NOTICE OF INTENT

PROPOSED 7-UNIT RESIDENTIAL DEVELOPMENT

373 PLEASANT STREET
MELROSE, MA 02176

Prepared by:
FODERA Engineering
28 Harbor Street, Suite 204
Danvers, MA 01923

Prepared for (Applicant):
373 Pleasant Street LLC
25 Channel Center Street
Boston, MA 02210

Date:
October 27, 2021

FODERA
ENGINEERING

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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

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

A. Applicant Information

1. Location of Project:

373 Pleasant Street	Melrose
a. Street Address	b. City/Town
	$537.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Raymond	Boghos	
a. First Name	b. Last Name	
Boghos Properties		
c. Organization		
25 Channel Center Street		
d. Mailing Address		
Boston	MA	02210
e. City/Town	f. State	g. Zip Code
(781) 820-5129		ray.boghos@boghosproperties.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

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
Category 3 - Building for development	1	$1,050.00	$1,050.00

Step 5/Total Project Fee:

Step 6/Fee Payments:

Total Project Fee:	$1,050.00 (a. Total Fee from Step 5)
State share of filing Fee:	$512.50 (b. 1/2 Total Fee **less** $12.50)
City/Town share of filling Fee:	$537.50 (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.)

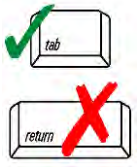
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
& Town of Reading General Bylaw Section 7.1

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
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):

a. Street Address	b. City/Town	c. Zip Code
373 Pleasant Street	Melrose	02176

Latitude and Longitude:

d. Latitude	e. Longitude
42.449324	-71.070190

f. Assessors Map/Plat Number	g. Parcel /Lot Number
B5	122

2. Applicant:

a. First Name	b. Last Name
Raymond	Boghos

c. Organization: Boghos Properties

d. Street Address: 25 Channel Center Street

e. City/Town	f. State	g. Zip Code
Boston	MA	02210

h. Phone Number	i. Fax Number	j. Email Address
(781) 820-5129		ray.boghos@boghosproperties.com

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

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):

a. First Name	b. Last Name

c. Company

d. Street Address

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

h. Phone Number	i. Fax Number	j. Email address

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

a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid
$500.00	$237.50	$262.50

A. General Information (continued)

6. General Project Description:

Proposal of a 7-unit town-home style development with associated driveway, utilities, and landscaping.

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)

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:

a. County	b. Certificate # (if registered land)
Middlesex South	
c. Book	d. Page Number
Deed Book 76228	Deed Page 489

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.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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& Town of Reading General Bylaw Section 7.1

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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	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 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	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: 13,186 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.
13,186	3,296	7,150

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.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
& Town of Reading General Bylaw Section 7.1

Provided by MassDEP:
MassDEP File Number
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City/Town

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

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

   10/27/2021
   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 http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/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 http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). 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, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; 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 - Cohasset 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@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

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.

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Bureau of Resource Protection - Wetlands
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& Town of Reading General Bylaw Section 7.1

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
City/Town

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

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

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

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.

D. Additional Information (cont'd)

3. [X] 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. [X] List the titles and dates for all plans and other materials submitted with this NOI.

Proposed 7-unit Residential: Multi-Family Building	
a. Plan Title	
Fodera Engineering	Giovanni Fodera, P.E. #54884
b. Prepared By	c. Signed and Stamped by
10/27/2021	1" = 10'
d. Final Revision Date	e. Scale
Stormwater Management Report	August 13, 2021
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. [X] Attach NOI Wetland Fee Transmittal Form

9. [X] 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:

1051	10/4/2021
2. Municipal Check Number	3. Check date
Online Transaction ID: 1314072	10/4/2021
4. State Check Number	5. Check date
Fodera Engineering	
6. Payor name on check: First Name	7. Payor name on check: Last Name

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.

DocuSigned by:
Raymond Boglios
EADF5CCA27B8464...

1. Signature of Applicant	2. Date: 10/29/2021
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any)	6. Date

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.

1.0: INTRODUCTION

The proposed project is a seven (7) unit multi-family development project located on map B5 lot 122 (373 Pleasant Street) in Melrose Massachusetts. The parcel is 13,186 square feet (0.30 acres) and currently contains a single-family dwelling and detached garage accessed from Pleasant Street. The constructed Spot Pond Brook is located slightly over fifty (50) feet south of the parcel. Proposed work is within the 200' riverfront area of the Brook. The Brook is a human-made concrete channel at the portion associated to the site, and travels from Spot Pond, over 1.2 miles northwest, and southerly through a series of underground culverts to Malden River, about 1.6 miles south. The site is in a heavily populated area with the Massachusetts Bay Transportation Authority (MBTA) train route just east of the site and runs along the daylighted portion of the Brook. Additionally, the City of Malden is located just 0.6 mile south of the site and is a designated "densely developed area" pursuant to 301 CMR 10.00, with an associated 25-foot riverfront protected resource zone.

2.0: EXISTING CONDITIONS

2.1: RESOURCE AREAS

The following protected resource areas as defined by the Massachusetts Department of Environmental Protection (MassDEP) are located outside of the subject site. The nearest certified vernal pool is a half mile west of the site. Areas designated wildlife habitat by Natural Heritage of Endangered Species Programs (NHESP) were found to be a quarter mile west of the site. There are no areas of environmental concern. The site is outside of any wellhead protection and drinking supply areas. Areas subject to a 1% annual chance of flooding is located away from the site as displayed on the Flood Insurance Rate Map (FIRM) 25017C0429E with an effective date of 6/4/2010. Lastly, there are no areas nearby containing inland bordering vegetated wetlands.

The resource area on-site is the riverfront associated to Spot Pond Brook located over fifty (50) feet south of the site. All 13,186 square-feet (sf) of the lot is within the resource area and 4,821 sf of the lot is within 100-ft of the riverfront. The brook has a significant portion that travels underground through the city and daylights from a culvert in the section south of the subject site. This section of the brook is human-made and continues to flow southerly through more underground culverts. A certified wetlands scientist from Norse Environmental inspected the section south of the site in November 2020 and determined the boundaries of the brook to be the daylight opening at the culvert and delineated the edge of the concrete culvert as the Brook's outer edge. The provided site plans display the off-site field located boundary of the Brook and associated riverfront setbacks.

2.2: EXISTING SITE CONDITONS

The site currently contains an existing single-family home with a rear detached garage that is accessed from paved driveway from Pleasant Street. The remaining surface area on site is a grassed lawn with tree canopy in the rear (eastern side). A 43.75' wide drainage easement spans across the rear width of the parcel and is used as a subsurface drainage culvert for Spot Pond Brook.

All existing on-site degraded area was placed prior to 1996 and consists of the dwelling structure, detached garage, walkways with steps, a deck, on-site walls, and a paved driveway. The driveway is the closest portion of degraded area to the Brook at the closest point measuring 65.5'. Degraded area is summarized in Table 2.2(1) below. The remainder of the rear yard is a maintained grassed lawn with six on-site trees that shed canopy to the lawn.

Table 2.2(1): Existing Surfaces

	0' – 100'	100' – 200'	Total Riverfront
Degraded Surface, sq-ft	**1,128**	**2,483**	**3,611**
Vegetated Surface, sq-ft	**3,693**	**5,882**	**9,575**
TOTAL, sq-ft	**4,821**	**8,365**	**13,186**

Downgradient and closer to the Brook is off the subject parcel but contains additional degraded area from a shared driveway, and a private shed located about 36' from the Brook's boundary. All runoff from the degraded areas slopes towards Spot Pond Brook without any known stormwater Best Management Practices (BMPs).

2.3: TOPOGRAPHY, SITE SOILS & GROUNDWATER

The site is relatively flat with an overall slight pitch to the southeast, towards Spot Pond Brook. Topography slopes downgradient for a short section at a 3:1 pitch towards the middle of the site from elevation 106 to 102 and gradually tapers to a slightly level ground to an elevation of 99 at the lowest point on-site located at the eastern property line.

Site soils were determined by online data research from the Natural Resources Conservation Service (NRCS) mapping system. Soil maps from the NRCS has the site being located within an area of soils determined to be Urban Land, however, the overall area contains nearby soils to be Charlton-Urban land-Hollis complex with an associated Hydrologic Soil Group A (HSG-A). Soils classified as HSG-A have a high infiltration rate and generally has deep groundwater.

Soils were tested by deep observation test hole on July 23, 2021 by a certified soil evaluator MA #1848 and determined soil to be sand approximately two (2) feet below surface. Sand is classified as HSG-A. The estimated seasonal high-water table was determined to be about 7.5' – 8' below surface and at an elevation of 94.2 with respect to the site plans topography. Test hole locations and profile summaries are displayed on Sheet C4 of the site plans and evaluator's report within the Appendix D.

2.4: EXISTING UTILITIES & STORMWATER INFRASTRUCTURE

The existing dwelling on site is serviced by public and private utilities. Public water and sanitary sewer provided by the City of Melrose are currently in place. Private companies providing gas and electricity separately are also in place. There are no known stormwater facilities currently on site to mitigate on-site runoff. There is an existing stormwater collection system within Pleasant Street near the subject site. On-site runoff is in the general direction southernly towards Spot Pond Brook.

3.0: PROPOSED CONDITIONS

3.1: PROPOSED SITE CONDITONS

The project proposes to demolish the existing on-site structures and to construct seven (7) townhome style units with associated driveway access, parking, utilities, and stormwater recharge. All proposed work will be within the 200' riverfront that will consist of the new building, the driveway, a patio/ walkway, and proposed landscaping for riverfront restoration. Most of the site will be utilized throughout construction as displayed on the accompanied site plans prepared by Fodera Engineering, with a revision date of 10/27/21. The new building will be 65.5 feet from the Brook at the closest point. Associated walkways will be about 58 feet from the Brook, and a stormwater overflow structure will be 55.5 feet from the Brook. The patio will be made of pervious pavers to help mitigate stormwater runoff. The proposed project will increase total on-site impervious surface area by 6,665 sf. All surface runoff has been demonstrated to comply with local and state stormwater regulations, and the following sections outline in further detail regulations regarding the associated riverfront.

Table 3.1(1): Proposed Surfaces

	0' – 100'	100' – 200'	Total Riverfront
Degraded Surface, sq-ft	**3,296**	**7,150**	**10,446**
Vegetated Surface, sq-ft	**1,525**	**1,215**	**2,740**
TOTAL, sq-ft	**4,821**	**8,365**	**13,186**

3.2: PROPOSED STORMWATER INFRASTRUCTURE

The project will improve drainage capture for treatment of stormwater runoff, but the site will generally maintain the natural pitch to the southeast towards the daylighted section of Spot Pond Brook. All stormwater from roof runoff and the new driveway will be captured and directed to the subsurface infiltration system that is located under the paved driveway. The system is designed to contain 1,418 cubic-feet of storage volume and will treat runoff to a minimum of 80% removal of Total Suspended Solids (TSS), and other potential pollutants as described in other sections of this report. Any overflow, in an extreme event, will be directed to an outlet opening pipe that daylights to a rip-rap surface at the southern property line, directed towards the grassed strip upgradient of Spot Pond Brook. The overflow outlet will be 55.5 feet from the bordering Brook.

