Appendix A: Orders of Conditions

OOC Extension Request for Management of Aquatic Vegetation and Algae at Coes Reservoir (DEP File # 349-1191)
Worcester, MA

May 2024

Submitted by

City of Worcester Department of Sustainability and Resilience
Lakes and Ponds Program

Contents

A. Permit Extension Request Letter

May 1, 2024

Division of Planning & Regulatory Services
City Hall Room 404
455 Main Street, Worcester, MA 01608
planning@worcesterma.gov

RE: Coes Reservoir – 240 Mill Street, Worcester, Massachusetts
Order of Conditions, DEP File # 349-1191

Dear Commission Members:

The City of Worcester Department of Sustainability and Resilience would like to request a one-year extension to the current Orders of Conditions, DEP File # 349-1191, for the continued maintenance of the aquatic vegetation and algae in Coes Reservoir. This Order is due to expire on July 15, 2024.

Coes Reservoir provides incredible value to City residents through recreation and environmental services. However, high use and large amounts of impervious surfaces around the lake have caused the proliferation of harmful invasive aquatic vegetation and algae blooms due to stormwater driven nutrient loading. The Lakes and Ponds Program works to manage these threats to the environment and public health through a variety of measures, including the use of in-lake treatments of herbicides and algaecides.

Over the past years, City of Worcester, together with Tatnuck Brook Watershed Association, has contracted a local lake management company to conduct treatments at Coes Reservoir in accordance with the above referenced Order. All applications have been undertaken by licensed professionals in accordance with the manufacturer's label. A "License to Apply" has been acquired from the Division of Watershed Management at MassDEP in Worcester on an annual basis. Meeting the specifications of the permit and maintaining water quality for recreational use is of the highest priority and the City will continue to demand the meeting of these standards from any future contractor.

The continued management plan of Coes Reservoir includes the use of U.S. EPA/ MA registered herbicides and algaecides including Reward (diquat), Sonar (fluridone), Clearcast (Imazamox), Aluminum Sulfate, and Copper Sulfate (copper) herbicide to control the Eurasian watermilfoil, water chestnut, fanwort, and harmful algae. The products will be applied to the area at or below the permissible label dose. There have been no deviations in treatment from the present Order permissions, and none are planned. As required by the permit, the Commission will be notified prior to planned application dates.

In 2023, treatments applied to Coes Reservoir, together with non-chemical methods, were successful in reducing invasive aquatic vegetation, and keeping the lake free from toxin-producing cyanobacteria for the entire swimming season. As a result, we hope that the Commission will allow this request and issue an extension for the continued management of Coes Reservoir for an additional three years. If you have any questions or need additional information, please feel free to contact us.

Sincerely,

Katie Liming
Coordinator
Lakes and Ponds Program
City of Worcester Department of Sustainability and Resilience

cc: Ms. Pat Austin – Tatnuck Brook Watershed Association – Via Email

B. Original Plan of Land

Coes Reservoir

C. Order of Conditions

(Copy)

City of Worcester, Massachusetts

Conservation Commission

Certification of Receipt:

I Jacquelyn Burmeister hereby certify that I received the original copy of
(print name)

the OOC from the Worcester Conservation Commission.
(file type - e.g. OOC, COC, DOA, etc.)

For property located at 240 Mill St (Wes Reservoir)
(project address)

by hand delivery via the Office of the Conservation Commission on 4/9/18.
(i.e. Division of Planning and Regulatory Services) *(date received)*

Signature by the above party: _____
(receiver's signature)

Below this Line: For Administrative Purposes Only

CC File Number: CC-2018-014

Certifying DPRS Staff: Mia McDonald MM
(print name) *(initials)*

Date: 4/9/18
(date picked-up)

Please file in the above CC file or return to the acting Conservation Commission Agent. Thanks!

City of Worcester Conservation Commission
Worcester City Hall, 455 Main Street, Room 404 (4th floor), Worcester, Massachusetts 01608
Telephone: (508) 799-1400 x31440 Fax: (508) 799-1406
Email: planning@worcesterma.gov
Website: www.worcesterma.gov/development

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1191
MassDEP File #

eDEP Transaction #

Worcester
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. From: City of Worcester
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Jacquelyn — a. First Name
Burmeister — b. Last Name
City of Worcester Department of Public Works — c. Organization
18 East Worcester Street — d. Mailing Address
Worcester — e. City/Town
MA — f. State
01604 — g. Zip Code

4. Property Owner (if different from applicant):

a. First Name
b. Last Name
c. Organization
d. Mailing Address
e. City/Town
f. State
g. Zip Code

5. Project Location:

240 Mill Street (Coes Reservoir) — a. Street Address
Worcester — b. City/Town
51-016 — c. Assessors Map/Plat Number
-00002 — d. Parcel/Lot Number

Latitude and Longitude, if known: d m s — d. Latitude; d m s — e. Longitude

Massachusetts Department of Environmental Protection
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A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Worcester
a. County

b. Certificate Number (if registered land)

53325
c. Book

165
d. Page

7. Dates: 2/14/2018 a. Date Notice of Intent Filed; 3/19/2018 b. Date Public Hearing Closed; 4/9/2018 c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Coes Reservoir and Patch Reservoir, Worcester, MA - 2017 Vegetation Survey Summary
a. Plan Title

Solitude Lake Management
b. Prepared By

Rebecca Giguere, Biologist
c. Signed and Stamped by

12/14/2017
d. Final Revision Date

N/A
e. Scale

Notice of Intent Application Materials
f. Additional Plan or Document Title

February 2018
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☒ Private Water Supply
e. ☒ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

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B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — 0 a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	14,990 a. linear feet	14,990 b. linear feet	N/A – Impacts are temporary c. linear feet	N/A – Impacts are temporary d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☒ Land Under Waterbodies and Waterways	3,959,000 a. square feet	3,959,000 b. square feet	N/A – Impacts are temporary c. square feet	N/A – Impacts are temporary d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

* **#23.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

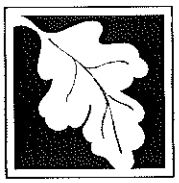
24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on _____ unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.



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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 349-1191 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☐ is subject to the Massachusetts Stormwater Standards
    (2) ☒ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):
See Attachment A.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The City of Worcester Conservation Commission hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:
   City of Worcester Wetlands Protection Ordinance & Regulations (1. Municipal Ordinance or Bylaw)
   COW GRO Part 1. Ch. 6. (2. Citation)

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:
   City of Worcester Wetlands Protection Ordinance & Regulations (1. Municipal Ordinance or Bylaw)
   COW GRO Part 1. Ch. 6. (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):
   See Attachment A.

ATTACHMENT A

Worcester Conservation Commission

Special Order of Conditions

City of Worcester Wetlands Protection Ordinance & City of Worcester Wetlands Protection Regulations

(City of Worcester Revised Ordinance Part I, Chapter 6)

And

Massachusetts General Laws, Chapter 131, §40 - Massachusetts Wetlands Protection Act

240 Mill Street (aka Coes Reservoir) (CC-2018-014)

Project Description: A comprehensive aquatic nuisance vegetation, algae, and cyanobacteria management program using a variety of methods including herbicides, algaecides, mechanical methods, and drawdown.

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Notes:

- **Office of the Commission** is located at the Division of Planning and Regulatory Services (455 Main Street 4th floor, Worcester, MA), which can be contacted by e-mailing planning@worcesterma.gov or calling 508-799-1400 ext. 31440.
- **Asterisked (*) conditions** are standard conditions of approval for all projects.

I. Conditions to Meet Prior to and During Construction

21. Person Responsible for Compliance with the Order of Conditions* – A person shall be designated to be responsible to monitor compliance with the Order of Conditions. Their name and contact information (24/7) shall be provided to the Office of the Commission prior to start of any activity. This person shall conduct:

    a) periodic inspections to assure the adequacy and continued effectiveness of erosion and sediment controls;

    b) inspections of said controls following 0.5-inch or greater rain events, or after a heavy snow melt.

22. Contract* - This Order of Conditions and all approved plans shall be included as part of any contract and subcontract and shall be posted in a prominently displayed location in the supervisory office on site during all phases of construction.

23. Notification -

    a) The applicant shall notify the Commission, in writing, via the Office of the Commission (Division of Planning and Regulatory Services), annually, of the scheduled commencement date of the drawdown. Such notice shall be provided a minimum of 48 hours prior to commencement. The applicant(s) shall also provide notice to the public of the expected date of the drawdown in accordance with standard DPW&P public service announcement procedures.

    b) The applicant shall notify the Commission, in writing, via the Office of the Commission (Division of Planning and Regulatory Services), of the scheduled treatment dates (i.e. chemical applications, mechanical harvesting, etc.). Such notice shall be provided a minimum of one week prior to commencement thereof. The applicant(s) shall also provide notice to the public of the expected date of each activity in accordance with standard DPW&P public service announcement procedures.

II. Conditions to Meet Before the Start of Any Activity

24. Pre-Construction Conference* -

    a) The Conservation Commission or its Agents shall conduct a pre-construction conference prior to commencement of activities in each phase of the project. Phasing, if any, shall conform to the approved plans.

    b) The property owner / applicant and any person performing work that is subject to this Order are responsible for understanding and complying with the requirements of this Order, the Wetlands Protection Act, 310 CMR 10.00 and City of Worcester Wetlands Protection Ordinance and Regulations. Said persons shall acknowledge such in writing prior to commencement of activities.

25. Inspections Prior to Site Preparation and Site Work* - Erosion and sediment controls shall be installed and verified, in compliance with final approved plans, by the Commission or its Agents prior to the commencement of any excavation, grubbing and/or stumping of vegetation, grading, construction, or other site preparation.

III. Conditions to Meet During Construction

26. Chemical Treatments – Only chemicals (i.e. algaecides, herbicides, etc.) approved by the Commission - applied in accordance with the specifications on file with the Office of the Commission - shall be used for chemical treatment of the waterbody.

27. Invasive Vegetation – The goal of this condition is to keep jurisdictional areas (bufferzone and resource areas) free of all invasive, likely invasive, and potentially invasive species as identified in *The Evaluation of Non-native Plant Species for Invasiveness in Massachusetts,* published by the MA Invasive Plant Advisory Group in April 1, 2005.

    a) Material Introduction – All imported materials and equipment, such as boats, tools, etc. shall be inspected for evidence of invasive vegetation prior to use within jurisdictional areas at the site in order to prevent introduction and/or the spread of invasive vegetation. No materials with evidence of invasive vegetation shall be used in jurisdictional areas. Materials and equipment shall be cleaned outside of any resource areas and the 100' buffer zone thereto.

    b) On-going Management - A weeding program must be implemented within all jurisdictional areas that are disturbed as part of the project. The weeding program shall begin within one month of when final grades are reached and shall continue, at a minimum of, twice per growing season until a Certificate of Compliance is issued for the project.

28. Limit of Work* – No removal, filling, dredging or altering of jurisdictional areas shall take place outside the approved work under this Order of Condition.

29. Work Sequencing* – Activities shall take place in accordance with all phasing and sequencing shown on the plan and/or provided in the application materials on file with the Office of the Commission and shall follow any lot opening restrictions otherwise provided herein.

30. Erosion Stabilization -

    a) *Erosion and Sediment Controls** - All erosion and sediment controls shall be monitored, maintained, and adjusted for the duration of the project to prevent adverse impacts to jurisdictional areas. Additional erosion and sediment controls may be utilized on site as needed.

    b) *Off Site Impacts** - There shall be no off-site erosion, flooding, ponding, or flood-related damage from runoff caused by the project activities.

    c) *Unanticipated Drainage or Erosion** - The applicant shall control any unanticipated drainage and/or erosion conditions that may cause damage to jurisdictional areas and/or abutting or downstream properties. Said control measures shall be implemented immediately upon need. The Office of the Conservation Commission shall be notified if such conditions arise and of the measures utilized.

    d) *Soil Stabilization due to Delay in Work** - If there is an interruption of more than 10, but less than 60 days between completion of grading and revegetation, the applicant shall sow all disturbed areas with annual rye grass to prevent erosion. If soils are to be exposed for longer than 60 days, a temporary cover of rye or other grass should be established following US Soil Conservation Services procedures, as recently amended, to prevent erosion and sedimentation. Once final grading is complete, loaming and seeding of final cover should be completed promptly.

    e) *Stockpile Maintenance** - Any stockpiling of loose materials shall be properly stabilized to prevent erosion into and sedimentation of jurisdictional areas. Preventative controls such as haybales or erosion control matting shall be implemented to prevent such an occurrence.

    f) *Stockpile Location* – Harvested biomass shall be stockpiled more than 50 feet away from any wetland or storm drain inlet or removed immediately by live loading, with containers removed from the site daily.

31. Monitoring Program – The applicant shall develop and implement a management monitoring program to be conducted during and after the drawdown and other management activities. Monitoring shall be on-going throughout the year to minimize impacts to fisheries, shellfish, wildlife habitat, non-target native species, and/or water quality (e.g. flow, clarity, etc.) and to evaluate and maintain the effectiveness of the treatment and minimize any related impacts. Upon request by the Commission, monitoring data/reports shall be made available and provided to the Commission. At minimum annual monitoring, and associated reporting information, shall include the following:

    a) During the winter months - evaluation of dissolved oxygen to ensure successful overwintering of organisms;

    b) During the summer months – evaluation of nutrients.

32. Contingency - A contingency plan should be available if unforeseen impacts were to occur (e.g. in the event of a fish kill, etc.); if such circumstances arise, the Office of the Commission shall be contacted immediately.

33. Invasive Insects* -

    a) *Wood Removal* – All tree, brush & wood removal shall adhere to the most recently amended requirements set forth by the Massachusetts Department of Conservation & Recreation for any project located in the Asian Longhorned Beetle Quarantine Zone.

