

February 17, 2014

Ms. Joanna Bilotta, President  
Lake Shirley Improvement Corporation (LSIC)  
PO Box 567  
Shirley, MA 01464

**Re: Proposal/Agreement for Aquatic Management Services at Lake Shirley - 2014**

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Dear Joanna:

Please accept this as our 2014 Proposal/Agreement for the Aquatic Management Program at Lake Shirley. Pursuant to our Year-End Report, dated January 30, 2014, last year's program was successful in providing control of problematic areas of spiny naiad (*Najas minor*) and tapegrass (*Vallisneria*) as well the now scattered growth of invasive curlyleaf pondweed (*Potamogeton crispus*) and Eurasian watermilfoil (*Myriophyllum spicatum*). Nuisance algae was monitored throughout the summer by the LSIC, but fortunately no treatments were required.

Throughout the summer, numerous plant surveys were conducted to assess the lake's population of both native and non-native plants and guide treatment activities and on-going management recommendations. While curlyleaf pondweed and Eurasian milfoil have been the historical targets of management, last year's treatment focused mostly on control of naiad and tapegrass. We expect this will be the case again this summer and also recommend initiating management of the expanding infestation of fanwort (*Cabomba caroliniana*).

For this summer, we recommend a program consisting of

- DEP permitting
- Multiple plant/algae inspections as needed
- A combined herbicide treatment targeting all plants (milfoil, curlyleaf, naiad and tapegrass) at once in late June.
- Optional inclusion of fanwort in the combined treatment
- Monitoring algal populations and treatment with copper sulfate as needed
- Data interpretation & reporting

**Scope of Services**

***File Annual DEP permit, Pre/ Post-treatment Surveys/Inspections, Data Interpretation & Reporting***

A License to Apply Chemicals permit will be filed with the MA DEP to cover the proposed herbicide and algaecide treatments in 2014.

Multiple pre-treatment surveys/inspections of Lake Shirley will be conducted in order to identify and map areas of the lake needing treatment.

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**Aquatic Control Technology**

Within approximately 2-4 weeks of a treatment, a brief inspection of those areas that are chemically treated will be performed by a representative from Aquatic Control, along with representative(s) from LSIC, to confirm that targeted areas for nuisance plant control was achieved.

A late summer plant survey would be performed during September to help guide future nuisance plant management and potential herbicide treatment needs in the lake for 2015. That survey will be qualitative in scope but will seek to document the area coverage and relative abundance of invasive milfoil and other non-native and invasive plants. A post-treatment letter/report and plant map will be submitted on or before mid-November to the LSIC. The report shall include application dates, locations, rates and justification for applications (plant surveys and densities), as well as any anecdotal information regarding complaints, fish kills, etc. (as required by Lunenburg OOC, Special Condition #18).

### ***Algae Monitoring & Management***

Two water samples will typically be collected from the lake by LSIC when the water clarity begins to fall below ~ 5 - 6 feet and/or windblown algae are seen to accumulate on the water surface. These samples are to be delivered by LSIC (either on the day of collection or the next day) to our offices in Sutton. Based upon the results of the algae counts and water clarity readings, ACT in conjunction with LSIC will jointly determine if and when an algaecide treatment is to be performed. If performed, the treatment will most likely need to be "split", whereby one half of the lake is treated at one time, with the remaining half of the lake then treated 7-14 days later, to avoid potential oxygen loss. The treatment will be performed at a dose of 0.30 mg/l or less, as copper sulfate or less than 0.1 mg/l as metallic copper.

ACT does not guarantee to what extent or for how long the nuisance algal population may or may not be controlled in Lake Shirley post-treatment. Each lake responds differently to algaecide treatment and by virtue of the lake's water chemistry (low alkalinity) and permit requirements, ACT is being held to a relatively "low dose".

