NOTICE OF INTENT

Pare Project No. 23162.00

Pursuant to
The Massachusetts Wetlands Protection Act
and the
Town of Bellingham's Chapter 247 Wetlands Regulations

Silver Lake Dam Improvements Maintenance Easement at 80 Cross Street & 10 Dupre Road Bellingham, Massachusetts 02019

A.P. 72; Lots 24-1 & 25A

Applicant:
Town of Bellingham
10 Mechanic Street
Bellingham, MA 02019

DECEMBER 2024

PARE CORPORATION
ENGINEERS SCIENTISTS PLANNERS

December 23, 2024

Mr. Michael O'Herron, Chair
Bellingham Conservation Commission
10 Mechanic Street
Bellingham, MA 02019

Re: **Notice of Intent**
Town of Bellingham
Silver Lake Dam Improvements
Maintenance Easement at 10 Dupre Road and 80 Cross Street
Bellingham, MA
(Pare Project No. 23162.00)

Dear Mr. O'Herron and Members of the Bellingham Conservation Commission:

On behalf of the Town of Bellingham (the Town) and pursuant to the Regulations of the Massachusetts Wetlands Protection Act 310 CMR 10.00 as well as the Town of Bellingham's Chapter 247 Wetlands Regulations (the Bylaw), Pare Corporation (Pare) is submitting the attached Notice of Intent (NOI) for your review. Work associated with the maintenance and repair of the dam and appurtenant works described in this NOI is submitted under the Limited Project provisions of 310 CMR 10.53(3)(i) as the structure existed on April 1, 1983. Enclosed for your review are the following materials:

- Three (3) copies of a Notice of Intent for the above-referenced project, including the NOI Form, Transmittal Form, municipal forms, Figures, a Narrative Project Description, Wetland Delineation Documentation, a Photo Document, Phase I Inspection / Evaluation report; and the existing Operations and Maintenance Plan.
- Three (3) copies of the full size sets of Project Plans, prepared by Pare Corporation.

As the project applicant is a municipality, no checks for the state or local portions of the NOI fee have been included with this submission. In addition, abutters within 100-feet of the two (2) parcels on which work has been proposed have been notified via certificate of mailing, receipt of which will be presented at the public hearing.

Silver Lake Dam is located at the southern extent of Silver Lake in Bellingham, Massachusetts. Silver Lake is an impoundment of Peters River, which flows through the spillway at the eastern extent of the dam. The dam is located entirely on private property at 80 Cross Street (A.P. 72, Lot 25A) and 10 Dupre Road (A.P. 72, Lot 24-1), however it is owned and operated by the Town and the Department of Public Works, respectively. A permanent maintenance easement covers most of the work area on the private parcels, however a small encroachment outside of the easement is required to complete the downstream work at 80 Cross Street.

A routine Phase 1 Inspection / Evaluation Report was completed on July 6, 2022 found the dam to be in Fair condition with the following deficiencies:

- Areas of unwanted vegetative growth within the upstream riprap, downstream slope, and downstream toe.
- Minor cracking and scouring of the concrete throughout the spillway, especially at the bottom of the downstream end of the left and right piers, and at the left training wall.
- Areas of surface irregularities, including a potential 25-foot-long depression along the downstream shoulder and holes/animal burrows behind the upstream and downstream walls.
- Several areas of uncontrolled seepage along the downstream toe of the dam.
- An area of settled/eroded riprap adjacent to the right wall of the spillway.

The results of a follow up Seepage Stability analysis, performed in early 2024, indicate that the modeled dam embankments do not provide adequate resistance to seepage with seepage breakout occurring along the downstream

slope of the dam embankment. The results are consistent and in agreement with multiple field inspections with observed breakout and stained surface water at the downstream toe. As such, the Town is proposing repairs at the Dam to provide a long-term solution to the noted deficiencies. The proposed repair program includes the following elements:

- Cutting, clearing, and grubbing all trees, vegetation, and roots systems from the Dam;
- Regrading the downstream slope to address stability and seepage concerns as well as to a more uniform and maintainable slope;
- Installation of a toe drain within the downgradient slope to lower the water table within the dam embankment and improved seepage exit conditions at the downstream toe; and
- Fill and compact erosion along the dam embankment in order to ensure bank stability.

The project will result in unavoidable permanent and temporary impacts to freshwater wetlands due to the nature of the work, however impacts have been minimized to the extent practicable given the constraints of the site. In order to offset unavoidable impacts to the A-series bordering vegetated wetland, the Town is proposing to construct an onsite wetland replication area that will replicate filled wetland areas at a 2:1 ratio.

Thank you for your consideration of this application. If you have any questions, please feel free to contact us.

Sincerely,

Gregory LaCroix
Environmental Scientist

cc: DEP Central Regional Office (via electronic copy to cero_noi@mass.gov)
Town of Bellingham

Y:\JOBS\23 Jobs\23162.00 Bellingham - Silver Lake Dam Imp-MA\PERMITTING\NOI\Cover Letter NEW.docx

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Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 1

ADMINISTRATIVE DOCUMENTATION

WPA Form 3 – Notice of Intent
Filing Fee Transmittal Form
Application for a Permit – Bellingham Wetlands Protection Bylaw and Regulations
Affidavit of Service

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

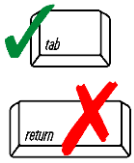
Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Bellingham
City/Town

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



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Maintenance Easement on 80 Cross Street and 10 Dupre Road (a. Street Address)
Bellingham (b. City/Town)
02019 (c. Zip Code)
Latitude and Longitude:
N42.058938 (d. Latitude)
W71.467802 (e. Longitude)
72 (f. Assessors Map/Plat Number)
24-1 & 25A (g. Parcel /Lot Number)

2. Applicant:

Jessie (a. First Name)
Riedle (b. Last Name)
Town of Bellingham (c. Organization)
215 Depot Street (d. Street Address)
Bellingham (e. City/Town)
MA (f. State)
02019 (g. Zip Code)
508-966-5813 (h. Phone Number)
(i. Fax Number)
JRiedle@bellinghamma.org (j. Email Address)

3. Property owner (required if different from applicant): ☐ Check if more than one owner

See Attachment A (a. First Name)
(b. Last Name)
(c. Organization)
(d. Street Address)
(e. City/Town)
(f. State)
(g. Zip Code)
(h. Phone Number)
(i. Fax Number)
(j. Email address)

4. Representative (if any):

Gregory (a. First Name)
LaCroix (b. Last Name)
Pare Corporation (c. Company)
10 Lincoln Road #210 (d. Street Address)
Foxborough (e. City/Town)
MA (f. State)
02035 (g. Zip Code)
508-543-1755 (h. Phone Number)
(i. Fax Number)
glacroix@parecorp.com (j. Email address)

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

N/A - Exempt (a. Total Fee Paid)
N/A - Exempt (b. State Fee Paid)
N/A - Exempt (c. City/Town Fee Paid)

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A. General Information (continued)

6. General Project Description:

The Town is proposing repairs at Silver Lake Dam to provide a long-term solution to the existing deficiencies. The proposed repair program includes cutting, clearing, and grubbing all trees, vegetation, and roots systems from the Dam; regrading the downstream slope; installation of a toe drain; and fill and compact erosion along the dam embankment in order to ensure bank stability.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(3)(i)
2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Norfolk
a. County

b. Certificate # (if registered land)

See Attachment A
c. Book

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	237 (temporary) 1 (perm.) (1. linear feet)	- (2. linear feet)
b. ☒ Bordering Vegetated Wetland	2,404 (temp.) 129 (perm.) (1. square feet)	129 sf (2. square feet)
c. ☒ Land Under Waterbodies and Waterways	345 (temp.) (1. square feet) N/A (3. cubic yards dredged)	- (2. square feet)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☒ Bordering Land Subject to Flooding	1,154 (temp.) 1,195 (perm.) (1. square feet) 584 (3. cubic feet of flood storage lost)	(2. square feet) 397 (4. cubic feet replaced)
e. ☐ Isolated Land Subject to Flooding	(1. square feet) (2. cubic feet of flood storage lost)	(3. cubic feet replaced)
f. ☒ Riverfront Area	Peters River (1. Name of Waterway (if available) - **specify coastal or inland**)	

2. Width of Riverfront Area (check one):

   ☐ 25 ft. - Designated Densely Developed Areas only

   ☐ 100 ft. - New agricultural projects only

   ☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: N/A - exempt (square feet)

4. Proposed alteration of the Riverfront Area:

   a. total square feet ____ b. square feet within 100 ft. ____ c. square feet between 100 ft. and 200 ft. ____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☒ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement
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.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

August 2021
b. Date of map

If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area _____ percentage/acreage

(b) outside Resource Area _____ percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Bourne to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Plymouth to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

c. ☒ Is this an aquaculture project? d. ☐ Yes ☒ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

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C. Other Applicable Standards and Requirements (cont'd)

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

a. ☐ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

2. ☐ A portion of the site constitutes redevelopment

3. ☐ Proprietary BMPs are included in the Stormwater Management System.

b. ☒ No. Check why the project is exempt:

1. ☐ Single-family house

2. ☐ Emergency road repair

3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Silver Lake Dam Improvements
a. Plan Title

Pare Corporation
b. Prepared By

Mark McClusky
c. Signed and Stamped by

December 2024
d. Final Revision Date

1"=20'
e. Scale

f. Additional Plan or Document Title

g. Date

5. ☒ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☐ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

N/A - Exempt
2. Municipal Check Number

N/A - Exempt
3. Check date

N/A - Exempt
4. State Check Number

N/A - Exempt
5. Check date

N/A - Exempt
6. Payor name on check: First Name

N/A - Exempt
7. Payor name on check: Last Name

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant

2. Date: 12/23/24

3. Signature of Property Owner (if different): Edward A. Fallon

4. Date: December 20, 2024.

5. Signature of Representative (if any)

6. Date: 12/23/2024

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

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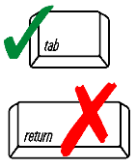

A. Applicant Information

1. Location of Project:

Maintenance Easement on 80 Cross Street and 10 Dupre Road	Bellingham
a. Street Address	b. City/Town
	N/A - Exempt
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Jessie	Riedle	
a. First Name	b. Last Name	
Town of Bellingham		
c. Organization		
215 Depot Street		
d. Mailing Address		
Bellingham	MA	02019
e. City/Town	f. State	g. Zip Code
508-966-5813		JRiedle@bellinghamma.org
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

See Attachment A		
a. First Name	b. Last Name	
c. Organization		
d. Mailing Address		
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
N/A - Exempt			

Step 5/Total Project Fee:

Step 6/Fee Payments:

Total Project Fee:	N/A - Exempt a. Total Fee from Step 5
State share of filing Fee:	N/A - Exempt b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	N/A - Exempt c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Application for Permit
Bellingham Wetlands Protection Bylaw & Regulations

1. Applicant: Name: Town of Bellingham c/o Jessie Riedle Phone: 508-966-5813
Address: 215 Depot Street Bellingham MA 02019
E-mail: JRiedle@bellinghamma.org

2. Project Location: Street:
Maintenance Easement at 80 Cross Street and 10 Dupre Road
Assessor's Map 72 Parcel\Lot 24-1 & 25A

3. This application is filed simultaneously with and consistent with the Project Filing Guidelines found on the town web site for:

- ☐ Request for Determination of Applicability
- ☐ Abbreviated Notice of Resource Area Delineation
- ☒ Notice of Intent
- ☐ Abbreviated Notice of Intent
- ☐ Amendment Request

Resource Area(s) Delineation to be confirmed: (Please complete number of linear feet)

# Linear Feet	
487 lf	Bordering Vegetated Wetlands (BVW)
1080 lf	Bordering Land Subject to Flooding (BLSF)
	Isolated Land Subject to Flooding (ILSF)
	Isolated Vegetated Wetland (IVW)
	Land Under Water Bodies (LUWB)
206 lf	Bank
439 lf	Perennial Stream: (MHAW) Stream Name: Peters River
	Intermittent Stream:

Is Estimated or Priority Habitat present on the site? Yes_____ No X
Species: _____
Number of Vernal Pools present on the site: Certified 0 Potential 0

4. Work is proposed in the following Resource Areas:

☒	Bank	Total #of square feet of impacts: 237 lf (temp.) 1 lf (perm.)
☐	Beach or Flat	Total #of square feet of impacts: -
☒	Land Subject to Flooding(bordering or isolated)	Total # of square feet of impacts 1,154 sf (temp.) 1,195 sf (perm.)
☒	Bordering Vegetated Wetlands	Total # of square feet of impacts 2,404 sf (temp.) 129 sf (perm.)
☒	Buffer Zone	Total # of square feet of impacts 9,179 sf
☐	Isolated Wetland	Total # of square feet of impacts -
☐	Lakes or Ponds	Total # of square feet of impacts -
☒	Land under Water Bodies	Total # of square feet of impacts 345 sf (temp.)
☒	Riverfront Area	Total # of square feet of impacts Exempt
☐	Vernal Pool	Total # of square feet of impacts -
		Total # of above 13,317 sf (temp.) 1,325 sf (perm.)

5. Work is proposed in the following No Alteration Zones:

☐	Areas of Critical Environmental Concern	Total# of square feet of impacts	
☒	Buffer Zone 0 -25 feet	Total# of square feet of impacts	6,689 sf
☐	Estimated Habitat	Total# of square feet of impacts	
☐	Priority Habitat	Total# of square feet of impacts	
☐	0 – 50 feet No Disturb Zone to Vernal Pool	Total# of square feet of impacts	
		Total of above	

6. Work in buffer zone only: N/A - Work is proposed in resource areas (outlined above)

☐	0-25 feet	Total# of square feet of impacts	
☐	25-50 feet	Total# of square feet of impacts	
☐	50-100 feet	Total# of square feet of impacts	
		Total of above	

7. Project Description:

a. Existing Conditions where work is proposed

☐	Impervious	☒	Lawn or landscaped area
☒	Regulated Resource Area	☒	Wooded or natural area
☒	Other		

b. Description of proposed work: _____

The Town is proposing repairs at Silver Lake Dam to provide a long-term solution to the existing deficiencies. The proposed repair program includes cutting, clearing, and grubbing all trees, vegetation, and roots systems from the Dam; regrading the downstream slope; installation of a toe drain; and fill and compact erosion along the dam embankment in order to ensure bank stability.

c. Type of equipment required for project: Excavator

d. Type of erosion control proposed: Construction entrance and compost filter sock. Turbidity barrier.

8. Plans must adhere to the criteria in Section 29 "Plan Requirements" of the Regulations.

9. Project Impacts (Use separate page if necessary referring to corresponding item)

Buffer Zone Setback:

If the project involves work in the buffer zone only, what is the shortest distance between project disturbance and the regulated resource area? _____ feet

Tree Cutting:

List the number of trees and approximate diameter of tree(s) in jurisdictional areas proposed for removal: (Use separate sheet if necessary.) 17

Fill & grading:

Amount of fill proposed for removal from site	14.07	cu yds.
Amount of fill proposed for use on site	22.03	cu yds.

Explain the difference between the proposed final grade and the existing conditions. _____
Changes in grade are only proposed for the boulder retaining wall and upgradient of it to allow for the proposed toe drain installation.

Explain proposed site stabilization methodology during and post construction. _____
Construction of the toe drain is not anticipated to last a long period of time as it only involves the installation of a 6-inch diameter pvc pipe will fill material surrounding it. During this time, perimeter erosion controls will be installed to ensure no sedimentation of resource areas outside of the site. After work, wetland areas will be seeded with a wetland seed mix and upland areas will be seeded with grass. No woody vegetation is proposed (outside of the replication area) as the

10. If an exemption or waiver from the WPA or the Bellingham Wetland Bylaw will be required to complete the proposed project, the applicant shall, at the time of filing, provide information consistent with six requirements listed in Section 10 of the Bellingham Wetland Regulations.

11. The following completed items are included in each set of the filing:

☒ Abutters list, ☒ Abutter Notification Form, ☒ Affidavit of Service N/A Bylaw Fee Calculation N/A Worksheet & remittance ☒ Plans (see #8 above), ☒ Narrative for projects **Please include**: THUMB DRIVE with pdf copy of entire filing

12. **Statement of applicant:** I hereby certify under penalties of perjury that this application and all supporting plans and documents are true and complete to the best of my knowledge and that these have been prepared in conformance with the requirement of the Bellingham Wetlands Protection Bylaw and its attendant Regulations I further certify that all abutters and other parties have been notified of this application as required by the Bellingham Wetlands Protection Regulations. I understand that I may be asked to pay for a consultant to review my application for the Commission.

Initialed sign off by Treasurer's Office:

CERTIFICATION OF MUNICIPAL TAXES AND CHARGES PAID
TOWN OF BELLINGHAM

N/A - Work is proposed on Town owned easement.

Property Information	
Parcel ID	
Map	
Lot	
Street Number	
Street Name	
First Name	
Last Name	

As the Collector

Taxes / Charges	Paid
Tax Title	☐
Motor Excise Tax	☐
Real Estate Tax	☐
Personal Property Tax	☐
Water	☐
Sewer	☐
Trash	☐

As the Collector/Treasurer for the Town of Bellingham, MA I certify that the municipal taxes are paid in full for the above property.

(Print name) _____ (Signature) _____

(Date) _____

3/2011, 8/2017, 2/2021

Conservation Commission Category Activities and Fees

Category 1 (Fee for each activity is **$50**):

a.) work on single family lot; addition, pool, etc.;
b.) site work without a house;
c.) control vegetation;
d.) resource improvement;
e.) work on septic system separate from house;
f.) monitoring well activities minus roadway;
g.) new agricultural or aquaculture projects.

Category 2 (Fee for each activity is **$125**)

a.) construction of single family house;
b.) parking lot;
c.) beach nourishment;
d.) electric generating facility activities;
e.) inland limited projects minus road crossings and agriculture;
f.) each crossing for driveway to single family house;
g.) each project source (storm drain) discharge;
h.) control vegetation in development;
i.) water level variations;
j.) any other activity not in Category 1, 3, or 4;
k.) water supply exploration.

Category 3 (Fee for each activity is **$250**)

a.) site preparation (for development) beyond Notice of Intent scope;
b.) each building (for development) including site;
c.) road construction not crossing or driveway;
d.) hazardous cleanup;
e.) water supply development.

Category 4 (Fee for each activity is **$500**):

a.) each crossing for development or commercial road;
b.) dam, sluiceway, tidegate (safety) work;
c.) landfills operation/closures;
d.) sand and gravel operations;
e.) railroad line construction;
f.) bridge;
g.) hazardous waste alterations to resource areas;
h.) dredging;
i.) package treatment plant and discharge;
j.) airport tree clearing;
k.) oil and/or hazardous material release response actions.

Category 5 (Fee is $2.00/linear foot):

a.) Construction, repair, replacement of docks, piers, revetments, dikes, or other engineering structures on inland resource areas.

Revised 7/1/2013

Town of Bellingham Wetlands Protection Bylaw
Fee Calculations Worksheet
(Bylaw Fees are in addition to WPA Fees)
Fees must be submitted with application
(Check to be made payable to "Town of Bellingham")

N/A - Work is proposed on Town owned easement.