34. Dewatering* – If dewatering is required,

    a) Notice of such activities shall be given to the Office of the Commission within 24 hours of commencement;

    b) There shall be no discharge of untreated dewatered stormwater or groundwater to jurisdictional areas either by direct or indirect discharge to existing drainage systems;

    c) Any discharge to surface waters or drainage structures must be visibly free of sediment;

    d) To the maximum extent practicable, proposed dewatering activities should be located outside of the 100' buffer. If such activities must be located within the 100' buffer, they shall be monitored at all times when the pumps are running;

    e) Dewatering activities shall be confined within an area of secondary containment at all times.

35. Erosion Controls* - There shall be no flood-related damage, flooding, or ponding caused by the project emanating from the project onto lands of an abutter, or onto nearby downstream properties. The applicant shall make sufficient provision to control any unexpected drainage and erosion conditions that may arise during the project that may create damage to jurisdictional areas (e.g. wetlands, streams, brooks, etc.) and abutting or downstream properties. Said control measures are to be implemented immediately upon need and the Conservation Commission so notified in writing.

36. Spill Prevention* -

    a) No fuel, oil, or other pollutants shall be stored in any resource area or the buffer zone thereto, unless specified in this Order;

    b) No refueling shall take place within resource areas [or 100-ft to a resource area];

    c) The applicant shall take all necessary precautions to prevent discharge or spillage of fuel, oil or other pollutants onto any part of the site;

    d) A spill kit shall be present on site at all times.

IV. Drawdown

Drawdown activities shall follow the Performance Guidelines contained in Section 4.2.6.3 of "Eutrophication and Aquatic Plant Management in Massachusetts, Final Generic Environmental Impact Report," including but not limited to:

37. Depth - The annual drawdown shall be limited to a maximum of 3 feet;

38. Drawdown Timeframe –

    a) The annual drawdown shall commence no sooner than November 1st in order to lessen impacts to wildlife;

    b) The target drawdown depth shall be achieved by December 1st in order to allow wildlife to move to deeper water, locate alternate lodge sites, or relocate food caches prior to ice formation and substrate freezing; and to minimize impacts to fish spawning and other non-target organisms that may have water level requirements for reproduction;

39. Outflow Rates –

    a) During the drawdown outflow rates shall be kept below a discharge equivalent to 4 cfs per square mile of watershed;

    b) Once the target water level is achieved, outflow rates shall match inflow rates to the greatest extent possible in order to maintain a stable water level; and

    c) Outflow during refill shall be kept above a discharge equivalent to 0.5 cfs per square mile of watershed.

40. Refill Timeframe - Full lake level shall be achieved by mid-March (note: while earlier than specified in the GEIR, the additional time serves to protect the functions of a potential vernal pool (located at 51-006-0020)) to lessen impacts on fish recruitment;

V. Conditions to Meet at Completion of Project

41. Site Stabilization* - All disturbed areas shall be properly stabilized with well-established perennial vegetation or other approved methods before the project is considered complete.

42. Erosion and Sediment Controls* - Erosion and sediment controls shall not be removed from the site until all disturbed areas have been stabilized with final vegetative cover and approval has been received from the Commission or its Agents to do so. The controls must then be removed within two weeks of receipt of that certification.

43. Certificate of Compliance* - Upon completion of the project, the applicant shall request in writing a Certificate of Compliance from the Commission. If the project has been completed in accordance with plans stamped by a registered professional engineer, architect, landscape architect, or land surveyor, certification must include a written statement by such professional certifying the same.

    a) If the project required compliance with the Massachusetts Stormwater Standards and/or work was conducted within Riverfront Area or Bordering Land Subject to Flooding, a certified as-built plan-of-land shall be provided showing final grades, resource areas, and all constructed improvements;

    b) If permanent markers were required, the certified as-built plan-of-land shall depict their location.

VI. General Conditions

44. Conservation Agent's Power to Act* - With respect to all conditions, the Conservation Commission designates the Conservation Agent, as its Agent with full powers to act on its behalf in administering and enforcing this Order, unless the Agent determines approval from the Commission is appropriate.

45. Right to Inspect* - A member of the Conservation Commission or its Agent may enter and inspect the property and the activity that are the subjects of this Order at all reasonable times, with or without probable cause or prior notice, and until a Certificate of Compliance is issued, for the purpose of evaluating compliance with this Order (and other applicable laws and regulations).

46. Changes to the Plan or Errors & Omissions* -

    (a) If any plan, calculation, or other data presented to the Office of the Commission is in error or have omissions, and are deemed significant by the Commissioners or their Agents, all work will stop at the discretion of the Commission, until the discrepancies have been rectified to the Commission's satisfaction.

    (b) The applicant must notify the Commission in writing of any changes in the plans or implementation of the proposed activity where mandated by any local, state, or federal agencies having jurisdiction over the proposed activity. If, in the opinion of the Commission, any changes in the plans or implementation of the proposed activity so require, then the Commission may modify, amend or rescind this Order in a way consistent with:

    - M.G.L. Chapter 131, Section 40,
    - 310 CMR 10.00, *Wetlands Protection*,
    - the City of Worcester's *Wetlands Protection Ordinance*, and
    - the Commission's *Wetlands Protection Regulations*

    If any provisions of any conditions, or application thereof is held to be invalid, such invalidity shall not affect any other provisions of this Order. If the Commission deems that a proposed change is major or substantial, a new hearing may be required.

47. Liability* - The applicant shall indemnify and save harmless the Commonwealth, the City of Worcester, the Conservation Commission, and its Agents against all sites, claims or liabilities of every name and nature arising at any time out of or in consequence of the acts of the Commission or its Agents in the performance of the work covered by this Order and/or failure to comply with the terms and conditions or this Order whether by itself or its employees or subcontractors.

CC-2018-014
240 Mill St/
Coes Reservoir

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1191
MassDEP File #

eDEP Transaction #

Worcester
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

4/9/2018
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

3
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

☒ by hand delivery on 4/9/2018
Date

☐ by certified mail, return receipt requested, on
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1191
MassDEP File #

eDEP Transaction #

Worcester
City/Town

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location | MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

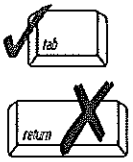
a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

CC-2018-014

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

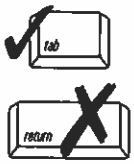
DEP File Number:

WPA Form 7 – Extension Permit for Orders of Conditions

349-1191
Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. General Information

1. Applicant:

Jacquelyn Burmeister, City of Worcester Department of Sustainability & Resilience
Name

455 Main Street
Mailing Address

Worcester | MA | 01608
City/Town | State | Zip Code

2. Property Owner (if different):

Name

Mailing Address

City/Town | State | Zip Code

B. Authorization

The Order of Conditions (or Extension Permit) issued to the applicant or property owner listed above on:

4/9/2018
Date

Issued by: Worcester
Conservation Commission

for work at: 240 Mill Street (Coes Reservoir) | 51-016 | -00002
Street Address | Assessor's Map/Plat Number | Parcel/Lot Number

recorded at the Registry of Deeds for:

Worcester | OOC: 65333 | 232
County | Book | Page

Certificate (if registered land)

is hereby extended until: **7/15/2023**
Date

*original expiration date tolled by COVID-19 Emergency (to 7/15/22)
Date the Order was last extended (if applicable)

This date can be no more than 3 years from the expiration date of the Order of Conditions or the latest extension. Only unexpired Orders of Conditions or Extension may be extended.
This Extension Permit must be signed by a majority of the Conservation Commission and a copy sent to the applicant and the appropriate DEP Regional Office (http://www.mass.gov/eea/agencies/massdep/about/contacts/find-the-massdep-regional-office-for-your-city-or-town.html).
The names typed below represent the intent to sign the foregoing document in accordance with MGL Chapter 110G §9. Duly authorized by Ch.110G and recorded at Worcester Registry of Deeds in Book 62537 Page 329.

Signatures:

6/7/2022
Date

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 7 – Extension Permit for Orders of Conditions

349-1191
Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

C. Recording Confirmation

The applicant shall record this document in accordance with General Condition 8 of the Order of Conditions (see below), complete the form attached to this Extension Permit, have it stamped by the Registry of Deeds, and return it to the Conservation Commission.

Note: General Condition 8 of the Order of Conditions requires the applicant, prior to commencement of work, to record the final Order (or in this case, the Extension Permit for the Order of Conditions) in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, it shall be noted in the Registry's Granter Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, it shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done.

Detach this page and submit it to the Conservation Commission prior to the expiration of the Order of Conditions subject to this Extension Permit.

To:

Worcester
Conservation Commission

Please be advised that the Extension Permit to the Order of Conditions for the project at:

Project Location | DEP File Number

has been recorded at the Registry of Deeds of:

County

for:

Property Owner

and has been noted in the chain of title of the affected property in accordance with General Condition 8 of the original Order of Conditions on:

Date | Book | Page

If recorded land the instrument number which identifies this transaction is:

Instrument Number

If registered land, the document number which identifies this transaction is:

Document Number

Signature of Applicant

D. Additional Information

DRAWDOWN

How It Works

Drawdown is a process whereby the water level is lowered by gravity, pumping or siphoning and held at that reduced level for some period of time, typically several months and usually over the winter. Drawdown can provide control of plant species that overwinter in a vegetative state, and oxidation of sediments may result in lower nutrient levels with adequate flushing. Drawdowns also provide flood control and allow access for nearshore clean ups and repairs to structures. The ability to control the water level in a lake is affected by area precipitation pattern, system hydrology, lake morphometry, and the outlet structure. The base elevation of the outlet or associated subsurface pipe(s) will usually set the maximum drawdown level, while the capacity of the outlet to pass water and the pattern of water inflow to the lake will determine if that base elevation can be achieved and maintained. In some cases, sedimentation of an outlet channel or other obstructions may control the maximum drawdown level.

Several factors affect the success of drawdown with respect to plant control. While drying of plants during drawdowns may provide some control, the additional impact of freezing is substantial, making drawdown a more effective strategy during late fall and winter. However, a mild winter or one with early and persistent snow may not provide the necessary level of drying and freezing. The presence of high levels of groundwater seepage into the lake may mitigate or negate destructive effects on target submergent species by keeping the area moist and unfrozen. The presence of extensive seed beds may result in rapid re-establishment of previously occurring plant species, some of which may be undesirable. Recolonization from nearby areas may be rapid, and the response of macrophyte species to drawdown is quite variable.

Drawdown Example #1

Drawdown Example #2

Drawdown Example #3

Aside from direct impact on target plants, drawdown can also indirectly and gradually affect the plant community by changing the substrate composition in the drawdown zone. If there is sufficient slope, finer sediments will be transported to deeper waters, leaving behind a coarser substrate. If there is a thick muck layer present in the drawdown zone, there is probably not adequate slope to allow its movement. However, where light sediment has accumulated over sand, gravel or rock, repetitive drawdowns can restore the coarse substrate and limit plant growths.

The actual conduct of a drawdown involves facilitating more outflow than inflow for several weeks or months. After the target water level is reached, outflow is roughly matched to inflow to maintain the drawdown for the desired period, usually at least a month and often up to 3 months, usually over the winter. At a time picked to allow refill before any undesirable spring impacts can occur, outflow is reduced (although it should not be eliminated) and "excess" inflow causes the water level to rise. In some cases, refill is commenced after an inch or two of ice forms, ripping up plants and bottom material. This "extreme disturbance" approach has been applied where sediments will not dewater sufficiently to provide the level of freezing and desiccation desired, but impacts have not been studied extensively.

Despite the apparent simplicity of the concept of drawdown, proper conduct of a drawdown to maximize effectiveness and minimize adverse side effects necessitates that many considerations be

addressed (Table 5). Expected response of target species (Table 6) is of particular importance when plant control is the major goal.

Benefits

- Kills vegetative portions of plants by drying, freezing, or physical disturbance
- Increases plant species richness in many cases
- Allows sediment oxidation and compaction, with potential reduction of sediment oxygen demand, sediment volume, and available nutrient content
- May reduce fine sediments in drawdown zone, creating coarser peripheral substrate and enhancing plant control and habitat for some organisms
- Provides protection from ice damage to shoreline and associated structures
- Facilitates access for shoreline clean-up, sediment removal, and structural maintenance
- Provides flood storage capacity

Detriments

- Will not kill seeds or other non-vegetative overwintering propagules, and may stimulate increased seed germination
- Nutrient release during exposed sediment oxidation may fuel increased algal production if not flushed from system before next growing season
- Will reduce available water for supplies, and may impair nearby shallow well production
- May strand and harm minimally mobile aquatic fauna (such as molluscs)
- Concentration of fish in smaller volume may harm some populations through predation or oxygen stress particularly in warmer months
- Fish may not be able to reach spawning areas during drawdown
- May expose and harm hibernating reptiles and amphibians
- May restrict access and cover for aquatic mammals and birds
- Limits human access where peripheral sediments are soft
- Although largely dormant in winter, hydrologically connected wetlands may experience some changes in species composition and relative abundance if dewatering occurs

Drawdown

Drawdown: after many years, rocks have become the dominant nearshore substrate

Drawdown: refill at this stage may rip plants and stumps from the bottom

Drawdown: access provided for swimming area maintenance

The disadvantages of drawdown are linked to reduced areal coverage by water and lowered water volume and elevation. Water supply from the lake or wells may be impaired, and species that depend upon the exposed area may be harmed. Changes in exposed sediment features may affect water quality after refill. Downstream resources may be impacted as well. Repeated drawdown may result in the invasion of plants that are resistant to drawdowns, some of which may be nuisance species. Failure to refill the lake in time for spring spawning may affect fish populations. None of these impacts may be manifest, and various mitigative means may avoid or minimize them. However, it is difficult to predict the ecological impact to many non-target organisms, due largely to the lack of published information and site-specificity of many possible impacts.