4.0: RESOURCE AREA REGULATIONS

The following sections are excerpts from local and state bylaws to outline the associated project and riverfront area's significance to the interests identified in the Wetlands Protection Act and MGL c. 131, § 40. *Italicized text* are bylaw excerpts and **bold texts** are project associated responses to the bylaws.

4.1: LOCAL ENVIRONMENTAL BYLAWS

CITY OF MELROSE, MA. PART II: GENERAL LEGISLATION. CHAPTER 231 – WETLANDS PROTECTION

§ 231-1. Purpose.

A. The purpose of this chapter is to protect the wetlands, water resources, and adjoining land areas in the City of Melrose by controlling activities deemed by the Conservation Commission likely to have a significant or cumulative effect upon resource area values, including but not limited to the following: public or private water supply, groundwater, flood control, erosion and sedimentation control, storm damage prevention, water quality, water pollution control, fisheries, shell fisheries, wildlife habitat, rare species habitats, including rare plant species, native plant species, and recreation values (collectively, the "resource area values protected by this chapter").

B. This chapter is intended to utilize the home rule authority of the City of Melrose to protect additional resource areas, for additional values, with additional standards and procedures stricter than those of the Wetlands Protection Act, MGL c. 131, § 40, and the regulations promulgated thereunder at 310 CMR 10.00.

§ 231-6. Standards.

No permit shall be granted unless the applicant's proposed project complies with the following requirements or unless the Commission, in its sole discretion, deems it necessary or desirable to waive any provision herein.

A. Setbacks. The following setbacks are minimum setbacks and may be extended further if the Commission, in its sole discretion, deems it necessary for the protection of the resource values protected by this chapter. Minimum setbacks will be viewed on a case-by-case basis. The Commission shall take into account the cumulative adverse effects of loss, degradation, isolation, and replication of the resource areas protected by this chapter. Information to be assessed includes, but is not limited to, leaching, erosion, drainage, on-site ponding, and general effect on wetlands.

(1) General. No permit for any alteration or structure shall be issued unless the proposed project complies with the following minimum setbacks:

(a) No disturbance zone. A no disturbance zone shall be provided and maintained in the area of land situated between a wetland and a parallel line located 15 feet away, measured outward horizontally from the edge of the wetland. The no disturbance zone shall be naturally vegetated and free from oil, hazardous materials, and chemicals (including, without limitation, fertilizers, herbicides and pesticides).

The site is not subject to wetland buffer restrictions, however, all work is located over fifty-five (55) feet from the culvert.

(b) No construction zone. A no construction zone shall be provided and maintained in the area of land situated between a wetland and a parallel line located 20 feet away, measured outward horizontally from the edge of the wetland. Lawns and landscaping are permitted but structures and appurtenances thereto are prohibited in the no construction zone.

The site is not subject to wetland buffer restrictions, however, all work is located over fifty-five (55) feet from the culvert.

(2) Wetland-dependent structures. A zero-foot setback for wetland dependent structures (drain outfalls, weirs, etc.) will be permitted where the Commission, in its sole discretion, deems reasonable.

(3) Upland access. A zero-foot setback for site improvements necessary for upland access will be permitted where the Commission, in its sole discretion, deems reasonable alternative access to be unavailable.

(4) Wetland setbacks for preexisting structures. Projects associated with preexisting structures or projects not presently in compliance with this chapter may not increase the degree of nonconformance of those structures or projects. No new alteration shall be commenced and no new structure shall be located within the no construction zone or no disturbance zone, as set forth in this chapter.

B. Floodplain requirements. There shall be no net loss of flood storage volume at any elevation. There shall be no increase in the rate of runoff as a result of any project. The Commission may impose specific planting and/or maintenance requirements in order to achieve floodplain requirements. The Commission may also require the applicant to conduct drainage calculation studies and to take other mitigation measures as appropriate.

The site does not contain area of flooding as demonstrated on the latest FEMA Flood Insurance Rate Map. The 100-year flood boundary is limited to within the concrete channel of Spot Pond Brook, and therefore proposed work will not alter flood storage volume. Additionally, stormwater calculations are provided to demonstrate a decrease in peak rate of runoff.

C. Wildlife habitat. No project may result in the loss of critical habitat or cause negative impacts on critical habitat of rare, threatened, or endangered species, or species of special concern. Any applicant proposing an alteration near a critical habitat area shall be required to include a description of wildlife habitat characteristics observed on the property. The Commission may require a wildlife habitat study of the project area, to be paid for by the applicant, whenever it deems appropriate, regardless of the type of resource area or the amount or type of alteration proposed. The decision to perform a wildlife habitat study shall be based upon the Commission's estimation of the importance of the habitat area, considering (but not limited to) such factors as proximity to other areas suitable for wildlife, importance of wildlife corridors in the area, or possible presence of rare species in the area. The work shall be performed by an

individual who, at a minimum, meets the qualifications set out in the wildlife habitat section of the Wetlands Protection Act.

The site is not located near any areas that contain wildlife habitat, as displayed from the Natural Heritage & Endangered Species Program (NHESP) maps for rare species habitat areas. The project will not have any impact to wildlife habitat.

D. Stormwater management.

(1) Any applicant proposing an increase of impervious area greater than 500 square feet within a buffer zone or land subject to flooding must demonstrate that there will be no net increase in runoff peak discharge rate and no net loss of recharge to groundwater.

(2) This requirement may be met in one of two ways:

(a) DEP Stormwater Policy method. An applicant may submit engineering calculations using methods approved in the Massachusetts DEP Stormwater Management Policy and guidance documents in effect at the time of the application, showing pre- and post-development recharge and peak discharge rates for a one-, two-, and ten-year storm. Drainage calculations submitted in compliance with the DEP Stormwater Policy may be used to satisfy this requirement but must include calculations for a one-year storm in addition to those required under the DEP policy.

Stormwater calculations are provided and are performed in compliance with the City of Melrose and MA Stormwater Handbook. A subsurface infiltration system is proposed and calculations demonstrate that the peak rate of runoff is decreased for all storm events up to the 100-year storm. Additionally, all stormwater is sufficiently treated in accordance with the Massachusetts Stormwater Handbook and that groundwater recharge is enhanced from the proposed design. Stormwater design has been reviewed by, and approved by the City of Melrose Engineering Department.

(b) Low-impact development method.

[1] As an alternative to the DEP method, applicants may receive a presumption that the stormwater performance standard is met by applying low-impact development (LID) best management practices to all new impervious surfaces. The applicant may utilize as many or as few of the following techniques as needed to effectively manage stormwater on site, subject to the approval of the Commission:

[a] Removal of preexisting impervious area of the same or greater size in the same drainage area;

[b] Use of permeable pavers in place of impervious materials;

All pavers proposed on-site will be pervious.

[c] Design of surfaces so that runoff will be in the form of sheet flow directed towards a naturally vegetated buffer area. The width of the naturally vegetated area must be at least equal to the width of the impervious area;

[d] Direction of runoff flow to rain gardens or bioretention areas. These areas should be large enough to accommodate the volume of one inch of runoff over the area of contributing impervious surface;

[e] Use of green roof systems;

[f] Connection of runoff from new impervious areas to dry wells or other infiltration devices. Said devices should be large enough to accommodate the volume one inch of runoff over the area of contributing impervious surface; or

[g] Other similar stormwater management practices as may be approved by the Commission on a case by- case basis.

[2] Applicants electing to apply LID methods are not required to submit drainage studies unless required to do so under the Massachusetts DEP Stormwater Management Policy. Use of low-impact development practices is encouraged for all projects, including those involving under 500 square feet and those subject to the DEP Stormwater Management Policy. The Commission may require the use of LID practices in any project where the Commission deems such use necessary to preserve the values protected under this chapter.

§ 231-9. Waiver.

A. Strict compliance with this chapter may be waived when, in the sole judgment of the Commission, such action is in the public interest and is consistent with the intent and purpose of the chapter. In addition, any person may request a waiver by submitting a waiver request to the Commission in writing. The waiver request shall be presented at the time of filing the application, along with a written justification stating why a waiver is desired or needed, is in the public benefit, or otherwise is in the interest of justice, and is consistent with the intent and purpose of the chapter. In evaluating whether a waiver shall be granted, the Commission shall consider whether there are any practicable alternatives to the proposed project with less adverse impacts upon the resource areas protected by this chapter. The Commission may require the applicant to conduct an analysis of alternatives to show that there are no practicable alternatives.

The proposed project is within an area that has riverfront, by definition, but provides minimal protection to the presumptions identified in 310 CMR 10.58(3). We are hereby requesting the commission to exercise their discretion in accepting the project as such. If the commission finds that the on-site riverfront is significant to the presumptions, request of waiver(s) shall be appropriate.

4.2: MASSACHUSETTS ENVIRONMENTAL BYLAWS

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION. 310 CMR 10.00: WETLANDS PROTECTION ACT REGULATIONS

§ 10.58 Riverfront Area

(1) Preamble. Riverfront areas are likely to be significant to protect the private or public water supply; to protect groundwater; to provide flood control; to prevent storm damage; to prevent pollution; to protect land containing shellfish; to protect wildlife habitat; and to protect the fisheries. Land adjacent to rivers and streams can protect the natural integrity of these water bodies. The presence of natural vegetation within riverfront areas is critical to sustaining rivers as ecosystems and providing these public values. The riverfront area can prevent degradation of water quality by filtering sediments, toxic substances (such as heavy metals), and nutrients (such as phosphorus and nitrogen) from stormwater, nonpoint pollution sources, and the river itself. Sediments are trapped by vegetation before reaching the river. Nutrients and toxic substances may be detained in plant root systems or broken down by soil bacteria. Riverfront areas can trap and remove disease-causing bacteria that otherwise would reach rivers and coastal estuaries where they can contaminate shellfish beds and prohibit safe human consumption. Natural vegetation within the riverfront area also maintains water quality for fish and wildlife.

Where rivers serve as water supplies or provide induced recharge to wells, the riverfront area can be important to the maintenance of drinking water quality and quantity. Land along rivers in its natural state with a high infiltration capacity increases the yield of a water supply well. When riverfront areas lack the capacity to filter pollutants, contaminants can reach human populations served by wells near rivers or by direct river intakes. The capacity of riverfront areas to filter pollutants is equally critical to surface water supplies, reducing or eliminating the need for additional treatment. In the watershed, mature vegetation within riverfront areas provides shade to moderate water temperatures and slow algal growth, which can produce odors and taste problems in drinking water.