### ***Herbicide Treatment***

As a result of on-going management, the infestation of non-native curlyleaf pondweed and Eurasian milfoil has decreased significantly and only very scattered growth of these plants were observed in 2013. At the same time, the growth of non-native spiny naiad and nuisance tapegrass have become more widespread and increasingly problematic. The herbicide treatment in late June was timed to target all of these plants and provided a desirable level of control.

We again recommend a late June treatment to target any remaining areas of milfoil and curlyleaf pondweed as well as problematic areas of spiny naiad with Reward (diquat) herbicide. Problematic areas of tapegrass would be targeted using Reward herbicide and a copper based product (Nautique/Captain) to increase effectiveness on this hearty species. Treatment areas will be designated in cooperation with the LSIC based on our pre-treatment inspection(s).

If approved by the Association, designated areas of fanwort would be treated with the Clipper (flumioxazin) herbicide on the same day as the other treatments described above. The most prominent areas of fanwort observed during the late summer plant survey are shown in Figure 1 and total approximately 50-acres. All of these areas are recommended for treatment or the LSIC can designate a portion of these areas for treatment in 2014 based on use patterns and available budget. There may be

additional areas where fanwort growth warrants treatment so fanwort growth will be evaluated again in the pre-treatment survey to finalize the area of infestation and recommended treatment areas.

As discussed in our Year-End Report, we will need to request approval to use Clipper (and the liquid copper products) from the Conservation Commissions this winter/spring. Additionally, the MA DEP currently requires pre & post treatment mussel survey when using Clipper herbicide. The DEP is reviewing additional data from the manufacturer and may lift these restrictions, but if not, these surveys could add \$5,000-\$7,000 or more to the cost of the program. The status of the requirement and a firm cost will be discussed and approved by the LSIC prior to any treatment of fanwort with Clipper herbicide.

**Tentative Schedule of Performance:**

- ◆ Pre-treatment inspection ..... May/early June
- ◆ Combined Herbicide treatment ..... late June
- ◆ Initial post-treatment inspection ..... 2-4 weeks after treatment
- ◆ Additional plant inspections as needed ..... July-August
- ◆ Late summer plant survey ..... September
- ◆ Algal monitoring ..... Late June through early September
- ◆ Algal treatment ..... July – September (if and as required)
- ◆ Year-end report ..... December

**Insurance**

ACT carries workmen’s compensation, property damage and liability insurance which will remain in effect throughout the duration of this Agreement. A “certificate of insurance” will be provided to LSIC upon request.

**Client (LSIC) Responsibilities**

LSIC is responsible for compliance with the Lunenburg Conservation Commission’s, Order of Conditions (OOC) permit for this project, unless otherwise agreed to by ACT as outlined below. LSIC shall also be responsible for all treatment approvals/notifications to the Town of Shirley and compliance with all permit conditions from the Shirley Conservation Commission.

**ACT’s Responsibilities (in-whole or in-part as applicable)**

- ACT will have a copy of the Order on-site and ACT’s Supervisory Applicator on-site will have read the Order and will perform the chemical treatment(s) in a manner consistent with the NOI and the DEP License to Apply Chemicals and the chemical label.
- Special Condition 3. An algal expert will perform the algal identification and counts.
- Special Condition 9. There will be no treatment within a 5-foot wildlife habitat preservation zone around the lake.
- Special Condition 14 and 16. Reward will be applied as defined in the Sequence of Application with timetable, dosage and locations which is consistent with the Mass. GEIR (2004) for Eutrophication & Aquatic Plant Management in Massachusetts).
- Special Condition 15. Precautions shall be taken to prevent spillage of chemicals during the application.

**LSIC is also responsible for the following**

- Conduct of all required notifications,
- Well sampling/analyses,
- Reporting requirements;

- LSIC will engage outside third party consultant (Geosyntec) for their annual Aquatic Plant Survey.
- Posting of printed signs around the entire lake shoreline prior to all treatments. ACT to provide the signs and posting instructions.
- Compliance/enforcement of the temporary water use restrictions to be imposed post-treatment.
- Providing a boat/motor and one or more LSIC members to be present during the herbicide weed treatment to verify that treatment was performed to only those areas that were designated on the map of Proposed Treatment.