Information for Proper Application

The listing of key considerations provided in Table 5 indicates the extensive data needs for proper implementation of this technique. Key needs include:

- Detailed hydrology and lake morphometry to allow estimates of drawdown and refill times under the range of potential conditions
- Knowledge of outlet features essential to releasing and holding water
- Maps of aquatic macrophytes and expected area of exposure
- Evaluation of sediment types and slopes in expected drawdown zone
- Biological surveys of populations perceived to be at risk from drawdown
- Assessment of downstream channel configuration and resources, to facilitate planning to minimize adverse impacts
- Local well depths or water supply intake elevations
- A carefully crafted monitoring program to track water levels and outflow, and to assess potential impacts, positive and negative

Drawdown pipe (left) usurps flow from normal outlet (right)

Excessive downstream flow from a discharge to achieve drawdown

Inadequate downstream flow during refill after drawdown

Factors Favoring the Use of this Technique

- The lake periphery is dominated by undesirable species that are susceptible to drying and freezing
- Drawdown can be achieved by gravity outflow via an existing outlet structure, or such a structure can be established for a reasonable cost
- Drawdown can reach a depth that impacts enough of the targeted plants to make a difference for recreational interests and habitat enhancement
- Areas to be exposed have sediments and slopes that promote dewatering
- Drawdown and refill can be accomplished within a few weeks under typical flow conditions and without causing downstream flows outside the natural range
- Drawdown can be timed to avoid key migration and spawning periods for non-target organisms
- Populations of molluscs or other nearshore-dwelling organisms of limited mobility are not significant
- The lake is not used for water supply and nearby wells are deep
- Flood storage capacity generated by drawdown prevents downstream flood impacts
- The downstream channel and associated resources will not be impacted by fluctuating flows expected during drawdown and refill periods
- Shoreline structures are prone to ice damage

Performance Guidelines

- Determine susceptibility of target plants to drawdown
- Evaluate potential risks to non-target flora and fauna
- Limit drawdown to 3 ft or contact the MDFG for assistance in evaluating impacts of greater drawdown
- Commence drawdown after the beginning of November

- Achieve the target drawdown depth by the beginning of December; target a drawdown rate of <3 inches/day
- Achieve full lake status by the beginning of April
- Keep outflow during drawdown below a discharge equivalent to 4 cfs per square mile of watershed; once the target water level is achieved, match outflow to inflow to the greatest extent possible, maintaining a stable water level
- Keep outflow during refill above a discharge equivalent to 0.5 cfs per square mile of watershed
- Conduct a monitoring program that includes water level, flow, water clarity, winter oxygen, the plant community, and representative sensitive faunal populations
- After target species are controlled, evaluate the potential to move to an every other or every third year drawdown schedule

Possible Permits

- WPA permit through local Conservation Commission/DEP
- Review by NHESP (further action if protected species are present)

Impacts Specific to the Wetlands Protection Act

- Protection of public and private water supply – Potential detriment (if adequate water for supply is not maintained), but can be neutral in some cases with proper management
- Protection of groundwater supply – Potential detriment (if lowered lake level lowers groundwater), but can be neutral (if adequate groundwater level is maintained or there is no significant interaction)
- Flood control – Benefit (flood storage potential increased)
- Storm damage prevention – Benefit (flood storage potential increased), but possible detriment as exposed areas may be subject to potentially damaging storm impacts
- Prevention of pollution – May provide benefit (water quality enhancement) or detriment (water quality deterioration), but impacts generally limited
- Protection of land containing shellfish – Detriment (shellfish potentially exposed), but impacts may be neutral in some cases, and shellfish habitat may be improved overall
- Protection of fisheries - Potential detriment by temporary habitat loss, potential benefit by habitat improvement (may have benefit and detriment to different species in same lake from same drawdown)
- Protection of wildlife habitat - Potential detriment by temporary habitat loss for completely aquatic species and impact on muskrat and beaver lodges, potential benefit by habitat improvement (may have benefit and detriment to different species in same lake from same drawdown)

Cost Considerations

Drawdown is a relatively inexpensive lake management technique, if the means to conduct a drawdown are present. Where an outlet structure facilitates drawdown, the cost may be as little as what is required to obtain permits, open and close the discharge structure, and monitor. If pumps are required to lower the water level, the drawdown will be more expensive. It is unusual to alter a dam for less than $100,000, but if the structure already supports water level control, costs of $3,000 to $10,000 per year would be a reasonable expectation for permitting and monitoring. Where protected species are present, permitting may be difficult and monitoring and mitigation costs can escalate.

Table 5. Key Considerations for Drawdown

Reasons for Drawdown
Access to structures for maintenance or construction – note that other permits may apply
Access to sediments for removal (dredging) – additional permits apply
Flood control – a major late winter benefit, but minimally available in spring with regulatory refill date
Prevention of ice damage to shoreline and structures – control of late winter water level needed
Sediment compaction – only if sediments dewater sufficiently
Rooted plant control – for species that rely on vegetative forms to overwinter

Necessary Drawdown Planning Information
Target level of drawdown – depth of water lost
Pond bathymetry – detailed contours for calculation exposed area
Area to be exposed – area of sediment at water depth < target depth, plus ice contact zone
Volume to remain – quantity of water available for habitat and supply during drawdown
Timing and frequency of drawdown – initiation/duration and whether annual or less frequent event
Outlet control features – method for controlling outflow
Climatological data – frequency of sub-freezing weather, precipitation and snow cover data
Normal range of outflow – maximum, minimum and average over expected time of drawdown
Outflow during drawdown and refill – provisions for downstream flow control (high and low)
Time to drawdown or refill – rate of water level change, number of days to achieve target level

In-Lake and Downstream Water Quality
Possible change in nutrient levels – any expected increases due to oxidation of sediments
Possible change in oxygen levels – any expected increase through oxidation or decrease under ice
Possible change in pH levels – any expected shift due to interactions with smaller volume
Other water quality issues – any expected changes as a function of drawdown

Water Supply
Use of lake water as a supply – dependence on water availability and impact of drawdown
Presence/depths of supply wells – potential for supply impairment
Alternative water supplies – options or supplying water to impacted parties
Emergency response system – ability to detect and address supply problems during drawdown
Downstream flow restrictions – maintenance of appropriate flows for downstream habitat and uses

Sediments
Particle size distribution (or general sediment type) – dewatering potential
Solids and organic content – dewatering potential, nutrient content
Potential for sloughing – potential for coarse sediment to be exposed in drawdown zone
Potential for shoreline erosion – threat of erosive impacts to bank resources
Potential for dewatering and compaction – possibility of sediment alteration and depth increase
Potential for odors – emissions from exposed area
Access and safety considerations – issues for use of lake during drawdown

Flood Control
Anticipated storage needs – ability to meet needs with target drawdown
Flood storage gained – volume available to hold incoming runoff
Effects on peak flows – dampening effect on downstream velocities and discharge

Table 5 (continued). Key Considerations for Drawdown

Protected Species
Presence of protected species – NHESP designated species may require special protection
Potential for impact – assessment of possible damage to protected populations
Possible mitigative measures – options for avoiding adverse impacts

In-lake Vegetation
Composition of plant community – details of species present and susceptibility to drawdown
Areal distribution of plants – mapping of plant locations relative to drawdown impact zone
Plant density – quantity of plants present
Seed-bearing vs. vegetative propagation – drawdown will only control vegetative propagators
Impacts to target and non-target species – analysis of which species will be impacted

Vegetation of Connected Wetlands
Composition of plant community – details of species present and susceptibility to drawdown
Areal distribution of plants – mapping of plant locations relative to drawdown impact zone
Plant density – quantity of plants present
Temporal dormancy of key species – potential for seasonal impacts
Anticipated impacts – analysis of likely effects of drawdown

Macroinvertebrates, Fish and Wildlife
Composition of fauna – types of animals present
Association with areas to be exposed – when and how drawdown zone is used on a regular basis
Breeding and feeding considerations – use of drawdown for breeding or food on intermittent basis
Expected effects on target and non-target species – analysis of likely faunal impacts

Downstream Resources
Erosion or flooding potential – susceptibility to impacts from varying flow
Possible habitat alterations – potential for impacts
Water quality impacts – potential for alteration
Direct biotic impacts – possible scour or low flow effects on biota
Recreational impacts – effects on downstream recreational uses
Supply impacts – effects on downstream supply uses

Access to the Pond
Alteration of normal accessibility – issues for seasonal use of pond by humans and wildlife
Possible mitigation measures – options for minimizing impacts

Associated Costs
Structural alteration to facilitate drawdown by gravity – expense for any needed changes to outlet
Pumping or alternative technology – operational expense for pumped or siphoned outflow
Monitoring program – cost of adequate tracking of drawdown and assessment of impacts

Other Mitigating Factors
Monitoring program elements – may be very lake specific and vary over years
Watershed management needs – additional actions beyond drawdown may be warranted
Ancillary project plans (dredging, shoreline stabilization) – additional actions may require separate planning and permitting

Table 6. Anticipated Response of Some Aquatic Plants to Winter Drawdown (After Cooke et al., 1993).

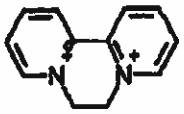
	Change in Relative Abundance		
	Increase	No Change	Decrease
Acorus calamus (sweet flag)	E		
Alternanthera philoxeroides (alligator weed)	E		
Asclepias incarnata (swamp milkweed)			E
Brasenia schreberi (watershield)			S
Cabomba caroliniana (fanwort)			S
Cephalanthus occidentalis (buttonbush)	E		
Ceratophyllum demersum (coontail)			S
Egeria densa (Brazilian Elodea)			S
Eichhornia crassipes (water hyacinth)		E/S	
Eleocharis acicularis (needle spikerush)	S	S	S
Elodea canadensis (waterweed)	S	S	S
Glyceria borealis (mannagrass)	E		
Hydrilla verticillata (hydrilla)	S		
Leersia oryzoides (rice cutgrass)	E		
Myrica gale (sweetgale)		E	
Myriophyllum spp. (milfoil)			S
Najas flexilis (bushy pondweed)	S		
Najas guadalupensis (southern naiad)			S
Nuphar spp. (yellow water lily)			E/S
Nymphaea odorata (water lily)			S
Polygonum amphibium (water smartweed)		E/S	
Polygonum coccineum (smartweed)	E		
Potamogeton epihydrus (leafy pondweed)	S		
Potamogeton robbinsii (Robbins' pondweed)			S
Potentilla palustris (marsh cinquefoil)			E/S
Scirpus americanus (three square rush)	E		
Scirpus cyperinus (wooly grass)	E		
Scirpus validus (great bulrush)	E		
Sium suave (water parsnip)	E		
Typha latifolia (common cattail)	E	E	
Zizania aquatic (wild rice)		E	

E=emergent growth form; S=submergent growth form (includes rooted species with floating leaves); E/S=emergent and submergent forms

REWARD® Landscape and Aquatic Herbicide

(36.4% Diquat Dibromide* + 63.6% Inerts)

Chemical Structure:



Chemical Nomenclature:
1,1'-ethylene-2,2'-bipyridilium ion, dibromide salt;
6,7-dihydrodipyrido(1,2-a:2',1'-c)pyrazidium ion, dibromide salt

CAS No.: **Use:**
85-00-7 (dibromide) — Non-selective contact
2764-72-9 (cation) — herbicide and desiccant
6385-62-2 (dibromide monohydrate)

Molecular Formula: $C_{12}H_{12}N_2Br_2$

Molecular Weight:
344.0 g/mol (dibromide)
184.2 g/mol (cation)
362.0 g/mol (monohydrate)

Physical Properties:

State:	Liquid (red-brown)
Boiling Point:	100°C
Sp. Gravity:	1.22-1.27 g/mL @ 20°C
pH:	6.0 - 7.5

Physicochemical Properties:

Aq. Solubility:	718,000 mg/L @ 20°C
Log Kow:	-4.6 @ 20°C
Log Koc:	4.5 - 6.8 mL/g
Vapor Pres.:	10^{-7} Torr; $<10^{-5}$ Kpa @ 25°C

Chemical Stability:

Aq. Photolysis ($t_{1/2}$):	74 days (lab)
Aq. Hydrolysis ($t_{1/2}$):	stable (acidic or neutral solutions)
Volatility:	non-volatile

Environmental Fate Profile:
REWARD® rapidly dissipates in water due to the naturally high water solubility and adsorptive characteristics of the active ingredient (diquat cation). Exposure is further reduced by microbial degradation in plants and in water, and by photodegradation from the action of sunlight.

Reported Pond-Water Dissipation Rate ($t_{1/2}$): <1-2 days

Ecotoxicological Profile:

Birds:	oral LD_{50} = moderately toxic dietary LC_{50} = moderately to slightly toxic
Bees:	contact LD_{50} = practically non-toxic
Fish:	acute LC_{50} = moderately toxic
Invertebrates:	acute EC_{50} = highly to moderately toxic
Plants/Algae:	acute EC_{50} = highly to moderately toxic

Application Rates:
Applied at 1 - 2 pounds diquat cation per acre maximum; equivalent to an instantaneous maximum concentration of 0.57 mg cation/L (ppm cation). Instantaneous concentrations of 0.57 ppm cation fall to about 0.1 ppm after 24 hours and 0.01 ppm by 4 days.

Margin of Safety/Environmental Exposure:
Based on an instantaneous maximum concentration of 0.57 mg cation/L, the corresponding 48 and 96 hour post-application margins of safety to bluegill sunfish are 578X (at 48 hours) and 1822X (at 96 hours), respectively.