Within riverfront areas, surface water interaction with groundwater significantly influences the stream ecosystem. The dynamic relationship between surface and groundwater within the "hyporheic zone" sustains communities of aquatic organisms which regulate the flux of nutrients, biomass and the productivity of organisms including fish within the stream itself. The hyporheic zone extends to greater distances horizontally from the channel in large, higher order streams with alluvial floodplains, but the interaction within this zone is important in smaller streams as well.

By providing recharge and retaining natural flood storage, as well as by slowing surface water runoff, riverfront areas can mitigate flooding and damage from storms. The root systems of riverfront vegetation keep soil porous, increasing infiltration capacity. Vegetation also removes excess water through evaporation and transpiration. This removal of water from the soil allows for more infiltration when flooding occurs. Increases in storage of floodwaters can decrease peak discharges and reduce storm damage. Vegetated riverfronts also dissipate the energy of storm flows, reducing damage to public and private property.

Riverfront areas are critical to maintaining thriving fisheries. Maintaining vegetation along rivers promotes fish cover, increases food and oxygen availability, decreases sedimentation, and provides spawning habitat. Maintenance of water temperatures and depths is critical to many important fish species. Where groundwater recharges surface water flows, loss of recharge as a result of impervious surfaces within the riverfront area may aggravate low flow conditions and increase water temperatures. In some cases, summer stream flows are maintained almost exclusively from groundwater recharge. Small streams are most readily impacted by removal of trees and other vegetation along the shore.

Riverfront areas are important wildlife habitat, providing food, shelter, breeding, migratory, and overwintering areas. Even some predominantly upland species use and may be seasonally dependent on riverfront areas. Riverfront areas promote biological diversity by providing habitats for an unusually wide variety of upland and wetland species, including bald eagles, osprey, and kingfishers. Large dead trees provide nesting sites for bird species that typically use the same nest from year to year. Sandy areas along rivers may serve as nesting sites for turtles and water snakes. Riverfront areas provide food for species such as wood turtles which feed and nest in uplands but use rivers as resting and overwintering areas. Riverfront areas provide corridors for the migration of wildlife for feeding or breeding. Loss of this connective function, from activities that create barriers to wildlife movement within riverfront areas, results in habitat fragmentation and causes declines in wildlife populations. Wildlife must also be able to move across riverfront areas, between uplands and the river.

Vernal pools are frequently found within depressions in riverfront areas. These pools are essential breeding sites for certain amphibians which require isolated, seasonally wet areas without predator fish. Most of these amphibians require areas of undisturbed woodlands as habitat during the non-breeding seasons. Some species require continuous woody vegetation between woodland habitat and the breeding pools. Depending on the species, during nonbreeding seasons these amphibians may remain near the pools or travel ¼ mile or more from the pools. Reptiles, especially turtles, often require areas along rivers to lay their eggs. Since amphibians and reptiles are less mobile than mammals and birds, maintaining integrity of their habitat is critical.

In those portions so extensively altered by human activity that their important wildlife habitat functions have been effectively eliminated, riverfront areas are not significant to the protection of important wildlife habitat and vernal pool habitat.

(3) Presumption. Where a proposed activity involves work within the riverfront area, the issuing authority shall presume that the area is significant to protect the private or public water supply; to protect the groundwater; to provide flood control; to prevent storm damage; to prevent pollution; to protect land containing shellfish; to protect wildlife habitat; and to protect fisheries.

The presumption is rebuttable and may be overcome by a clear showing that the riverfront area does not play a role in the protection of one or more of these interests. In the event that the presumption is deemed to have been overcome as to the protection of all the interests, the issuing authority shall make a written determination to this effect, setting forth its grounds on Form 6. Where the applicant provides information that the riverfront area at the site of the activity does not play a role in the protection of an

interest, the issuing authority may determine that the presumption for that interest has been rebutted and the presumption of significance is partially overcome.

To Protect the Private or Public Water Supply:

Spot Pond Brook travels from the upgradient Spot Pond to the downgradient Malden River. Location of the subject site is not in an area that serves as water supply, as outlined from the MassDEP Online Map Viewer of Water Supply Protection Areas Map (Attached as Appendix B). Additionally, all waters downstream of Spot Pond Brook are not classified as areas for public water supply. The city of Melrose and the downstream municipalities are supplied by the Massachusetts Water Resources Authority (MWRA) from the Quabbin and Wachusett Reservoirs in Central Massachusetts.

Spot Pond Brook has a concrete lined channel and does not directly connect the on-site soils with waters associated to the Brook, and therefore the high infiltrating soils on-site does not act as filtration for subsurface waters because it is separated by the lined channel. Surface runoff overland is limited to the grassed strip directly beyond the Brook edge and has minimal treatment of overland flow of potential pollutants. Shade trees on-site are not directly located over the Brook. The Brook is largely underground and is heavily shaded by the culvert. Any on-site trees that provide shade does not significantly protect surface water temperatures due to the high infiltrating soils on-site. Runoff entering the area of shade trees is directed to a puddling area that recharges all stormwater into the ground without entering the Brook, as demonstrated during the 100-year storm event (see Appendix C). Additionally, runoff from storm events moves quickly in this relatively small site and generally would be shadowed by a storm's overcast before naturally recharging or entering the Brook.

Due to the site not being within an area of Water Supply Protection Areas, the on-site riverfront area is not significant to protect private and public water supply.

To Protect the Groundwater:

Protection of groundwater is intended to prevent contamination of public drinking water supply wells within regulated areas in addition to the dynamic relationship between surface and groundwater within the "hyporheic zone". Spot Pond Brook does not contain a hyporheic zone at the location of the subject site, due to the Brook's concrete lined channel. Additionally, the site is not within an Interim Wellhead Protection Area or a Zone II, as regulated by MassDEP. As a result, the riverfront area of the subject site is not significant for protection of groundwater.

To Provide Flood Control:

The on-site riverfront area does not contain area of flooding as provided by FEMA. Spot Pond Brook is subject to the 100-year floodplain, however it is controlled by the channel's concrete embankment. Retaining natural flood storage is not completed "naturally" by the riverfront area. The trees located on-site has surface runoff area of a maintained grassed lawn rather than a naturally occurring forested area. Reduction of peak rate of runoff from the vegetation is minor in area and is negligible to flood control.

To Prevent Storm Damage:
Storm damage by rivers and/or streams can be in the form of flooding, erosion from high flows, uprooting vegetation, and coastal surges. Because of the concrete channel of the Brook, the riverfront on-site does not contribute to controlling flooding, erosion, vegetation, and/ or surges. The concrete channel is self sufficient in allowing the Brook to flow without interruption of during a storm event and the riverfront area is insignificant in preventing storm damage.

To Prevent Pollution:
Identifying sources of pollution are from direct discharge (point source) and indirect discharge (non-point source). The subject site is not known to contain point sources of pollution. However, non-point sources can be in the form of land use type. Prevention of pollution is generally performed by on-site Best Management Practices (BMPs). The on-site riverfront area currently contains areas that are subject to accumulate potential pollutants such as, vehicular oil and grease, Total Suspended Solids (TSS), and pollutant loadings from human activity. Pollutants from non-point sources are transferred through groundwater and overland runoff. Vegetation rooting can absorb nutrients and prevent pollution from groundwater transfer. However, Spot Pond Brook does not transfer shared groundwater from on-site due to the separation of the concrete channel.

Areas on-site that would ultimately prevent pollution would be the vegetated surface cover directly outside the Brook's boundary. Surface runoff over vegetated cover prior to discharge into surface waters has a pollutant removal efficiency of 45% for 50-foot vegetated travel paths or more, in accordance with the MA Stormwater Handbook, refer to Appendix C. All vegetated cover beyond 50 feet has no additional pollutant removal rates. All areas on-site have over 50 feet of a vegetated travel path prior to discharge overland towards Spot Pond Brook, and therefore on-site vegetated cover does not have additional pollutant removal efficiencies in accordance with TSS removals rates and is insignificant to pollution prevention.

To Protect Land Containing Shellfish:
The site is not located within an area containing shellfish, as demonstrated by MassDEP, and is therefore not significant to protect land containing shellfish.

To Protect Wildlife Habitat:
As demonstrated on the latest NHESP maps, the site is not located within an area of wildlife habitat and therefore the site is not significant to protection of wildlife habitat.

To Protect Fisheries:
As demonstrated on the fisheries map provided by MassDEP, the site is not located within an area of protected fisheries and therefore the site is not significant to protection of fisheries.

(4) General Performance Standard. Where the presumption set forth in 310 CMR 10.58(3) is not overcome, the applicant shall prove by a preponderance of the evidence that there are no practicable and

substantially equivalent economic alternatives to the proposed project with less adverse effects on the interests identified in M.G.L. c.131 § 40 and that the work, including proposed mitigation, will have no significant adverse impact on the riverfront area to protect the interests identified in M.G.L. c. 131 § 40. In the event that the presumption is partially overcome, the issuing authority shall make a written determination setting forth its grounds in the Order of Conditions and the partial rebuttal shall be taken into account in the application of 310 CMR 10.58 (4)(d)1.a. and c.; the issuing authority shall impose conditions in the Order that contribute to the protection of interests for which the riverfront area is significant.

(a) Protection of Other Resource Areas. The work shall meet the performance standards for all other resource areas within the riverfront area, as identified in 310 CMR 10.30 (Coastal Bank), 10.32 (Salt Marsh), 10.55 (Bordering Vegetated Wetland), and 10.57 (Land Subject to Flooding). When work in the riverfront area is also within the buffer zone to another resource area, the performance standards for the riverfront area shall contribute to the protection of the interests of M.G.L. c. 131, § 40 in lieu of any additional requirements that might otherwise be imposed on work in the buffer zone within the riverfront area.

(b) Protection of Rare Species. No project may be permitted within the riverfront area which will have any adverse effect on specified habitat sites of rare wetland or upland, vertebrate or invertebrate species, as identified by the procedures established under 310 CMR 10.59 or 10.37, or which will have any adverse effect on vernal pool habitat certified prior to the filing of the Notice of Intent.

(c) Practicable and Substantially Equivalent Economic Alternatives. There must be no practicable and substantially equivalent economic alternative to the proposed project with less adverse effects on the interests identified in M.G.L. c. 131 § 40.

(d) No Significant Adverse Impact. The work, including proposed mitigation measures, must have no significant adverse impact on the riverfront area to protect the interests identified in M.G.L. c. 131, § 40.

