MEMORANDUM

DOUGLAS HARBOR AUTHORITY

March 20, 2023

TO: Douglas Harbor Authority

FROM: Rich LaBombard, City Manager

SUBJECT: Aquatic Invasive Species Treatment

For annual budget purposes, the City is presenting Aquatic Doctor's quote dated September 12, 2022, for two treatments of the harbor along with necessary permitting fees.

At the October 2022 workshop, Aquatic Doctors stated that the treatment of the invasive species was producing good results and the native plants have returned. The presenters determined that there was a 75-85 percent improvement in the treatment of Eurasian Milfoil. Certain native species however cannot be treated (such as coontail) per the State of Michigan permit. However, curly leaf pond weed can be targeted. The return of native species is typical of a shallow lake.

The Authority should entertain a discussion about continuing treatment of the harbor, reducing the treatment area, or discontinuing the treatment area.

Discussion Item

Table 1: Comparison of control and management methods for Eurasian watermilfoil. To date no method has successfully eradicated an established EWM population. Multiple methods can be combined in an integrated plant management program. Information on cost have been omitted. [1] Local regulations are not presented here.

	Method	Strengths	Challenges	State and Federal Regulations[1]
Chemical	Contact herbicides	• Selective if early season • Fast uptake and impact • Safe at permitted concentrations	• Not selective if mid- to late season • Only kills what it contacts (roots not impacted) • May require repeat application within season • Some water use restrictions • Tolerance/resistance	• Part 33, Aquatic Nuisance Control
	Systemic herbicides	• Largely selective all season • Potentially kill all above ground biomass • Safe at permitted concentrations	• May not kill root crown • Slower acting than contact herbicides • Some water use restrictions (irrigation, swim) • Tolerance/resistance	• Part 33, Aquatic Nuisance Control
Physical	Harvesting, mechanical	• Immediate visual impact • Safe for human health • No water use restrictions • Removal of cut plant material • Site specific	• Not selective • May increase spread (fragmentation) • May impact water quality (e.g., turbidity) • Regrowth as only top of plants are removed • Disposal	• Not regulated by if soils are not disturbed • If soils are disturbed: • Part 301 Inland Lakes and Streams Permit • Part 303, Wetlands Protection • Part 325, Great Lakes Submerged Lands
	Diver assisted suction harvesting (DASH)	• Selective • Potential to remove root crown • Safe for human health • No water use restrictions • Removal of plant material • Site specific	• Disruption of sediment • May impact water quality (e.g., turbidity) • Impractical for large areas • Regrowth • Disposal	• Part 301 Inland Lakes and Streams Permit
	Weed roller	• Safe for human health • No water use restrictions • Site specific	• Not selective • May impact water quality (e.g., turbidity) • Impractical for large areas	• Part 301 Inland Lakes and Streams Permit
	Benthic barrier	• Safe for human health • No water use restrictions • Site specific	• Not selective • May promote other invasive species • Impractical for large areas • Maintenance (e.g., removal and cleaning)	• Part 301 Inland Lakes and Streams Permit
	Dredging	• Safe for human health • Removal of plant material • Site specific	• Not selective • May impact water quality (e.g., turbidity) • May increase spread (fragmentation)	• Part 301 Inland Lakes and Streams Permit • Part 303, Wetlands Protection • Part 325, Great Lakes Submerged Lands
	Lake drawdown	• Safe for human health • No water use restrictions	• Not selective • May have more impact on native species • Seeds and winter buds may survive • Potential impacts to wetlands	• Part 301 Inland Lakes and Streams Permit • Part 303, Wetlands Protection
Biological	Milfoil weevil	• Native to North America (including Michigan) • Potential long-term solution • Largely selective for EWM • Safe for human health and environment	• Control takes time (years) • Results unpredictable • May not kill root crown • Not commercially available	• Not regulated by the State of Michigan
	Mycoleptodiscus terrestris (fungal pathogen)	• Native to North America (including Michigan) • Potential long-term solution • Potential synergy with herbicides	• Not approved by USEPA • Poor success in field trials • Not commercially available	• EPA Experimental Use Permit
	Grass carp	• Consumes plants	• Consumes native plants	• Prohibited to buy, sell, or own in Michigan
Indirect	Native aquatic plant restoration	• Safe for human health and the environment • Beneficial for native fish and wildlife	• Requires direct management to reduce EWM • Limited research on effectiveness	• Not regulated if soils are not disturbed • If soils are disturbed: • Part 301 Inland Lakes and Streams Permit • Part 303, Wetlands Protection • Part 325, Great Lakes Submerged Lands
	Natural shoreline buffers	• Safe for human health and the environment • Improves overall lake health	• Requires direct management to reduce EWM	• Part 301 Inland Lakes and Streams Permit
	Laminar flow/bacterial augmentation	• Safe for human health • No water use restrictions	• May disrupt natural lake processes • Requires constant electricity • Limited research on effectiveness	• Part 301 Inland Lakes and Streams Permit • Part 31 Bacterial Augmentation Certification