1. **A flat fee of $50.00 each for the following requests: (*check off appropriate item*)**
   ____ Request for Determination of Applicability (RDA)…… $_____
   (For RDA also see item 4 or 5 below as appropriate)
   _____Request for an Extension to Orders of Conditions (Ext)---------- $ _____

2. **The following schedule applies for Notice of Intent (NOI) categories at 310CMR 10.03(7) (c), as follows:**
   *(Also complete Item #4 below for all filings including RDA, NOI and ANRAD and Item #5 for Riverfront Area if applicable.)

		No.	Total
Category 1	**$ 50.00 per activity**	**x _____**	**= $ _____**
Category 2	**$125.00 per activity**	**x _____**	**= $ _____**
Category 3	**$250.00 per activity**	**x _____**	**= $ _____**
Category 4	**$500.00 per activity**	**x_____**	**= $ _____**
Category 5	**$ 2.00 per linear ft.**	**x _____**	**= $ _____**

3. **A flat fee of $50.00 for Request for an Amendment to each existing Order of Conditions permit:**
   $ 50.00 per activity x ___ = $_____

4. **Application for review of Resource Area Delineation: .20 per linear foot (not less than $25.00 or more than $200.00 for single family house projects; not less than $50.00 or more than $2,000.00 for any other activity).**

   - *This fee will be in addition to the fee for a Request for Determination of Applicability (RDA) or Notice of Intent (NOI) listed in items #1 for RDA and #2 NOI or Abbreviated Notice of Resource Area Delineation (ANRAD).*

   Type of activity: _____
   Total linear feet _____x .20/linear foot = $_____
   ($25/ min. or $2000/ max.)

5. **Fees for projects within the Riverfront Area and another resource area shall be 150% of the above fees:**
   (Check off appropriate item below)
   _____
   _____Request for Determination of Applicability (RDA) **$ 50.00 x 150% = $ _____**
   _____ Notice of Intent (NOI) (total from item 2 above) **$ _____x 150% = $ _____**

Total Bylaw Fee Submitted $ _____

DEP & BWP File No. _____

Name & Address of Applicant: _____

Project name (if applicable)**:** _____

Project location: Assessors Map: _____Lot or Parcel:_____ Street Address: _____

Affidavit of Service
Under the Massachusetts Wetlands Protection Act &
Bellingham Wetlands Protection Bylaw

I, Gregory LaCroix, hereby certify
Name of person making Affidavit
under pains and penalties of perjury that on 12/23/2024
Date
I gave notification to abutters in compliance with the second paragraph of

Massachusetts General Law Chapter 131, Section 40, and the DEP Guide to

Abutter Notification dated April 8, 1994, in the connection with the following

matter:

A Notice of Intent/Abbreviated Notice of Resource Area Delineation/Request for Amendment was filed under the Massachusetts Wetlands Protection Act and the Bellingham Wetlands Protection Bylaw, by

The Town of Bellingham with the
Name of applicant
Bellingham Conservation Commission on
Name of Municipality
12/23/2024 for property located at
Date
Maintenance Easement on 80 Cross Street and 10 Dupre Road
Address of land where work is proposed

The form of notification and a certified list of the abutters to whom it was given
and their addresses are attached to the Affidavit of Service.

Signature

12/23/2024
Date

NOTIFICATION TO ABUTTERS UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT CHAPTER 131, SECTION 40 AND THE TOWN OF BELLINGHAM WETLANDS PROTECTION BY LAW

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the Bellingham Wetlands Protection Bylaw, you are hereby notified of the following:

Town of Bellingham has filed a Notice of Intent/Abbreviated Notice of
(Applicant)
Intent/ Abbreviated Notice of Resource Area Delineation/Request for Amendment;
with the Bellingham Conservation Commission for review of the following activity:

Description of Project:
The Town is proposing repairs at Silver Lake Dam to provide a long-term solution to the existing deficiencies. The proposed repair program includes cutting, clearing, and grubbing all trees, vegetation, and roots systems from the Dam; regrading the downstream slope; installation of a toe drain; and fill and compact erosion along the dam embankment in order to ensure bank stability.
The location of the proposed activity is
Assessors Map 72 Lot 24-1 & 25A
Street address: Maintenance Easement on 80 Cross Street and 10 Dupre Road

Copies of the filing may be examined at the Bellingham Conservation Commission office during their normal business hours(please call 508-657-2858) OR at the following
Applicant or representative name Town of Bellingham c/o Jessie Riedle
Address: 215 Depot Street Bellingham MA 02019
Phone number: 508-966-5813

Questions regarding the filing may be directed to the Conservation Commission at 508-657-2858 OR the Applicant's representative (Please see above)

The public hearing will be held at the Bellingham Municipal Center, 10 Mechanic Street, Bellingham. Information on the date and time of the hearing may be directed to the Conservation Commission or the applicant's representative at the above numbers.

NOTE: Notice of the public hearing, including date, time and place:

1. Will be published at least five (5) days in advance in the Woonsocket Call
2. Will be posted at the Town Clerk's Office and on the town web site no less than forty-eight (48) hours in advance of the public hearing.

NOTE: You may also contact the nearest Department of Environmental Protection Regional Office for more information about this application or the Wetlands Protection Act. To contact DEP, call Central Regional (508)-792-7650

Checklist for filing under Bellingham Wetlands Protection Bylaw

Notice of Intent and Abbreviated Notice of Intent:

Completion of and submittal of three complete copies of the following:

- Notice of Intent Form or Abbreviated Notice of Intent Form
  Please use WPA and Bellingham Wetlands Protection Bylaw Form
  found on the Conservation Commission page of the town website
  (bellinghamma.org) unless filing under Wetlands Protection Act only
  Send appropriate copies to DEP
- Associated Stormwater Management forms if required
- Application for Permit under local bylaw
- Narrative on proposed work and mitigation as directed in Submittal Standards for small or large projects
- Abutter Notification Form
- Abutter list (certified from Board of Assessor's Office)
- Affidavit of Service-signed
- DEP Wetland transmittal form and associated town fee
- Bylaw fee form and associated fees (application fee & resource area verification fee)
- Plans as per Plan Specifications as outlined in "Section 29 Plan Requirements" of the Regulations
- Thumb Drive with pdf version of the entire filing

Request for Determination of Applicability:

Completion of and submittal of three complete copies of the following:

- RDA Form
  Please use WPA and Bellingham Wetlands Protection Bylaw Form
  found on the Conservation Commission page of the town website
  (bellinghamma.org) unless filing under Wetlands Protection Act only (Send appropriate signed copy to DEP)
- Application for Permit under local bylaw
- Narrative on proposed work and mitigation as directed in Submittal Standards for small or large projects
- Bylaw fee form and associated fees (application fee & resource area verification fee)
- Associated Plans
- Thumb Drive with pdf version of the entire filing

Request for Extension to an existing Order of Conditions:

Completion of and submittal of three copies of the following:

- Letter submittal requesting Extension including reasons for request
- Bylaw fee form and associated fee

Request for Amendment to an existing Order of Conditions:

Completion of and submittal of three complete copies of the following:

- Letter submittal requesting Amendment including reasons for request
- Application for Permit under local bylaw
- Narrative on proposed work and mitigation as directed in Submittal Standards for small or large projects
- Bylaw fee form and associated fee
- Associated Plans
- Thumb Drive with pdf version of the entire filing

Request for Certificate of Compliance:

Completion of and submittal of three copies of the following:

- Request for Certificate of Compliance Form 8A (Please use WPA and Bellingham Wetlands Protection Bylaw Form found on the Conservation Commission page of the town website (bellinghamma.org) unless filing under Wetlands Protection Act only
- As built Plans signed and stamped
- Thumb Drive with pdf version of the entire filing

Attachment A: List of Subject Property Owner Information

Silver Lake Dam Improvements – Bellingham, MA

Subject Property	Proposed Work
Town owned Maintenance Easement Location: Silver Lake Dam Book/Page: 581585/11052 & Noted in Certificate No. 116110 & 116852 Owner Mailing Address: Town of Bellingham (Applicant) 10 Mechanic Street Bellingham, MA 02019	***Dam repairs and improvements***
A.P. 72, Parcel 25A Location: 80 Cross Street Certificate #: 181551 Owner Mailing Address: 80 Cross Street Bellingham, MA 02019	***Dam Repairs and Improvements*** ***Toe Drain Installation and Vegetation Removal are the only work proposed outside of the existing maintenance easement.***
A.P. 72, Parcel 24-1 Location: 10 Dupre Road Certificate #: 187408 Owner Mailing Address: 10 Dupre Road Bellingham, MA 02019	***Access and Vegetation Removal*** ***All work occurs within existing maintenance easement, therefore no property owner signature is included.***

Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 2

ABUTTER NOTIFICATION INFORMATION

Notification to Abutters
Certified List of Abutters

NOTIFICATION TO ABUTTERS UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT CHAPTER 131, SECTION 40 AND THE TOWN OF BELLINGHAM WETLANDS PROTECTION BY LAW

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(Applicant)
Intent/ Abbreviated Notice of Resource Area Delineation/Request for Amendment;
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NOTE: Notice of the public hearing, including date, time and place:

1. Will be published at least five (5) days in advance in the Woonsocket Call
2. Will be posted at the Town Clerk's Office and on the town web site no less than forty-eight (48) hours in advance of the public hearing.

NOTE: You may also contact the nearest Department of Environmental Protection Regional Office for more information about this application or the Wetlands Protection Act. To contact DEP, call Central Regional (508)-792-7650

TOWN OF BELLINGHAM

Assessment Administration Office
Municipal Center - 10 Mechanic Street
Bellingham, Massachusetts 02019
508-657-2862 * FAX 508-657-2894
Email: Assessors@bellinghamma.org
www.bellinghamma.org

December 17, 2024

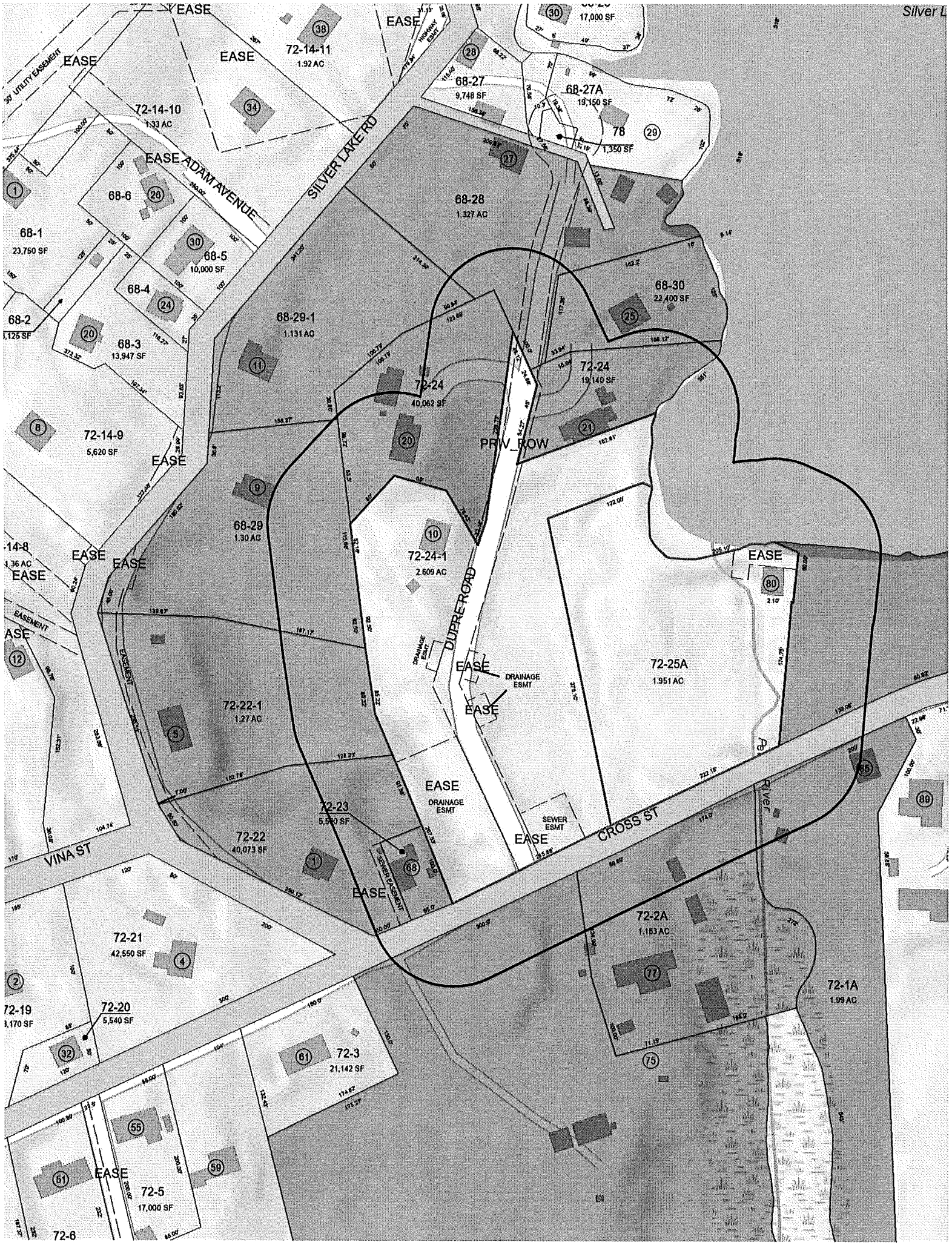
THE PROPERTY OWNERS LISTED HEREIN ARE THE KNOWN ABUTTERS TO THE PROPERTY OWNERS:

100 feet Abutters – Conservation Commission – Map 72 Parcel 24-1, 25A

Property Address(es):	10 Dupre Rd & 80 Cross St Bellingham, MA 02019
Owner(s) of Record:	Martin, Douglas & Sarah 10 Dupre Rd Bellingham, MA 02019
	Falkenstrom, Edward & Mary 80 Cross St Bellingham, MA 02019
Requested by	Gregory LaCroix Pare Corporation 8 Blackstone Valley Place Lincoln, RI 02865

ABUTTERS ATTACHED

Certified: Michelle Nowlan
Michelle Nowlan, Principal Clerk


Silver L
EASE
72-14-11
1.92 AC
72-14-10
1.33 AC
EASE ADAM AVENUE
SILVER LAKE RD
68-6
68-1
23,750 SF
68-5
10,000 SF
68-4
68-2
68-3
13,947 SF
68-27
9,748 SF
68-27A
19,150 SF
78
1,350 SF
68-28
1.327 AC
68-30
22,400 SF
68-29-1
1.131 AC
72-24
40,062 SF
72-24
19,140 SF
PRIV_ROW
72-14-9
5,620 SF
68-29
1.30 AC
72-24-1
2.609 AC
DUPRE ROAD
DRAINAGE ESMT
72-25A
1.951 AC
72-22-1
1.27 AC
72-23
5,580 SF
72-22
40,073 SF
SEWER ESMT
SEWER EASEMENT
CROSS ST
VINA ST
72-2A
1.183 AC
72-1A
1.99 AC
72-21
42,550 SF
72-20
5,540 SF
72-19
72-3
21,142 SF
72-5
17,000 SF
72-6

100 feet Abutters List Report

Bellingham, MA
December 17, 2024

Subject Properties:

Parcel Number:	0072-0024-0001	Mailing Address:	MARTIN, DOUGLAS & SARAH
CAMA Number:	0072-0024-0001		10 DUPRE RD
Property Address:	10 DUPRE RD		BELLINGHAM, MA 02019

Parcel Number:	0072-025A-0000	Mailing Address:	FALKENSTROM, EDWARD
CAMA Number:	0072-025A-0000		FALKENSTROM, MARY KATHLEEN
Property Address:	80 CROSS ST		80 CROSS ST
			BELLINGHAM, MA 02019

Abutters:

Parcel Number:	0068-0028-0000	Mailing Address:	DAPRATO ALFRED
CAMA Number:	0068-0028-0000		94 LAUREL LN
Property Address:	27 DUPRE RD		BELLINGHAM, MA 02019

Parcel Number:	0068-0029-0000	Mailing Address:	STANIKMAS, NORMAN B & LAURA P
CAMA Number:	0068-0029-0000		9 SILVER LAKE RD
Property Address:	9 SILVER LAKE RD		BELLINGHAM, MA 02019

Parcel Number:	0068-0029-0001	Mailing Address:	AWISZUS, MOLLY & MCLEAN, MICHAEL
CAMA Number:	0068-0029-0001		11 SILVER LAKE RD
Property Address:	11 SILVER LAKE RD		BELLINGHAM, MA 02019

Parcel Number:	0068-0030-0000	Mailing Address:	FERRIS, JILL M
CAMA Number:	0068-0030-0000		25 DUPRE RD
Property Address:	25 DUPRE RD		BELLINGHAM, MA 02019

Parcel Number:	0068-0031-0000	Mailing Address:	BROTHER, MATTHEW J WILLIS,
CAMA Number:	0068-0031-0000		AMANDA N
Property Address:	21 DUPRE RD		21 DUPRE RD
			BELLINGHAM, MA 02019

Parcel Number:	0072-001A-0000	Mailing Address:	DAVIS, ROSS M
CAMA Number:	0072-001A-0000		85 CROSS ST
Property Address:	85 CROSS ST		BELLINGHAM, MA 02019

Parcel Number:	0072-0022-0000	Mailing Address:	YELLE, ERIC & LISA
CAMA Number:	0072-0022-0000		1 SILVER LAKE RD
Property Address:	1 SILVER LAKE RD		BELLINGHAM, MA 02019

Parcel Number:	0072-0022-0001	Mailing Address:	PIETTE, ROSS L & JENNIFER M
CAMA Number:	0072-0022-0001		5 SILVER LAKE RD
Property Address:	5 SILVER LAKE RD		BELLINGHAM, MA 02019

Parcel Number:	0072-0023-0000	Mailing Address:	ZIMMERMAN, KEVIN & MARIA
CAMA Number:	0072-0023-0000		68 CROSS ST
Property Address:	68 CROSS ST		BELLINGHAM, MA 02019