### **Termination**

Either LSIC or ACT may terminate this Agreement by notifying the other party in writing. In the event of termination, LSIC shall pay ACT for all work completed or in-progress, up to the time that termination is received.

### **Cost and Payment**

#### ***Permitting/Inspections, Data Interpretation & Reporting:***

Total cost of \$3,000. Payment to be commensurate with the services performed.

#### ***Herbicide Treatment***

The cost of treatment will be based on the type of herbicide used and the size of the treatment area. For the combined treatment approach described above the cost will be,

- \$4,300 for the first 15-acres of treatment (using Reward only)
- Additional \$190/acre for Reward only
- Additional \$245/acre for Reward/Copper (i.e. Nautique)
- OPTIONAL - Additional \$385/acre for fanwort treatment using Clipper

This above costs assume that all herbicides will be applied on the same day. A total treatment cost will be approved by the LSIC following the pre-treatment survey and designation of various treatment areas. Payment for herbicide treatment to be made in full on or before the day of treatment.

#### ***Algae Monitoring***

Cost for algal monitoring is \$1,020 based on analyses of 12 samples @ \$85/sample. Payment to be commensurate with the services performed.

#### ***Algaecide Treatment***

It is now customary and required by the copper sulfate label, that no more than half of the lake will be treated at any one time. The cost for a half lake treatment is \$4,250. In some cases, the half treatment may be enough to restore desirable water clarity however if needed, another half treatment can be conducted 10-14 days later. The cost of two "half treatments" is equivalent to cost of a whole lake "split" treatment provided in the past. Payments for algae monitoring services will be invoiced monthly and made within 14 days of submission. Payment in full for algae treatments would be due on or before the day(s) of treatment.

**Additional Services and Compensation**

In the event additional services by ACT (not specifically outlined above) are requested by LSIC or are required by either Conservation Commission, LSIC shall compensate ACT based on the hourly consulting rates provided below.

- Principal Biologist .....\$135/hr.
- Senior Biologist/Engineer .....\$115/hr.
- Biologist ..... \$85-\$105
- Field Tech/Tech. Support .....\$50/hr.
- Reimbursable Expenses.... Copying @ (\$0.15/pg; mileage @ \$0.50/mi.; additional algae sample analyses @ \$85/sample and/or water testing and other reimbursable expenses at direct cost plus 15%.)

This Proposal shall become our Contract/Agreement for the project as outlined above upon affixing the required signature(s) in the space provided below. At this time, we are requesting approval of the tasks of DEP permitting/inspections/reporting, algal monitoring and curlyleaf pondweed/milfoil treatment. Any optional treatments or additional services will be discussed and approved by the LSIC before proceeding.

***Please sign and return the Proposal to our office as soon as possible so that we can begin the DEP permitting process.***

We look forward to continuing our work with the Board and the LSIC.

Thank you.