ENVIRONMENTAL OVERVIEW

The safety of a chemical in the environment and potential risk to non-target plants and animals is a function of exposure to the chemical and toxicity. In the absence of chemical exposure, there is no opportunity for toxicological effects. Exposure is determined by the fate of the chemical in the environment. It is the fate characteristics of diquat dibromide, in conjunction with a moderate toxicity, that result in the exceptional environmental safety of diquat dibromide. In aquatic environments, diquat exposure is rapidly reduced after application by adsorption onto target plants. Exposure is further reduced by microbial degradation in plants and in water, and by photodegradation from the action of sunlight. Similar degradation processes occur in terrestrial environments. Diquat rapidly and strongly binds to soil particles. In aquatic environments, diquat is also adsorbed to suspended sediments, including clay particles. Once adsorbed, diquat dibromide is no longer bioavailable and the opportunity for exposure to non-target species is minimized. In addition, diquat is immobile once adsorbed and does not move into surrounding soil or sediment, or leach into groundwater. Therefore, there is minimal risk of contamination of surface water or groundwater. Following labeled application rates, the window of opportunity for exposure to non-target organisms is small because of the rapid dissipation of diquat. Laboratory toxicity studies that are conducted in the absence of mitigating environmental conditions, show that diquat dibromide is only moderately toxic to aquatic organisms, and terrestrial birds and wildlife. The toxicity of diquat dibromide has been extensively studied with more than 200 aquatic toxicity data points covering 26 species of fish and 20 species of aquatic invertebrates. Diquat is also rapidly excreted from organisms and does not bioaccumulate in aquatic organisms or cause biomagnification in food chains. Thus, when used according to label recommendations, diquat dibromide will not cause unreasonable risk to the environment.

CONSUMER INFORMATION

Common Questions and Answers on REWARD®

Q. Why is REWARD® diquat being recommended for aquatic weed control ?
A. It is frequently decided that chemical treatment for weeds in lakes is necessary to preserve the recreational use of the lake during summer months. Other options are available, such as harvesting or dredging, but these are often dismissed as being ineffective or, in the case of dredging, too expensive. A draw-down of the water in the winter may be effective in reducing the weeds in the areas exposed, but the weeds still inhabit the areas left underwater during the draw-down. It is not feasible to draw the lake down much further because this would damage and eliminate habitat for populations of fish and other aquatic organisms. Mechanical harvesting is not effective against some of the weed species, since the fragments generated by the harvesting process can root in new areas. It is also ineffective where the weed problem is severe due to the density of the vegetation. Also mechanical harvesting indiscriminately damages fish and other aquatic organisms as they are caught in the weeds being removed. In contrast, REWARD® is in part registered on the basis of a worst-case scenario risk assessment where effects on any single non-target organism are unacceptable.

Q. How do State Departments of Agriculture regulate this type of activity?
A. The Department of Agriculture can regulate aquatic pesticide applications from three perspectives. First, the chemical to be used in the state must be registered by the State and Federal governments. The second area of regulation is the requirement that any aquatic application must receive the necessary approval and/permits if required by the state. Consult the responsible state agencies (e.g., Department of Ecology, Fish and Game Agency or Department of Natural Resources) for further information. The review process may involve an assessment and/or comparison of the chemical, application rate, and water use of the area to be treated. The result assures that the appropriate herbicide is selected for the water body, and type of weed species to be controlled, and that the proper rate is used. The final area of regulation is the certification of pesticide applicators if required by the state. The applicators must pass a written and oral examination of the category of application they intend to perform.

Q. Can water be used for other purposes after treatment with diquat?
A. Yes. Diquat may only be used in accordance with label instructions which require certain time restrictions for some types of water use. There are no restrictions for recreational activities (swimming or fishing). The restrictions for potable water (drinking) do not exceed 3 days, non-food crop irrigation (e.g., turf, ornamentals, etc) has a maximum of 3 days, livestock consumption has a maximum of 1 day, and food crop irrigation has a maximum of 5 days. Irrigation has the greatest restriction because of the possible concern for phytotoxicity to crop plants. Restrictions are based on not exceeding the Maximum Contaminant Level Goal (MCLG) of 0.02 mg cation/L.

Q. What type of plants are commonly treated?
A. The most common plants treated are exotic species often referred to as "noxious weeds" (e.g., hydrilla, watermilfoils, waterhyacinth, waterlettuce). These plants are not native to North America, and consequently do not have as many natural enemies as many native plants. They can also spread and grow rapidly resulting in dense areas that are unsuitable habitat for fish and aquatic organisms. They also compete with the native vegetation and can eliminate natural plant populations that provide habitat for fish and other aquatic organisms. This can seriously impair the recreational value of a lake, river or pond invaded by these exotic weeds. Harvesting is not effective against some of the species, since the fragments generated by the harvesting process can spread the infestation to other locations when they root after drifting back into the lake. Often chemical control is the only effective and practical method of managing aquatic weeds.

Q. What are the characteristics of diquat?
A. Diquat is commonly used aquatic herbicide and commonly marketed under the trade name REWARD®. It has been used widely throughout the world for weed control and as a crop desiccant for over 30 years and consequently a considerable amount is understood about the properties and risk associated with the use diquat. It is very water soluble and dissipates rapidly in the water, and kills plants by disrupting photosynthesis. A very important characteristic of diquat is its rapid and strong binding to soil or sediment particles. More than half the residues in aquatic bodies will have disappeared from the water phase within 12 hours. The binding of diquat to soil and sediment also means that its potential for leaching into groundwater is negligible.

Q. Will diquat accumulate in fish or the environment?
A. No. Diquat does not have any potential for bioaccumulation because of its very high solubility in water. It is rapidly excreted by fish and other animals if ingested. Consequently, there is no potential for biomagnification through food chains.

Q. Is diquat degraded after application ? What is the method of degradation ?
A. Yes. Diquat undergoes microbial degradation on plants, in water and in sediment. Sunlight also degrades diquat by the process of photodegradation.

Q. What happens to diquat in the sediment?
A. Diquat becomes rapidly and strongly bound to sediment particles. Once adsorbed to sediments it is not bioavailable for uptake by aquatic organisms including plants. This lack of bioavailability is demonstrated by the fact that sensitive rooted plants repeatedly recolonize diquat treated areas.

Q. Usually very water soluble materials are prone to leaching, why is diquat different?
A. Diquat is not prone to leaching through the soil profile because it binds very strongly and completely to soil particles. Diquat will not leach in any soil types. In fact, the soil adsorption values for diquat are an order of magnitude greater than required for a chemical to be classified as immobile.

Q. How much diquat will be in the water?
A. Very little and usually only in a portion of the water body. The instantaneous maximum concentration will be approximately 0.37 ppm (parts per million) in shallow waters 2 ft in depth. When that concentration is diluted through the 5 foot of average depth in the treated area the concentration would be less than 0.2 ppm. Usually only "spot applications" or no more than 1/3 of the lake would be treated, leaving untreated areas of refuge for fish. However, these levels refer to the instantaneous concentrations, the actual exposure concentrations will be lower since absorption to target plants, adsorption onto sediments, and removal from the water is very rapid.

Q. Will diquat deplete the oxygen in the water and suffocate fish ?
No. The microorganism activity in decomposing plant material uses up oxygen and oxygen depletion can occur if there are dense areas of decaying weeds covering the entire water body. Where weed beds are dense, diquat can only be applied to 1/3 to 1/5 of the water body, with 14 days between each application. Therefore, fish and other aquatic organisms will not be affected as there will be a refuge area.

Q. Is diquat toxic to fish?

A. No. The toxic dose of diquat to fish ranges from 0.5 to 240 ppm, depending on the species of fish and the hardness of the water. Given the expected concentrations from label directions, there is an adequate safety margin for fish i.e., maximum concentrations possible from label use are considerably less that the fish toxicity values. Fish can be killed by oxygen depletion when very heavy weed populations are all killed at once. The decay process depletes the oxygen in the water, causing fish suffocation. However, this scenario is unlikely to occur because under these conditions the label states that that only 1/3 to 1/2 of the dense areas are to be treated at one time, which gives the fish an untreated refuge.

Q. Why is "toxic to aquatic invertebrates" required on the label ?
A. This statement is based on EPA labeling requirements for "Environmental Hazards". The toxicity statements triggered are based only on acute laboratory toxicity studies conducted with technical grade active ingredient in clean water. The toxic effects of the chemical in a real water situation is not considered. In aquatic systems, the properties of diquat cause it to become rapidly bound to particulate matter where it is unavailable to cause toxic effects.

Q. How do toxic effects on fish measured in the laboratory relate to actual effects in the environment ?
A. They do not relate directly. Toxicity studies are conducted in the laboratory in clean water (sediment-free) where there is no sediment or plant material present to mitigate exposure. Toxicity in the actual pond will be considerably less particularly for diquat, as diquat rapidly binds to sediment and plants, and becomes unavailable biologically. This can be seen in comparative laboratory studies conducted with *Hyalella azteca* (an amphipod that lives on the sediment surface) where the toxicity is 1400X less in a test system that mimics a real water body (sediment present) in comparison to the regular "water-only" test system.

Q. What will happen if aquatic herbicides are not used to control noxious weeds?
A. Exotic weeds can completely devastate lakes and rivers if left unmanaged. These species have the capacity to completely eliminate communities of native plants and cause both direct and indirect effects in other animals such as invertebrates and fish. Managed aquatic vegetation beds can provide excellent habitat for invertebrates and fish early life stages. In contrast, dense weed beds do not as they severely impact the water quality including dissolved oxygen levels. There are several success stories where diquat has been used to treat a severe weed situation allowing natural plant communities to recolonize, and the lake to return to the balance necessary for healthy aquatic organism populations.

Q. Is diquat more harmful to fish and other aquatic organisms than mechanical weed harvesters ?
A. No. Registration of diquat by the US Environmental Protection Agency does not allow for effects on any individual organism, in fact there also has to be a safety margin. In contrast, mechanical weed harvesters are not regulated and in the process of harvesting weeds, many fish and invertebrates are physically destroyed.

Q. Is diquat harmful to microbial organisms ?
No. Once bound to the sediment diquat is generally not bioavailable to living organisms including microbial organisms. Small amounts of diquat that do become available are actually degraded by microbial organisms.

INFORMATION REQUEST	*FACT*
What is the maximum amount of diquat that can be applied to a water body ?	2 gals/surface acre (4 lb cation) in 4 ft depth 1 gal/surface acre (2lb cation) in 2 ft depth
What is the typical worst case concentrations following application to water ?	0.37 ppm (max. label rate scenario of 2 gals/acre in 4 ft or 1 gal/acre in 2 ft)
Does diquat persist in the water after application?	0.37 ppm (instantaneous concentration) falls to about 0.1 ppm after 24 hours and to 0.01 ppm after 4 days
How much diquat could enter a water body from surface runoff ?	0.78 ppb or 0.00078 ppm (from modeling a worst case scenario)
How much diquat could enter a water body from spray drift aftermarket application?	80.1 ppb or 0.08 ppm (8% of maximum application rate)
Does diquat bioaccumulate ?	Low fish bioconcentration factors of <2.5X . Low aquatic invertebrate bioconcentration factors of 32 X. Rapid elimination of diquat following exposure in all organisms tested.
What is the toxicity of diquat to fish ?	Slightly to moderately toxic.
What is the toxicity of diquat to birds ?	Slightly to moderately toxic.

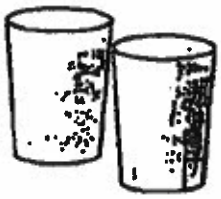
REWARD®

Landscape & Aquatic Herbicide

Low Toxicity, Low or No Exposure = *Low Risk*

What happens to REWARD after application?

REWARD rapidly dissipates after application because it is very water soluble and because it binds very tightly to vegetation and particulate matter. This binding is strong and complete (>99.9%), and the chemical is rendered biologically inactive for uptake by organisms. Instantaneous concentrations of 0.37 ppm fall to about 0.1 ppm after 24 hours and 0.01 ppm by 14 days. Our understanding of this extremely rapid dissipation is based on numerous aquatic field studies.

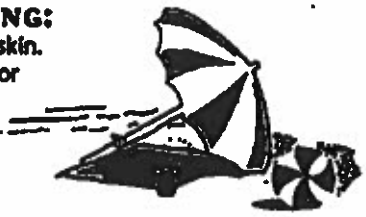


Drinking:

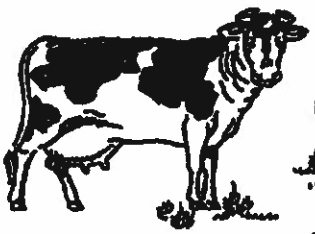
An adult would have to drink over 15,700 gallons of water a day for a lifetime, every day at the EPA-established limit in water of 0.02 mg/liter to absorb an amount of REWARD equivalent to levels that caused *no* effects in animal studies. Since REWARD rapidly dissipates and is below 0.02 or is not detectable in treated water within 1-3 days after application at maximum rates, the daily possibility of drinking water containing REWARD is nonexistent.

Swimming:

REWARD is very poorly absorbed through the skin. Consequently, an adult would need to swim continuously for 447 hours in water treated at the maximum rate to absorb and ingest an amount of REWARD equivalent to levels that caused *no* effects in animal studies (NOEL).



Livestock:



Because REWARD dissipates so rapidly and is so poorly absorbed, the EPA agrees that livestock can drink REWARD-treated water within 24 hours after an application. Furthermore, any small amounts of REWARD that are absorbed by the animal are quickly excreted and are not accumulated in meat, milk, or fat.

Fish:

A person would have to eat 13 pounds of fish every day for a lifetime to achieve an amount of REWARD equivalent to levels that cause *no* effects in animal studies (the NOEL). This assumes that the person obtains fish daily that contains the EPA-established limit of 0.06 parts per million. Given the quick dissipation of REWARD in water and its rapid elimination from the fish, this degree of concentration and exposure is *highly* improbable.