Table 2: Research needs for EWM management

Management Option	Strategic Action	Potential Stakeholders	Expected Outcome
Optimize chemical treatment methods	• Determine optimal herbicide concentration and contact time (esp. fluridone) • Evaluate if fluridone destroys EWM root crowns • Investigate chemical management strategies to lower risk of reduced sensitivity • Examine response of hybrid genotypes to treatment • Ascertain if treatment selects for hybrid genotypes • Document and mitigate any non-target impacts on native species.	• MDEQ ANC Program • Lake consultants and managers • Commercial herbicide applicators • University research	• Improve EWM and hybrid treatment efficacy • Reduce non-target impacts • More cost effective treatment strategies • Reduce long-term treatment costs
Establish biocontrol strategies that will sustain EWM populations below control and minimize negative impacts	• Determine factors that limit success with current biocontrol agents (milfoil weevils and *Mycoleptodiscus terrestris*, Mt) • Evaluate the Mt / herbicide synergy • Determine biocontrol agents efficacy for hybrid milfoil control	• University research	• Better use of public and private funds for biocontrol • Lower long-term management costs • A viable and sustainable management option
Utilize the best physical control methods to mediate the effects of EWM	• Monitor and evaluate EWM and native populations before, during, and after removal	• University research	• Better understand the effects of mechanical management techniques on native and non-native macrophytes • Better use of public and private funds
Increased scientific understanding of the impact of indirect management on EWM populations	• Evaluate the relationship between shoreline buffers and natural shorelines and EWM populations • Investigate the role of native macrophyte beds as both a restoration tool and as a tool to increase resilience from infestation • Determine the efficacy of laminar flow aeration and bacterial augmentation as an EWM management tool • Understand the effectiveness as well as the potential negative impacts of using benthic barriers for EWM control	• University research	• Better use of public and private funds • Provide viable and sustainable supplement to management efforts

Aquatic Doctors Lake Management, Inc.
MT Ryan Schauland
PO Box 150247
Grand Rapids MI 49515
(616) 365.1698

September 12, 2022

Dear Friend,

To start I would like to thank you for choosing ***Aquatic Doctors Lake Management, Inc.***, Michigan's fastest growing Lake Management Company. The 2022 season started WET and just got WETTER!! After the rain came the heat, this combination is extremely difficult to manage. The record amonts of rain succedded in loading the ponds and lakes with large amounts of fresh nutrients. Weeds and algae love the nutrients and use it to grow aggressivley. By the time the heat arrived the waterbodies were primed for excessive growth. Even the beneficail growth becomes a problem. This season's conditions were successful in bolstering Michigan waters with excessive weed and algae growth. The large and rapid growth of weeds and algae was very evident in many of our clients' water bodies. In many cases additional treatments were needed to keep up with the excessive growth. It certainly was a battle, but with your help, we were able to successfully control the growth of nuisance weeds and algae. We are hopeful next season will return to more normal conditons.

Our main goal for the 2023 season is the early submittance of the permit applications. We feel confident this will help erase the permit delays, experienced this past summer, in Michigan. We are attempting to submit all applications by the 1st of the year. This will give EGLE ample time to return our permits in time for early treatments.

Enclosed is a 2023 contract **(if not included, a multi-year contract is still in effect)**. Please review it and return the completed contract to us as soon as possible. Along with the contract please enclose a check to "State of Michigan", for the permit fee, --Please refer to letter attached "Permit fees by State of Michigan". If there is no attached "Fees Letter" simply disregard the fee…

We are thrilled to be working with you and believe we have started a long-lasting friendship. If you would like to adjust your treatments or have any questions or concerns, please call me anytime. Thank you again, we look forward to speaking with you.