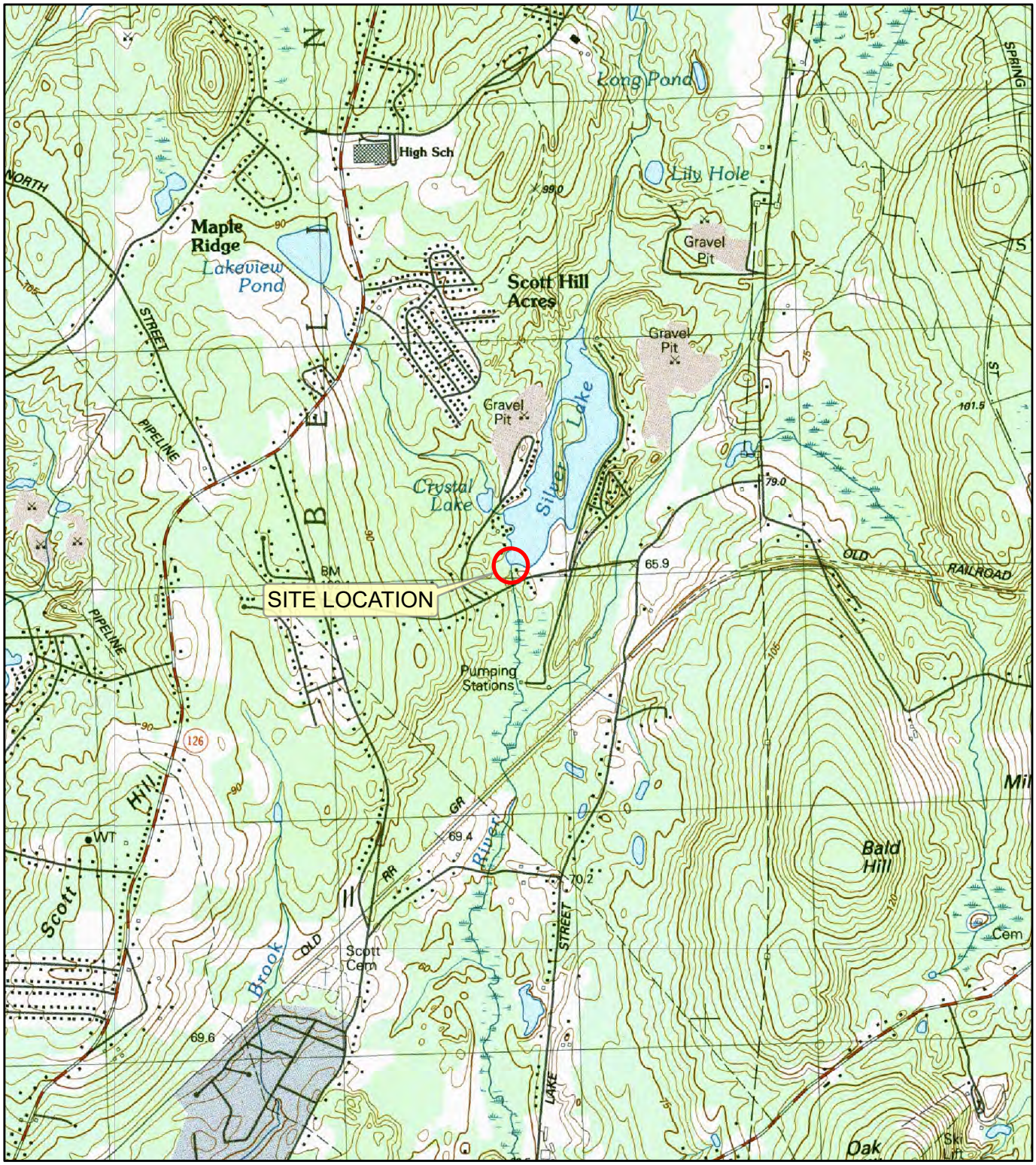
100 feet Abutters List Report

Bellingham, MA
December 17, 2024

Parcel Number:	0072-0024-0000	Mailing Address:	FRAINE, DENIS C
CAMA Number:	0072-0024-0000		20 DUPRE RD
Property Address:	20 DUPRE RD		BELLINGHAM, MA 02019
Parcel Number:	0072-0025-0000	Mailing Address:	TOWN OF BELLINGHAM
CAMA Number:	0072-0025-0000		CONSERVATION
Property Address:	100 CROSS ST		10 MECHANIC STREET
			BELLINGHAM, MA 02019
Parcel Number:	0072-002A-0000	Mailing Address:	COOK, KENNETH L & DEBRA
CAMA Number:	0072-002A-0000		77 CROSS ST
Property Address:	77 CROSS ST		BELLINGHAM, MA 02019

SECTION 3

FIGURES



MASS GIS

SITE LOCATION MAP

SCALE:1"=2,000'

N
W E
S

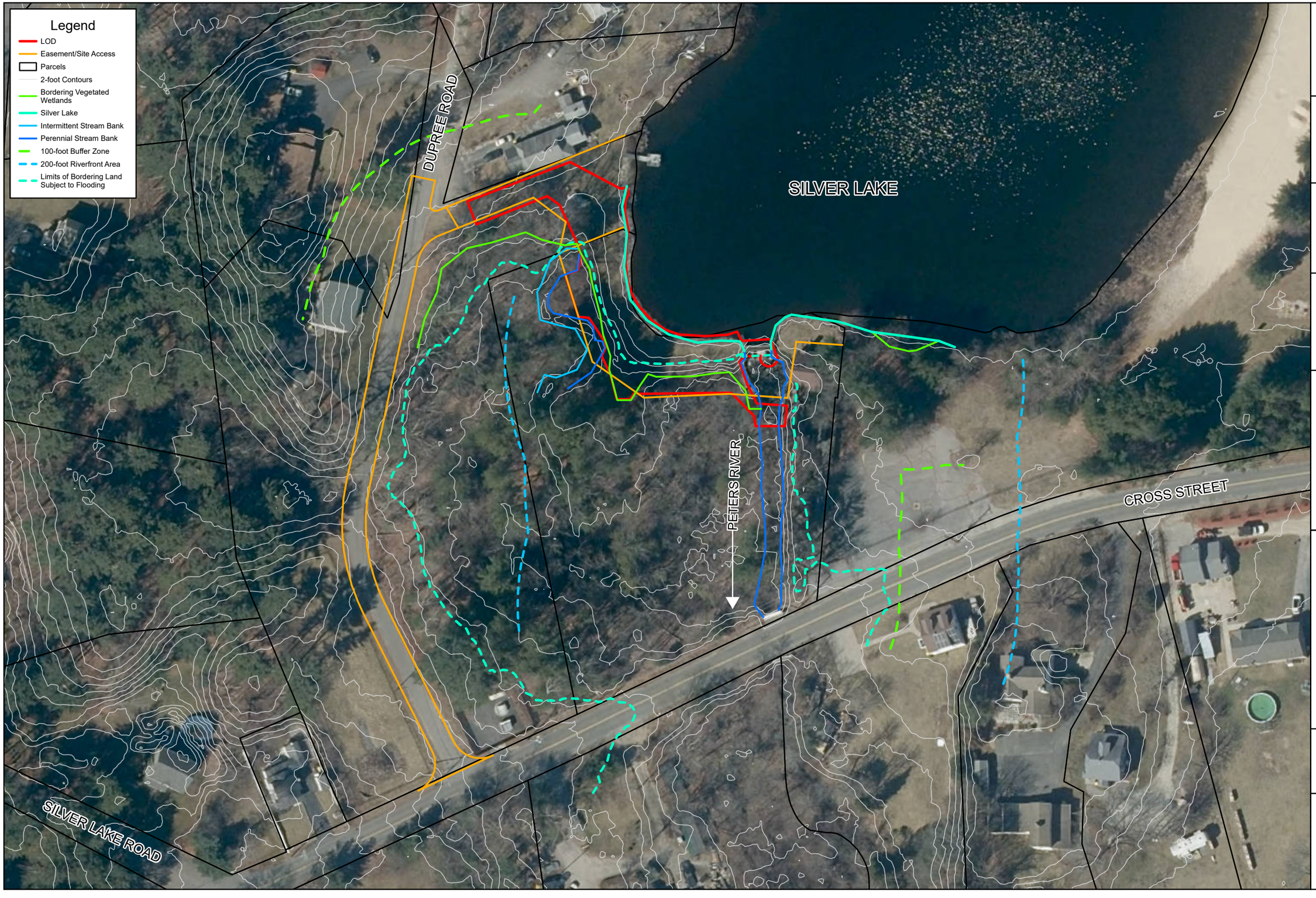
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
(401) 334-4100

10 LINCOLN ROAD, SUITE 210
FOXBORO, MA 02035
(508) 543-1755

PARE PROJECT No. 23162.00 DECEMBER 2024

FIGURE 1

SILVER LAKE DAM
BELLINGHAM, MA



PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

MASS GIS

1 INCH = 75 FEET

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING

N
W E
S

SILVER LAKE DAM
BELLINGHAM, MA

PROJECT NO.: 23162.00
DATE: DECEMBER 2024
SCALE: AS NOTED

FIGURE 2:
ANNOTATED
AERIAL
PHOTOGRAPH

National Flood Hazard Layer FIRMette

FEMA

71°28'22"W 42°3'45"N

71°27'45"W 42°3'19"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

FIGURE 3

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/24/2024 at 10:34 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 4

PROJECT NARRATIVE

I. Introduction

This Notice of Intent (NOI) is submitted on behalf of the Town of Bellingham (the Town) for the proposed Silver Lake Dam Improvements project in Bellingham, Massachusetts. The proposed dam improvements are eligible as a Limited Project under the provisions of 310 CMR 10.53(3)(i). The proposed improvements are necessary to address existing deficiencies at the dam and will be beneficial to the overall performance and long-term stability of the earthen embankment dam.

Silver Lake Dam impounds water along the Peters River to create Silver Lake, an impoundment located north of Cross Street within the Silver Lake Conservation Area in Bellingham. The Dam is classified as **Intermediate** sized, **Significant hazard potential** (Class II) structures under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00. The Town is proposing improvements to Silver Lake Dam to provide a long-term solution to uncontrolled seepage along the downstream toe of the dam as well as other deficiencies such as vegetation growth, cracking of the concrete spillway, and areas of surface irregularities. Several alternatives were considered for the project approach as well as various elements of the proposed project, and the selected approach represents that which meets project goals of ensuring long-term stability and performance of the dam while reducing resource area impacts to the extent practicable.

The proposed repair program includes the following elements:

- Cutting, clearing, and grubbing all trees, vegetation, and roots systems from the Dam;
- Regrading the downstream slope to address stability and seepage concerns as well as to a more uniform and maintainable slope;
- Installation of a toe drain within the downgradient slope to lower the water table within the dam embankment and improved seepage exit conditions at the downstream toe; and
- Fill and compact erosion along the dam embankment in order to ensure bank stability.

All work associated with the project is intended to improve the dam structure and provide long term stability for the embankment. No additional work is proposed that falls outside of the coverage of Limited Projects under the provisions of 310 CMR 10.53(3)(i). Wetland resource areas in the project vicinity include Bank and Land Under Water (LUW) associated with Silver Lake, Peters River, and an intermittent stream; a Bordering Vegetated Wetland (BVW); 200-foot Riverfront Area associated with Peters River; and Bordering Land Subject to Flooding (BLSF). While the project is located within Riverfront Area, it is not subject to the performance standards of Riverfront Area according to 310 CMR 10.58(6)(a). Impacts have been avoided to the extent practicable given the nature of the work and constraints of the site and have been limited to minor work within BVW, BLSF, Riverfront Area, and the Buffer Zone of Silver Lake and the BVW.

The following narrative discusses the project background and existing site conditions; demonstrates the need for the work; describes the proposed project and alternatives evaluated; discusses activity within jurisdictional areas; and demonstrates project compliance with the applicable regulatory provisions of 310 CMR 10.00. The existing site conditions and the proposed improvements are shown on plans entitled "*Silver Lake Dam Improvements*" prepared by Pare Corporation, dated December 2024.

II. Existing Site Conditions

The project site consists of ±15,245 square feet (sf) primarily located within an existing maintenance easement at 80 Cross Street (A.P. 72, Lot 25A) and 10 Dupre Road (A.P. 72, Lot 24-1) (referred to herein as the Site). The site also includes minor downstream work outside the maintenance easement which encroaches onto the private property at 80 Cross Street. The subject parcels consist of natural areas as well as previously developed land including the dam structure, a single-family house, and a portion of Dupre Road. The entire spillway and a large portion of the dam structure is located at 80 Cross Street with a small portion of the rip rap embankment and the accessway for the dam being located at 10 Dupre Road. The site is bounded by Silver Lake to the northeast, Peters River to the east, forest and Cross Street to the south, and forest and Dupre Road to the west.

a. Silver Lake Dam

Silver Lake Dam (the Dam) is located within the Silver Lake Conservation Area in Norfolk County in the Town of Bellingham, Massachusetts. The Dam impounds water along Peters River to create Silver Lake upstream and to the north of Cross Street. The dam is currently owned by the Town and is maintained and operated by the Town of Bellingham Department of Public Works.

The Dam (National ID MA03097/State ID 6-11-25-4) is an intermediate sized Class II (Significant) hazard structure that consists of an earthen embankment with a concrete spillway located near the left abutment. The alignment of the embankment generally consists of approximately 100 linear feet of dam orientated in an east-west direction before bending approximately 90 degrees to the north for approximately 150 feet to the right abutment.

The upstream side of the embankment consists of a gradual slope averaging approximately 2.5H:1V near the spillway and flattening to approximately 6H:1V before the bend in the embankment and extending to the right abutment. The upstream slopes are protected by armor stone overlaying a bedding stone and geotextile fabric. The crest of the dam consists of an approximately 10-foot-wide grass surface at design elevation 216.5 feet. The downstream side of the dam is variable with a 36-foot-long dry set stone masonry wall, which is founded on a concrete pad footing to the right of the spillway. An approximate 2H:1V grassed slope is located between the wall and the bend in the embankment. Beyond the bend, the slope is variable averaging roughly 2.5H:1V. Immediately upstream of the stone masonry wall concrete footing, a wall drain consisting of a 1-foot square section of drainage stone with a 4-inch-diameter pipe runs along the length of the wall and discharges through the wall approximately 2 feet right of the spillway.

The outlet structure, located near the left abutment, consists of a concrete spillway that is divided into three sections. The center section of the spillway is a 10-foot-wide uncontrolled overflow section with a crest elevation of 214.5 feet. Flows over this section cascade down a series of three, 2-foot by 2-foot steps before entering a riprapped downstream channel. On either side of the uncontrolled section, 5-foot-wide sluiceways equipped with timber stops provide control to regulate the level of the impoundment and allow for the implementation of drawdowns. Maintenance stop log slots are also present at the upstream ends of each sluiceway. A timber catwalk supported on steel beams spans the spillway and provides access to the stop log bays.

There were no design or construction records of the original construction of the dam available for review during the preparation of this NOI. However, it is believed that Silver Lake Dam was in place circa 1900 and that the previous spillway was reconstructed between 1960 and 1970 by a private owner prior to the

Town of Bellingham obtaining ownership. Silver Lake Dam was partially breached in May 1998 as the result of a piping failure below the spillway. Repairs included the removal of the undermined structure, the abandonment and removal of the auxiliary spillway, and the construction of a new reinforced concrete spillway system that includes a fixed overflow section and two deep sluices. A steel sheet pile cutoff wall was installed along the centerline of the embankment for 10.5-feet on either side of the spillway. Repairs to the spillway and discharge channel were completed in December 1998, and the impoundment returned to normal pool in April 1999. In July 2000, work was performed on the earthen portion of the dam. Stump and root systems were removed from the embankment, the slopes were graded to a stable geometry, the dam crest was raised to a uniform elevation, and stone riprap was installed along the upstream slope. The downstream stone masonry retaining wall was reconstructed and a drainage blanket was installed downstream of the previously abandoned auxiliary spillway. In addition, on the right side of the spillway the steel sheet pile cutoff wall was extended from 10.5 feet to 75 feet to the right of the spillway (about to the bend in the embankment).

Recent inspections of the Dam found it to be in **Fair** condition with several deficiencies, which included the following:

- Areas of unwanted vegetative growth within the upstream riprap, downstream slope, and downstream toe.
- Minor cracking and scouring of the concrete throughout the spillway, especially at the bottom of the downstream end of the left and right piers, and at the left training wall.
- Areas of surface irregularities, including a potential 25-foot-long depression along the downstream shoulder between STA 2+25 and 2+50 and holes/animal burrows behind the upstream and downstream walls.
- Several areas of uncontrolled seepage along the downstream toe of the dam.
- An area of settled/eroded riprap adjacent to the right wall of the spillway

The specific conditions observed during Pare's inspections at the Dam are detailed in the Phase 1 Inspection / Evaluation Report, which is attached in Section 7 of this NOI.

c. Wetlands and Floodplain

Wetland resource areas present in the vicinity of the project site include the Bank and LUW associated with Silver Lake, Peters River, and an intermittent stream; a BVW; Riverfront Area associated with Peters River; and BLSF. Under the Bylaw, all of the above resource areas, except for Riverfront Area, receive a 100-foot Buffer Zone. Impacts to resource areas are unavoidable due to the nature of the work, and have been avoided to the extent practicable, as demonstrated in Section V of this Narrative. Wetlands are described in greater detail in the Wetland Delineation Report, which is included as Section 6 of this NOI.

According to the FEMA Flood Insurance Rate Map (FIRM) for Norfolk County (Map Number 25021C0312E, effective date July 17, 2012), Peters River is designated as a regulatory floodway downgradient of the dam spillway. Areas within and surrounding Silver Lake and Peters River are defined as Flood Zone AE with a base flood elevation of 212.4 at the site. The remaining areas of the site are designated as Zone X.

d. Other Environmental Considerations

According to the most recent available MassGIS data, the site is not located within or in the vicinity of any Areas of Critical Environmental Concern (ACECs), Outstanding Resource Waters (ORW), or mapped Priority or Estimated Habitat (MassGIS data layers PRIHAB_POLY, ESTHAB_POLY). No Certified or Potential Vernal Pools have been identified on or near the site (MassGIS data layers PVPX1 and CVP_PT).

III. Proposed Work

The Town, as the applicant, is proposing improvements to Silver Lake Dam to provide a long-term solution to the noted deficiencies, which are described in the attached Phase 1 Inspection / Evaluation Report (Section 7 of this NOI).

a. Dam Improvements

Embankment work: The scope of embankment work includes:

i. Clearing and grubbing: Clear trees, brush and others unwanted woody vegetation from the dam as shown on Sheet 3.0: Site Access and Erosion Control. Grub remaining stump and root systems within the footprint of the dam. Fill resulting voids with approved material compacted in lifts to subgrade for the specific treatment (i.e. loam and seeds, riprap, etc.). This is work that should occur as typical maintenance for the dam and is necessary for the long term stability of the embankment.
ii. Downstream slope: Regrade the downstream slope to more uniform and maintainable slope, on the immediate right of the spillway.
iii. Provide a low stone/boulder retaining wall along the eastern most extent of the toe drain and right abutment in order to avoid wetland impacts to the greatest extent practicable while accommodating the new toe drain and more gradual slopes.
iv. Upstream slope protection: Remove tree growth in riprap areas along the upstream embankment of Silver Lake Dam. Rip rap from around substantial vegetation growth will be temporarily removed to allow for the removal of any root masses. After removal of root masses, riprap will be reinstalled bank to existing elevations. This is work that should occur as typical maintenance for the dam and is necessary for the long term stability of the embankment.

Spillway Improvements: The scope of spillway improvements includes:

i. Debris Removal: Remove any accumulated debris and sediment along the spillway crest and downstream channel.
ii. Wing Walls Repair: Scour damage along the face of the concrete training walls will be patch repaired as shown on Sheet 6.0: Construction Details. In addition, where erosion has loosened rip rap upgradient of the wing walls, these areas will be filled and compacted and riprap will be reinstalled at previously existing elevations. Lastly, loose masonry on the downgradient right side of the spillway will be removed and reset in order to ensure stability.
iii. Spillway Modifications: Based upon visual inspection, the spillway generally appears sound and stable; as such, the existing spillway crest and approach will be maintained.