1. Within 200 foot riverfront areas, the issuing authority may allow the alteration of up to 5000 square feet or 10% of the riverfront area within the lot, whichever is greater, on a lot recorded on or before October 6, 1997 or lots recorded after October 6, 1997 subject to the restrictions of 310 CMR 10.58(4)(c)2.b.vi., or up to 10% of the riverfront area within a lot recorded after October 6, 1997, provided that:

a. At a minimum, a 100 foot wide area of undisturbed vegetation is provided. This area shall extend from mean annual high-water along the river unless another location would better protect the interests identified in M.G.L. c. 131 § 40. If there is not a 100 foot wide area of undisturbed vegetation within the riverfront area, existing vegetative cover shall be preserved or extended to the maximum extent feasible to approximate a 100 foot wide corridor of natural vegetation. Replication and compensatory storage required to meet other resource area performance standards are allowed within this area; structural stormwater management measures may be allowed only when

there is no practicable alternative. Temporary impacts where necessary for installation of linear site-related utilities are allowed, provided the area is restored to its natural conditions. Proposed work which does not meet the requirement of 310 CMR 10.58(4)(d)1.a. may be allowed only if an applicant demonstrates by a preponderance of evidence from a competent source that an area of undisturbed vegetation with an overall average width of 100 feet will provide equivalent protection of the riverfront area, or that a partial rebuttal of the presumptions of significance is sufficient to justify a lesser area of undisturbed vegetation;

The proposed project will alter more than 5,000 sf of riverfront area and disturbance will be 55.6' from the Brook at closest. Existing conditions contains areas within the 100-foot setback that were previously altered before 1996. Additional alteration is proposed within 100 feet of the Brook. An analysis of a 100-foot width of naturally occurring vegetated surface around the Brook is analyzed for the proposed project and demonstrates that the project has equal or improved effects to the protection of the riverfront area. For purposes of quantitative analysis, Figure 4.1(1) below was used to obtain associated surface areas to perform the analysis. Surface areas were evaluated into the follow groups:

- **Impervious: Roof, building, pavement, and retaining walls.**
- **Pervious Developed: Grass, and patio.**
- **Pervious Wooded: Tree canopy, and natural vegetation.**

Figure 4.2(1). Evaluation Areas using a 100-foot Naturally Vegetated Buffer

Table 4.2(1): Areas Summary for 100-ft Vegetated Analysis

	Summary with 100-ft Vegetation	Summary as Proposed
Impervious, sq-ft	**7,253**	**10,246**
Pervious Developed, sq-ft	**1,112**	**2,542**
Pervious Wooded, sq-ft	**4,821**	**398**
TOTAL, sq-ft	**13,186**	**13,186**

To Protect the Private or Public Water Supply:
The site is not located within an area of protected water supply and a 100-foot vegetated strip would not enhance the riverfront to protect these interests.

To Protect the Groundwater:
The site is not located within an area of protected groundwater and a 100-foot vegetated strip would not enhance the riverfront to protect these interests.

To Provide Flood Control:
The site is not located within an area of flooding and a 100-foot vegetated strip would not enhance the riverfront to protect these interests.

To Prevent Storm Damage:
The site does not act as a means of protection from storm damage and a 100-foot vegetated strip would not enhance the riverfront to protect these interests.

To Prevent Pollution:
An evaluation of potential pollution was emphasized for this analysis. In accordance with the MA Stormwater Handbook, a vegetated grass strip of 50 feet or more accounts for 45% TSS removal rates. All additional length beyond 50 feet does not increase credits for this removal efficiency. However, other potential pollutants such as phosphorous (TP), nitrogen (TN), and zinc (ZN) were evaluated, in addition to providing more comprehensive TSS calculations. Using the surface areas as summarized in Table 4.2(2), pollutant loading rates were compared for the proposed project and the project with a 100-foot vegetated buffer.

The United States Environmental Protection Agency - Region 1 (USEPA) provides statistical data for the pollutant removal efficiencies for several BMP types. Subsurface infiltration BMPs achieve greater than 90% removal for a runoff treatment volume of 1.0 inches. Additionally, the EPA has provided a pollutant estimation calculator (EPA Opti-Tool), which estimates the TP, TN, ZN, and TSS removal efficiency given drainage area and BMP design criteria. Table 4.2(2) below is a summary of calculations using the input parameters from surface areas above, and treated runoff depth of 1.0 inches. Calculation sheets are in Appendix C. The results demonstrate that the riverfront provides improved pollutant removal efficiencies from the proposed project.

Table 4.2(2): Areas Summary for 100-ft Vegetated Analysis

	Project with 100-ft Vegetation	Proposed Project
Phosphorous Removal	**90.5%**	**92.3%**
Nitrogen Removal	**91.2%**	**92.2%**
Zinc Removal	**90.2%**	**92.4%**
TSS Removal	**89.5%**	**92.2%**

To Protect Land Containing Shellfish:
The site is not located within an area containing shellfish, as demonstrated by MassDEP, and is therefore not significant to protect land containing shellfish.

To Protect Wildlife Habitat:
As demonstrated on the latest NHESP maps, the site is not located within an area of wildlife habitat and therefore the site is not significant to protection of wildlife habitat.

To Protect Fisheries:
As demonstrated on the fisheries map provided by MassDEP, the site is not located within an area of protected fisheries and therefore the site is not significant to protection of fisheries.

b. Stormwater is managed according to standards established by the Department in its Stormwater Policy.

c. Proposed work does not impair the capacity of the riverfront area to provide important wildlife habitat functions. Work shall not result in an impairment of the capacity to provide vernal pool habitat identified by evidence from a competent source, but not yet certified. For work within an undeveloped riverfront area which exceeds 5,000 square feet, the issuing authority may require a wildlife habitat evaluation study under 310 CMR 10.60.

Proposed work is located a significant distance away from wildlife habitat and vernal pools. The nearest wildlife habitat is about 1,400 feet west of the site and nearest vernal pools are about 2,500 feet south of the site. See Appendix B for a map of the resource areas as provided by the State's GIS tool.

d. Proposed work shall not impair groundwater or surface water quality by incorporating erosion and sedimentation controls and other measures to attenuate nonpoint source pollution.

The calculation of square footage of alteration shall exclude areas of replication or compensatory flood storage required to meet performance standards for other resource areas, or any area of restoration within the riverfront area. The calculation also shall exclude areas used for structural stormwater management measures, provided there is no practicable alternative to siting these structures within the riverfront area and provided a wildlife corridor is maintained (e.g. detention basins shall not be fenced).

(5) Redevelopment Within Previously Developed Riverfront Areas; Restoration and Mitigation. Notwithstanding the provisions of 310 CMR 10.58(4)(c) and (d), the issuing authority may allow work to redevelop a previously developed riverfront area, provided the proposed work improves existing conditions. Redevelopment means replacement, rehabilitation or expansion of existing structures, improvement of existing roads, or reuse of degraded or previously developed areas. A previously developed riverfront area contains areas degraded prior to August 7, 1996 by impervious surfaces from existing structures or pavement, absence of topsoil, junkyards, or abandoned dumping grounds. Work to redevelop previously developed riverfront areas shall conform to the following criteria:

(a) At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40. When a lot is previously developed but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58(4) shall be met.

The lot currently contains degraded areas as close as 65.5’ from the Brook and have been in place prior to 1996.

(b) Stormwater management is provided according to standards established by the Department.

Stormwater management has been designed in compliance and satisfies all Standards set forth in the MA Stormwater Handbook.

(c) Within 200 foot riverfront areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25 foot riverfront areas, except in accordance with 310 CMR 10.58(5)(f) or (g).

The closest degraded area currently on site is 65.5’ from the Brook and proposed work will be 55.6’ from the Brook.

(d) Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).

(e) The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).

Degraded area currently on site is 3,611 sf and is over 27% of the riverfront area and entire lot.

(f) When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along

the river shall be selected for restoration. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Restoration shall include:

Degraded area that is proposed to be restored will consist of 301 sf. Of the total restored area, 190 sf will be within the 100-ft riverfront and the remaining 111 sf will be between the 100-ft and 200-ft boundaries.

1. removal of all debris, but retaining any trees or other mature vegetation;
2. grading to a topography which reduces runoff and increases infiltration;
3. coverage by topsoil at a depth consistent with natural conditions at the site; and
4. seeding and planting with an erosion control seed mixture, followed by plantings of herbaceous and woody species appropriate to the site;

The tables below summarize the surface areas associated with the project.

Table 4.2(3): Existing Surfaces

	0' – 100'	100' – 200'	Total Riverfront
Degraded Surface, sq-ft	**1,128**	**2,483**	**3,611**
Vegetated Surface, sq-ft	**3,693**	**5,882**	**9,575**
TOTAL, sq-ft	**4,821**	**8,365**	**13,186**

Table 4.2(4): Proposed Surfaces

	0' – 100'	100' – 200'	Total Riverfront
Degraded Surface, sq-ft	**3,296**	**7,150**	**10,446**
Vegetated Surface, sq-ft	**1,525**	**1,215**	**2,740**
TOTAL, sq-ft	**4,821**	**8,365**	**13,186**

Table 4.2(5): Proposed Change

	0' – 100'	100' – 200'	Total Riverfront
Degraded Surface, sq-ft	**2,168**	**4,667**	**6,835**
Vegetated Surface, sq-ft	**-2,168**	**-4,667**	**-6,835**
TOTAL, sq-ft	**0**	**0**	**0**

It is important to note that degraded areas are separate from impervious surfaces. The proposed impervious surfaces on site are limited to the building footprint, and pavement surface. Proposed walkways, patios, and waste areas are considered degraded but will be pervious surfaces.

5.0: CONSTRUCTION AND LONG-TERM MAINTENANCE

5.1: TEMPORARY EROSION, SEDIMENTATION, AND POLLUTION PREVENTION

During land disturbance and construction activities, project proponents must implement controls that prevent erosion, control sediment movement, and stabilize exposed soils to prevent pollutants from moving offsite or entering wetlands or waters. Land disturbance activities include demolition, construction, clearing, excavation, grading, filling, and reconstruction. Please refer to the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas provided by MassDEP for more detailed information.

Erosion control silt fence will be a minimum of two (2) feet high and straw wattles will be a minimum of 9" in diameter, as detailed on the civil site plan set. With proper care and maintenance as outlined within this report, it is determined that these barriers will suffice as sedimental transfer protection to outside areas.

5.1.1: STABILIZATION SCHEDULE

The site shall be controlled and maintained with stabilization methods on disturbed areas. Disturbed areas are areas that will be exposed of dirt from construction activities. A temporary vegetative cover will be established on areas of exposed soils (including stockpiles) as described in Table 5.1.1(1). Disturbed areas shall be periodically inspected and after ever storm event of 0.5" of rainfall.