Sincerely,

MT Ryan Schauland
President

Avoid Permit Delays- Act Now

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AQUATIC DOCTORS LAKE MANAGEMENT, INC. ("Aqua Docs") of P.O. Box 150247, Grand Rapids, Michigan 49515 and City of Douglas of Douglas, Michigan agree:

Aqua Docs will provide a professional aquatic program for the control of weeds and/or algae in **Kalamazoo River- Wades Bayou**. The program will consist of the following:

May/June: Weed and Algae treatment applying restrictive products such as Navigate (2,4-D), Diquat, Triclopyr, Aquathol K, Hydrothol 191, and non-water restrictive products such as copper sulfate, Cutrine-Plus, Cutrine-Ultra, Cygnet Plus, and shade as a tracer.
**3-4 weeks after initial treatment- spot treat weed beds and algae treatment.

July and August: Algae treatments applying non-water restrictive products such as copper sulfate, Cutrine-Plus, Cutrine-Ultra, Cygnet Plus and shade as a tracer. Spot weed treatment for EWM and other nuisance plant growth.

Cost per Acre:

Navigate: Granular systemic 2,4-D herbicide to control Eurasian Watermilfoil	$ 315.00
Triclopyr: Granular systemic herbicide to control Eurasian	$ 560.00
Triclopyr: Liquid systemic herbicide to control EWM	$ 285.00
Clipper: systemic herbicide to control Starry Stonewort	$ 575.00
Harpoon: granular systemic herbicide to contro Starry Stonewort	$ 425.00
Diquat: Liquid herbicide to control EWM, Curlyleaf, and Pondweeds	$ 185.00
Aquathol K-Hydrothol 191: Liquid herbicide to control Pondweeds	$ 205.00
Algaecides: Granular products to control Chara	$ 50.00
Algaecides: Granular and liquid products to control algae	$ 40.00
Water Quality Program:	$ 50.00/sample

Description and Optional Services:

Weed Treatment: Milfoil, Curly-leaf, Coon-tail, Chara, and various pondweed treatments applying restrictive products such as granular Navigate (2,4-D), Aquathol K, Hydrothol 191, Diquat, Triclopyr, Komeen, Glyphosate, and Cygnet Plus.

Algae treatment: Non-water restrictive algaecides such as Copper Sulfate, Curtain-Plus, Cutrine-Ultra, Chelated Copper, Earthtech, Greenclean, and shade as a tracer. Treatments should occur monthly to prevent existing growth and prevent re-growth. Surrounding conditions (i.e. sunlight, temperature, nutrient concentration, etc…) may require additional treatments.

Muck/Enzyme Treatment: Designed to decrease levels of organic sediment in lakes and ponds while reducing odors and improving water clarity. The pellets sink quickly, targeting 'muck' on the bottom. Mukk Busster does not contain pathogenic bacteria and it is fish and wildlife friendly. Contains 3 billion CFU/gram (Colony-forming units).

Water Quality Program: Water quality program consists of lake samples taken and sent to an independent laboratory (Prein & Newhof). The samples can be tested for a variety of things including; fecal bacteria (E. coli), dissolved oxygen, conductivity, total dissovled solids, pH and alkalinity. Primarily E. coli is the focus.

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- Specific treatment dates will be set by Aqua Docs, in cooperation with Jenny Pearson.
- Please be aware Aqua Docs can only treat weeds and algae present at the time of treatment. We have no control over future weed or algae growth based on the current chemicals registered for aquatic use in Michigan.
- Unless otherwise stated in the program, all other aquatic pest control will require a separate program (i.e. cattails, duckweed, largeleaf pondweed, lily pads, purple loosestrife, watermeal, etc…)

Aqua Docs will obtain the DEQ "Aquatic Nuisance Control permit" and post restriction signs as required. Any facility or location related permits/requirements, for example, "Discharge or Retention" permits will be the responsibility of the customer, association, resident or facility. It is your association's/group's responsibility to notify each resident within one hundred (100) feet of the treatment area at least seven (7) days in advance of the first treatment that chemicals will be applied. This notification requirement must be provided to every property owner who has consented to have their property treated. Lake boards and townships who assess the lake property owners are exempt from individual consent documentation. The property owner is responsible for removing any restriction signs ten (10) days after the conclusion of water use restrictions.