Toe Drain Installation: A toe drain is proposed along the downgradient side of the dam embankment to address seepage concerns. The schematic approach includes the following:

i. Construct a new toe drain extending from approximately station 200 (in the vicinity of the existing blanket drain) to Peters River. Construct a new control structure immediately upstream of the existing intake.
ii. The toe drain will consist of a 6-inch diameter slotted PVC pipe immediately surrounded by an area of drainage stone that will be 18-inches wide and will vary in height. The drainage stone will be surrounded by a geotextile fabric and compacted filter diaphragm material. The surface of the toe drain area will be treated with 6-inches of common borrow and 6-inches of loam.
iii. Three (3) clean out locations are proposed, generally located at angles in the toe drain pipe.

The toe drain will drain directly into Peters River as it will only received unpolluted groundwater inputs. At the terminus of the toe drain pipe, a stainless steel guard is proposed to restrict animals and debris from clogging the pipe.

b. Control of Water and Erosion Controls

Work is intended to occur during the seasonal drawdown period of Labor Day to Memorial Day, with no changes to the extent or duration of the approved annual drawdown. Silver Lake has been permitted to allow for an annual seasonal drawdown of 1-foot to an elevation of 213.50 from its normal pool elevation of 214.50. This will assist in lowering the hydrologic head within the dam embankment which will assist during installation of the toe drain.

For the minor work within the Peters River, including the removal and replacement of the stone slabs for the installation of the end of the toe drain, a turbidity barrier is proposed downgradient and will span the width of the River. There is a possibility that this work will occur in dry conditions due to the seasonal drawdown lowering the water surface elevation below the spillway crest, however the turbidity barriers are proposed in case of high water conditions.

For the scour damage repairs along the face of the left (east) concrete training walls, temporary water diversion is proposed at the inlet of the east spillway intake section and surrounding the work. This will ensure dry conditions for the concrete repair work which is necessary for the repair concrete to set correctly. All control of water devices will removed following work.

Compost filter sock is proposed downgradient of all work on the downgradient side of the dam embankment. It will closely follow the Limit of Disturbance (LOD) at the limits of clearing, grading, and the wetland replication area. No terrestrial erosion and sediment controls are proposed on the upgradient side of the dam embankment as no work is being completed on the dam crest. Where vegetation removal and resetting of existing riprap stones is occurring along the banks of Silver Lake, terrestrial erosion controls are not feasible as they cannot be set into large riprap stones. As such, all erosion controls would have to be placed downgradient of the existing riprap area, which is consistently inundated. A turbidity barrier was considered for this area, however the vegetation removal is not anticipated to cause significant erosion and the installation of the turbidity barrier may cause excess disturbance.

A construction entrance is proposed at the maintenance easement's access point, for which a detail has been provided on Sheet 6.0 of the Plans. Temporary staging is proposed at 100 Cross Street (A.P. 72, Lot 25) however this area is currently paved and will not experience any earth disturbing activities and therefore was not included in the LOD.

c. *Wetland Impact Mitigation*

To offset unavoidable losses to vegetated wetlands, the Town is proposing to construct a compensatory replication area replacing all impacted BVW at a 2:1 ratio at a location on the project site. The selected location provides the required area while limiting disturbance to mature forest. The proposed mitigation is described in greater detail in Section V(f) of this Narrative and is shown on Sheet 5.1 of the Plans.

IV. Alternatives Analysis

During the conceptual design, several alternative designs were considered to meet the goal of reducing or eliminating seepage through the embankment and bring the dam into compliance with current dam safety regulations and requirements.

1. **Dam Repair**: Complete a repair program at the dam to consist of the following:
    a. Clearing and grubbing of trees and other unwanted vegetation
    b. Fill animal burrows near left and right spillway training walls
    c. Establishing a maintainable surface coverage for the downstream slope

2. **Dam Rehabilitation:** Complete a rehabilitation program at the dam to consist of the following:
    a. Clearing and grubbing of trees and other unwanted vegetation
    b. Addressing potential embankment seepage and stability concerns:
        i. Installing additional steel sheet pile cutoff wall
        ii. Installing a clay core wall
        iii. Installing a graded soil seepage blanket at the downstream slope toe
        iv. Installing a subsurface seepage relief or toe drain consisting of slotted or perforated pipe, drainage stone, and filter diaphragm soil

3. **No Action**: Perform no corrective action (not recommended as it fails to address the identified dam safety deficiencies).

Pare internally reviewed the alternatives listed above for consideration of project goals, which is to reduce or eliminate seepage emanating at the downstream slope toe.

- Dam removal and dam decommissioning were not considered as alternatives or options to the overall project goal of reducing seepage
- No Action was also identified as not meeting project goals.

As such, a hybrid of dam repair and rehabilitation measure were selected for advancement to final design. It was determined that the proposed toe drain, alternative iv, and the dam repairs listed above were the least environmentally impactful but will provide a constructed project that meets the overall goals.

In addition, alternative design options were evaluated and are listed above in Dam Rehabilitation. The final selection of Alternative iv, Toe Drain, with a layout and depth of the toe drain piping located to provide the desired seepage collection and relief for the modeled reservoir pool scenarios.

V. Wetland Impacts and Regulatory Compliance

Due to the nature and location of the proposed work, the project will result in unavoidable impacts to various wetland resource areas. Permanent and/or temporary alterations are proposed to Bank, Land Under Water, Bordering Vegetated Wetland, and Bordering Land Subject to Flooding. In addition, a majority of the proposed work located outside of the resource areas will occur within the 100-foot Buffer Zones associated with the wetland resources on the site. Throughout the design, efforts have been made to avoid or minimize permanent impacts to the extent practicable. Temporary and permanent impacts to the resource areas at the Dam are quantified in the table below:

Resource Area	Permanent Impact	Temporary Impact	Total
Bank (lf)	Silver Lake: 0	Silver Lake: 201	Silver Lake: 201
	Peters River: 1	Peters River: 36	Peters River: 37
	Total: 1	**Total: 237**	**Total: 238**
LUW (sf)	Silver Lake: 0	Silver Lake: 0	Silver Lake: 0
	Peters River: 0	Peters River: 345	Peters River: 345
	Total: 0	**Total: 345**	**Total: 345**
BVW (sf)	129	2,404	**2,533**
BLSF (sf)	1,195 (7.33 cy net fill)	1,154	**2,349**

Impacts to the various resource areas in the project site, and compliance with the applicable performance standards, are described in the following sections. The impacts are also shown on the Wetland Impact Plan, included as Sheet 5.0 of the Plans.

a. Bank

The project will only result in less than 1 linear feet (lf) of permanent impacts to the west Bank of the Peters River. No permanent impacts to the Bank of Silver Lake are proposed. The 1 foot of permanent impact will result from the installation of the toe drain pipe outlet on the west bank of the river. It will be built into the bank, above normal flow elevations, and will drain groundwater seepage from the dam embankment into the river. The pipe is 6-inches wide and engineered fill will be placed around it to stabilize the bank post construction.

The remaining 36 lf of impacts to the Bank of the Peters River and all 201 lf of impacts to the Bank of Silver Lake are temporary. Temporary impacts to the Bank of the Peters River are a result of the removal and resetting of the stone slabs at the toe drain outfall location. This work will result primarily in temporary impacts to LUW, however Bank impacts were also quantified as the slabs extend into the banks on either side. The slabs and material surrounding them will be replaced following construction. The 201 lf of temporary impacts to the Bank of Silver Lake are strictly from the removal of vegetation along the riprap armoring that serves as the Bank. This is work that should occur as typical maintenance for the dam and is necessary for the long term stability of the embankment. Work will involve removal of all vegetation, removal of riprap around larger shrub/sapling root masses, removal of root masses, replacement of material to fill any void left by removal of the root mass, and replacement of riprap to match existing elevations.

None of the proposed temporary or permanent Bank impacts will adversely affect the physical stability of the Bank, ground water and surface water quality, or whatever capacity the Bank may have to provide breeding habitat, escape cover and food for fisheries. As mentioned, the only Bank to be permanently impacted consists of the western bank of Peters River, which is regularly maintained for woody

vegetation and thus offers minimal potential for use by wildlife. Pursuant to the Limited Project provisions of 310 CMR 10.53(3)(i), the applicant requests that the Conservation Commission waive the requirement for a wildlife habitat evaluation for work affecting more than 50 linear feet to Bank.

b. Land under Waterbody/Waterway

The proposed work will result in approximately 345 sf of temporary impacts to Land Under Water (LUW) of Peters River, which is defined as land below the mean annual low water (MLW) mark of the River. The project does not include any permanent or temporary impacts to LUW associated with Silver Lake as no vegetation removal below the MLW (approved seasonal drawdown elevation of 213.50 feet) is required. For the purposes of Pare's impact calculations, the delineated Banks of the River were used as conservative boundaries for LUW in the river channel. Temporary impacts to LUW associated with Peters River are shown on the Wetland Impact Plan, included as Sheet 7.0 of the Plans. Temporary impacts to LUW will include the following:

- Adequate space for work access to allow for the concrete patching of the left (east) training wall immediately downgradient of the spillway.
- Removal and replacement of the two (2) granite slabs that cross the river at the location of the toe drain outfall. The stone slabs are located immediately east of the Bank R-7 flag and serve as a pedestrian footbridge across the River.

As all work within LUW is temporary and previously existing conditions will be restored, no impacts to the water carrying capacity and surface water quality are anticipated from the proposed work. In addition, there will be no impacts to the capacity of the LUW to provide breeding habitat, escape cover, and food for fisheries.

c. Bordering Vegetated Wetland

The proposed work will result in a total of approximately 129 sf of permanent impacts to the A-series BVW. The boulder retaining wall and grading necessary for the toe drain installation will extend into the BVW between wetland flags A-2 through A-6. Impacts are unavoidable as the boulder retaining wall and associated grading cannot be moved upgradient and away from the wetland as another masonry retaining wall restricts available space. In this area, the BVW consists of low growth shrubs and vines including Concord Grape (*Vitis labrusca*), Raspberry (*Rubus sp.*), and Sensitive Fern (*Onoclea sensibilis*) with only one tree, a Red Maple (*Acer rubrum*), that needs to be removed. The boulder retaining wall and grading are the only permanent impacts that are necessary to achieve the project goal. An onsite replication area, described in section V.f. of this narrative, will provide greater than 2:1 mitigation for lost BVW.

Approximately 2,404 sf of temporary impacts will result from vegetation clearing and installation of erosion and sediment controls within BVW. Approximately 1,017 sf of these impacts are located within the A-series BVW between wetland flags A-13 and A-31, downgradient of the dam embankment. The remaining 1,387 sf of temporary impacts to BVW are located between wetland flags A-1 and A-11 immediately downgradient of the proposed boulder retaining walls and the associated permanent impacts.

The project meets the applicable Performance Standards for BVW established in Section 7(3)(d) of the Bylaw Regulations, as demonstrated below:

1. Where the presumption set forth above is not overcome, any proposed work in a bordering vegetated wetland shall not destroy or otherwise impair any portion of said area.

The proposed work will result in minimal loss of wetland resource areas that are unavoidable due to the nature of the project. A majority of the impacts to BVW are temporary and will result from clearing of vegetation along the downstream toe of the dam. These areas must be maintained for woody vegetation as a standard dam safety practice; however, they will be restored by planting with a native wetland seed mix to provide stabilization and enhance the wildlife habitat value of the wetland areas. The portions of the wetlands to be impacted consist of areas immediately bordering the dam and will have a negligible impact on the expansive wetland systems downgradient, and thus will not impair the functions and values provided by these wetland systems.

2. Notwithstanding section 7(3) (d) 1. above, the Conservation Commission may issue a Permit allowing the work which results in the loss of up to 5,000 square feet of bordering vegetated wetlands after review of an alternatives analysis and when said area is replaced in accordance with the following general conditions and any additional, specific conditions the Conservation Commission deems necessary to ensure that the replacement area will function in a manner similar to the area that will be lost:

a. the surface of the replacement area to be created ("the replacement area") shall require up to 2:1 replication of the area that will be lost ("the lost area"), except where conditions warrant as determined by the Conservation Commission;

The proposed replacement area will provide approximately 319 sf of replacement wetland to mitigate for approximately 129 sf of permanent impacts to BVW. Under the Bylaw, 2:1 replacement is required for BVW, totaling 258 square feet of required mitigation which is exceeded by the proposed replication plan.

b. the distance between ground water elevation and surface elevation of the replacement area shall be approximately equal to that of the lost area.

The proposed replacement area is located immediately west of the lost BVW area, extending between A-9 and A-10 to A-13 and A-14. The elevation of the proposed wetland replacement area will be dictated by field conditions, however topography indicates that the area will have a finish grade of approximately 210 to 211 to achieve the desired wetland hydrology. The A-series BVW to be altered has a surface elevation of 207 to 208 feet, which closely matches the replication area. The difference in elevation is the result of the existing A-series wetland that reduces in elevation from west to east. The replication area is located west of the lost BVW area in a location where the wetland extends upslope, and therefore must be marginally higher in elevation in order to achieve proper hydrology.

c. the replacement area shall have an unrestricted hydraulic connection to the same water body or waterway associated with the lost area;

The replacement area will be constructed along the edge of the A-series BVW, approximately 40-feet west of the portion A-series BVW to be impacted. It is therefore hydrologically connected to the same wetland. This location presented the most suitable area for replacement due to its positioning within the existing maintenance easement, its

previously disturbed nature, its size, and the proximity to the BVW being impacted by the boulder wall installation.

d. the replacement area shall be located within the same general area of the water body or reach of the waterway as the lost area;

The proposed replacement area is located within the same general area of the watershed, within the downstream area of the Dam system. It is located a short distance from the lost areas at the Dam site.

e. At least 75% of the surface of the replacement area shall be reestablished with indigenous wetland plant species within two growing seasons, and prior to said vegetative reestablishment any exposed soil in the replacement area shall be temporarily stabilized to prevent erosion in accordance with standard US Natural Resource Conservation Service methods (formerly Soil Conservation Service); and

The applicant understands that two growing seasons of annual post-construction monitoring and reporting will be required to measure success of the replacement area and note any deficiencies. The ground surface will be stabilized as needed to protect the adjoining wetlands prior to establishment of vegetation.

f. the replacement shall be provided in a manner which is consistent with all other General Performance Standards for each resource area described in these regulations.

The proposed replication area will be constructed in accordance with performance standards for other wetland areas. The selected location represents that which will best minimize disturbance to naturally vegetated buffer areas within the state forest.

3. Notwithstanding the provisions of (d) 1. and 2. above, no project may be permitted which will have any adverse effect on specific habitat sites of rare vertebrate or invertebrate species as identified on the Natural Heritage and Endangered Species Estimated Habitat Maps, as identified under section 310 CMR 10.59, as may be amended, ("Rare Species") of the Wetland Protection Act Regulations and/or correspondence provided by the Division of Fisheries and Wildlife, Natural Heritage Endangered Species Program.

According to the most recent MassGIS data, no such species are known to exist on or near the project.

d. Bordering Land Subject to Flooding

The project will result in 1,195 sf of permanent impacts to BLSF. 876 sf of permanent impacts will result from the installation of the boulder wall and toe drain along with associated grading immediately downgradient of the dam embankment. The boulder wall will be approximately 1-2 feet high and will be back filled behind it in order to house the proposed tow drain at the required elevation. This work will result in filling of 22.03 cubic yards of BLSF. The remaining 319 sf of permanent impacts to BLSF are the result of the proposed replication area. The replication area will extend off of the limits of the A-series wetland and will be excavated to a lower depth in order to achieve proper wetland hydrology. The replication area was chosen as it is currently primarily maintained lawn, with only a small area of forest. Through the excavation of the wetland replication area, 14.7 cy of material will be removed from the site.

As the final elevations of the wetland replication area will be verified in the field by a wetland specialist, the total excavation from the site may be larger or smaller than 14.7 cy in order to achieve proper hydrology, however this was used as an approximation. As such, the project requires a new loss of approximately 7.33 cy of flood storage volume within BLSF.

1,154 sf of temporary impacts to BLSF will occur as a result of the project. These impacts will result from vegetation clearing, installation of the toe drain, and installation of erosion and sediment controls within BVW. In the area of the temporary impacts to BLSF, the toe drain will be installed sub-grade and the existing grades and surface will be brought back to existing conditions

There is not sufficient area within the existing maintenance easement and outside of existing BVW areas to provide an additional 7.33 cy of compensatory flood storage. However, the net 7.33 cy of fill within BLSF as a result of permanent impacts to BLSF is not anticipated to result in a significant change to flood elevations in the area. The fill is designed in a way that will not restrict flows in any way. The proposed impacts are the minimum required in order to ensure long term stability of the dam, which must be maintained properly.

e. 100-Foot Buffer Zone

The entire project area located outside of wetland resource areas (9,179 sf) is located within the 100-foot buffer zones associated with the Banks, BVW, and BLSF areas on the site. As with all dam repair projects, work within the buffer zones is unavoidable due to the nature and location of the proposed work. The installation of the toe drain piping along the downgradient dam embankment slope represents the only permanent alteration to the buffer zone. Additional temporary alterations to the buffer zones may result from construction vehicle access for the repairs, staging and stockpile areas, installation of a construction entrance, installation of perimeter erosion controls, and additional vegetation clearing.

f. Compensatory Mitigation

An onsite replication area, shown on sheet 5.1 of the Plans, is proposed to mitigate for the unavoidable losses of BVW. The replication area is located a short distance downstream of the dam bordering the northern perimeter of the A-series wetland. The proposed mitigation has a surface area of approximately 319 square feet, providing a greater than 2:1 replacement ratio for permanently impacted BVW, as required under the Bylaw.

Several mitigation sites were evaluated during the preliminary stages of the design, and the selected site represents the option that which would allow for the required replacement ratio while limiting impacts to mature woody vegetation due to its accessibility and previously disturbed plant community. Additionally, the gradual slope of the site adjoining the existing wetland edge will require minimal excavation for the wetland construction. The proposed mitigation site is easily accessible from the work area and is located within a moderately disturbed area with sparse trees and no shrub understory, avoiding the need for substantial disturbance to vegetation within the state forest. In addition, the wetland replication area is located within the Town's existing dam maintenance easement and will therefore not require an alteration to the easement.

The mitigation area will be constructed by excavating to 12" below the proposed finish grade, to be determined in the field by a wetland specialist, and backfilling with 12" of high organic content soils with mound and pool microrelief. The high organic content soils will be a mix of the organic topsoil removed from the BVW permanent impact area and clean high organic topsoil brought in from off-site. The area

will be planted with a mixture of shrubs and wetland seed mix to establish a native community of wetland vegetation. In order to maintain proper dam safety practice, no saplings are proposed so that tree growth does not extend closer to the dam embankment. Salvaged woody debris and boulders, or other suitable material, may be installed throughout the area to provide landscape variability and wildlife habitat value.

g. *Avoidance and Minimization Measures*

The project includes various measures to avoid and minimize impacts to wetland resources, including the following:

- Straw wattle perimeter erosion controls;
- Turbidity barriers at the perimeter of in-water work;
- Completing work during the seasonal drawdown period to minimize adverse impacts to fish and wildlife, as described in Section III.d.; and
- Restoring temporary disturbed areas of vegetated wetlands with native wetland seed mix (where applicable).

h. Tree Removal

Tree removal will be necessary to facilitate the proposed dam improvements and associated parking improvements. A total of approximately 17 trees (greater than 3-inch diameter at breast height) will be cleared and the stumps of each will removed. The resulting voids will be backfilled in order to ensure consistent grade along and down gradient of the dam embankment. The areas of trees to be removed are shown on Sheet 3.0 of the Plans.