Table 5.1.1(1): Temporary Construction Stabilization Schedule

Area requiring permanent stabilization	Time frame to apply erosion controls
Any disturbed areas within 50 feet of a surface water of the State and not at final grade	Within two days of the most recent disturbance if the area will remain idle for more than 14 days
For all construction activities, any disturbed areas that will be dormant for more than fourteen (14) days but less than one year, and not within 50 feet of a surface water of the State	Within five (5) days of the most recent disturbance within the area. For residential subdivisions, disturbed areas must be stabilized at least seven days prior to transfer of permit coverage for the individual lot(s).
Disturbed areas that will be idle over winter	Prior to the onset of winter weather

5.1.2: POTENTIAL STORMWATER CONTAMINANTS

The purpose of this section is to identify methods to minimize potential pollutants that could impact storm water during construction. Pollutants that result from clearing, grading, excavation, and building materials and have the potential to be present in stormwater runoff.

To minimize the potential for stormwater contamination the following practices shall be followed:

- No solid or liquid waste, including building materials or their packaging, shall be discharged in stormwater runoff.

- Concrete trucks are not permitted to wash out directly into storm sewers, streams or drainage channels.
- Off-site tracking of sediments by construction vehicles must be minimized.
- Contaminated soils or soils where construction site chemicals have been spilled must be removed from the site and disposed of in accordance with federal, state and local regulations.
- Stormwater that comes in contact with contaminated soils or solid & industrial waste must be collected and disposed of as a wastewater.
- Fuel tanks and drums or other containers holding construction site chemicals must be stored within a diked area.
- Sediment-laden trench or groundwater must pass through a sediment-settling pond, or be dewatered in place using a sump pit, filter bag or other comparable method, prior to being discharged from the site.
- Trench and ground water free from sediment or other pollutants may be discharged without treatment, provided this water does not become pollutant-laden by traversing over disturbed soils or other pollutant sources.

5.2: LONG-TERM OPERATION AND MAINTENANCE PLAN

The goal of the operation and maintenance plan is to protect resources in the region that may be adversely impacted by the proposed development. Water quality treatment measures and the implementation of Best Management Practices (BMP's) for structural controls will result in the treatment of site stormwater and the removal of a minimum of 80% of the TSS load in runoff prior to discharge from the site, consistent with the MA Stormwater Management Handbook.

The stormwater management system will be owned by the future landowner(s) who will be responsible for operation and maintenance. The estimated operation and maintenance budget is estimated to be approximately $2,000 (two-thousand) annually. Inspections shall be made for the following maintenance systems and shall be recorded with information of the inspection date, inspector's name, system inspected, findings of inspection, and actions made for maintenance. A log for these inspections is attached in Appendix E.

5.2.1: STRUCTURAL POLLUTANT CONTROLS AND MAINTENANCE

The proposed stormwater management system(s) is(are) designed to protect runoff water quality through the removal of sediment and pollutants. Structural pollutant controls used to separate and capture stormwater pollutants are described below.

(1) Catch Basins / Inlets & Manholes

Proposed catch basins/ inlets at the site will be equipped with deep sumps and hooded outlets that trap debris, sediments, and floating contaminants, which are the largest constituents of urban runoff. The proper removal of sediments and associated pollutants and trash occurs only when catch basin inlets and sumps are cleaned out regularly. The more frequent the cleaning, the less likely sediments will be re-suspended and subsequently discharged. In addition, frequent

cleaning also results in more volume available for future deposition and enhances overall performance.

Maintenance: All catch basins and inlets will be inspected at a minimum of at least once per year and cleaned when the sump has accumulated to a depth of one (1) foot of sediment. Sediment and/or floatable pollutants will be pumped from the inlet drain opening and disposed of at an approved offsite facility in accordance with all applicable regulations. Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary. During colder periods, catch basin and inlet grates will be kept free of snow and ice. During warmer periods, catch basin and inlet grates will be kept free of leaves, litter, sand, and debris. Regular maintenance and cleaning of catch basins and inlets will assure adequate performance of these structures.

(2) Subsurface Infiltration System

The stormwater management system includes a subsurface infiltration system to provide water quality treatment and recharge, as well as attenuate peak flows. The maintenance of the system may affect the functioning of stormwater management practices.

Maintenance: Visual inspection of the subsurface infiltration system will occur twice per year and after every major storm during the first 3 months of operation. Remove any debris that might clog the system. If water is observed and it is at least 72 hours after a rain event, the system will require to be cleaned to remove any built-up sediment.

(3) Subsurface Infiltration System Isolator Row

The stormwater management system(s) include the use of an isolator row in the subsurface infiltration system to enhance total suspended solids removal and provide easier access for cleaning and maintenance. The proper function of these items is crucial to providing adequate groundwater recharge and flood control.

Maintenance: Subsurface infiltration system isolator row may affect the functioning of stormwater management practices. Visual inspection of the isolator row through the inspection port is to occur every six months in the first year of use. After the first year of use, visually inspect annually at a minimum. The isolator row shall be cleaned when the average depth of sediment exceeds three (3) inches. Refer to StormTech® Isolator Row O&M manual for cleaning procedure. For more information and details on maintenance and cleaning of this particular product, it is recommended to seek advice from the manufacturer - StormTech®. StormTech® can be contacted by phone at 888-892-2694.

APPENDIX A

Notification to Abutters

Certified Abutters List

Notification to Abutters Under the Massachusetts Wetlands Protection Act

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

373 Pleasant Street LLC has filed a Notice of Intent (NOI) with the Conservation Commission of the City of Melrose. The applicant is seeking to construct a multi-family townhome development project that will include site work, new utility installations, and associated driveway and landscaping under the Wetlands Protection Act (General Laws Chapter 131, Section 40) for the property located at 373 Pleasant Street.

Copies of the NOI can be examined at the Melrose Conservation Commission located at Melrose City Hall, 562 Main Street, Melrose, MA between 8:30 and 5:00 Monday through Friday.

For more information, call the Melrose Conservation Commission Office at (781) 979-4312 during regular business hours. Copies of the NOI may be purchased or viewed at the office of Fodera Engineering at 28 Harbor Street in Danvers, MA 01923 during regular business hours of 9:00 – 5:00, or may be requested by telephone at (617) 992-8492.

A public hearing will be held at the Melrose City Hall at a time to be determined. Further information regarding this public hearing may be obtained from the Melrose Conservation Commission at (781) 979-4312.

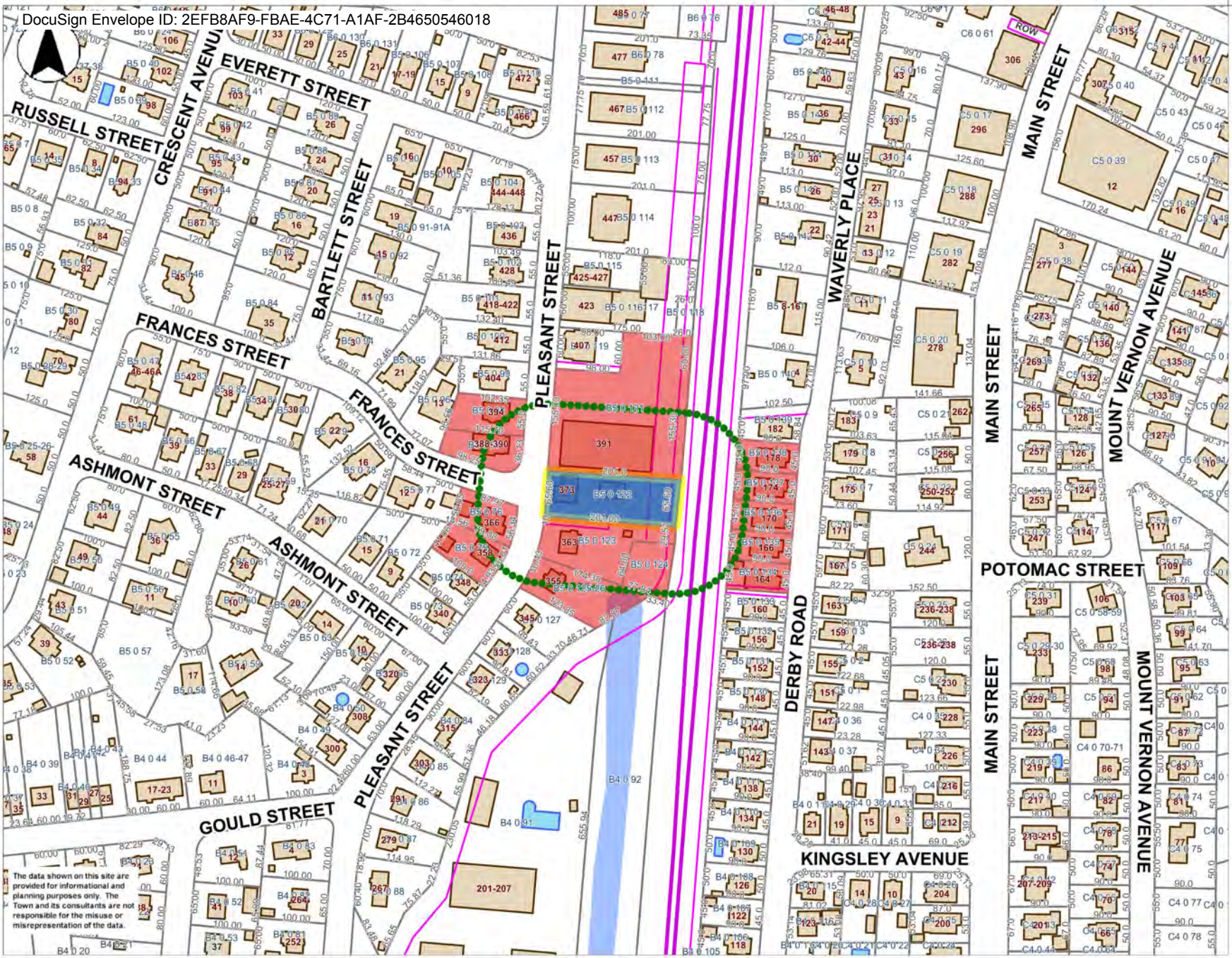
Notice of the public hearing, including its date, time and place, will be advertised and held by the Melrose Conservation Commission. You may also contact the Melrose Conservation Commission or the Department of Environmental Protection Central Office for more information about this application. To contact DEP Northeast Reginal Office, please call their Office at 978-694-3246.

