

Chain of Custody: COC2345 **LABORATORY REPORT**

Customer Company **Customer Contact**

Company Name Ecology and Enviornment Inc	Contact Person: Lynne Parker
Address: 368 Pleasant View Dr. Lancaster NY 14086	E-mail Address: lparker@ene.com
	Phone: 716-684-8060

Waterbody Information

Waterbody:	Cayuga Lake - NY
Waterbody size:	0
Depth Average:	0

Sample ID	Sample Location	Test	Method	Results	Sampling Date / Time
CTM7678-1	TREATS-092117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/21/2017
CTM7679-1	LAKEN-092117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/21/2017
CTM7680-1	LAKES-092117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/21/2017
CTM7681-1	INTAKE-092117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/21/2017
CTM7682-1	TREATN-092117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/21/2017
CTM7683-1	DW-FINISHED-092117	Sonar/Fluridone (ug/L)	FAST 10	<1	09/21/2017

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:
Date Results Sent: Wednesday, September 27, 2017

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.

Reviewed By: Quality Assurance Officer