SAFETY TESTING

REWARD was tested over many years in a multitude of animal tests to establish what effects it could cause and at what level of exposure. In these tests, animals are exposed to a range of daily exposure levels, from very low to very high, and over a wide span of time, from one single dose to a lifetime of daily exposure. From these tests, the level that caused no harm to the animal is determined and is called the No-Effect Level, or NOEL.

Always read and follow label directions carefully.

ZENECA

Professional Products

Sonar*

Humans who are exposed to Sonar-treated water are at negligible risk

Drinking Sonar-Treated Water

A 70-kg adult (about 154 pounds) would have to drink over 1,000 gallons (child - 285 gallons) of water daily, containing the maximum legally allowable concentration of Sonar in potable water (0.15 ppm), for a significant portion of their lifetime to receive a dose equivalent to the NOEL.

Swimming in Sonar-Treated Water

At the maximum allowable concentration of Sonar in water (0.15 ppm), an adult would have to swim for 24 hours every day for over 57 years to receive an amount equal to the NOEL.

Eating Fish from Sonar-Treated Water

Adults would have to consume 2,467 pounds (child - 705 pounds) of fish daily, at the maximum allowable tolerance limit in fish (0.5 ppm), for a significant portion of their lifetime to receive the dose equal to the NOEL.

Eating Food Crops Irrigated with Sonar-Treated Water

Adults would need to eat over 8,250 pounds (child - 2,300 pounds) of these foods daily, at the maximum allowable tolerance limit (0.1 - 0.15 ppm), for a significant portion of their lifetime to receive the dose equal to the NOEL.

Eating Livestock Exposed to Sonar from Drinking Treated Water

Adults would need to eat 25,000 pounds (child - 7,000 pounds) of these foods daily, at the maximum allowable tolerance limit in meat, poultry, eggs, and milk (0.05 ppm), for a significant portion of their lifetime to receive the dose equal to the NOEL.

WHAT IS NOEL?

No Observable Effect Level (NOEL) - the highest dose at which no adverse effects are observed in laboratory animals.

The maximum non-toxic dose is usually established by laboratory studies in animals and is reported as the NOEL.

The dietary NOEL for Sonar is approximately 8 milligrams per kilogram of body weight per day (8mg/kg/day). This NOEL was determined from a study in rats that were fed Sonar in their regular diets every day for their entire two-year lifetime.

WHAT IS NEGLIGIBLE RISK?

This term is used because it is beyond the capabilities of science to prove that a substance is absolutely safe, i.e., that the substance poses no risk whatsoever. Any substance, be it aspirin, table salt, caffeine, or household cleaning products, will cause adverse health effects at sufficiently high doses. Normal exposure to such substances in our daily lives, however, are well below those associated with adverse health effects. At some exposure, risks are so small that, for all practical purpose, no risk exists. We consider such risks to be negligible or insignificant.

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11650 N. Meridian St. Suite 120
Carmel, IN 46032-4582
1.800.419.7779

Imazamox Chemical Fact Sheet

Formulations

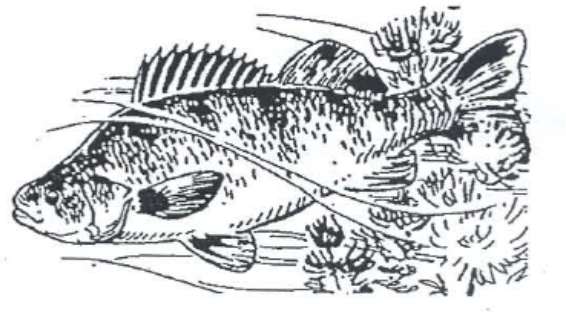
Imazamox is the common name of the active ingredient ammonium salt of imazamox (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-(methoxymethl)-3-pyridinecarboxylic acid. It was registered with EPA in 2008, and is currently marketed for aquatic use as Clearcast™. It is a liquid formulation that is applied to submerged vegetation by broadcast spray or underwater hose application and to emergent or floating leaf vegetation by broadcast spray or foliar application. There is also a granular version (Clearcast 2.7G™).

Aquatic Use and Considerations

Imazamox is a systemic herbicide that moves throughout the plant tissue and prevents plants from producing a necessary enzyme, acetolactate synthase (ALS), which is not found in animals. Susceptible plants will stop growing soon after treatment, but plant death and decomposition will occur over several weeks.

In Wisconsin, imazamox is used for treating emergent vegetation such as common reed (*Phragmites australis*) and flowering rush (*Butomus umbellatus*). Imazamox may also be used to treat the invasive curly-leaf pondweed (*Potamogeton crispus*). Imazamox is a relatively new herbicide that has not been extensively field tested, so there is some uncertainty regarding the sensitivity of non-target species. Desirable native species that may be affected could include other pondweeds (*P. nodosus, P. zosteriformis, P. foliosus, P. illinoensis, P. pusillus, P. gramineus, P. diversifolius, P. perfoliatus, P. amplifolius*), water shield (*Brasenia schreberi*) and some bladderworts (*Utricularia* spp.). Higher rates of imazamox will control Eurasian watermilfoil (*Myriophyllum spicatum*), but would also have a greater impact on native plants.

If used as a post-emergence herbicide, imazamox should be applied to plants that are



actively growing. It can also be used during a drawdown to prevent plant regrowth and on the emergent vegetation.

Repeated use of herbicides with the same mode of action can lead to herbicide-resistant plants. Herbicide resistance has now been found in at least one aquatic nuisance plant species. In particular, ALS inhibitor-resistant weeds have appeared at a higher rate than other herbicide types in terrestrial uses. In order to prevent herbicide resistance, avoid using the same type of herbicides year after year, and when possible, use non-herbicide methods of control instead.

Post-Treatment Water Use Restrictions

Treated water may be used immediately following application for fishing, swimming, cooking, bathing, and watering livestock. If water is to be used as potable water or for irrigation, the tolerance is 50 parts per billion (ppb), and a 24-hour irrigation restriction may apply depending on the water body.

Herbicide Degradation, Persistence and Trace Contaminants

Dissipation studies in lakes indicate a half-life ranging from 4 to 49 days with an average of 17 days. Herbicide breakdown doesn't occur in deep, poorly-oxygenated water where there is no light. In this part of a lake, imazamox will tend to bind to sediment rather than breaking down, with a half-life of approximately 2 years.

Once in soil, leaching to groundwater is believed to be very limited.

The breakdown products of imazamox are nicotinic acid and di- and tricarboxylic acids. None of the breakdown products are herbicidal nor suggest concerns for aquatic organisms or human health.

Impacts on Fish and Other Aquatic Organisms

Laboratory tests using rainbow trout, bluegill, and water fleas (*Daphnia magna*) indicate that imazamox is not toxic to these species at label application rates. Imazamox is rated practically non-toxic to fish and aquatic invertebrates. Imazamox does not bioaccumulate in fish.

Additional studies on birds indicate toxicity only at dosages that exceed approved application rates. However, honeybees are affected at application rates so drift during application should be minimized.

Human Health

Most concerns about adverse effects on human health involve applicator exposure. Concentrated imazamox can cause eye and skin irritation and is harmful if inhaled. Applicators should minimize exposure by wearing long-sleeved shirt and pants, rubber gloves, and shoes and socks.

In chronic tests, imazamox was not shown to cause tumors, birth defects or reproductive toxicity in test animals. Most studies show no evidence of mutagenicity. Imazamox is not metabolized and was excreted by mammals tested. Based on its low acute toxicity to mammals, and its rapid disappearance from the water column due to light and microbial degradation and binding to soil, imazamox is not considered to pose a risk to recreational water users.

For Additional Information

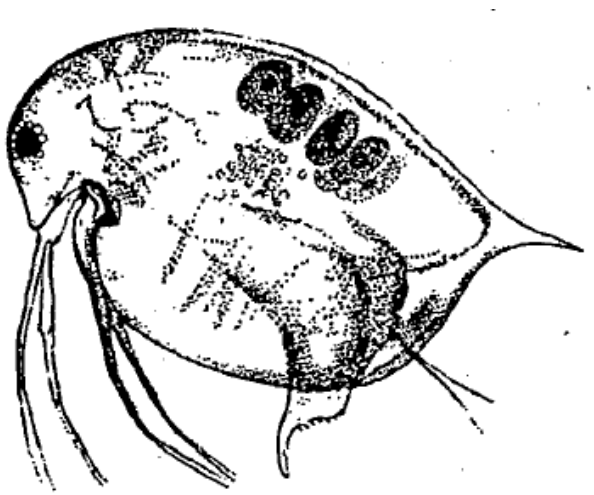
Environmental Protection Agency
Office of Pesticide Programs
www.epa.gov/pesticides

Wisconsin Department of Agriculture, Trade, and Consumer Protection
http://datcp.wi.gov/Plants/Pesticides/

Wisconsin Department of Natural Resources
608-266-2621
http://dnr.wi.gov/lakes/plants/

Wisconsin Department of Health Services
http://www.dhs.wisconsin.gov/

National Pesticide Information Center
1-800-858-7378
http://npic.orst.edu/



Pure Water Gazette Water Treatment Issues

Places to Visit

The Pure Water Occasional Home Page

The Pure Water Gazette

Pure Water Products

Fair Use Statement

Water Treatment Issues:

Acid Water

Algae, cyanotoxins

Alkalinity

Alum (Aluminum Sulfate)

Aluminum

Ammonia

Arsenic

Asbestos

Bacteria

Barium

Benzene

Bicarbonate Alkalinity

Boron (Borate, Boric Acid)

Brackish Water

Bromine

Bromate

Cadmium

Calcium

Alum (Aluminum Sulfate)

One of the first of the several steps that municipal water suppliers use to prepare water for distribution is getting it as clear and as particulate-free as possible. To accomplish this, the water is treated with aluminum sulfate, commonly called alum, which serves as a flocculant. Raw water often holds tiny suspended particles that are very difficult for a filter to catch. Alum causes them to clump together so that they can settle out of the water or be easily trapped by a filter.

Usually a mixture of water with 48 percent filter alum is injected into the raw incoming water at a rate of 18 to 24 parts per million. The alum promotes coagulation of fine particles which helps resolve problems of color as well a turbidity. If the process is given enough time to work and is applied properly, it not only corrects problems in the water but actually results in removing most of the aluminum used in the process.

Although concern over the safety of treating water with aluminum has often been voiced, there is no evidence that aluminum in water, whether it comes from the aluminum sulfate used in treatment or from other sources, is a health issue. Actually, most aluminum that we take in does come from other sources. One study showed that only between 0.4% and 1.0% of our lifetime intake of aluminum comes from alum used to prepare municipal water. Most aluminum intake is from aluminum that occurs naturally in foods, aluminum used in food packaging, and from products like deodorants and vaccines.

Water treatment for aluminum is normally not needed, but aluminum is easy to remove with reverse osmosis or distillation.

See also "Simple Facts about Aluminum."

More about alum from other sources:

There are a variety of primary coagulants which can be used in a water treatment plant. One of the earliest, and still the most extensively used, is aluminum sulfate, also known as alum. Alum can be bought in liquid form with a concentration of 8.3%, or in dry form with a concentration of 17%. When alum is added to water, it reacts with the water and results in positively charged ions.

Coagulation/flocculation is a process used to remove turbidity, color, and some bacteria from water. In the flash mix chamber, chemicals are added to the water and mixed violently for less than

Carbon Dioxide

Carbon Tetrachloride

Chloramines

Chloride

Chlorine

Chromium

Color

Copper

Corrosion

Cryptosporidium

Cyanide

Dichloroethylene

Endocrine Disruptors

Fluoride

Giardia Lambia

Hardness

Heterotrophic Bacteria (HPC)

Hydrogen Sulfide

Iodine

Iron

Iron Bacteria

Lead

Magnesium

Manganese

Mercury

Methane

MTBE

Napthalene

Nickel

Nitrates and Nitrites

a minute. These coagulants consist of primary coagulants and/or coagulant aids. Then, in the flocculation basin, the water is gently stirred for 30 to 45 minutes to give the chemicals time to act and to promote floc formation. The floc then settles out in the sedimentation basin.

Coagulation removes colloids and suspended solids from the water. These particles have a negative charge, so the positively charged coagulant chemicals neutralize them during coagulation. Then, during flocculation, the particles are drawn together by van der Waal's forces, forming floc. The coagulation/flocculation process is affected by pH, salts, alkalinity, turbidity, temperature, mixing, and coagulant chemicals.

Source: http://water.me.vccs.edu/courses/env110/lesson4_3.htm

Aluminum sulfate is widely used as a flocculant in water treatment plants in the United States. It is also widely available in developing countries, sold in blocks of soft white stone, and generally called alum. There are numerous ways to use alum as a flocculant, including to crush it into a powder before adding it to water, stirring and decanting or stirring the whole stone in the water for a few seconds and waiting for the solids to settle. The benefits of alum are that it is widely available, is proven to reduce turbidity, and is inexpensive. The drawback of alum is that the necessary dosage varies unpredictably. Laboratory studies have shown that alum is effective at reducing turbidity and chlorine demand 3.

Source: http://www.cdc.gov/safewater/chlorination-pretreatment.html#3

Wisconsin Department of Natural Resources

January 2012

Copper Compounds Chemical Fact Sheet

Formulations

Copper has been used as an aquatic herbicide and algaecide since 1950. Copper compounds for aquatic use are manufactured either as copper sulfate, or as a copper chelate. Both forms contain metallic copper as the active ingredient, but in the chelate forms the copper is combined with other compounds to keep the copper in solution and active in the water longer. Chelated copper is also less toxic to non-target organisms.