City of Melrose Abutters List **373 Pleasant.xls**

abutters_id_field	abutters_owner1	abutters_owner2	abutters_address	abutters_address2	abutters_town	abutters_state	abutters_zip	abutters_bookpage	abutters_location
B5 0 136	REIDY,DAVID C		170 DERBY RD		MELROSE	MA	02176	1219-182	170 DERBY RD
B5 0 76	WANG, GUILIN		366 PLEASANT ST		MELROSE	MA	02176	62718-376	366 PLEASANT ST
B5 0 121101	ROBERTSON, ZOE K.	ANTONIO FURTADO, JR., WHTE	391 PLEASANT ST #101		MELROSE	MA	02176	66229-285	391 PLEASANT ST UNIT 101
B5 0 121102	THOMPSON, JENNIFER M.		391 PLEASANT ST.#102		MELROSE	MA	02176	51213-390	391 PLEASANT ST UNIT 102
B5 0 121103	GRAFTON, JAMES M. JR.		43 CRANMORE LANE		MELROSE	MA	02176	50164-291	391 PLEASANT ST UNIT 103
B5 0 121104	BARRANCO, CARLA		391 PLEASANT ST.#104		MELROSE	MA	02176	50905-411	391 PLEASANT ST UNIT 104
B5 0 121105	KOSTOPOULOS, CHARLES J.		391 PLEASANT ST. #105		MELROSE	MA	02176	50616-453	391 PLEASANT ST UNIT 105
B5 0 121106	DANGELO, MARIANNE		391 PLEASANT ST. #106		MELROSE	MA	02176	52807-514	391 PLEASANT ST UNIT 106
B5 0 121107	CARRABIS, CATHERINE K.		391 PLEASANT ST. #107		MELROSE	MA	02176	56811-575	391 PLEASANT ST UNIT 107
B5 0 121108	MORGAN CHRISTOPHER JAMES	COWELL KATHLEEN ANNE HWTE	391 PLEASANT ST, Unit 108		MELROSE	MA	02176	76390-146	391 PLEASANT ST UNIT 108
B5 0 121201	WU ZIYAO IND.		391 PLEASANT ST, Unit 201		MELROSE	MA	02176	78036-285	391 PLEASANT ST UNIT 201
B5 0 121202	PENDEA, LUMINITA ADRIANA		391 PLEASANT ST. #202		MELROSE	MA	02176	64047-33	391 PLEASANT ST UNIT 202
B5 0 121203	MARTIGNETTI, ERIC A.		391 PLEASANT ST #203		MELROSE	MA	02176	64185-170	391 PLEASANT ST UNIT 203
B5 0 121204	WONG, JUDY	ROLAND HANG KWOK SO, JT	391 PLEASANT ST. #204		MELROSE	MA	02176	63370-416	391 PLEASANT ST UNIT 204
B5 0 121205	BERNARD, MADELINE	ROBERT C. BERNARD, HWTE	391 PLEASANT ST#205		MELROSE	MA	02176	63815-51	391 PLEASANT ST UNIT 205
B5 0 121206	MOCKLER, SARAH E.		391 PLEASANT ST #206		MELROSE	MA	02176	65256-58	391 PLEASANT ST UNIT 206
B5 0 121207	BRUGMAN, SHELLEY R.		391 PLEASANT ST #207		MELROSE	MA	02176	53468-529	391 PLEASANT ST UNIT 207
B5 0 121208	GOULET, TRACY L.		391 PLEASANT ST. #208		MELROSE	MA	02176	49896-425	391 PLEASANT ST UNIT 208
B5 0 121301	KAVUKCUOGLU, CAGATAY	MELIHA KAVUKCUOGLU, HWTE	391 PLEASANT ST #301		MELROSE	MA	02176	62553-531	391 PLEASANT ST UNIT 301
B5 0 121302	BUKHARI, SYED IRFAN AHMAD	JUWAIRIA MALIK, TE	391 PLEASANT ST. #302		MELROSE	MA	02176	73800-72	391 PLEASANT ST UNIT 302
B5 0 121303	WEERASEKARA, VAJIRA KAUSHALYA	MUDIYANSELAGE AYANGA WEERASEKA	391 PLEASANT ST.#303		MELROSE	MA	02176	73615-204	391 PLEASANT ST UNIT 303
B5 0 121304	NAUMOV, ARKADIY		391 PLEASANT ST #304		MELROSE	MA	02176	51751-400	391 PLEASANT ST UNIT 304
B5 0 121305	PATIDAR, PRAMOD	HARSHALI PATIL, HWTE	391 PLEASANT ST. #305		MELROSE	MA	02176	54049-106	391 PLEASANT ST UNIT 305
B5 0 121306	RANGARAJAN, SHEELA	KARTHIK IYER, WHTE	391 PLEASANT ST. #306		MELROSE	MA	02176	68316-275	391 PLEASANT ST UNIT 306
B5 0 121307	GOHIL, ROBIN	DOSHI SALONI HWTE	391 PLEASANT ST. #307		MELROSE	MA	02176	53875-43	391 PLEASANT ST UNIT 307
B5 0 121308	QIU WEITENG	SUI LESHEN	391 PLEASANT ST. #308		MELROSE	MA	02176	78386-522	391 PLEASANT ST UNIT 308
B5 0 121309	NASCIMENTO, MIRIAM G.	MARINO R+ FRANK CORNELIO	391 PLEASANT ST. #309		MELROSE	MA	02176	53889-235	391 PLEASANT ST UNIT 309
B5 0 121310	GRAF, RONALD		391 PLEASANT ST. #310		MELROSE	MA	02176	71786-431	391 PLEASANT ST UNIT 310
B5 0 125-26	OKENNEDY,JOANNE K	DOMINIC OKENNEDY HWTE	355 PLEASANT ST		MELROSE	MA	02176	29729-568	355 PLEASANT ST
B5 0 122	BOGHOS RAYMOND ANTHONY		373 PLEASANT ST		MELROSE	MA	02176	76228-489	373 PLEASANT ST
B5 0 123	JAYAMANI ELAMPARITHI	SUBBURAJ YAMUNA DEVI HWTE	363 PLEASANT ST		MELROSE	MA	02176	75700-82	363 PLEASANT ST
B5 0 138	SIGGINS,JOHN C		178 DERBY RD		MELROSE	MA	02176	1222-190	178 DERBY RD
B5 0 98	FRANKENTHALER,VICTOR P	CINDY L LEHMANN JTRTSVR	394 PLEASANT ST		MELROSE	MA	02176	31502-569	394 PLEASANT ST
B5 0 124	COMM OF MASS,MDC		PLEASANT ST		MELROSE	MA	02176	9027-402	PLEASANT ST
B5 0 75	WARNER, STEVEN E	MARTIN T BRESLIN JT	358 PLEASANT ST		MELROSE	MA	02176	51596-80	358 PLEASANT ST
B5 0 97	METCALF, JOSEPH V,	JULIA BUKER HUDSON, HWTE	388-390 PLEASANT ST.		MELROSE	MA	02176	67504-208	388-390 PLEASANT ST
B5 0 134	TURKINGTON, DAVID E	JESSICA J BUSTER HWTE	164 DERBY RD		MELROSE	MA	02176	1408-71	164 DERBY RD
B5 0 135	CURTIS, KATHERINE	MEGAN CURTIS, MCTE	166 DERBY RD		MELROSE	MA	02176	1489-148	166 DERBY RD
B5 0 137	CHRISPHONTE, ASTRIDE		174 DERBY RD		MELROSE	MA	02176	1459-95	174 DERBY RD

City of Melrose Board of Assessors
100 Ft. Certified Abutters List 10/4/21

jag



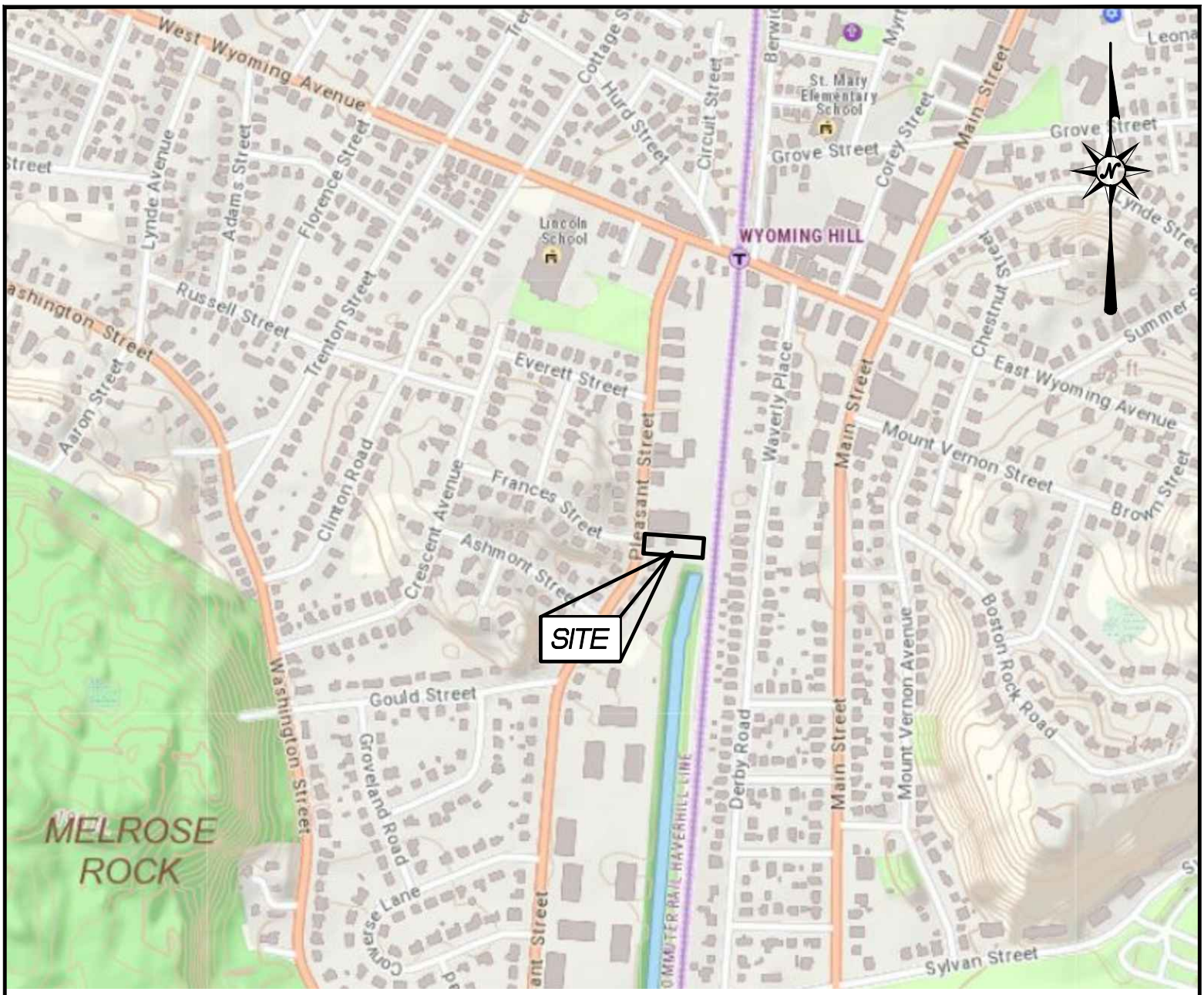
Streets
MBTA Commuter Rail Stat
MBTA Commuter Rail
Easements
Hist Lines
Parcels
Buildings
Pools
MA Highways
Interstate
US Highway
Numbered Routes
Abutting Town Labels
Bathymetry
0-5 ft
5-10 ft
10-15 ft
15-20 ft
20-30 ft
30-40 ft
40-50 ft
50-60 ft
60-70 ft
70+ ft
Town Boundary
Abutting Towns
Mask