IX. Summary

This NOI addresses the proposed improvements to Silver Lake Dam and is submitted pursuant to the Limited Project provisions of 310 CMR 10.53(3)(i). The proposed improvements are necessary to comply with current dam safety regulations, to protect the downstream public, and to protect the recreational functions provided by the Silver Lake impoundment.

Wetland resource areas present in the vicinity of the site include the Banks and Land Under Water associated with Silver Lake and Peters River; Bordering Land Subject to Flooding, and Bordering Vegetated Wetlands located within the project area. Impacts to wetlands have been minimized to the extent practicable given the nature of the project and the extensive constraints of the site. Mitigation in the form of wetland replication is proposed to offset the impacts proposed to BVW.

On behalf of the applicant, Pare respectfully requests that the Bellingham Conservation Commission issue an Order of Conditions allowing the repairs to proceed as proposed.

SECTION 5
SITE PHOTOGRAPH DOCUMENT

Photo No. 1: View of the Silver Lake dam and spillway facing north.

Photo No. 2: View of the Silver Lake dam spillway discharging to Peters River facing south near flag R-3. The eastern bank of the river is masonry retaining walls associated with the residential dwelling.

Photo No. 3: View of the dam crest immediately west of the spillway.

Photo No. 4: View of the downgradient side of the dam crest.

Photo No. 5: View of the location of the proposed toe drain and associated boulder retaining wall.

Photo No. 6: View of the stone slabs that are to be removed and replaced for the installation of the toe drain.

Photo No. 7: View of entrance to the maintenance easement located at 10 Dupre Road.

Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 6

WETLAND DELINEATION DOCUMENTATION

WETLAND FIELD REPORT

PROJECT TITLE: Silver Lake Dam

PARE JOB NO.: 23162.00

LOCATION: 80 Cross St. Bellingham, MA

WEATHER: Sunny, 80°

REPORT DATE: 10/4/2023

PERFORMED BY: Seaver Anderson & Gregory LaCroix

DISCUSSIONS AND COMMENTS

Wetlands at Silver Lake Dam in Bellingham were defined and delineated in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00, referred to as the WPA Regulations), the Town of Bellingham Wetlands Protection Bylaw (Chapter 245) and its implementing Wetlands Regulations (Chapter 247, referred to as the Bylaw), and the methodology specified in the publications entitled Delineating Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act, Second Edition (Jackson, 2022) and The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North Central and Northeast Region (U.S. Army Corps of Engineers, 2012). Inspection and delineation of wetland resource areas were completed on October 4, 2023.

The Silver Lake Dam (the dam) impounds Peters River to form the Silver Lake impoundment. The dam structure is located in the vicinity of 3 parcels of land located on the north side of Cross Street which are identified as Lots 24-1, 25A, and 25 on Bellingham Assessors Map 72. Silver Lake Conservation Area is located on Lot 25 and easements are in place to provide access to the dam on Lots 24-1 and 25. The dam exists on a residential lot (25A) with the dwelling and associated landscaping adjacent to the dam on its east side.

According to the most recent available MassGIS data, no certified or potential vernal pools, Areas of Critical Environmental Concern, Outstanding Resource Waters, or NHESP Priority or Estimated Habitats of Rare Species are located in the vicinity of the site.

Pink field flags were placed at appropriate intervals along the wetland/upland border and along the Banks of Silver Lake and Peters River as well as one intermittent stream. Primary parameters evaluated in wetland delineation included vegetation, indicators of wetland hydrology, and hydric soil indicators. Banks were delineated according to the first observable break in slope and Ordinary High-Water (OHW) marks. Observed wetland hydrologic indicators and soils are described in the following sections and within the attached Wetland Determination Data Forms. Wetland resource areas in the vicinity of the site include the following: **Bank, Bordering Vegetated Wetland, Land Under Water Bodies/Waterways, 200-Foot Riverfront Area,** and **Bordering Land Subject to Flooding.**

WETLAND DESCRIPTIONS

Silver Lake

Silver Lake is an impoundment of Peters River and is identified as **Lake** under section 10.04 of the WPA Regulations. Water surface levels are controlled by the Silver Lake Dam located at the southern end of the lake. The edges of the lake are defined in section 10.54 (2) of the WPA Regulations as Bank. The Bank flags correspond to ordinary high water (OHW) of the lake.

Flag series P-1 to P-10 defines the bank to the west of the dam spillway at the base of a rip rap slope associated with the dam berm. The flag series ends at the terminus of the embankment. The upstream slope is entirely covered with rip rap stone with sparse woody shrub and sapling vegetation throughout.

Flag series P-100 to P-105 defines the bank to the east of the spillway. It begins east of a masonry retaining wall that serves as the bank to the north of the adjacent residential dwelling. The masonry retaining wall extends from the eastern limit of the spillway to bank flag P-1. In the vicinity of the delineated flag series, forested slope leads gradually down the bank from a grass access drive.

Per the WPA Regulations, the bank extends down to the mean low water mark of the lake, with Land Under Water Bodies/Waterways (LUW) existing below the mean low water mark. As the water levels of the lake are dam controlled, the mean low water mark and the edge of LUW is not significantly lower than the delineated bank.

Bank vegetation observed along Silver Lake included, but were not limited to, the following species:

Common Name	**Scientific Name**	**Indicator Status**
Red Maple	*Acer rubrum*	FAC
White Pine	*Pinus strobus*	FACU
Northern Catalpa	*Catalpa speciosa*	FACU
Flowering Dogwood	*Cornus florida*	FACU
Speckled Alder	*Alnus incana*	FACW
Glossy Buckthorn	*Frangula alnus*	FAC
Highbush Blueberry	*Vaccinium corymbosum*	FACW
Smooth Arrowwood	*Viburnum recognitum*	FAC
Poison Ivy	*Toxicodendron radicans*	FAC
Common Goldenrod	*Solidago canadensis*	FACU
Carex sp.	*Carex sp.*	Assume FACW or wetter
Cinnamon Fern	*Osmunda cinnamomea*	FACW
Jewelweed	*Impatiens capensis*	FACW

Peters River

The Peters River flows in a southernly direction in the vicinity of the site. The river is mapped as a perennial river on the USGS 7.5-minute Topographic Quadrangle for the area and is shown as a regulatory floodway on the FEMA Flood Insurance Rate Map. Therefore, the Peters River is classified as a **River** and has an associated **200-foot Riverfront Area** under §10.58 of the WPA Regulations. The river is also federally jurisdictional as a Water of the United States. The edges of the river are defined in 10.54 (2) of the WPA Regulations as **Bank**.

Flag series R-1 to R-17 defines the western edge of the river for the length of the site. The Bank is relatively well defined at the site by a break in slope and stone masonry walls and the bank flags correspond to ordinary high water (OHW) of the river. Bank flags R-1 and R-2 represent the dam concrete spillway training wall. Bank flags R-3 to R-7 are associated with a stone masonry retaining wall at the site. After flag R-7 the bank extends along a low-gradient, forested slope with a bordering wetland. The intermittent stream

from the dam's blanket drain outlet enters the river just north of Cross Street. The flag series continues south until it ends at flag R-17 at the Cross Street bridge.

Flag series R-100 to R-109 defines the eastern edge of the river downstream of the spillway. This flag series starts approximately 60 feet south of the spillway, downgradient of the stone masonry retaining wall. This northern section of the riverbank was not delineated by flags as it exists as predominantly stone masonry retaining walls along landscaped areas associated with the residential dwelling. A small section, immediately south of the spillway exists as the dam's concrete retaining wall. Bank flag R-100 is where the bank transitions to a very steep forested slope downgradient from the residential house driveway. The remainder of the eastern bank of the river, between Silver Lake and Cross Street, exists as this steep forested slope downgradient from landscaped areas and the driveway. The flag series continues south until it ends at flag R-109 at the Cross Street bridge.

Per the WPA Regulations, the bank extends down to the mean low water mark of the river, with Land Under Water Bodies/Waterways (LUW) existing below the mean low water mark.

Bank vegetation observed along Peters River included, but were not limited to, the following species:

Common Name	**Scientific Name**	**Indicator Status**
Red Maple	*Acer rubrum*	FAC
White Pine	*Pinus strobus*	FACU
Red Oak	*Quercus rubra*	FACU
White Oak	*Quercus alba*	FACU
Northern Catalpa	Catalpa speciosa	FACU
Black Cherry	Prunus serotina	FACU
Smooth Arrowwood	*Viburnum recognitum*	FAC
Multiflora Rose	*Rosa multiflora*	FACU
Spicebush	*Lindera benzoin*	FACW
Highbush Blueberry	*Vaccinium corymbosum*	FACW
Cinnamon Fern	*Osmunda cinnamomea*	FACW
Hay-Scented Fern	*Dennstaedtia punctilobula*	UPL
Foxgrape	*Vitis labrusca*	FACU

Intermittent Stream

A blanket drain outlet discharges to the intermittent stream at flag A-20, flowing at a steady rate through the BVW. The banks are well-defined from their abrupt break in slope. The depth of the stream is less than 1 foot, and it has a mucky substrate with iron concentrations. Flag series S-1 to S-15 and S-100 to S-113 define the left and right banks of the intermittent stream, respectfully. Vegetation within the stream bank included, but is not limited to, the following:

Common Name	**Scientific Name**	**Indicator Status**
Red Maple	*Acer rubrum*	FAC
White Pine	*Pinus strobus*	FACU
Highbush Blueberry	*Vaccinium corymbosum*	FACW
Spicebush	*Lindera benzoin*	FACW

Arrowwood	*Virburnum dentatum*	FAC

Bordering Vegetated Wetlands

Two freshwater wetland resource areas were identified and delineated on the site property. The resource area is classified as a **Bordering Vegetated Wetland (BVW)** according to §10.55(2) of the WPA Regulations and has an associated **100-foot Buffer Zones** extending upslope from the delineated edge. The two BVW are described below.

Wetland A

Flag series A-1 to A-30 defines the edge of a forested swamp that borders the Peters River and toe dam embankment for a large majority of the site. The wetland follows the manmade stone river wall and turns west where it meets the dam. The wetland edge follows the downstream toe of the dam embankment until flag A-21, where it turns towards Dupre Road. It follows the toe of forested slope to the Dupre road embankment, and then turns south and follows along the toe of the roadway. A blanket drain from the dam discharges at flag A-20 to the intermittent stream. The site is dominated by red maple (*Acer rubrum*) with a shrub understory. Wetland hydrology appears to range from saturated to seasonally flooded. Typical vegetation within the wetland included, but is not limited to, the following:

Common Name	**Scientific Name**	**Indicator Status**
Red Maple	*Acer rubrum*	FAC
White Pine	*Pinus strobus*	FACU
Highbush Blueberry	*Vaccinium corymbosum*	FACW
Winterberry	*Ilex verticillata*	FACW
Spicebush	*Lindera Benzoin*	FACW
Gray Birch	*Betula populifolia*	FAC
Slippery Elm	*Ulmus rubra*	FAC
Royal Fern	*Osmunda regalis*	OBL
Wild Sarsaparilla	*Aralia nudicaulis*	FACU
Jewelweed	*Impatiens capensis*	FACW

Wetland B

Flag series B-1 to B-5 defines the edge of a fringe wetland off the southern bank of Silver Lake located between Flags P-101 and P-104 to the east of the spillway and residential dwelling. It's approximately 5-10 feet at its maximum width with a saturated hydrology. Vegetation within the wetland included, but is not limited to, the following:

Common Name	**Scientific Name**	**Indicator Status**
Red Maple	*Acer rubrum*	FAC
White Pine	*Pinus strobus*	FACU
Smooth Arrowwood	*Viburnum recognitum*	FAC
Sassafras	*Sassafras albidum*	FACU
Highbush Blueberry	*Vaccinium corymbosum*	FACW
Sensitive Fern	*Onoclea sensibilis*	FACW

Skunk Cabbage	*Symplocarpus foetidus*	OBL
Poison Ivy	*Toxicodendron radicans*	FACU
Carex sp.	*Carex sp.*	Assume FACW or wetter

Bordering Land Subject to Flooding

According to the FEMA Flood Insurance Rate Map (FIRM) for the Town of Bellingham, Massachusetts (community-panel no.'s 25021C0311E and 25021C0312E, effective July 17, 2012), **Bordering Land Subject to Flooding** (defined under Rule 10.57 (2)(a) of the WPA Regulations) encompasses a portion of land associated with the BVW A-Series and bordering the Peters River on the site. The floodplain on the site is located within Zone AE, areas with a base flood elevation of 212 feet (NAVD 88). There is a Zone X floodplain contiguous with the western border of Zone AE. In addition, the Peters River is designated as a Regulatory Floodway.

SWA/GDL/jp

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Photo No. 1: View of the Silver Lake dam and spillway facing north.

Photo No. 2: View of the Silver Lake dam spillway discharging to Peters River facing south near flag R-3. The eastern bank of the river is masonry retaining walls associated with the residential dwelling.

Photo No. 3: View of the southern bank of Silver Lake facing east towards the spillway at flag P-4. Notice the substantial woody growth throughout the rip rap slope.

Photo No. 4: View of the intermittent stream facing north at flag S-14. The intermittent stream is hydrologically fed by a low-level outlet associated with the dam.

Photo No. 8: View of the A-series BVW at the toe of the dam embankment facing east at flag A-10. The dam and spillway are located on the west side of the photo.

Photo No. 9: View of the A-series BVW facing east at flag A-26. The wetland edge exists at the toe of a forested slope.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Lake Dam Improvements City/County: Bellingham Sampling Date: 10/04/2023

Applicant/Owner: Town of Bellingham State: MA Sampling Point: A-24

Investigator(s): Seaver Anderson, Greg LaCroix Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): _____

Subregion (LRR or MLRA): LRR Lat: 42°3'33.1"N Long: 71°28'5.5"W Datum: NAD 83

Soil Map Unit Name: Scarboro and Birdsall soils, 0 to 3 percent slopes (10) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

The A-series wetland begins along the toe of slope associated with the downgradient side of a dam. As such, this area is significantly disturbed and does not resemble a natural environment. Hydrology, soils, and vegetation, on the upgradient and downgradient sides of the dam have been significantly impacted since its installation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: A-24

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	38.0	Yes	FAC
2. Pinus strobus	20.5	Yes	FACU
3. Gray Birch	20.5	Yes	FAC
4.			
5.			
6.			
7.			
	79.0	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Betula populifolia	5.0	No	FAC
2. Ulmus rubra	5.0	No	FAC
3. Lindera benzoin	20.5	No	FACW
4. Berberis thunbergii	10.5	No	FACU
5. Viburnum dentatum	10.5	No	FAC
6. Vaccinium corymbosum	10.5	No	FACW
7. Pinus strobus	10.5	No	FACU
	72.5	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Aralia nudicaulis	20.5	Yes	FACU
2. Maianthemum canadense	5.0	No	FACU
3. Toxicodendron radicans	10.5	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	36.0	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Toxicodendron radicans	10.5	No	FAC
2. Vitis labrusca	38.0	Yes	FACU
3. Celastrus orbiculatus	10.5	No	UPL
4.			
	59.0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	31	x 2 =	62
FAC species	100	x 3 =	300
FACU species	105	x 4 =	420
UPL species	10.5	x 5 =	52.5
Column Totals:	246.5 (A)		834.5 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: A-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
Oe 1-0"	10YR 7.5/2	100		0				
Ap 0-8"	10YR 2/2	100		0			Sil	
Bw 8-16+"	10YR 4/6	100		0			FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Lake Dam Improvements City/County: Bellingham Sampling Date: 10/04/2023

Applicant/Owner: Town of Bellingham State: MA Sampling Point: A-24

Investigator(s): Seaver Anderson, Greg LaCroix Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR Lat: 42°3'33.1" N Long: 71°28'5.5" W Datum: NAD 83

Soil Map Unit Name: Scarboro and Birdsall soils, 0 to 3 percent slopes (10) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID:
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

The A-series wetland begins along the toe of slope associated with the downgradient side of a dam. As such, this area is significantly disturbed and does not resemble a natural environment. Hydrology, soils, and vegetation, on the upgradient and downgradient sides of the dam have been significantly impacted since its installation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):	
Water Table Present?	Yes X	No	Depth (inches):	12"
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches):	0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Buttressed roots

VEGETATION – Use scientific names of plants. Sampling Point: A-24

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	63.0	Yes	FAC
2. Pinus strobus	10.5	No	FACU
3.			
4.			
5.			
6.			
7.			
	73.5	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Vaccinium corymbosum	10.5	Yes	FACW
2. Ilex verticillata	10.5	Yes	FACW
3. Lindera benzoin	10.5	Yes	FACW
4. Betula populifolia	10.5	Yes	FAC
5. Ulmus rubra	10.5	Yes	FAC
6.			
7.			
	52.5	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Osmunda regalis	10.5	Yes	OBL
2. Aralia nudicaulis	5.0	Yes	FACU
3. Impatiens capensis	5.0	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20.5	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	0.0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 88.89% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: A-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
Oe 0.5-0"	10YR 2/2	100		0				
A 0-6"	10YR 2/1	88	2.5Y 4/2	10	D	M	Sil	
			5YR 3/4	2	C	M		
Bg 6-16+"	2.5Y 4/2	90	5YR 3/4	10	D	M	FSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Lake Dam Improvements City/County: Bellingham Sampling Date: 10/04/2023

Applicant/Owner: Town of Bellingham State: MA Sampling Point: B-2

Investigator(s): Seaver Anderson, Greg LaCroix Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): _____

Subregion (LRR or MLRA): LRR Lat: 42°03'32.1" N Long: 71°28'01.6" W Datum: NAD 83

Soil Map Unit Name: Udorthents, sandy (653) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

The soils are disturbed fill soils as a result of a grass access way on the upgradient side of the wetland edge.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: B-2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus strobus	85.5	Yes	FACU
2. Betula populifolia	10.5	No	FAC
3.			
4.			
5.			
6.			
7.			
	96.0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Malus pumila	20.5	-	N/A
2. Frangula alnus	5.0	Yes	FAC
3. Vaccinium corymbosum	5.0	Yes	FACW
4. Elaeagnus angustifolia	5.0	Yes	FACU
5.			
6.			
7.			
	15.0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Digitaria ischaemum	38.0	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	38.0 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Vitis labrusca	5.0	Yes	FACU
2.			
3.			
4.			
	5.0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 16.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.0	x 1 =	0.0
FACW species	5.0	x 2 =	10.0
FAC species	15.5	x 3 =	46.5
FACU species	133.5	x 4 =	534.0
UPL species	0.0	x 5 =	0.0
Column Totals:	154.0 (A)		590.5 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: B-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
^C 0-20+"	10YR 5/6,	50%						Mixed matrix
	10YR 5/2	50%						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

Disturbed/mixed soils.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Silver Lake Dam Improvements City/County: Bellingham Sampling Date: 10/04/2023

Applicant/Owner: Town of Bellingham State: MA Sampling Point: B-2

Investigator(s): Seaver Anderson, Greg LaCroix Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR or MLRA): LRR Lat: 42°03'32.1" N Long: 71°28'01.6" W Datum: NAD 83

Soil Map Unit Name: Udorthents, sandy (653) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X	No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 2"

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: B-2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	63.0	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	63.0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Viburnum recognitum	38.0	Yes	FAC
2. Pinus strobus	10.5	No	FACU
3. Sassafras albidum	5.0	No	FACU
4.			
5.			
6.			
7.			
	53.5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	5.0	No	FACW
2. Symplocarpus foetidus	5.0	No	OBL
3. Toxicodendron radicans	20.5	No	FAC
4. Carex sp.	5.0	Yes	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35.5 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	0.0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: B-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
Oe 0-2"	10YR 4/3	100		0			Fibric	
A 2-4"	10YR 2/2	100		0			SL	
Bg 4-12+"	10YR 6/2	100		0			SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 7

PHASE 1 INSPECTION / EVALUATION REPORT

Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 8

OPERATION AND MAINTENANCE MANUAL

PREPARED FOR: TOWN OF BELLINGHAM

OPERATIONS & MAINTENANCE MANUAL
SILVER LAKE DAM
BELLINGHAM, MASSACHUSETTS

PREPARED BY:

PARE ENGINEERING CORPORATION
49 WALPOLE STREET, SUITE 2
NORWOOD, MASSACHUSETTS 02062

PARE PROJECT NUMBER 98130.00

SEPTEMBER 12, 2000

PARE
CORPORATION

PARE
ENGINEERING CORPORATION

September 12, 2000

Mr. Donald DiMartino, Director
Department of Public Works
40 Blackstone Street
Bellingham, MA 02019

RE: Operations & Maintenance Manual
Silver Lake Dam
PARE Project No. 98130.00

Mr. DiMartino:

In accordance with our proposal, Pare Engineering Corporation (PARE) is pleased to provide the Town of Bellingham with the attached Operations & Maintenance (O&M) Manual for Silver Lake Dam. The manual has been prepared in accordance with the current recommendations from the Massachusetts Department of Environmental Management, Office of Dam Safety.