There are copper sulfate products available as fungicides and other terrestrial uses, which are not allowed for use in water. Aquatic copper products are sold under a variety of brand names, including Nautique™, Komeen®, Captain™, K-Tea™, Earthtec®, Cutrine®-Plus, Clearigate® and SeClear (product names are provided solely for your reference and should not be considered endorsements nor exhaustive).

Aquatic Use and Considerations

Copper products are primarily used to treat algae but certain formulations will affect some plants, as well. The target species vary by product, so it is important to confirm that the intended target is listed on the label of the product being used.

Copper works by interfering with enzyme production. Results from treatments for algae occur within hours, while the effects of treatment on plants will be evident in about a week. Large-scale algae die-off can deplete oxygen levels in the water quickly, which can be lethal to fish and other aquatic life. If more than a 1/3 of the total water area is covered in algae, treatments should be done in sections, and applied in a pattern that allows fish an escape route to untreated water. Ten to fourteen days are needed between treatments to protect fish and aquatic life.

Copper products will treat blue-green (free-floating) algae and filamentous (mat-forming) algae as well as larger algae species that look like plants, such as *Chara* spp. and *Nitella* spp.. In Wisconsin, copper is not typically used to treat aquatic plants, but some are labeled to treat the invasives Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*), as well as the native species coontail (*Ceratophyllum demersum*), naiads (*Najas* spp.), elodea (*Elodea canadensis*), sago pondweed (*Stuckenia pectinata*) and water celery (*Vallisneria americana*).

Determining the correct copper formulation and calculating the proper dosage are key factors in determining how well copper will control undesirable algae. Applicators need to consider target species, water hardness, water temperature, amount of algae present, as well as water clarity and flow.

In hard or alkaline waters, copper sulfate tends to settle to the bottom within 24 hours after application. Chelated copper remains in solution longer, allowing for a longer contact time with the algae.

All copper formulations can be toxic to some species of fish at recommended application rates, especially if the water has less than 50 ppm (parts per million) of carbonate hardness (soft water). However, toxicity generally decreases as water hardness increases.

Post-Treatment Water Use Restrictions

There are no restrictions on swimming, eating fish from treated water bodies, human drinking water, pet/livestock drinking water, or irrigation.

Herbicide Degradation, Persistence and Trace Contaminants

Copper is an element, and so is not broken down like other herbicides. Copper precipitates out of the water over a few days and settles into the sediments, where it persists indefinitely and accumulates over time. The buildup of copper in lake sediments is a serious concern, because high concentrations of copper in the sediment are toxic to both plant and animal life.

Impacts on Fish and Other Aquatic Organisms

Copper sulfate is rarely used in Wisconsin, in part due to its high toxicity to invertebrates (water fleas, crustaceans, mollusks, mayflies, snails, and crayfish) and multiple species of fish (trout, bluegill and minnow) at typical application concentrations. The chelated forms of copper have different toxicology profiles from each other and from copper sulfate.

The chelated copper products can also be toxic to fish at application rates, particularly to trout and bluegill in soft water ($CaCO_3$ <50ppm). Applications to harder water provide a greater margin of safety to fish.

Many of the chelated copper products are also toxic to invertebrates at application rates. High concentrations of copper in lake sediment can be toxic to invertebrates that live on the lake bottom, as well. These invertebrates are an important source of fish food.

Copper does temporarily accumulate in fish, but more in the gills and the liver than in muscle tissue. The copper in fish tissues are reduced once the copper level in the water is reduced.

The EPA risk assessment for birds and small mammals (based on dietary consumption) indicates that some risk may be present to birds or mammals at the worst-case scenario. However, this maximum dietary exposure scenario is likely much higher than the exposure level that might occur to birds when copper is released into the environment as an algaecide. Birds, like humans, can physiologically acclimate to higher concentrations of copper in order to slow its uptake. Studies of copper's effects on birds have shown to be toxic at high levels; however, effects at standard treatment levels have not been shown to be harmful. Studies have shown that even at low levels (.07ppm) copper sulfate can have detrimental effects on amphibians, including slowed growth rates, decreased mobility and death. Effects on reptiles have not been documented.

Human Health

The risk of acute exposure to copper is primarily to chemical applicators. The acute toxicity risk from oral and inhalation routes is minimal; however concentrated copper products can be corrosive to the eyes and cause irreversible damage. Prolonged or frequent skin contact can cause allergic reactions in some people. Goggles, protective clothing, and rubber gloves are required when handling.

Even with regular use for many years, very few chronic health concerns have been documented. In one study agricultural applicators of copper were found to have some signs of liver damage, and there is some evidence that high copper may impair immune function. Copper is not carcinogenic.

For Additional Information

Environmental Protection Agency
Office of Pesticide Programs
www.epa.gov/pesticides

Wisconsin Department of Agriculture, Trade, and Consumer Protection
http://datcp.wi.gov/Plants/Pesticides/

Wisconsin Department of Natural Resources
608-266-2621
http://dnr.wi.gov/lakes/plants/

Wisconsin Department of Health Services
http://www.dhs.wisconsin.gov/

National Pesticide Information Center
1-800-858-7378
http://npic.orst.edu/

Order of Conditions for Management of Aquatic Vegetation and Algae at Indian Lake

(DEP File # 349-1326)

Worcester, MA

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1326
MassDEP File #

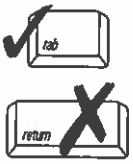
eDEP Transaction #

Worcester
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: City of Worcester
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Jacquelyn (a. First Name) | Burmeister (b. Last Name)
City of Worcester Department of Sustainability & Resilience (c. Organization)
455 Main Street, Room 108 (d. Mailing Address)
Worcester (e. City/Town) | MA (f. State) | 01608 (g. Zip Code)

4. Property Owner (if different from applicant):

(a. First Name) | (b. Last Name)
Commonwealth of Massachusetts (c. Organization)
(d. Mailing Address)
(e. City/Town) | (f. State) | (g. Zip Code)

5. Project Location:

(a. Street Address) | Worcester (b. City/Town)
MA-DEP (c. Assessors Map/Plat Number) | -INDIA (d. Parcel/Lot Number)

Latitude and Longitude, if known: 42.298131 (d. Latitude) | -71.812108 (e. Longitude)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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Worcester
City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Worcester
a. County

b. Certificate Number (if registered land)

n/a – Great Pond
c. Book

n/a – Great Pond
d. Page

7. Dates: 4/26/2022 (a. Date Notice of Intent Filed) 6/6/2022 (b. Date Public Hearing Closed) 6/7/2022 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Figure 1: September 2020 Aquatic Vegetation Survey
a. Plan Title

Solitude Lake Management
b. Prepared By

n/a
c. Signed and Stamped by

10/28/2020
d. Final Revision Date

n/a
e. Scale

NOI Application Materials
f. Additional Plan or Document Title

April 2022
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply
b. ☐ Land Containing Shellfish
c. ☒ Prevention of Pollution
d. ☒ Private Water Supply
e. ☒ Fisheries
f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply
h. ☒ Storm Damage Prevention
i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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Worcester
City/Town

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ **Buffer Zone Impacts:** Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration (Temporary)	Permitted Alteration (Temporary)	Proposed Replacement	Permitted Replacement
4. ☒ Bank	25,175 a. linear feet	25,175 b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☒ Land Under Waterbodies and Waterways	8,502,861 a. square feet	8,502,861 b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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City/Town

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet c. c/y dredged	b. square feet d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet c. c/y dredged	b. square feet d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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City/Town

B. Findings (cont.)

*** #23.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW

b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings

b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on _____ unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

Massachusetts Department of Environmental Protection
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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 349-1326 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

Massachusetts Department of Environmental Protection
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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☐ is subject to the Massachusetts Stormwater Standards
    (2) ☒ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;

    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;

    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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Worcester
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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1326
MassDEP File #

eDEP Transaction #

Worcester
City/Town

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

See Attachment A.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

Massachusetts Department of Environmental Protection
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Worcester
City/Town

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The City of Worcester Conservation Commission hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   City of Worcester Wetlands Protection Ordinance & Regulations
   1. Municipal Ordinance or Bylaw

   COW GRO Part 1. Ch. 6.
   2. Citation

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   City of Worcester Wetlands Protection Ordinance & Regulations
   1. Municipal Ordinance or Bylaw

   COW GRO Part 1. Ch. 6.
   2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

   See Attachment A.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1326
MassDEP File #

eDEP Transaction #

Worcester
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

6/7/2022
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

3 of 5
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.
The names typed below represent the intent to sign the foregoing document in accordance with MGL Chapter 110G §9
Duly authorized by Ch.110G and recorded at Worcester Registry of Deeds in Book 62537 Page 329.

Signatures:

☑ by hand delivery on
6/7/2022
Date

☐ by certified mail, return receipt requested, on
Date

F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.
Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.
The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location | MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1326
MassDEP File #

eDEP Transaction #

Worcester
City/Town

Document Number

Signature of Applicant

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

A. Request Information

1. Location of Project

a. Street Address

b. City/Town, Zip

c. Check number

d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

ATTACHMENT A

Worcester Conservation Commission

Special Order of Conditions

City of Worcester Wetlands Protection Ordinance & City of Worcester Wetlands Protection Regulations

(City of Worcester Revised Ordinance Part I, Chapter 6)

And

Massachusetts General Laws, Chapter 131, §40 - Massachusetts Wetlands Protection Act

Indian Lake (CC-2022-035 & DEP#349-1326)

Project Description: An Ecological Restoration Limited Project to manage invasive plants and cyanobacteria using herbicides and other mechanical methods.

Waivers Granted: Waiver of performance standard 4.2.4 for work within the 15' buffer zone (work is within the resource area itself)

Table of Contents:

Notes:

- **Office of the Commission** is located at the Division of Planning and Regulatory Services (455 Main Street 4th floor, Worcester, MA), which can be contacted by e-mailing planning@worcesterma.gov or calling 508-799-1400 ext. 31440.
- **Asterisked (*) conditions** are standard conditions of approval for all projects.

I. Conditions to Meet Prior to and During Work

21. Person Responsible for Compliance with the Order of Conditions* – A person shall be designated to be responsible to monitor compliance with the Order of Conditions. Their name and contact information (24/7) shall be provided to the Office of the Commission prior to start of any activity. This person shall conduct:

    a) periodic inspections to assure the adequacy and continued effectiveness of erosion and sediment controls;

    b) inspections of said controls following 0.5-inch or greater rain events, or after a heavy snow melt.

22. Contract* - This Order of Conditions and all approved plans shall be included as part of any contract and subcontract and shall be posted in a prominently displayed location in the supervisory office on site during all phases of construction.

23. Notification* - The applicant shall notify the Office of the Commission a minimum of 48 hours prior to the start of any activity.

II. Conditions to Meet During Work

24. Treatment & Monitoring Program – The applicant shall develop and implement a management monitoring program to be conducted during and after the drawdown and other management activities. Monitoring shall be on-going throughout the year to minimize impacts to fisheries, shellfish, wildlife habitat, non-target native species, and/or water quality (e.g. flow, clarity, etc.) and to evaluate and maintain the effectiveness of the treatment and minimize any related impacts. On an annual basis, treatment and work plans, and monitoring data/reports shall be provided to the office of the Commission. End of year monitoring reports shall be submitted to the office of the Commission. These reports shall include all management and treatment measures employed in that year, the results of said measures and recommendations for management for the following year. At minimum annual monitoring, and associated reporting information, shall include the following:

    a) During the winter months - evaluation of dissolved oxygen to ensure successful overwintering of organisms;

    b) During the summer months – evaluation of nutrients.

25. Chemical Treatments – Only chemicals (i.e. algaecides, herbicides, etc.) approved by the Commission - applied in accordance with the specifications on file with the Office of the Commission, and with any applicable MassDEP standards - shall be used for chemical treatment of the waterbody. If the applicant wishes to propose the use of any other chemicals, they shall submit a written request to the Commission for their review and approval.

26. Boat Washing – Boats and equipment shall not be washed out in any resource area or buffer zone area, or into any drainage system.

27. Drawdown - Drawdown activities shall follow the Performance Guidelines contained in Section 4.2.6.3 of "Eutrophication and Aquatic Plant Management in Massachusetts, Final Generic Environmental Impact Report," including but not limited to:

    a) Depth - The annual drawdown shall be limited to a maximum of 3 feet;

    b) Drawdown Timeframe –

        i) The annual drawdown shall commence no sooner than November 1st in order to lessen impacts to wildlife;

        ii) The target drawdown depth shall be achieved by December 1st in order to allow wildlife to move to deeper water, locate alternate lodge sites, or relocate food caches prior to ice formation

and substrate freezing; and to minimize impacts to fish spawning and other non-target organisms that may have water level requirements for reproduction;

c) Outflow Rates –

i) During the drawdown outflow rates shall be kept below a discharge equivalent to 4 cfs per square mile of watershed;

ii) Once the target water level is achieved, outflow rates shall match inflow rates to the greatest extent possible in order to maintain a stable water level; and

iii) Outflow during refill shall be kept above a discharge equivalent to 0.5 cfs per square mile of watershed.

d) Refill Timeframe - Full lake level shall be achieved by April 1.

28. Limit of Work* – No removal, filling, dredging or altering of jurisdictional areas shall take place outside the approved work under this Order of Condition.

29. Work Sequencing* – Activities shall take place in accordance with all phasing and sequencing shown on the plan and/or provided in the application materials on file with the Office of the Commission and shall follow any lot opening restrictions otherwise provided herein.