Aqua Docs carries a general liability policy of insurance for workmans comp, bodily injury and property damage with limits of $1,000,000.00 per occurrence. Certificates of insurance will be provided upon request.

The State of Michigan requires a minimum fee of $75.00 and increases the fee to $1500.00 for treatment areas of 100 acres or more. Please make check to the State of Michigan. Application for the DEQ "Aquatic Nuisance Control permit" shall occur promptly after the fee is received from the customer.

Special Notes & Conditions of Treatments

#1 – Our office must be notified of any inlets/outlets to meet specific permit requirements with the Michigan DEQ.
#2 – If the water body is being used as a source of irrigation, please notify our office prior to any treatments.
#3 – To minimize the possible effects on health and the environment, the treated waters MAY be restricted for such uses as swimming, bathing, irrigation, fish consumption and/or livestock.
#4 – If an access site has not been determined or established prior to services rendered, then an access site must be determined at the discretion of the applicator at the time of treatment.

Payment in full is due within fifteen (15) days of each application. Any amount remaining unpaid when due shall accrue a penalty of 1.5% per month.

All materials utilized by Aqua Docs shall be of the highest quality and are registered with the U.S. Environmental Protection Agency and the Michigan Department of Agriculture.

The accumulation of dying and decomposing plants and algae can deplete the dissolved oxygen supply in the water, which may result in fish mortality. Please note that such occurrences are minimal, however, the possibility does exist. Due to their level of sensitivity, Goldfish, Coy, and Trout are more susceptible to a treatment than other fish species. During Late Spring and Summer, many NATURAL fish kills occur due to an increase in water temperature and spawning habits, primarily.

Three or five year treatment program: As an incentive to establish a multiple year agreement we will treat your lake or pond at the same price structure as 2023 for 2024! The remaining years (2025-2027) will have cost increases of three percent or less. If total chemical costs exceeds 10% from the previous year a new agreement will have to be mutually acceptable. If during the life of the contract the DNR or other regulatory agencies significantly change the approved treatment procedures or the client finds the manner in which the work is performed less than satisfactory, either party may terminate this agreement upon giving ninety (90) days advance written notice thereof.

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Contract:

Signature Page for "City of Douglas"

Expected 2023 Budget:

1. Bayou Treatment: Late May – Early June Invoice: $37,000.00
2. Bayou Treatment: Mid – Late July Invoice: $34,000.00
3. Bayou Permit fee: $750.00 - $800.00
4. Pond Treatment: $500.00
5. Pond Permit fee: $75.00

Program Option for City of Douglas:

One (1) Year Program- _____
Three (3) Year Program- _____
Five (5) Year Program- _____
(Just initial your choice)

Aquatic Doctors Lake Management, Inc.

By: MT Ryan Schauland B.S.
President

_____ _____
Signature Date

For City of Douglas Representative:

Name (Print) _____ _____
Title _____ Signature
Address: _____
_____ _____
Phone: Date
(Day): _____
(Eve): _____ email: _____

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Permit Fees for 2023

Act No. 164
Public Acts of 2003
Approved by the Governor
Aug 11, 2003
Filed with the Secretary of State
Aug 12, 2003
EFFECTIVE DATE: Aug 12, 2003

STATE OF MICHIGAN
92ND LEGISLATURE
REGULAR SESSION OF 2003

ENROLLED SENATE BILL No. 596

States:

1. Until December 31, 2009, an application for a permit under this section for control work qualifying for a Certificate of Coverage under a general permit shall be accompanied by a fee of $75.00. Until December 31, 2009, an application for a permit under this section for any other control work shall be accompanied by the following fee, based on the size of the area of impact:

   a) Less than ½ acre, $80.00.
   b) ½ acre or more but less than 5 acres, $225.00.
   c) 5 acres or more but less than 20 acres, $450.00.
   d) 20 acres or more but less than 100 acres, $875.00.
   e) 100 acres or more, $1,600.00.

The Department of Environmental Quality shall forward fees collected under this section to the state treasure for deposit in the land and water management permit fee fund created in section 30113 of the natural resources and environmental protection act, 1994 PA 451, MCL 324.30113.

- **The highlighted section is the fee for you and your association.**

Aquatic Doctors Lake Management, Inc.
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