The manual is divided into three sections related to the operation of the discharge structure, inspection and monitoring requirements, and maintenance, and includes sample checklists and maintenance logs in the appendices.

We appreciate the opportunity to provide the Town of Bellingham with our professional services and should you have any questions or comments regarding the O&M Manual or its application feel free to contact us at (781)762-1442.

Very truly yours,

PARE ENGINEERING CORPORATION

J.Matthew Bellisle, P.E.
Senior Project Engineer

JMB

Attachment

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781-762-1442 781-762-4780 FAX

LINCOLN, RI

NEW LONDON, CT

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APPENDICES

Name of Dam:	**Silver Lake Dam**
Dam Identification No.:	**6-11-25-14**
Location:	**Bellingham, Massachusetts**
USGS Quadrangle:	**Franklin, Massachusetts**
Owner's Name:	**Town of Bellingham**
Owner's Address:	**Department of Public Works** **40 Blackstone Street** **Bellingham, MA 02019**

PREAMBLE:The Operation and Maintenance Manual was prepared for the Town of Bellingham, to establish a basis for continuing maintenance and inspection of the dam at Silver Lake, as well as to reduce the consequences of dam failure. The Operation and Maintenance Manual stresses the importance of the development and active pursuit of a dam safety program oriented to the specific requirements of Silver Lake Dam. The steps outlined in the plan are steps that can mitigate life and property loss.

The owner of the dam has a direct influence on the safety of the dam. The owner should play a direct role in the development of a continuing safety program, which includes important elements such as inspecting, monitoring and maintaining the structure. It is recommended that as personnel change a comprehensive briefing be conducted for new workers/personnel to familiarize them with the dam structures and the components of the Operation and Maintenance Manual.

1.00 INTRODUCTION

This Operation and Maintenance Manual has been prepared in accordance with the Commonwealth of Massachusetts General Laws, M.G.L. 253, Section 44, Chapter 302 C.M.R. 10.10, "Dam Safety" for Silver Lake Dam in Bellingham, Massachusetts. The development of this Operations and Maintenance Manual is based primarily on the Massachusetts Department of Environmental Management, Dam Operation and Maintenance Manual dated December 1986.

The purpose of this plan is to provide a formalized sequence of steps and procedures to be taken on a regular and infrequent basis to reduce the potential consequences of dam failure. The beneficiaries of such a program include the general public and the dam owner.

The Operation and Maintenance Manual outlines the inspection program required by the Massachusetts Department of Environmental Management Division of Dam Safety, and an overview of the necessary maintenance tasks that are required to maintain the dam in an operable condition. The Operation and Maintenance Manual should be housed in a three ring binder to facilitate updates to the plan and the inclusion of Maintenance, Inspection and Operation Records. The Operation and Maintenance Manual should be updated annually to ensure that the information contained in the plan is current.

1.10 DAM DESCRIPTION

Silver Lake Dam impounds water on an unnamed tributary to the Peter's River in Bellingham, Massachusetts, to form a recreational lake. The dam is located approximately two miles south of Bellingham Center and about 1/3 mile from the intersection of Lake and Cross Streets.

The dam is an earthen embankment, approximately 9 feet high and 275 feet long at the south end of Silver Lake. The embankment of the dam consists of an upstream slope and a combination of downstream slopes and dryset stone masonry retaining walls. The spillway is located near the left abutment and consists of a 10-foot long stepped concrete overflow section, with a fixed elevation of 98.0 feet[1], approximately 2 feet below the crest of the dam, and two 5-foot wide, deep sluiceways. The sluiceways are located on either side of the overflow section and are controlled by timber stoplogs that are manually adjusted to raise or lower the level of the impoundment. A timber-decked footbridge, supported by steel beams, spans the structures and provides access to the stoplogs.

The storage capacity at the top of the dam is approximately 168.8 acre-feet. Therefore, in accordance with Department of Environmental Management classification under Commonwealth of Massachusetts dam safety rules and regulations stated in 302 CMR 10.00 Silver Lake Dam is an **Intermediate** size structure.

[1] The elevation is based upon an assumed datum where the dam crest and tops of the spillway training walls are at elevation 100.00.

Silver Lake Dam is located in a primarily residential area. The development downstream of the dam includes roads, utilities, residential, and commercial structures. In accordance with current state regulations, the dam has been classified as a **Class II (Significant)** hazard structure. As such, it is anticipated that in the event of a failure there would be economic loss and human life could be threatened.

Based upon the size and hazard classifications, and in accordance with current regulations, Silver Lake Dam has a spillway design flood (SDF) equivalent to the 100-year storm. The combined capacity of the spillway and sluiceways is sufficient to pass the SDF as long as all the stoplogs are removed from the two sluiceways.

1.20 DAM HISTORY

It is believed that Silver Lake Dam was in place circa 1900 and that the spillway was reconstructed between 1960 and 1970 by a private owner prior to the Town of Bellingham obtaining ownership.

Silver Lake Dam was partially breached in May 1998 as the result of a piping failure below the spillway. A full breach was prevented by the rapid response of the Town of Bellingham Department of Public Works, and the local Conservation Commission. The Town was able to control the rate of discharge with sandbags and thus prevented the impoundment from being drained. As a result, a full flood wave did not develop and downstream damages were kept to a minimum. However, due to the damage that did occur, a temporary dam was installed and repairs undertaken. Repairs included the removal of the undermined structure, the abandonment and removal of the emergency spillway and the construction of a new reinforced concrete spillway system consisting of a fixed overflow section and two deep sluices. Repairs to the spillway and discharge channel were completed in December 1998, and the impoundment returned to normal pool in April 1999.

In 2000, work was performed on the earthen portion of the dam. Stump and root systems were removed from the embankment, the slopes were graded to a stable geometry, the dam crest was raised to a uniform elevation, and stone riprap was installed along the upstream slope. The downstream stone masonry retaining wall was reconstructed and a drainage blanket was installed downstream of the previously abandoned emergency spillway. A row of steel, sheet piling was installed along the centerline of the embankment for 75-feet right of the spillway. The work was completed in July 2000.

2.00 SPILLWAY OPERATION

The operation of the dam involves adjusting the reservoir level, maintaining records, and in general, ensuring public safety. The spillway operating protocol has been prepared to provide a logical sequence for monitoring and controlling the water levels in the lake by regulating the flow over the spillway and through the sluiceways. The routine operation of the Silver Lake Dam involves adjusting the number of stoplogs within the sluiceways to allow water to flow out of the lake. A sample operation log has been included in Appendix C to track and document the operation of the dam.

2.10 SPILLWAY SYSTEM

The spillway system consists of a fixed crest weir and two sluiceways each equipped with an adjustable stack of stoplogs. The timber stoplogs are stacked on top of each other within slots formed within the concrete walls of each sluiceway and the spillway. The flow through the dam is controlled by removing or adding timber stoplogs. The stop logs are fitted with lifter pins that can be grabbed with the lifter mechanism designed for this structure. This lifter mechanism attaches to the piers and bridge and is used to remove and place the stoplogs when necessary (see Figure 3). In the event that work is required on the stoplog system, a second set of slots are located near the upstream end of the piers so that additional timber stoplogs can be installed to prevent flow and permit maintenance activities.

2.20 OPERATION PROCEDURES

2.21 Normal Operation

Under normal operating conditions, the stoplogs maintain the lake at the elevation of the concrete spillway (Elevation 98 feet). The timber stoplogs extend to this elevation when all logs have been installed within each sluiceway. The elevation of the water level within the lake can be lowered by removing the logs from each sluiceway. The Town of Bellingham determines the normal elevation of the lake.

2.22 Operation during Significant Rainfall

During periods of significant rainfall, the operation of the dam is essential in providing safety to the surrounding community by controlling the flow of water through the dam. A significant rainfall is defined as a period when at least 3 inches or more of rainfall is anticipated or falls within the watershed over a 24-hour period. The following procedures should be followed with respect to discharging water through the dam during a significant rainfall:

1. At least one day prior to a storm (or as early as possible), remove one timber stoplog from each sluiceway (total of two timber boards). The level of the water within the lake should drop such that it is equal to the

top of the remaining in-place timber stoplogs. (EL 97.5) This will provide additional storage capacity within the lake.

2. During the rainstorm, monitor the level of water within the lake with respect to the concrete spillway. If the water elevation rises up to the concrete spillway and begins to flow over the spillway, remove one timber stoplog from each sluiceway (total of two timber boards). (EL 97.0) Continue to monitor the level of water within the lake. If the water level again rises and begins to spill over the concrete spillway, another timber stoplog should be removed from each sluiceway. This procedure should be repeated until the level of the water within the lake is maintained below the concrete spillway. Monitoring should be performed throughout the storm and associated period of runoff.

3. In instances where a heavy rainfall is occurring and a drop in the lake level is not observed after removing a timber stoplog, remove two timber stoplogs from each sluiceway (total of four boards). The amount of timber stoplogs that can be removed at one time should be based on the judgement of the dam operator as to the anticipated amount of rainfall and that occurring. It is anticipated that during periods of extremely heavy rainfall (such as that which may accompany a hurricane), many of the boards will be required to be removed such that the storm flow can be passed through the dam.

4. Once the precipitation has ended and the flow through the dam has been controlled such that the water level is maintained below the concrete spillway, replace the timber stoplogs so that the level of the lake can be returned to normal pool by the tail end of the inflow due to runoff. Replacing the timber stoplogs to the original level near the end of the storm such that the water level within the lake returns to the original elevation can optimize operation of the dam and minimize the time required to refill the lake. However, care should be exercised such that the replacement of the boards is not premature and does not result in the embankment being overtopped.

5. During the storm, monitor the downstream properties for potential damage due to the volume of water being discharged through the spillway.

2.23 Operation during Spring Runoff

Runoff during the spring due to snow melting will cause an increase of flow to the lake. Monitoring of the water level within the lake with respect to the concrete spillway should be performed daily during the spring. If the water level overtops the concrete spillway, follow the same procedures outlined in

Section 2.22. In addition, monitor the downstream properties for potential damage.

2.24 Operation during High Winds

Occurrences of high winds can damage exposed portions of the dam. Inspections of the riprap, dam crest, and walkway structure should be made to determine if damage has occurred and if maintenance is required.

2.25 Operation after Earthquakes

Inspection of the dam by a qualified Engineer should be made immediately after a significant earthquake. The inspection procedure is outlined in the following sections.

2.26 Seasonal Drawdown

In order to reduce the load on the dam during the winter months and to provide additional storage capacity for snow melt and winter storms, the impoundment should be draw down after Labor Day and returned to normal pool for Memorial Day. The impoundment should be drawn down by at least 12 inches. (EL 97) To draw down the impoundment two (2) logs should be removed from both of the sluiceways.

2.30 PERSONNEL

1. Mr. Don DiMartino, Director of Public Works, Town of Bellingham, MA

   Mr. DiMartino, through his position as the Director of Public Works, will be required to monitor and control the water levels in the lake, thus preventing the dam from overtopping and damaging property and endangering the downstream residents.

3.00 INSPECTION AND MONITORING REQUIREMENTS

An effective inspection program is essential for identifying problems and providing safe maintenance of the dams. The inspection program involves three types of inspections: (1) periodic formal inspections, (2) periodic maintenance inspections, and (3) informal observations by associated personnel as they operate the dam.

Formal inspections must be performed by specialists familiar with the design and construction of dams and should include assessments of the structural safety.

Maintenance inspections are performed more frequently than formal inspections in order to determine during an early stage, any developments that may be detrimental to the dam. They involve assessing the operational capability as well as structural stability of the dams.

The third type of inspection is actually a continuing effort by dam personnel performed in the course of their normal duties. As new personnel become involved in the inspection of the dams, education is required to continue the effectiveness of the inspections.

Visual inspection, performed on a regular basis, is one of the most economical means a dam owner can use to assure the safety and long life of a dam. Visual inspection involves careful examination of the surface and all parts of the structure, including the adjacent environment.

3.10 FREQUENCY OF TASKS

Pursuant to the Commonwealth of Massachusetts Department of Environmental Management Regulations CMR 302 Section 10.10 and based on the size and hazard potential of the dam a formal inspection must be conducted every 5 years. The inspection schedule may be modified, at the discretion of the Commissioner of the Department of Environmental Management (Commissioner), in special cases where it is desirable to observe the dams under particular conditions. Further, the inspection schedule may be modified if particular conditions exist which require more frequent monitoring.

- **Formal Inspections**

The Town may elect to employ the services of a registered Professional Engineer experienced in the design, construction, and inspection of dams, to inspect the dams according to the schedules determined by the Commissioner and on the forms provided by the Commissioner. Upon completion of the inspection the Town shall furnish a copy of each inspection report in a format determined by the Commissioner within thirty (30) days of the date of the inspection to the Commissioner. The inspection report shall be stamped by a registered Professional Engineer licensed in the Commonwealth of Massachusetts. In addition, the Town shall submit a statement of the intent to implement recommendations set forth in the inspection report. The Commissioner,

upon review and approval of the submitted inspection report, will determine compliance and appropriate remedial measures.

- **Maintenance Inspections**

Maintenance inspections should be performed yearly by either qualified Town employees or a registered professional engineer. A qualified employee would be someone who is familiar with the dam, its operation and has been instructed on the procedures for observing, identifying and documenting deficiencies. An inspection checklist should be completed during each maintenance inspection. A sample checklist is included in Appendix A.

- **Informal Observations**

Informal observations are to be made whenever the dam is operated, and during regular intervals during the year to identify and address maintenance issues before further deterioration compromises the structure or its operation. Notes of observations and work performed should be included within an inspection logbook.

It is recommended that the Town develops a log book to contain copies of all of the inspection reports and a record and date of all personnel involved in the inspections. A sample maintenance log has been provided in Appendix B.

3.20 ORGANIZING FOR INSPECTIONS

All inspections should be organized and systematic, and inspectors should use equipment appropriate for the task, record observations accurately, and survey the structure and the site comprehensively. Sample inspection sheets for use during Maintenance inspections are included in Appendix A.

3.21 Recording Inspections and Observations

An accurate and detailed description of conditions observed during each inspection will enable meaningful comparison of conditions observed at different times. All measurements and observed details required to get an accurate picture of the dam's current condition and potential problems should be recorded. The information has three key elements:

1. Location - The location of any questionable area or condition must be accurately described so that the area or condition can be evaluated for changes over time or examined further by experts. Photographs are often very helpful in this regard. The location along the dam, as well as above the toe or below the crest, should be established and recorded. Problems in the outlet works or spillway should be similarly located.

2. Extent or Area - The length, width, depth or height of any suspected problem should be determined.

3. Descriptive Detail - A brief, yet detailed description of an anomalous condition should be given. Some items to include are:

- Quantity of seepage from point and area sources
- Color or quantity of sediment in the water
- Depth of deterioration of concrete
- Length, displacement and depth of cracks
- Extent of moist, wet or saturated areas
- Adequacy of protective covers
- Adequacy of surface drainage
- Changes in conditions

3.22 Coverage

An inspection is conducted by walking along and over the dam as many times as is required to observe the entire structure. From any given location, a person can gain a detailed view for 10 to 30 feet in any direction, depending on the surface being observed. On the downstream slopes a zigzag pattern should be used to assure that any cracking is detected.

3.23 Sequence

A sequence of inspection ensuring systematic coverage of an entire site is:

- Upstream slope
- Crest
- Downstream slope
- Toe drain
- Seepage areas
- Spillway and stream channel

Following a consistent sequence lessens the chance of an important condition being overlooked. Reporting inspection results in the same sequence is recommended to ensure consistent records. Inspection forms are included in Appendix A. The forms should be supplemented with specific information or photographs that are generated during each inspection.

3.24 Record Keeping

A dated report should be filed for each inspection conducted and filed with any photographs taken (Photographs should be dated). In addition to inspection

observations, monitoring measurements and weather conditions should be recorded.

Immediately following an inspection, observations should be compared with previous records to see if there are any trends that may indicate developing problems. If a change or trend is noted, and failure of the dam is not imminent, the Town should consult a Professional Engineer experienced in dam safety. Quick reaction to questionable conditions will ensure the safety and long life of the dam and could prevent costly repairs.

3.25 Crucial Inspection Times

There are at least five times when an inspection of the dams is recommended regardless of the schedule.

1. Prior to a predicted major rainstorm, or heavy snow melt; check spillway, stream channel, and riprap

2. During or after a severe rainstorm; check spillway, stream channel, and riprap

3. During or following a severe windstorm; check riprap performance during the storm and after the storm has subsided

4. Following a reservoir filling, schedule a regular program of frequent inspections during the period a reservoir is being first filled to assure that the design and site conditions are as predicted.

5. Following an earthquake the dam and appurtenant structures should be inspected by a qualified Professional Engineer.

3.30 INSPECTION OF EMBANKMENT DAMS AND STRUCRURES

Embankment dams similar to the dam at Silver Lake represent the majority of dam structures in place in the United States. The major features at Silver Lake Dam include:

1. Upstream slope
2. Downstream slope
3. Downstream wall
4. Crest
5. Blanket drain
6. Seepage areas
7. Spillway Structure

3.31 Upstream Slope

Typically, the main problems encountered on the upstream slope are:

- Cracks
- Slides
- Cave-ins or sink holes
- Severe erosion

The first three conditions may indicate a serious problem within the embankment. Severe erosion obviously weakens the structure. An upstream slope should receive a close inspection because riprap and high water levels can hide problems. When the reservoir is empty, the exposed slope should be thoroughly inspected for settlement areas, rodent activity, sinkholes or slides. The reservoir basin should be inspected for cave-ins and sinkholes when possible.