30. Erosion Stabilization -

a) *Erosion and Sediment Controls** - All erosion and sediment controls shall be monitored, maintained, and adjusted for the duration of the project to prevent adverse impacts to jurisdictional areas. Additional erosion and sediment controls may be utilized on site as needed.

b) *Off Site Impacts** - There shall be no off-site erosion, flooding, ponding, or flood-related damage from runoff caused by the project activities.

c) *Unanticipated Drainage or Erosion** - The applicant shall control any unanticipated drainage and/or erosion conditions that may cause damage to jurisdictional areas and/or abutting or downstream properties. Said control measures shall be implemented immediately upon need. The Office of the Conservation Commission shall be notified if such conditions arise and of the measures utilized.

d) *Soil Stabilization due to Delay in Work** - If there is an interruption of more than 10, but less than 60 days between completion of grading and revegetation, the applicant shall sow all disturbed areas with annual rye grass to prevent erosion. If soils are to be exposed for longer than 60 days, a temporary cover of rye or other grass should be established following US Soil Conservation Services procedures, as recently amended, to prevent erosion and sedimentation. Once final grading is complete, loaming and seeding of final cover should be completed promptly.

e) *Grading of Slopes**-

i. >40% Slope – Slopes shall not exceed those specified in the plans approved by the Conservation Commission. Any slope equal to or greater than 40% (1 vertical to 2 1/2 horizontal) shall be stabilized with erosion control matting.

ii. <40% Slope – Final grades of vegetated areas shall not exceed a slope of 1 vertical to 2 1/2 horizontal (40%) and shall be stabilized to prevent erosion, particularly during the construction period.

f) *Stockpile Maintenance** - Any stockpiling of loose materials shall be properly stabilized to prevent erosion into and sedimentation of jurisdictional areas. Preventative controls such as strawbales or erosion control matting shall be implemented to prevent such an occurrence.

g) *Stockpile Location* – In no case shall any soil or excavated material be stockpiled within 50 feet of any wetland, floodplain, or storm drain inlet.

h) *Site Stabilization Prior to Winter** - Prior to winter, exposed soils shall be stabilized (e.g. with demonstrated vegetative growth, impermeable barriers, erosion control blankets, etc.).

31. Invasive Insects* -

a) *Plantings* – No trees to be planted shall be species susceptible to the Asian Longhorned Beetle or Emerald Ash Borer.

b) *Wood Removal* – All tree, brush & wood removal shall adhere to the most recently amended requirements set forth by the Massachusetts Department of Conservation & Recreation for any project located in the Asian Longhorned Beetle Quarantine Zone.

32. Dust Control* - Provisions for dust control shall be provided during all construction and demolition activities. Such provisions shall be conducted in compliance with all City of Worcester Water Use Restrictions, if in effect, during such activities.

33. Dewatering* – If dewatering is required,

a) Notice of such activities shall be given to the Office of the Commission within 24 hours of commencement;

b) There shall be no discharge of untreated dewatered stormwater or groundwater to jurisdictional areas either by direct or indirect discharge to existing drainage systems;

c) Any discharge to surface waters or drainage structures must be visibly free of sediment;

d) To the maximum extent practicable, proposed dewatering activities should be located outside of the 100' buffer. If such activities must be located within the 100' buffer, they shall be monitored at all times when the pumps are running;

e) Dewatering activities shall be confined within an area of secondary containment at all times.

34. Spill Prevention* -

a) No fuel, oil, or other pollutants shall be stored in any resource area or the buffer zone thereto, unless specified in this Order;

b) No refueling shall take place within resource areas or 100-ft to a resource area;

c) The applicant shall take all necessary precautions to prevent discharge or spillage of fuel, oil or other pollutants onto any part of the site;

d) A spill kit shall be present on site at all times.

III. Conditions to Meet at Completion of Project

35. Site Stabilization* - All disturbed areas shall be properly stabilized with well-established perennial vegetation or other approved methods before the project is considered complete.

36. Erosion and Sediment Controls* - Erosion and sediment controls shall not be removed from the site until all disturbed areas have been stabilized with final vegetative cover and approval has been received from the Commission or its Agents to do so. The controls must then be removed within two weeks of receipt of that certification.

37. Certificate of Compliance* - Upon completion of the project, the applicant shall request in writing a Certificate of Compliance from the Commission. If the project has been completed in accordance with plans stamped by a registered professional engineer, architect, landscape architect, or land surveyor, certification must include a written statement by such professional certifying the same.

IV. General Conditions

38. Validity and Duration of the Order - The activities authorized hereunder shall be completed within five (5) years from the date of issuance of this Order as this special condition hereby modifies General Condition four (4) of this Order. These activities have demonstrated success in managing aquatic nuisance, non-native, and/or invasive vegetation species without adverse impacts to either resource areas or interests they protect. The Commission recognizes the long-term benefits of this recurring, annual, activity and that an extended permit duration is necessary to observe discrete improvements of overall water quality and native habitat restoration due to the lifecycles of target plant growth. For example, many aquatic nuisance vegetation and invasive species, having extended periods of seed dormancy, may continue to propagate after initial treatment, thus additional time is warranted to complete effective treatments and monitor outcomes for overall, long-term improvements to the resource area and associated waters. Therefore, the Commission finds that the recurring and maintenance nature of the proposed activities have special circumstances warranting an extended permit life in order to best serve protected wetland interests.

39. Change in Ownership* - If a change in ownership takes place while this Order is still in effect, it is the responsibility of the new owner to notify the Commission of the change and to provide the name of the person responsible for compliance with the Order.

40. Conservation Agent's Power to Act* - With respect to all conditions, except _____, the Conservation Commission designates the Conservation Agent, as its Agent with full powers to act on its behalf in administering and enforcing this Order, unless the Agent determines approval from the Commission is appropriate.

41. Right to Inspect* - A member of the Conservation Commission or its Agent may enter and inspect the property and the activity that are the subjects of this Order at all reasonable times, with or without probable cause or prior notice, and until a Certificate of Compliance is issued, for the purpose of evaluating compliance with this Order (and other applicable laws and regulations).

42. Changes to the Plan or Errors & Omissions* -

    (a) If any plan, calculation, or other data presented to the Office of the Commission is in error or have omissions, and are deemed significant by the Commissioners or their Agents, all work will stop at the discretion of the Commission, until the discrepancies have been rectified to the Commission's satisfaction.

    (b) The applicant must notify the Commission in writing of any changes in the plans or implementation of the proposed activity where mandated by any local, state, or federal agencies having jurisdiction over the proposed activity. If, in the opinion of the Commission, any changes in the plans or implementation of the proposed activity so require, then the Commission may modify, amend or rescind this Order in a way consistent with:

    - M.G.L. Chapter 131, Section 40,
    - 310 CMR 10.00, *Wetlands Protection*,
    - the City of Worcester's *Wetlands Protection Ordinance*, and
    - the Commission's *Wetlands Protection Regulations*

    If any provisions of any conditions, or application thereof is held to be invalid, such invalidity shall not affect any other provisions of this Order. If the Commission deems that a proposed change is major or substantial, a new hearing may be required.

43. Liability* - The applicant shall indemnify and save harmless the Commonwealth, the City of Worcester, the Conservation Commission, and its Agents against all sites, claims or liabilities of every name and nature arising at any time out of or in consequence of the acts of the Commission or its

Agents in the performance of the work covered by this Order and/or failure to comply with the terms and conditions or this Order whether by itself or its employees or subcontractors.

Order of Conditions for Management of Aquatic Vegetation and Algae at Park Ponds

(DEP File # 349-1399)

Worcester, MA

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
349-1399
MassDEP File #

eDEP Transaction #

Worcester
City/Town

A. General Information

Please note: this form has been modified with added space to accommodate the Registry of Deeds Requirements

1. From: City of Worcester
Conservation Commission

2. This issuance is for (check one): a. ☒ Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

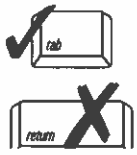
a. First Name | b. Last Name

City of Worcester Department of Sustainability and Resilience
c. Organization

455 Main Street
d. Mailing Address

Worcester | MA | 01608
e. City/Town | f. State | g. Zip Code

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



4. Property Owner (if different from applicant):

a. First Name | b. Last Name

c. Organization

d. Mailing Address

e. City/Town | f. State | g. Zip Code

5. Project Location:

Lincoln Pond (121 Russell Street), Green Hill Veterans Memorial Pond (301 Green Hill Parkway), Wawecus Road Pond (70 North Parkway), Crystal Pond (965 Main Street)
a. Street Address

Worcester
b. City/Town

02-INX, 57-003, 22-INX, & 07-007
c. Assessors Map/Plat Number

-00001, -00003, -00001, & -01+02
d. Parcel/Lot Number

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 349-1399
MassDEP File #

eDEP Transaction #

Worcester
City/Town

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Worcester
a. County

b. Certificate Number (if registered land)

1238; 1870
c. Book

1; 521
d. Page

7. Dates: 4/18/2024 a. Date Notice of Intent Filed; 7/1/2024 b. Date Public Hearing Closed; 7/2/2024 c. Date of Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

n/a
a. Plan Title

n/a
b. Prepared By

n/a
c. Signed and Stamped by

n/a
d. Final Revision Date

n/a
e. Scale

NOI Application Materials
f. Additional Plan or Document Title

04/18/2024
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution
d. ☒ Private Water Supply e. ☒ Fisheries f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 349-1399
MassDEP File #

eDEP Transaction #

Worcester
City/Town

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) — a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☒ Land Under Waterbodies and Waterways	357,192 a. square feet	357,192 b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront Area (25' - Worcester)	a. total sq. feet	b. total sq. feet		
Sq ft within 25 ft	c. square feet	d. square feet	e. square feet	f. square feet

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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment cu yd	d. nourishment cu yd
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

* **#23.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

23. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

24. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. The work is a maintenance dredging project as provided for in the Act; or
   b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
   c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on _____ unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

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C. General Conditions Under Massachusetts Wetlands Protection Act

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number 349-1399 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

19. The work associated with this Order (the "Project")
    (1) ☐ is subject to the Massachusetts Stormwater Standards
    (2) ☒ is NOT subject to the Massachusetts Stormwater Standards

    If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

    a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

    b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

    i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;

    ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;

    iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

See Attachment A.

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

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D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The City of Worcester Conservation Commission hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:
   City of Worcester Wetlands Protection Ordinance & Regulations (1. Municipal Ordinance or Bylaw)
   COW GRO Part 1. Ch. 6. (2. Citation)

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:
   City of Worcester Wetlands Protection Ordinance & Regulations (1. Municipal Ordinance or Bylaw)
   COW GRO Part 1. Ch. 6. (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.
   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

See Attachment A.

ATTACHMENT A

Worcester Conservation Commission

Special Order of Conditions

City of Worcester Wetlands Protection Ordinance & City of Worcester Wetlands Protection Regulations

(City of Worcester Revised Ordinance Part I, Chapter 6)

And

Massachusetts General Laws, Chapter 131, §40 - Massachusetts Wetlands Protection Act

Lincoln Pond (121 Russell Street), Green Hill Veterans Memorial Pond (301 Green Hill Parkway), Wawecus Road Pond (70 North Parkway), Crystal Pond (965 Main Street) (CC-2024-034 & DEP#349-1399)

Project Description:

Management of invasive and nuisance aquatic plant and algae species in City ponds using herbicides, algaecides, and physical removal.

Findings/Waivers:

1. This Order of Conditions is valid for **five (5) years** as an ongoing aquatic management plan.
2. This work is approved as an Ecological Restoration Limited Project pursuant to 310 CMR 10.53(4)

Table of Contents:

Notes:

- **Office of the Commission** is located at the Division of Planning and Regulatory Services (455 Main Street 4th floor, Worcester, MA), which can be contacted by e-mailing planning@worcesterma.gov or calling 508-799-1400 ext. 31440.
- **Asterisked (*) conditions** are standard conditions of approval for all projects.

I. Conditions to Meet Prior to Management

21. Person Responsible for Compliance with the Order of Conditions* – A person shall be designated to be responsible to monitor compliance with the Order of Conditions. Their name and contact information (24/7) shall be provided to the Office of the Commission prior to start of any activity.
22. Contract* - This Order of Conditions and all approved plans shall be included as part of any contract and subcontract and shall be posted in a prominently displayed location in the supervisory office on site during all phases of construction.
23. Notification - The applicant shall notify the Office of the Commission a minimum of 48 hours prior to conducting management activities.
24. Pre-Construction Conference* -
    a) The Conservation Commission or its Agents shall conduct a pre-construction conference prior to commencement of activities in each phase of the project. Phasing, if any, shall conform to the approved plans.
    b) The property owner / applicant and any person performing work that is subject to this Order are responsible for understanding and complying with the requirements of this Order, the Wetlands Protection Act, 310 CMR 10.00 and City of Worcester Wetlands Protection Ordinance and Regulations. Said persons shall acknowledge such in writing prior to commencement of activities.

II. Conditions to Meet During Management

25. Monitoring - regular inspections shall be conducted to assess the growth of the target plant species and overall pond conditions to guide management decisions. Post-management inspections shall be completed to assess the efficacy of the management efforts and any impacts on non-target species so that future applications can be properly adjusted to minimize non-target impacts. Annual monitoring reports documenting management efforts, observed conditions, management efficacy, and future recommendations shall be provided to the Commission.
26. Boat washing - Boats and equipment shall not be washed out in any resource area, the buffer zone, or into any drainage system.
27. Adaptive Management - Should the applicant wish to incorporate any additional management techniques not specifically identified in the Notice of Intent submitted in this filing, a written request shall be submitted to the Commission detailing the newly proposed management techniques for their review and approval.
28. Limit of Work* – No removal, filling, dredging or altering of jurisdictional areas shall take place outside the approved work under this Order of Condition.
29. Work Sequencing* – Activities shall take place in accordance with all phasing and sequencing shown on the plan and/or provided in the application materials on file with the Office of the Commission and shall follow any lot opening restrictions otherwise provided herein.
30. Invasive Insects* -
    a) *Plantings* – No trees to be planted shall be species susceptible to the Asian Longhorned Beetle or Emerald Ash Borer.
    b) *Wood Removal* – All tree, brush & wood removal shall adhere to the most recently amended requirements set forth by the Massachusetts Department of Conservation & Recreation for any project located in the Asian Longhorned Beetle Quarantine Zone.
31. Dewatering* – If dewatering is required,

a) Notice of such activities shall be given to the Office of the Commission within 24 hours of commencement;

b) There shall be no discharge of untreated dewatered stormwater or groundwater to jurisdictional areas either by direct or indirect discharge to existing drainage systems;

c) Any discharge to surface waters or drainage structures must be visibly free of sediment;

d) To the maximum extent practicable, proposed dewatering activities should be located outside of the 100' buffer. If such activities must be located within the 100' buffer, they shall be monitored at all times when the pumps are running;

e) Dewatering activities shall be confined within an area of secondary containment at all times.