0 260 520 ft

Printed on 10/04/2021 at 09:19 AM

APPENDIX B

USGS Locus Map
FEMA Flood Map
MassDEP Priority Resource Map
Map of Wildlife Habitat Vernal Pools



U.S.G.S. LOCUS MAP

SCALE: 1" = 500'

PROFESSIONAL SEAL:

DATE: 5/4/21

PROJECT LOCATION:
373 PLEASANT STREET
MELROSE, MA 02176

PLAN SET:
PROPOSED 7-UNIT DEVELOPMENT

PREPARED FOR:
BOGHOS PROPERTIES
655 E 2ND STREET, SUITE 204
BOSTON, MA 02127

PREPARED BY:
FODERA
ENGINEERING
(617)877-3293
gfodera@foderaengineering.com
28 Harbor St., Suite 204
Danvers, MA 01923

REVISION		DATE

SHEET TITLE
LOCUS MAP

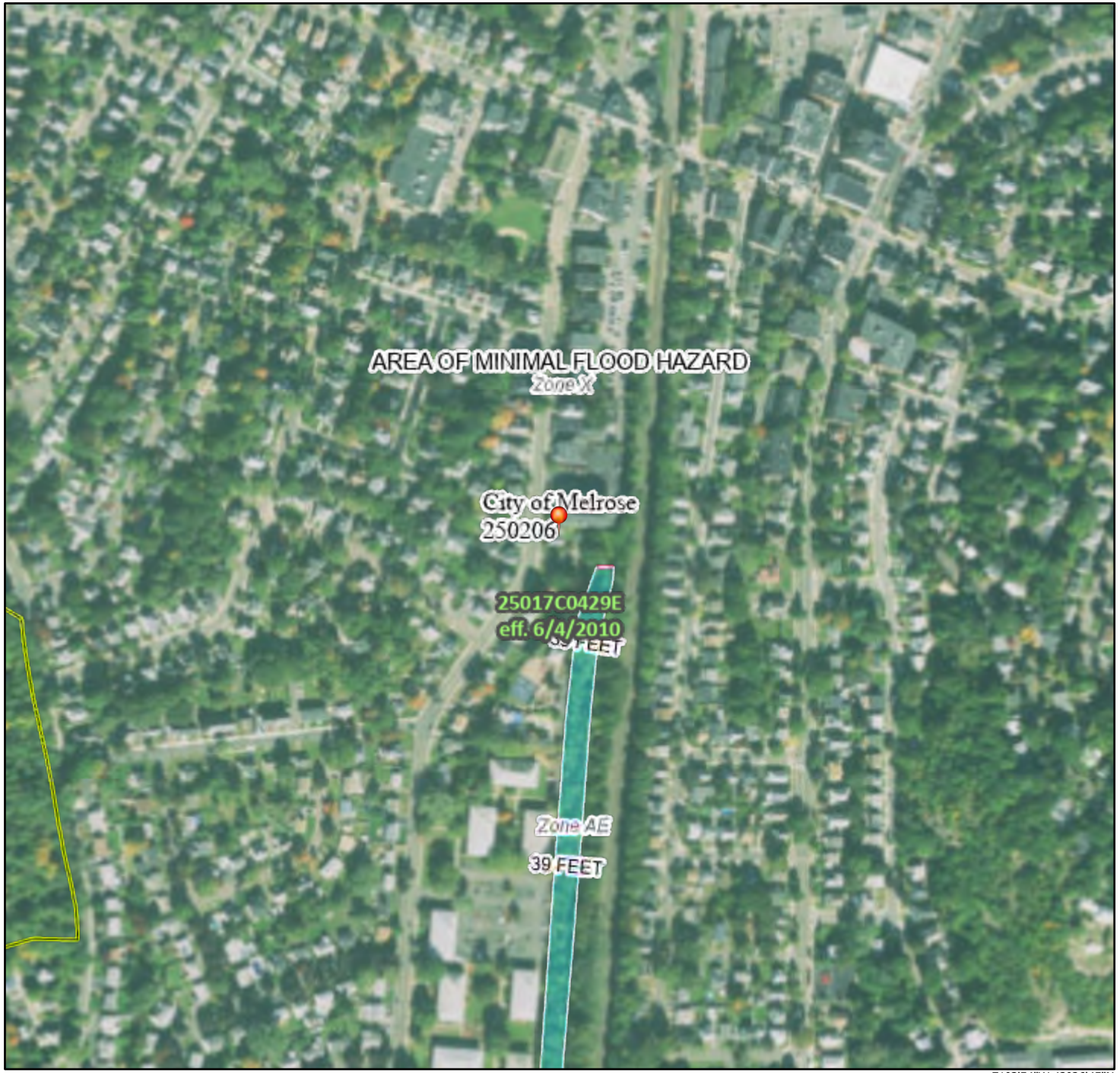
JOB NO.
20160-149

SHEET NUMBER:
1 OF 1

National Flood Hazard Layer FIRMette

FEMA

71°4'32"W 42°27'11"N



71°3'54"W 42°26'45"N

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

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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.

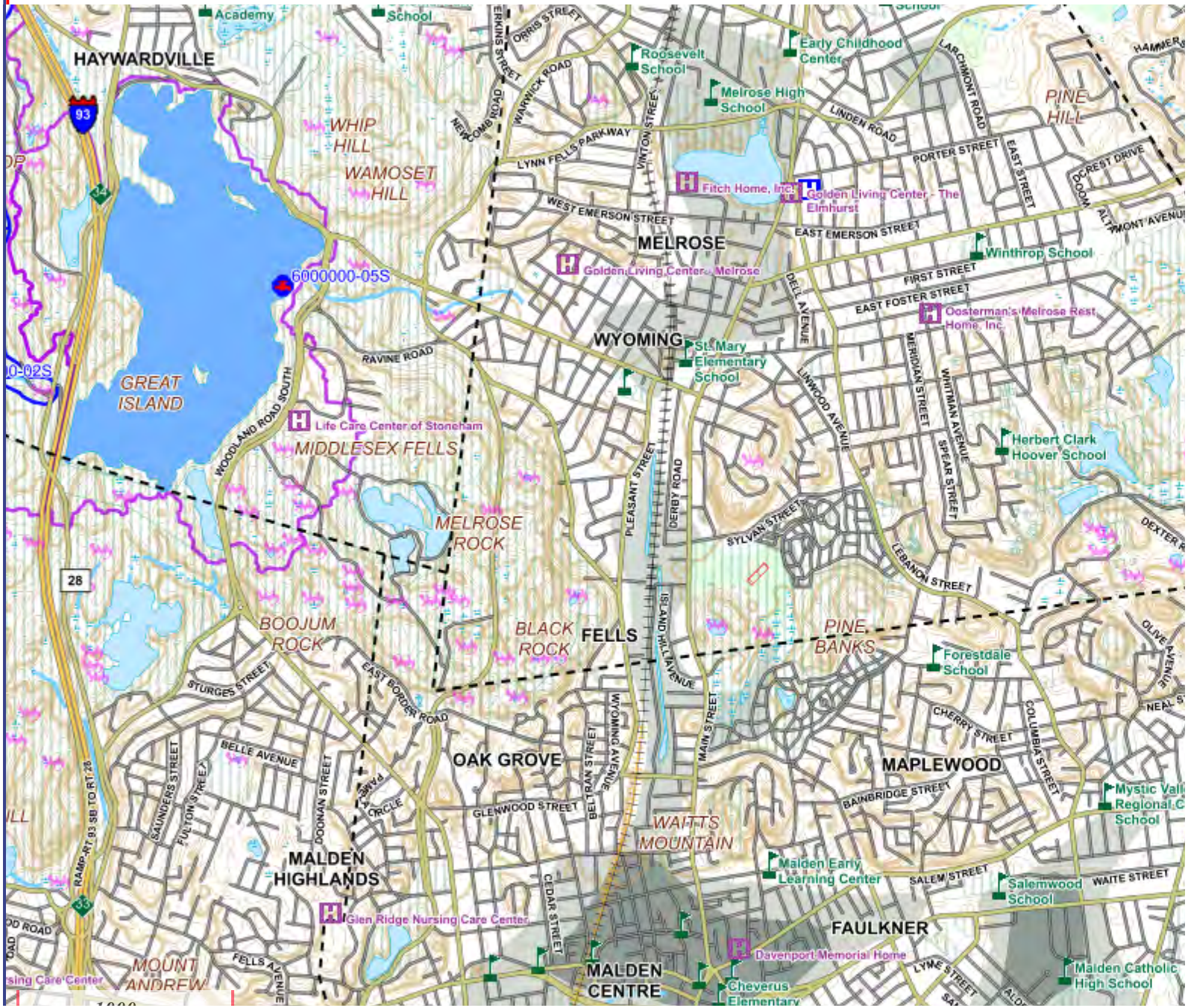
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/3/2021 at 9:01 PM 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.