A crisscross pattern should be used when inspecting the slopes so that cracks and slides can be easily identified. In many instances, sighting along the water side alignment will indicate a change in the uniformity of the slope. If a crack is seen, the crest and downstream slope in the immediate vicinity should be carefully inspected.

Cracks indicate possible foundation movement, embankment failure, or a surface slide. Locating them can be difficult. Cracks can be less than an inch in width, however may be several feet deep. Cracks that are 1-foot deep or greater usually are not produced by drying and are cause for concern. A line of dislodged riprap on an upstream slope could indicate a crack below the riprap.

Slides can be almost as difficult to detect as cracks. When a dam is constructed the slopes may not be uniformly graded. Familiarity with the slope configuration at the end of construction can help to identify subsequent slope movements.

Sink holes or cave-ins result from internal erosion of the dam. This is a serious condition for earthen embankment dams. The internal erosion or piping, may be reflected by turbid or cloudy water at the exit location. Surface materials may be eroded by wave action, rain runoff and burrow activities. If allowed to continue, the embankment thickness can be reduced and the structure weakened.

3.32 Downstream Slope

A downstream slope should be carefully inspected because it is the area where evidence of developing problems appears most frequently. To assure adequate inspection, this area should be kept free from obscuring weeds, trees and brush.

When cracks, slides, or seepage is noted in the downstream slope, the designated dam safety authorities should be notified immediately. On the downstream slope, some of the more threatening conditions that should be identified are the following: cracks, slides, and seepage.

Cracks can indicate settlement, drying, shrinkage, or the development of a slide. Whatever the cause, cracks should be monitored and changes in length or width should be noted. Drying cracks may appear and disappear seasonally and normally will not show vertical displacement as will settlement or slide cracks.

Slide cracks require immediate detailed evaluation. Early warning signs include a bulge in the embankment near the toe of the dam or vertical displacement in the upper portion of the embankment.

3.33 Masonry Walls

Masonry walls should be inspected for differential or rotational movement as well as for bulges that may indicate changes within the soils behind the wall. Leakage or seepage through the wall or at the base of the wall should be monitored. If noted, the area should be monitored for changes in flow or the presence of fines which would indicate that changes are occurring within the embankment.

To facilitate inspection the toe of the wall should be kept free of obscuring weeds, trees, and brush. Tree and brush growth should be prohibited along the top of the wall to prevent the development of additional pressure from expanding root systems.

3.34 Crest

A dam's crest usually provides the primary access for inspection and maintenance. Because surface water will pond on a crest unless that surface is maintained, this part of the dam usually requires periodic regrading. However, problems on the crest of a dam should not be simply graded over or covered up. When a questionable condition is found, the Town should consult a Professional Engineer immediately.

On the crest, some of the more threatening conditions that may be identified are the following: longitudinal cracking, transverse cracking, and misalignment. Longitudinal cracking can indicate localized instability, differential settlement, and/or movement between adjacent sections of the embankment. Longitudinal cracking is typically characterized by a single crack or a close, parallel system of cracks along the crest in a direction more or less parallel to the axis of the dam. These cracks which are generally, continuous over their length and are usually greater than 1-foot deep, and can be differentiated from drying cracks which are usually intermittent, erratic in pattern, shallow, very narrow and numerous.

Longitudinal cracking may precede vertical displacement as a dam attempts to adjust to a position of greater stability. Vertical displacements on the crest are usually accompanied by displacements on the upstream or downstream face of the dam.

Transverse cracking can indicate differential settlement or movement between adjacent sections of the dam. Transverse cracking is usually a single or a close parallel system of cracks that extend across the crest in a direction more or less perpendicular to the length of the dam. This type of cracking is usually greater than 1-foot in depth.

Transverse cracking poses a definite threat to the safety and integrity of the dam. If a crack should progress to a point below the reservoir water surface elevation, seepage could progress along the crack and through the embankment causing severe erosion and if not corrected, could lead to a failure of the dam.

Misalignment can indicate relative movement between adjacent portions of a dam generally in directions perpendicular to the axis of the dam. Excessive settlement of a dam material and/or foundations can cause misalignment. Misalignment may only be detectable by viewing the dam from either abutment.

3.35 Seepage Areas

Although all dams have some seepage, seepage in any area on or near a dam can be dangerous and should be treated as a potential problem. Wet areas downstream from dams are not usually natural springs, but seepage areas. Seepage must be controlled in both quantity and velocity. High velocity flows through a dam can cause progressive erosion, and ultimately, failure. Saturated areas of an embankment or abutment can move in massive slides and thus also lead to a failure.

Seepage can emerge anywhere on the downstream face of a dam, beyond the toe, or on the downstream abutments at elevations below normal reservoir elevations. A potentially dangerous situation exists when seepage appears on the downstream face above the toe of the dam. Seepage on the downstream slope can cause a slide or failure of the dam by internal erosion (piping). Evidence of seepage may vary from a soft, wet area to a flowing spring, and may appear initially as only an area where vegetation is lush and dark green in color. Plant life typical to wetlands including; cattails, reeds, or mosses often become established in seepage areas. Downstream abutment areas should always be inspected closely for signs of seepage, as should the areas of contact between an embankment.

3.36 Blanket Drains

Blanket drains are designed to intercept seepage water and channel the flow to a discharge point. To do this the blanket material and the conduit that forms the drain need to be free of debris, sediment and deposits.

The alignment of the drain should be visually inspected for any depressions or holes, which could indicate a crushed, collapsed, or separated pipe. The discharge from the toe drain should also be monitored. Sudden changes in flow or the transport of sediment are an indication of serious changes that are occurring within the embankment and need to be addressed.

3.37 Spillway

The condition of the concrete surfaces should be examined to evaluate the deterioration and continuing serviceability of the concrete. Deficiencies in the concrete could include:

- Cracking
- Misalignment
- Scour
- Seepage/leakage

Cracking of the concrete could result from overstress due to applied loads, shrinkage and temperature effects or differential movement. Cracks need to identified and monitored to determine the cause, rate of progression, if any, and the presence of leakage.

Movement of the structure can result in both horizontal and vertical misalignment at joints and cracks. This could be due to settlements, heaving, deflections and lateral displacement.

All water passages and surfaces subject to running water should be inspected for erosion, scour, and cavitation damage. This type of damage is progressive, and if not addressed will compromise the integrity of the structure.

The faces, joints, and edges of the structure should be examined for evidence of seepage or leakage. Records of the location, approximate flow rate, and upstream water level should be kept so that changes with time and water pressure may be determined. The source of seepage should be identified if possible.

The toe of the structure should be inspected for erosion, undermining, and seepage/leakage. These could contribute to future instability if not addressed in a timely manner. If seepage/leakage is observed the upstream source needs to be located.

The timber stop logs should be inspected for deterioration, rot, and leakage. Any debris that prevents the logs from properly seating in the stack or on the concrete base should be identified and removed.

4.00 MAINTENANCE

4.10 GENERAL

A good maintenance program will protect the dams against deterioration and prolong its life. Nearly all components of the dam and the materials used in the dam's construction are susceptible to deterioration if not maintained. A well implemented maintenance program provides protection not only for the dam owner, but for the general public as well. Moreover, the cost of a proper maintenance program is small compared to the cost of major repairs, loss of life and property, and resulting litigation.

The prescribed maintenance program is based primarily on systematic and frequent inspections. During the inspections, a checklist of items calling for maintenance should be developed and kept as part of the dam's permanent record.

4.20 MAINTENANCE PRIORITIES

4.21 Immediate Maintenance

The following items are critical to the stability of the dam and call for immediate attention:

- A dam about to be overtopped or currently being overtopped
- A dam about to be breached (by progressive erosion, slope failure or other circumstances)
- A dam showing signs of piping or internal erosion indicated by increasingly cloudy seepage, sinkholes or other symptoms
- A spillway being blocked or otherwise rendered inoperable, or having normal discharge restricted
- Evidence of excessive seepage appearing anywhere at the dam site (an embankment becoming saturated, seepage exiting on the downstream face of the dam increasing in volume)

Although the remedy for some critical problems may be obvious (such as clearing a blocked spillway), the problems listed above generally require the services of a Professional Engineer familiar with the construction and maintenance of dams. The Director of Public Works for the Town of Bellingham should be notified when any of the above conditions are noted.

4.22 Required Maintenance at the Earliest Possible Date

The following items should be completed as soon as possible after the defective conditions are noted:

- All underbrush and trees should be removed from the dam and a good grass cover should be established
- Eroded areas and gullies on embankment dams should be restored and reseeded
- Defective spillways, gates and other appurtenant features of a dam should be repaired
- Deteriorated concrete, wood, or metal components of a dam should be repaired as soon as weather permits

4.23 Continuing Maintenance

Several tasks should be performed on a continuing basis:

- Routine mowing and general maintenance
- Maintenance and filling of any cracks and joints found in concrete
- Observation of any springs or areas of seepage
- Cleaning of the toe drain system
- Monitoring of development in the watershed which would materially increase runoff from storms
- Monitoring of development downstream and updating the Emergency Action Plan to include any new homes or other occupied structures within the area.

4.30 GUIDELINES

4.31 Removal of Debris

As previously mentioned the proper operation of the spillway, sluiceways, approach channels, and stream channels require regular and thorough debris removal and cleaning. Cleaning is especially important after upstream storms that tend to send more debris into the reservoir.

4.32 Regrading of Crests and Slopes

Deterioration of the surface of the dam may occur for several reasons. Wave action may cut into the upstream slope, vehicles may cause ruts in the crest or slopes, or runoff waters may cause erosion gullies on the downstream slopes. Damage of this nature must be repaired on a continuing basis.

The material selected for repairing embankments depends on the purpose of the earthwork. Generally, material should be free of ice, snow, organic material, trash, large stones or other deleterious material. An important soil property affecting compaction is the moisture content. Soils that are to dry or too wet do not compact well. Soils should be placed as close to the optimum moisture content as possible to facilitate compaction.

Before placement of earth, the repair area must be prepared by removing all inappropriate material. Vegetation such as brush, roots and tree stumps must be cleared and any large rocks or trash removed. All unsuitable earth, such as organic material, should be removed so that the work surface consists of exposed firm clean embankment material.

Following clean-up, the affected area should be shaped and dressed, so that the new fill can be compacted and will tie into the existing fill. If possible the slopes should be trimmed, and surfaces roughened by scarifying to improve the bond between the existing and new fill.

Soils should be placed in loose layers up to 8-inches thick and compacted to form a dense mass. Runoff that may accumulate should be directed away from the work area and repairs should be overfilled so that the fill maintains a crown and will shed water.

Erosion is one of the most common maintenance items at embankment structures. Erosion is a natural process, and its continuous forces will eventually break down any surface or structure. Periodic and timely maintenance is essential to prevent continued deterioration and possible failure.

Sturdy sod, free of wood and brush, is an effective means of preventing erosion. Embankment slopes are normally designed and constructed so that surface drainage will be spread out in thin layers on the grassy cover. When embankment sod is in poor condition or flows are concentrated at any location the resulting erosion will leave gullies in the embankment slope. Erosion repairs must be promptly addressed to prevent further serious damage to the embankment. Erosion in large gullies can be slowed by stacking hay bales across the gully until permanent repairs can be made.

Paths due to pedestrian or truck traffic are a problem for any embankment. If paths become established, vegetation will not provide adequate protection and a

more durable cover will be required unless the traffic is eliminated. Railroad ties or treated wood beams can be embedded in to the embankment slope to form an inexpensive stairway.

Erosion is also common at the point where an embankment and the concrete walls of the spillway or other structures meet. Poor compaction adjacent to the wall during construction and subsequent settlement can result in an area along the wall lower than the grade of the embankment. Runoff, can therefore, concentrate along these structures with resulting erosion. Possible solutions include periodic regrading of the area so that it slopes away from the wall, adding a more resistant surface protection, or construction of wooden steps.

Adequate erosion protection is also needed along the contact between the downstream face of the embankments and the abutments. Runoff from rainfall can concentrate in gutters constructed in these areas and can reach erosive velocities due to the relatively steep slopes. It is recommended that construction of gutters be avoided. A well graded mixture of rocks up to 9-12 inches in diameter placed on a layer of gravel generally provides the best protection on small dams.

4.33 Riprap

Water running down the slope of the embankments and under the riprap can erode the embankment. Sections of riprap that have slumped downward are often signs of a "beaching" problem. Beaching occurs when waves caused by high winds or motorboats erode the exposed face of the embankment by repeatedly striking the surface just above the normal pool elevation, rushing up the slope and returning back to the pool.

Resulting erosion of unprotected soil can be rapid and, during a severe storm, could lead to a complete failure of the dam.

Riprap should extend a minimum of three feet below the expected normal pool elevation. Otherwise wave action during periods of low water levels will undermine the riprap.

Riprap should be a heterogeneous mixture of irregular shaped stones placed over a layer of gravel filter material. The largest rock must be large enough to dissipate the energy of the expected wave action and hold the smaller stones in place. The smaller stones help fill the spaces between the larger pieces to form a stable mass. The filter material prevents soil particles on the embankment surface from being washed out through the spaces between the riprap.

A dam owner should anticipate some riprap deterioration because of weathering. Freezing, thawing, wetting and drying, abrasive wave action and other natural processes will eventually break down the material. Therefore, sufficient

maintenance funds should be allocated for the regular replacement of riprap. The useful life of the riprap varies depending upon the characteristics of the stones used. Stone, that is used for riprap should be rock that is dense and well cemented. When riprap breaks down, and erosion and beaching occur more often than every three to five years, a Professional Engineer should be consulted to design a more effective slope protection.

4.34 Vegetation

The entire dam should be kept clear of unwanted vegetation such as brush or trees. Excessive growth may cause one or more of the following problems:

- Obscure the surface of an embankment and prevent a thorough inspection of the dam;
- Large trees can be uprooted by high winds or erosion and leave large holes, making the dam susceptible to breaching;
- Some root systems can decay and rot, providing passageways for water, thus causing erosion;
- Expanding root systems can lift concrete slabs or structures and displace masonry stone walls;
- Weeds can prevent the growth of desirable grasses and can allow rodent habitats to develop.

When brush is cut down, it should be removed from the dam to permit a clear view of the embankment. Following the removal of large brush or trees, the left over root system should be removed if possible and the resulting holes properly filled. In cases where they cannot be removed, root systems should be treated with a herbicide to retard further growth.

If properly maintained, grass is an effective means of controlling erosion and enhances the appearance of the dam, while at the same time providing a surface that can be easily inspected. Grass plants tend to trap fine sand and soil particles that are easily eroded, and tend to form an erosion resistant layer once the plants are well established. Grass is least effective in areas of concentrated runoff or where subjected to wave action.

4.35 Rodent Damage Control

Rodents, such as groundhogs (woodchucks), muskrats, and beavers are naturally attracted to the habitats created by dams, and can, by their behavior, endanger the structural integrity of the dam and proper performance of the embankments and spillways. Groundhog and muskrat burrows can weaken embankments and

serve as pathways for seepage. Beavers can plug a spillway and raise the normal pool elevation. Thus, rodent control is essential to the preservation of the dams.

Occupied groundhog burrows are easily recognized in the spring because of the groundhog's habit of keeping them "cleaned out." Fresh soil is generally found at the mouth of active burrows. When burrowing into an embankment, groundhogs stay above the phreatic surface (upper surface of saturation) to stay dry. The burrow is rarely a single tunnel but rather is usually forked, with more than one entrance and several side passages or rooms generally 10 to 12 feet in length.

Muskrats begin their burrows below the water surface on the upstream slope and once inside the embankment burrow their nests above water. Theses borrows can be sufficiently deep to encounter groundhog burrows and provide a direct conduit for seepage.

Controls should be implemented in the early spring when active burrows are easy to find. In summer, fall and winter game animals tend to scurry into the burrows for brief protection and may inhabit the burrows during the groundhogs period of hibernation. Groundhogs can generally be controlled through the use of fumigants or firearms. Fumigation is the most practical method, although around buildings firearms may be more practical. Gas cartridges can be purchased at local firearms stores. Groundhogs can be discouraged from burrowing if the embankment grass is kept closely mown.

Methods of repairing rodent damage depend upon the nature of the damage, but in any case, extermination of the rodent population is the required first step. If damage consists mostly of shallow holes scattered across an embankment, repair may be necessary to maintain the appearance of the dam, to keep runoff waters from infiltrating the dam, or to discourage the rodents from subsequently returning to the embankments. In these cases simply tamping soil into the rodent hole serves as sufficient repair. Soil should be placed as deeply as possible and compacted with a pole or shovel handle.

Large burrows on an embankment should be filled by mud-packing. This simple, inexpensive method involves placing one or two lengths of metal stove pipe vertically over the entrance to the den with a tight seal between the pipe and den. A mud-pack mixture is then poured into the pipe until the burrow and the pipe are filled with the mixture. The pipe is removed and additional dry earth is tamped into the entrance. The mud-pack mixture is made by adding water to a 90 percent earth and 10 percent cement mixture until a smooth slurry of thin cement is attained. After completing all entrances should be plugged with well-compacted earth and grass cover reestablished as soon as possible. It is imperative that rodent activity around the dams be controlled as this often poses the single most important threat to the stability of the dam.

4.36 Concrete and Stone Masonry

Periodic maintenance should be performed on all concrete surfaces to repair deteriorated areas and along the stone masonry walls to maintain the necessary freeboard. Concrete deterioration should be repaired immediately when noted; it is most easily repaired in its early stages. Deterioration can accelerate and, if left unrepaired, can result in serious problems or dam failure. An experienced engineer should be consulted to determine both the extent of deterioration and the proper method of repair.

Concrete repairs to spalled areas, cracks, joints or overlays should be completed using an epoxy-modified mortar applicable to underwater applications. Where stones along the masonry stone walls have been displaced or disturbed, they should be removed, surfaces cleaned, and reset. All of the mortars should be applied in accordance with the manufacturer's recommendations. The Sika Corporation of Lyndhurst, New Jersey and Avanti International of Webster, Texas produce several products that may be applicable to dam environments.

4.37 Metal Components

All exposed, bare ferrous metal components on all structures where submerged or exposed to air will tend to rust. To prevent corrosion, exposed ferrous metal must be either painted or heavily greased. If painted, the paint should be appropriate to the required application and applied in accordance with the manufacturer's recommendations. Because rust is especially damaging to contact surfaces, all rust should be removed prior to the application of paints or periodic application of grease to the required components.

4.38 Timber Maintenance

Wood is one of the most durable materials, but over extended periods it may be subjected to deterioration from decay, insect attack, or mechanical damage. Timber structures must be periodically maintained or rehabilitated in order to keep them in a condition that will give optimum performance and service life. Effective timber structure maintenance programs improve public safety, extend the service life of the structure, and reduce the frequency and cost of repairs. The objective is not only to repair existing deficiencies, but also to take corrective measures to reduce or prevent future problems. When tied to a comprehensive dam inspection program, regular maintenance represents the most cost effective approach for achieving a long service life.

Moisture control is the simplest, most economical method of reducing the hazard of decay in timber structures. When exposure due to wetting is reduced, members can dry to moisture contents below that required to support most fungal and insect growth. Although most current timber construction is treated with preservative treatments, decay can still occur where the layer of

preservative is shallow or broken. Decay is the major cause of deterioration in timber structures. It is recommended that a preservative be applied to the structures at least every two years in accordance with the manufacturer's specifications.