32. Spill Prevention* -

a) No fuel, oil, or other pollutants shall be stored in any resource area or the buffer zone thereto, unless specified in this Order;

b) No refueling shall take place within resource areas or 100-ft to a resource area;

c) The applicant shall take all necessary precautions to prevent discharge or spillage of fuel, oil or other pollutants onto any part of the site;

d) A spill kit shall be present on site at all times.

III. Conditions to Meet at Completion of Project

33. Certificate of Compliance* - Upon completion of the project, the applicant shall request in writing a Certificate of Compliance from the Commission. If the project has been completed in accordance with plans stamped by a registered professional engineer, architect, landscape architect, or land surveyor, certification must include a written statement by such professional certifying the same.

IV. General Conditions

34. Change in Ownership* - If a change in ownership takes place while this Order is still in effect, it is the responsibility of the new owner to notify the Commission of the change and to provide the name of the person responsible for compliance with the Order.

35. Conservation Agent's Power to Act* - With respect to all conditions, except _____, the Conservation Commission designates the Conservation Agent, as its Agent with full powers to act on its behalf in administering and enforcing this Order, unless the Agent determines approval from the Commission is appropriate.

36. Right to Inspect* - A member of the Conservation Commission or its Agent may enter and inspect the property and the activity that are the subjects of this Order at all reasonable times, with or without probable cause or prior notice, and until a Certificate of Compliance is issued, for the purpose of evaluating compliance with this Order (and other applicable laws and regulations).

37. Changes to the Plan or Errors & Omissions* -

(a) If any plan, calculation, or other data presented to the Office of the Commission is in error or have omissions, and are deemed significant by the Commissioners or their Agents, all work will stop at the discretion of the Commission, until the discrepancies have been rectified to the Commission's satisfaction.

(b) The applicant must notify the Commission in writing of any changes in the plans or implementation of the proposed activity where mandated by any local, state, or federal agencies having jurisdiction over the proposed activity. If, in the opinion of the Commission, any changes in the plans or implementation of the proposed activity so require, then the Commission may modify, amend or rescind this Order in a way consistent with:

- M.G.L. Chapter 131, Section 40,
- 310 CMR 10.00, *Wetlands Protection*,
- the City of Worcester's *Wetlands Protection Ordinance*, and
- the Commission's *Wetlands Protection Regulations*

If any provisions of any conditions, or application thereof is held to be invalid, such invalidity shall not affect any other provisions of this Order. If the Commission deems that a proposed change is major or substantial, a new hearing may be required.

38. Liability* - The applicant shall indemnify and save harmless the Commonwealth, the City of Worcester, the Conservation Commission, and its Agents against all sites, claims or liabilities of every name and nature arising at any time out of or in consequence of the acts of the Commission or its Agents in the performance of the work covered by this Order and/or failure to comply with the terms and conditions or this Order whether by itself or its employees or subcontractors.

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E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

7/2/24
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

4 of 6
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

The names typed below represent the intent to sign the foregoing document in accordance with MGL Chapter 110G §9
Duly authorized by Ch.110G and recorded at Worcester Registry of Deeds in Book 62537 Page 329.

Signature	Printed Name
	Andrew Truman
	Devin Canton
	Stuart Kirshner
	Timothy Magliaro
	Lindsay Nystrom
	Diane Fratoni

☒ by hand delivery on
7/2/2024
Date

☐ by certified mail, return receipt requested, on
Date

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F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

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G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the Project at:

Project Location | MassDEP File Number

Has been recorded at the Registry of Deeds of:

County | Book | Page

for: Property Owner

and has been noted in the chain of title of the affected property in:

Book | Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

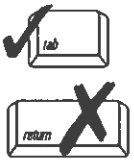
A. Request Information

1. Location of Project

a. Street Address | b. City/Town, Zip

c. Check number | d. Fee amount

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



2. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town | State | Zip Code

Phone Number | Fax Number (if applicable)

3. Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineation (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):

Name

Mailing Address

City/Town | State | Zip Code

Phone Number | Fax Number (if applicable)

4. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions – Fee: $120.00 (single family house projects) or $245 (all other projects)

☐ Superseding Determination of Applicability – Fee: $120

☐ Superseding Order of Resource Area Delineation – Fee: $120

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Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

B. Instructions (cont.)

Send this form and check or money order, payable to the *Commonwealth of Massachusetts,* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

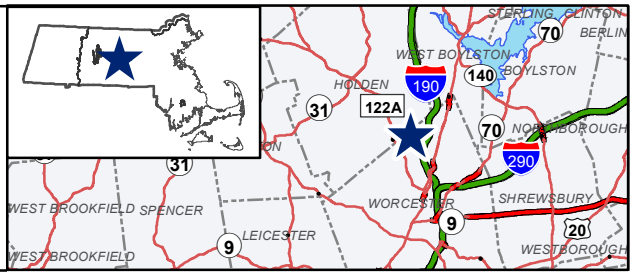
3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see https://www.mass.gov/service-details/massdep-regional-offices-by-community).

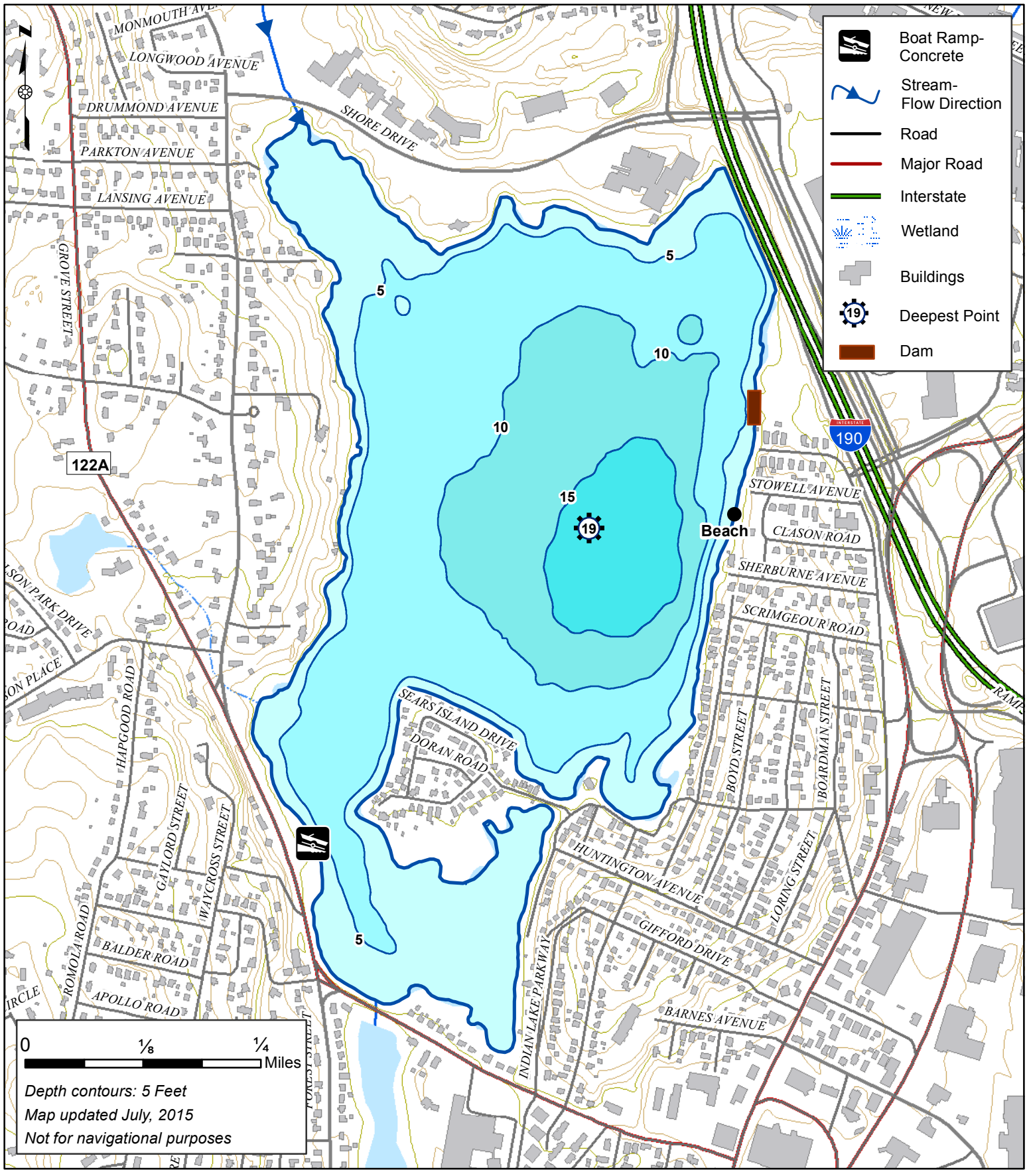
4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Appendix B: Bathymetry

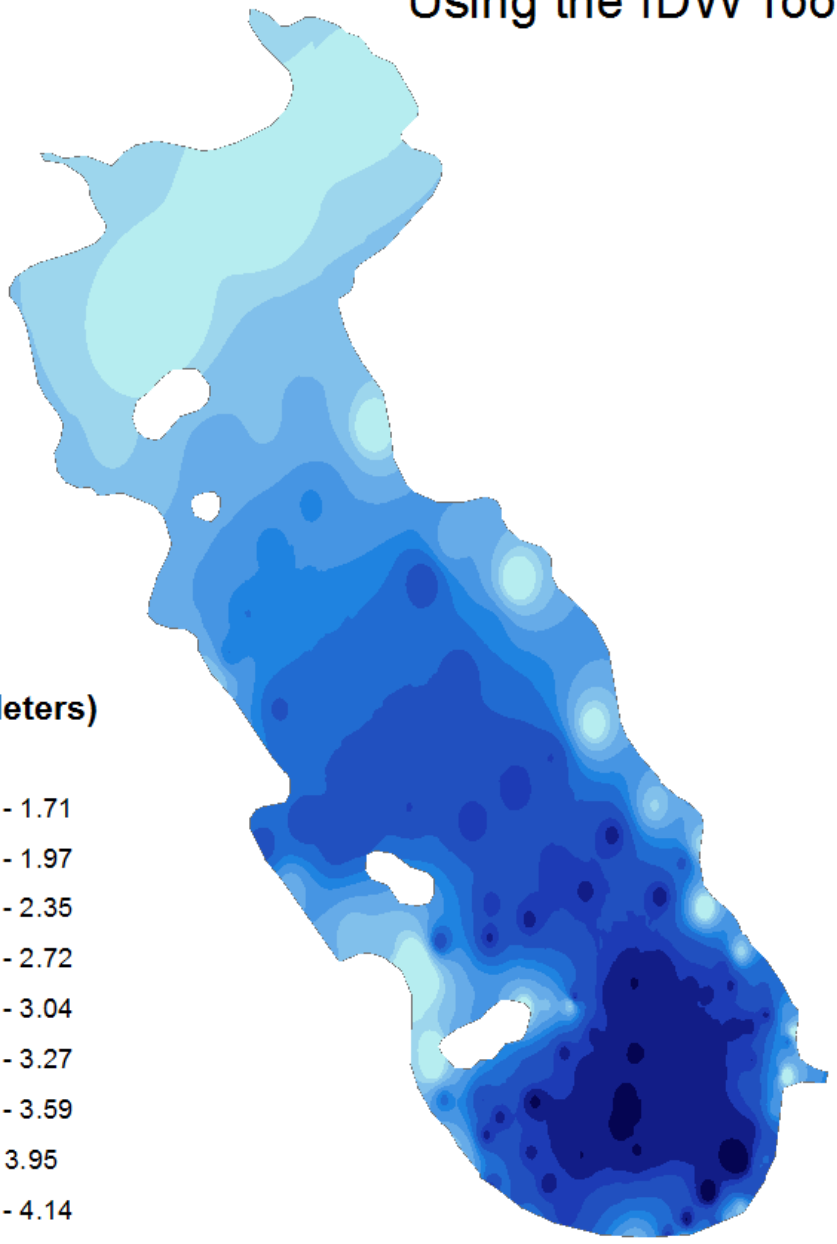
Indian Lake

204 Acres
Worcester
Blackstone River Watershed
Coordinates: 71 48'58" W 42 17'35" N
USGS Quad: Worcester North





Bathymetry of Coes Reservoir
Worcester, MA
Using the IDW Tool



Legend

Depth (Meters)

<VALUE>

- 0.33 - 1.71
- 1.72 - 1.97
- 1.98 - 2.35
- 2.36 - 2.72
- 2.73 - 3.04
- 3.05 - 3.27
- 3.28 - 3.59
- 3.6 - 3.95
- 3.96 - 4.14
- 4.15 - 4.43
- 4.44 - 4.95

N

0 0.05 0.1 0.2 Miles

Created by Joey Hersh