**Aquatic Control Technology**



Marc D. Bellaud  
President/Aquatic Biologist

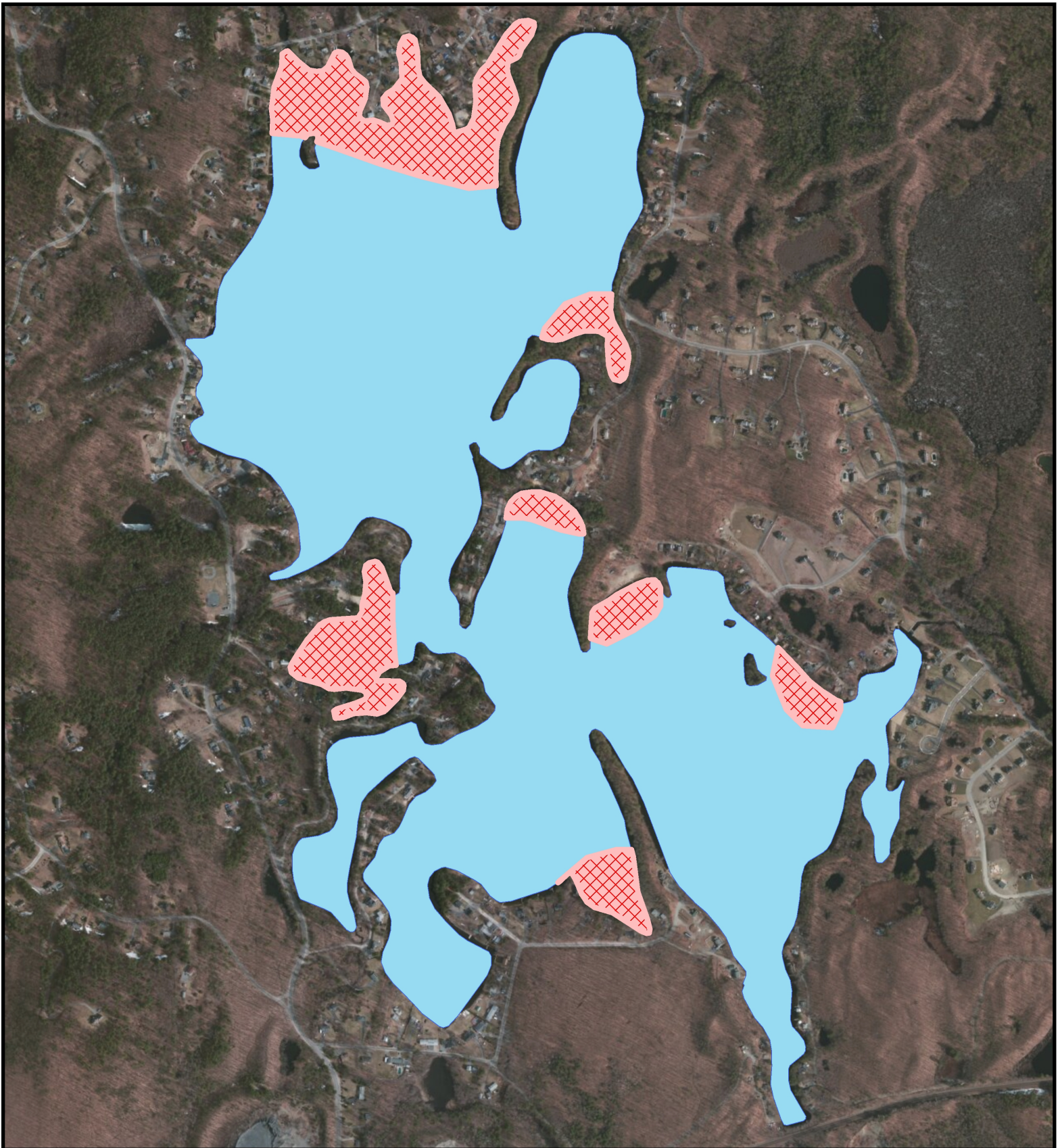
Accepted: **Lake Shirley Improvement Corporation (LSIC)**

By: \_\_\_\_\_

Print Name: Joanna Bilotta, President, LSIC

Date: \_\_\_\_\_





# Lake Shirley

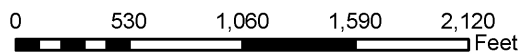
Lunenburg/Shirley, MA

## Potential Fanwort Treatment Areas with Clipper Herbicide

FIGURE:	SURVEY DATE:	MAP DATE:
1	10/11/13	2/17/14

Legend:

 Potential Fanwort Treatment Areas



 **AQUATIC CONTROL TECHNOLOGY, INC.**

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