4.39 Traffic Damage Control

Maintenance vehicles driving across the top of the embankments of the dams may create ruts in the dam crest if the crest is not surfaced with roadway material. The ruts are likely to collect water and cause saturation and softening of the embankment structure. These ruts often collect and intensify runoff, leading to severe erosion. Unauthorized vehicles should be banned from dam slopes and crest. Ruts that develop should be repaired as soon as noticed.

FIGURES

SILVER LAKE

N

PARE CORP.

CHAINLINK FENCING

CHAINLINK FENCING
WITH 10' WIDE GATE.

SITE ENTRANCE

STONE RIP RAP

NORMAL POOL
ELEV. 98

STEEL SHEETPILE CUTOFF WALL
STA. 0+00 TO 0+75

CONCRETE SPILLWAY @ ELEV. 98
WITH 2 BAYS OF TIMBER STOPLOGS

TIMBER WALKWAY AND RAILING

STONE WALL AND RIP RAP

STONE RETAINING WALL

TIMBER FENCE

RESIDENCE

BLANKET DRAIN

DAM CREST

DUPRE ROAD

STONE WALL AND RIP RAP

FLOW

38'

STONE RETAINING WALL

GARAGE

GRAPHIC SCALE
30' 0 30'
SCALE 1"=30'

PARE ENGINEERING CORPORATION
49 WALPOLE STREET, SUITE 2
NORWOOD, MA 02062
781 - 762 - 1442

BAR IS ONE INCH ON ORIGINAL DRAWING.

0" 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

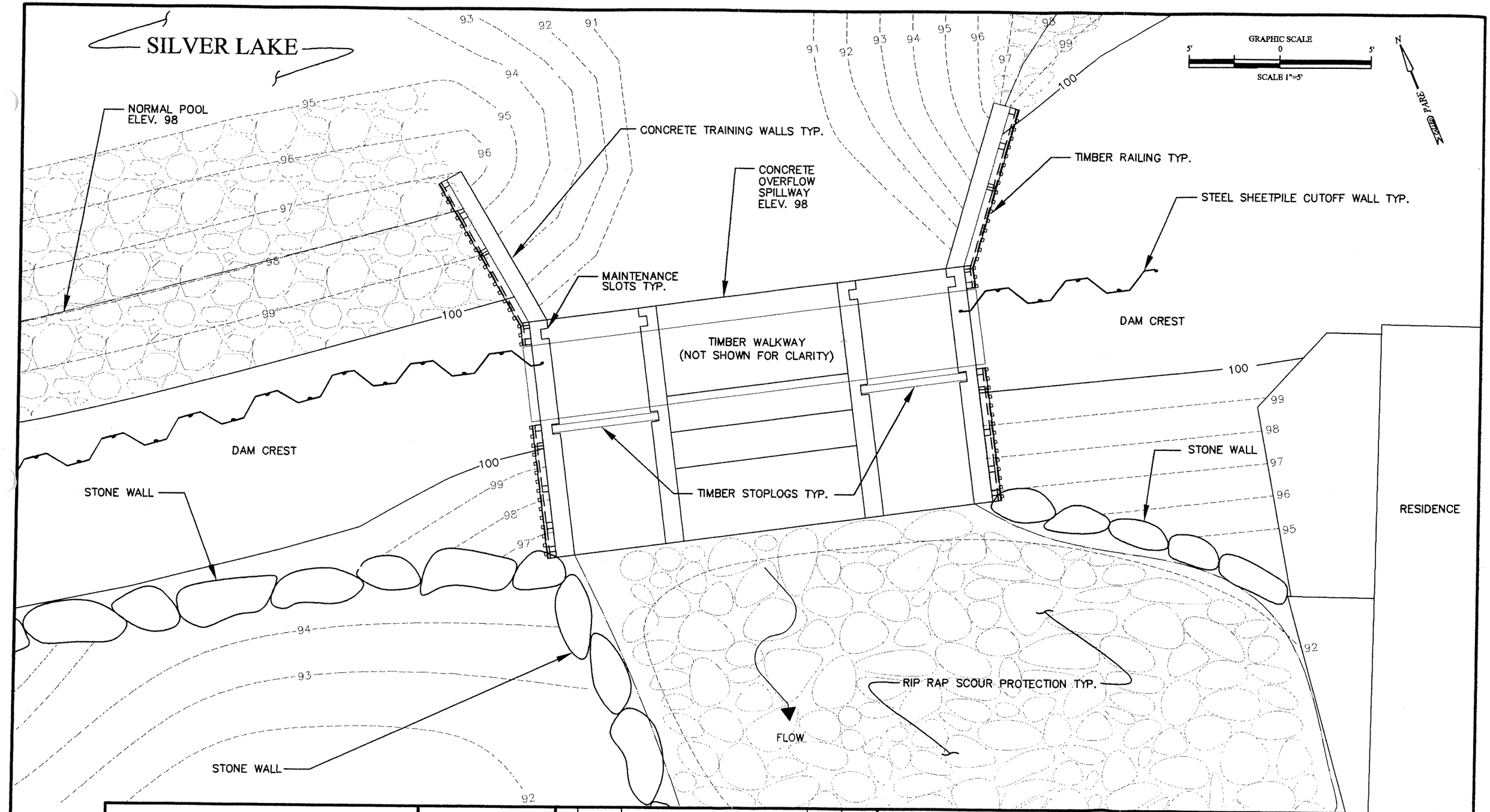
NO.	DATE	REVISIONS	BY	APVD.

FIGURE 1

GENERAL SITE PLAN

SILVER LAKE DAM
TOWN OF BELLINGHAM
BELLINGHAM, MASSACHUSETTS

SCALE:	1"=30'
DATE:	AUGUST 2000
PROJECT NO.:	98130.02
DRAWING:	SLDGSITE.DWG



PARE ENGINEERING CORPORATION
49 WALPOLE STREET, SUITE 2
NORWOOD, MA 02062
781 - 762 - 1442

BAR IS ONE INCH ON ORIGINAL DRAWING.

0" ——— 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

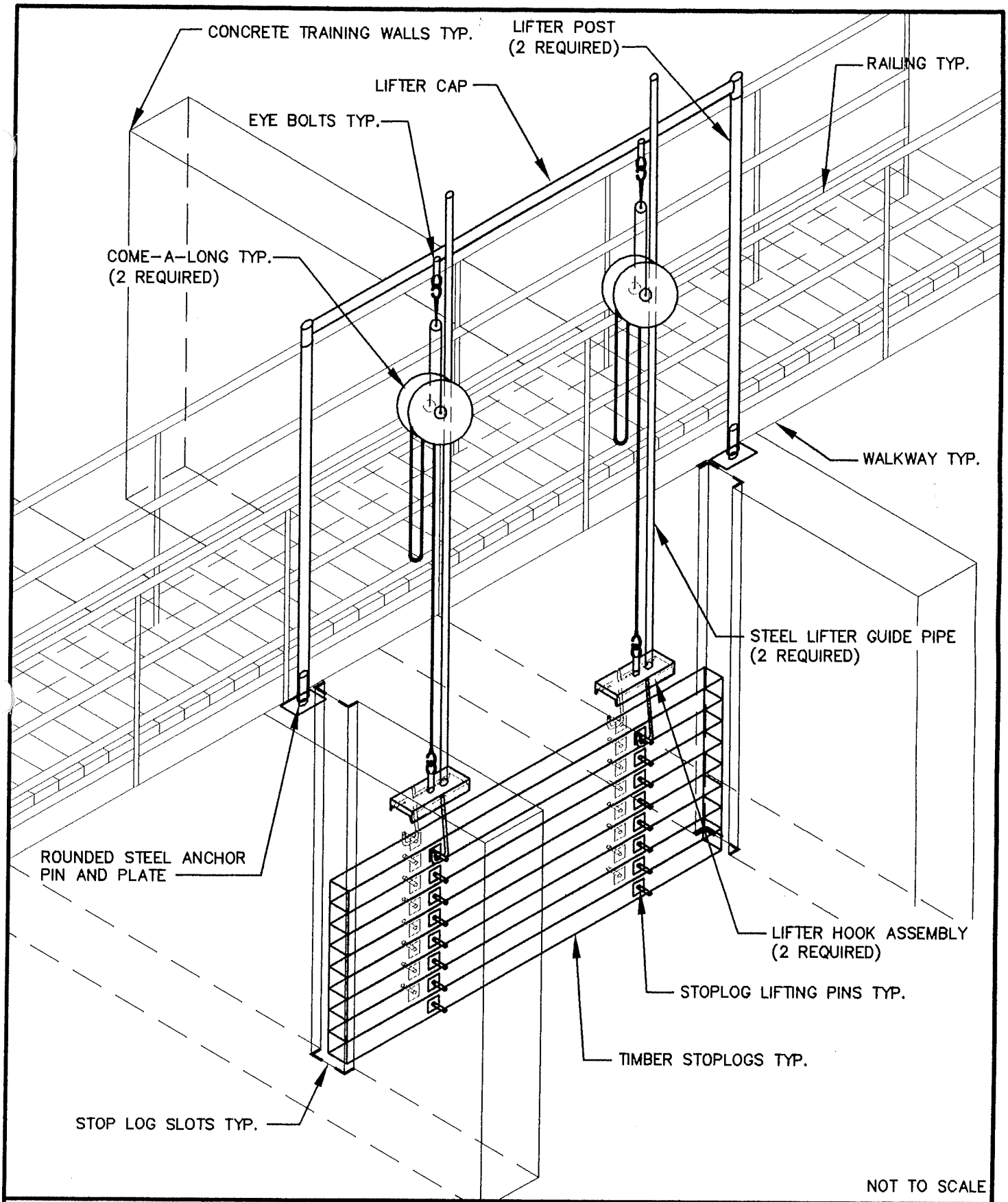
NO.	DATE	REVISIONS	BY	APVD.

FIGURE 2

GENERAL SPILLWAY PLAN

SILVER LAKE DAM
TOWN OF BELLINGHAM
BELLINGHAM, MASSACHUSETTS

SCALE:	1"=5'
DATE:	AUGUST 2000
PROJECT NO.:	98130.02
DRAWING:	SLDo&m.DWG



NOT TO SCALE

PROJECT NO. 98130.02 DATE: AUGUST 2000

FIGURE 3

STOPLOG LIFTING SYSTEM AND LIFTER DEVICE

SILVER LAKE DAM
TOWN OF BELLINGHAM
BELLINGHAM, MASSACHUSETTS

PARE

PARE ENGINEERING CORPORATION
49 WALPOLE STREET, SUITE 2
NORWOOD, MA 02062
781 - 762 - 1442

TABLES

TABLE 1

TELEPHONE LIST

1. OWNER: Town of Bellingham
   CONTACT: Director of Public Works
   Mr. Don DiMartino
   PHONE: (508) 966-5813 (work)
   (000) 000-0000 (home)

2. LOCAL FIRE DEPARTMENT
   PHONE: (508)966-1112

3. LOCAL POLICE DEPARTMENT
   PHONE: (508)966-1515

4. MASSACHUSETTS STATE POLICE - Foxboro Barracks
   PHONE: (508) 543-8550

5. DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
   OFFICE OF DAM SAFETY – Mr. R. David Clark, Chief
   PHONE: (508) 792-7716 X115

6. PARE ENGINEERING CORPORATION
   CONTACT: Mr. J. Matthew Bellisle, P.E.
   PHONE: (781) 762-1442 (work)
   (401) 821-6674 (home)

7. DOWNSTREAM PROPERTY OWNERS:

NAME	ADDRESS	PHONE
1. Edward Falkenstrom	80 Cross Road	(508) 883-9365
2. Maurice and Pauline Blais	21 Dupre Road	Not Listed
3. Roy A. Silva c/o Renee Massee	59 Silver Lake Road	Not Listed
4. Walter and Frances Tetreault	20 Dupre Road	Not Listed

TABLE 2

MAINTENANCE/INSPECTION SCHEDULE

Month	Maintenance Item	Inspection
January	*	**
February	*	**
March	*	**
April	1. Return impoundment to normal pool. (Memorial Day) 2. Clean toe drain and discharge channel.	1. Informal observation
May	*	**
June	1. Mow grass along slopes.	1. Informal observations
July	*	**
August	*	**
September	1. Implement winter drawdown. (Labor Day)	1. Maintenance Inspection (before drawdown)
October	1. Mow grass along slopes. 2. Clean toe drain sumps and discharge channel.	1. Informal observations
November	*	**
December	*	**

* Additional maintenance should be performed as required to address deficiencies as observed.

** Informal observations should be performed whenever the site is visited and after all storms.

APPENDIX A
INSPECTION FORMS

DAM SAFETY INSPECTION CHECKLIST

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF DAM SAFETY

NAME OF DAM: SILVER LAKE DAM

DEM I.D. NO.: 6-11-25-14

NATIONAL I.D. NO.: NA

DEM SIZE CLASSIFICATION: INTERMEDIATE

DEM HAZARD CLASSIFICATION: SIGNIFICANT

CITY/TOWN: BELLINGHAM

COUNTY: NORFOLK

USGS QUAD.: FRANKLIN

LAT./LONG.: 42º3'32" / 71º28'3"

DRAINAGE BASIN: BLACKSTONE

RIVER: ST. PETERS RIVER

IMPOUNDMENT NAME: SILVER LAKE

TYPE OF DAM: EMBANKMENT

HEIGHT OF DAM: 9 FT

LENGTH OF DAM 275 FT

NORMAL POOL STORAGE: 168.8 ACRE FEET

EL. NORMAL POOL: 98 FT

EL. POOL DURING INSP.:

EL. TAILWATER DURING INSP.

DATUM: ASSUMED (TOP OF TRAINING WALL = 100 FT)

BENCHMARK: TOP OF CONRETE SPILLWAY (ELEVATION 98 FT)

DATE OF INSPECTION:

DATE OF LAST INSPECTION:

WEATHER:

TEMPERATURE:

INSPECTED BY:

SIGNATURE:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

EMBANKMENT

AREA INSPECTED	CONDITION	OBSERVATIONS
CREST	SURFACE TYPE	
	SURFACE CRACKING	
	SINKHOLES, ANIMAL BURROWS	
	VERTICAL ALIGNMENT (DEPRESSIONS)	
	HORIZONTAL ALIGNMENT	
	RUTS AND/OR PUDDLES	
	VEGETATION (PRESENCE/CONDITION)	
	ABUTMENT CONTACT	

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

EMBANKMENT

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S SLOPE	WET AREAS (NO FLOW)	
	SEEPAGE	
	SLIDE, SLOUGH, SCARP	
	EMB.-ABUTMENT CONTACT	
	SINKHOLE/ANIMAL BURROWS	
	EROSION	
	UNUSUAL MOVEMENT	
	VEGETATION (PRESENCE/CONDITION)	

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

UPSTREAM AND/OR DOWNSTREAM MASONRY WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
D/S WALLS	WALL TYPE			
	WALL ALIGNMENT			
	WALL CONDITION			
	HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	SEEPAGE OR LEAKAGE			
	ABUTMENT CONTACT			
	EROSION/SINKHOLES BEHIND WALL			
	ANIMAL BURROWS			
	UNUSUAL MOVEMENT			
	WET AREAS AT TOE OF WALL			

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

EMBANKMENT

AREA INSPECTED	CONDITION	OBSERVATIONS
U/S SLOPE	SLIDE, SLOUGH, SCARP SLOPE PROTECTION TYPE AND COND. SINKHOLE/ANIMAL BURROWS EMB.-ABUTMENT CONTACT EROSION UNUSUAL MOVEMENT VEGETATION (PRESENCE/CONDITION)	

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

UPSTREAM AND/OR DOWNSTREAM MASONRY WALLS

AREA INSPECTED	CONDITION	OBSERVATIONS		
U/S WALLS	WALL TYPE			
	WALL ALIGNMENT			
	WALL CONDITION			
	HEIGHT: TOP OF WALL TO MUDLINE	min:	max:	avg:
	ABUTMENT CONTACT			
	EROSION/SINKHOLES BEHIND WALL			
	ANIMAL BURROWS			
	UNUSUAL MOVEMENT			

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

DOWNSTREAM AREA

AREA INSPECTED	CONDITION	OBSERVATIONS
D/S AREA	ABUTMENT LEAKAGE	
	FOUNDATION SEEPAGE	
	SLIDE,SLOUGH,SCARP	
	WEIRS	
	DRAINAGE SYSTEM	
	INSTRUMENTATION	
	VEGETATION	
	ACCESSIBILITY	
	DOWNSTREAM HAZARD DESCRIPTION	
	DATE OF LAST EAP UPDATE	

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

PRIMARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: NATIONAL I.D. NO.: NA

AUXILIARY SPILLWAY

AREA INSPECTED	CONDITION	OBSERVATIONS
SPILLWAY	SPILLWAY TYPE	
	WEIR TYPE	
	SPILLWAY CONDITION	
	TRAINING WALLS	
	SPILLWAY CONTROLS AND CONDITION	
	UNUSUAL MOVEMENT	
	APPROACH AREA	
	DISCHARGE AREA	
	DEBRIS	
	WATER LEVEL AT TIME OF INSPECTION	

ADDITIONAL COMMENTS:

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

INSPECTION DATE: _____ NATIONAL I.D. NO.: NA

MISCELLANEOUS

AREA INSPECTED	CONDITION	OBSERVATIONS		
MISC.	RESERVOIR DEPTH (AVG)			
	RESERVOIR SHORELINE			
	RESERVOIR SLOPES			
	ACCESS ROADS			
	SECURITY DEVICES			
	VANDALISM OR TRESPASS	YES: ☐	NO: ☐	WHAT:
	AVAILABILITY OF EAP/LAST UPDATE	YES: ☐	NO: ☐	DATE:
	AVAILABILITY OF O&M MANUAL	YES: ☐	NO: ☐	DATE:

ADDITIONAL COMMENTS: _____

APPENDIX B
MAINTENANCE RECORD LOG

MAINTENANCE RECORD LOG

NAME OF DAM: SILVER LAKE DAM DEM I.D. NO.: 6-11-25-14

DATE: NATIONAL I.D. NO.: NA

WORK PERFORMED BY: EQUIPMENT USED:

SUMMARY OF WORK PERFORMED:

AREA	EXISTING CONDITION	DESCRIPTION OF WORK
Ex. Spillway	*Spillway blocked with debris*	*Removed debris with backhoe*

ADDITIONAL COMMENTS:

APPENDIX C
RECORD OF DAM OPERATIONS

RECORD OF DAM OPERATIONS

NAME OF DAM: SILVER LAKE DAM

DEM I.D. NO.: 6-11-25-14

NATIONAL I.D. NO.: NA

SUMMARY OF OPERATING PROCEDURES:

DATE	PERSONNEL	AREA	DESCRIPTION OF WORK
Ex. 6/1/99	*C. Dammer*	*Spillway*	*Removed top two stop logs at east sluiceway*

Town of Bellingham

SILVER LAKE DAM IMPROVEMENTS

SECTION 9

PROJECT PLANS

titled "Silver Lake Dam Improvements" dated December 2024
by Pare Corporation (bound separately)