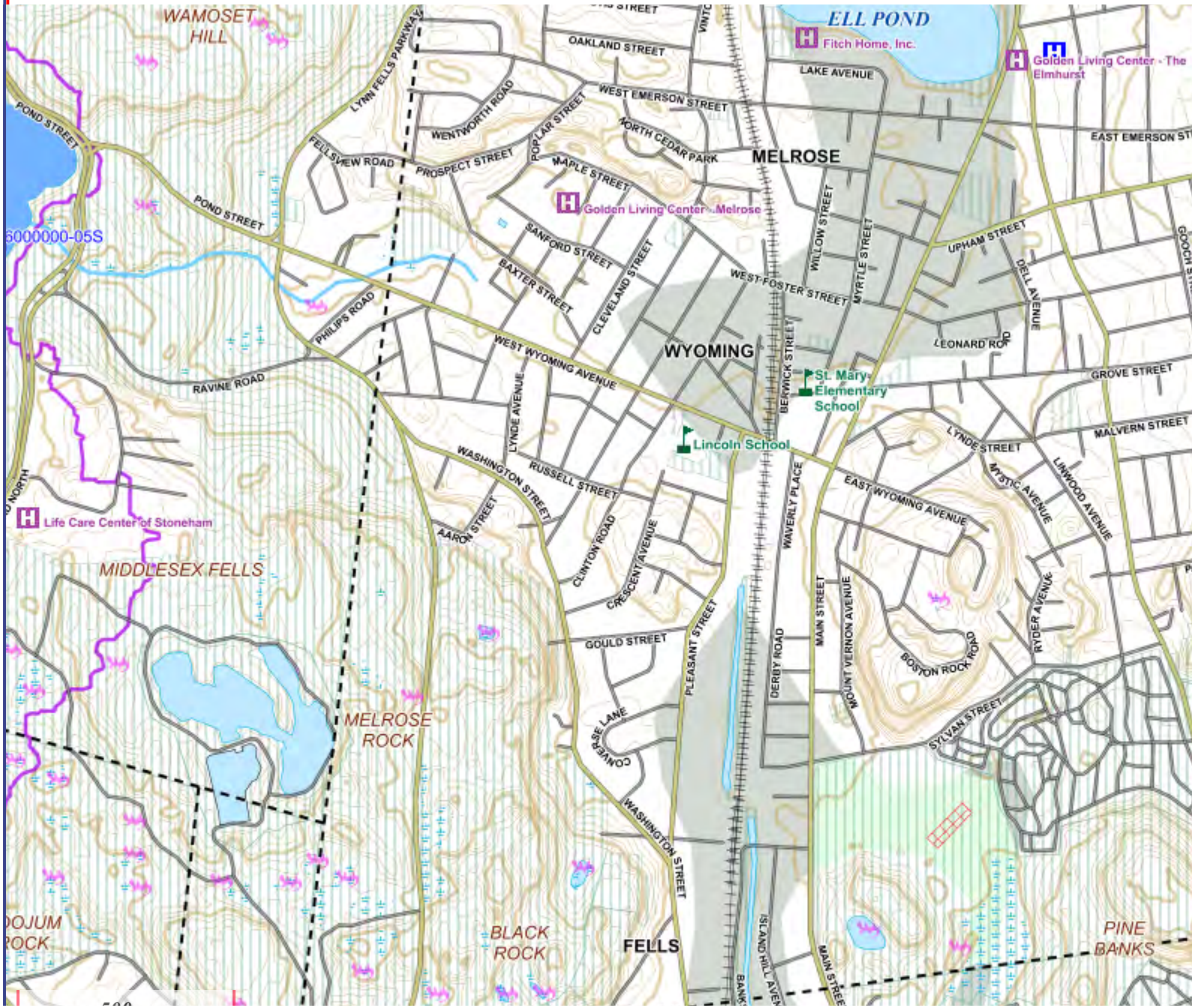
MassDEP Online Map Viewer

Priority Resource Map



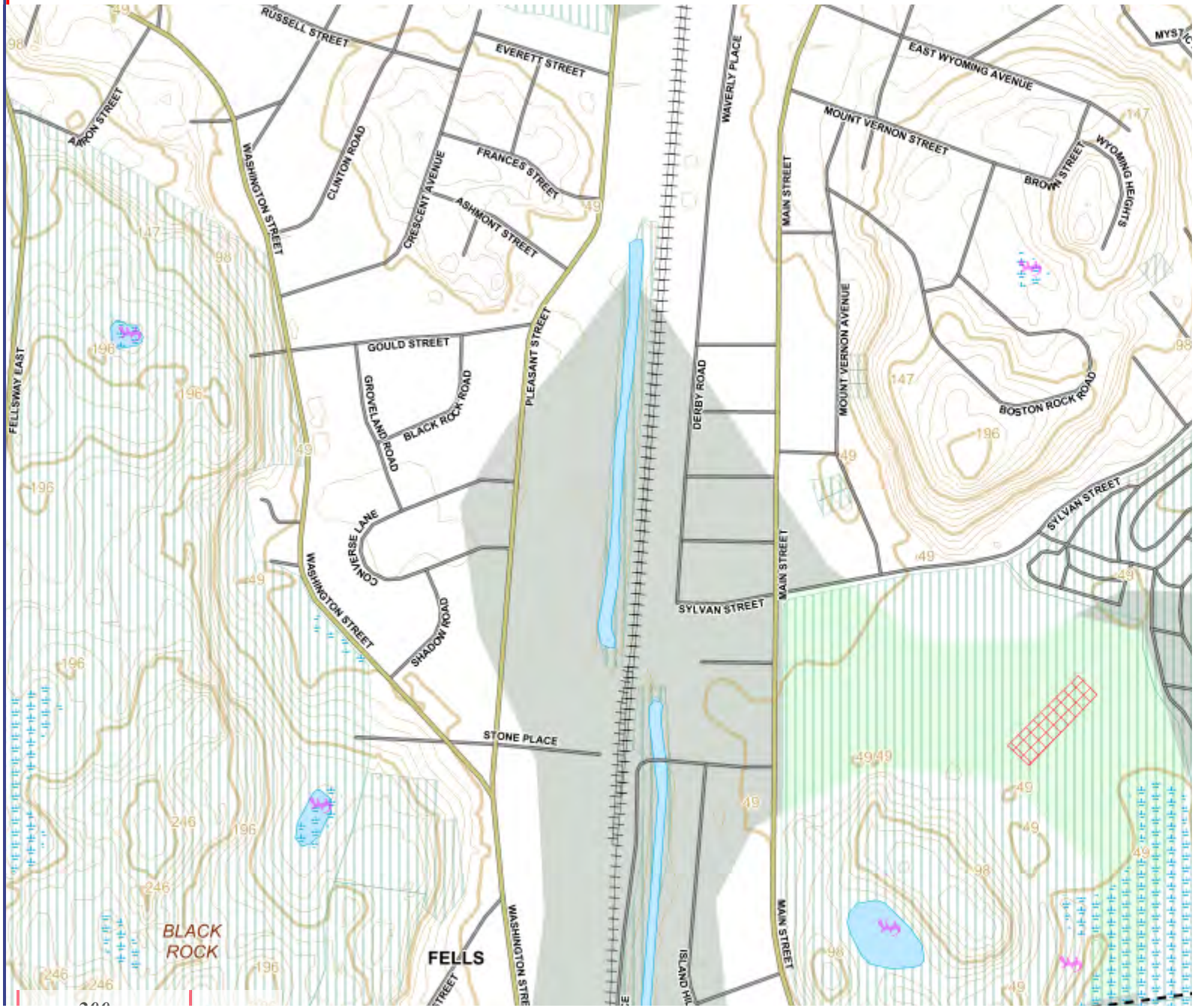
MassDEP Online Map Viewer

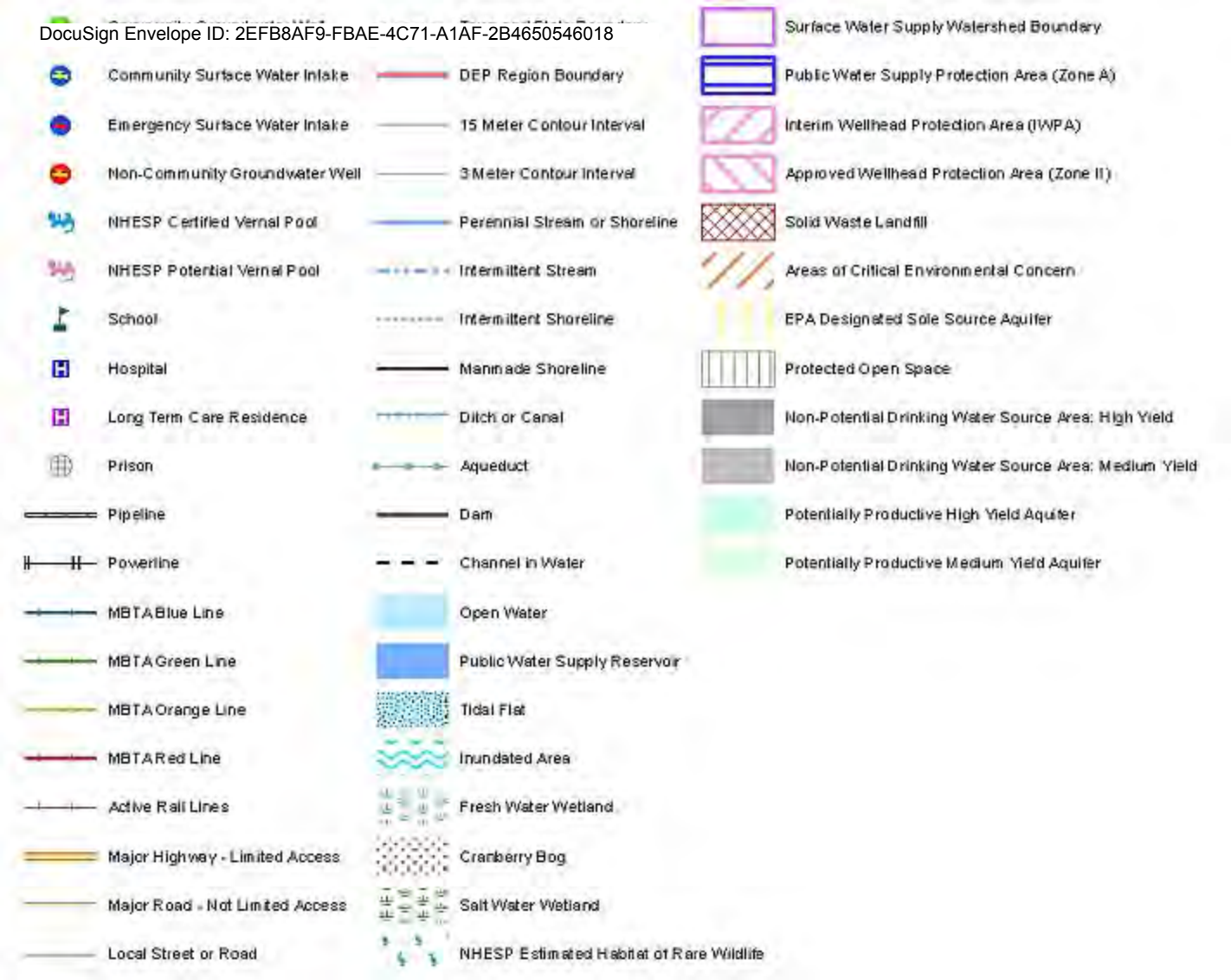
Priority Resource Map



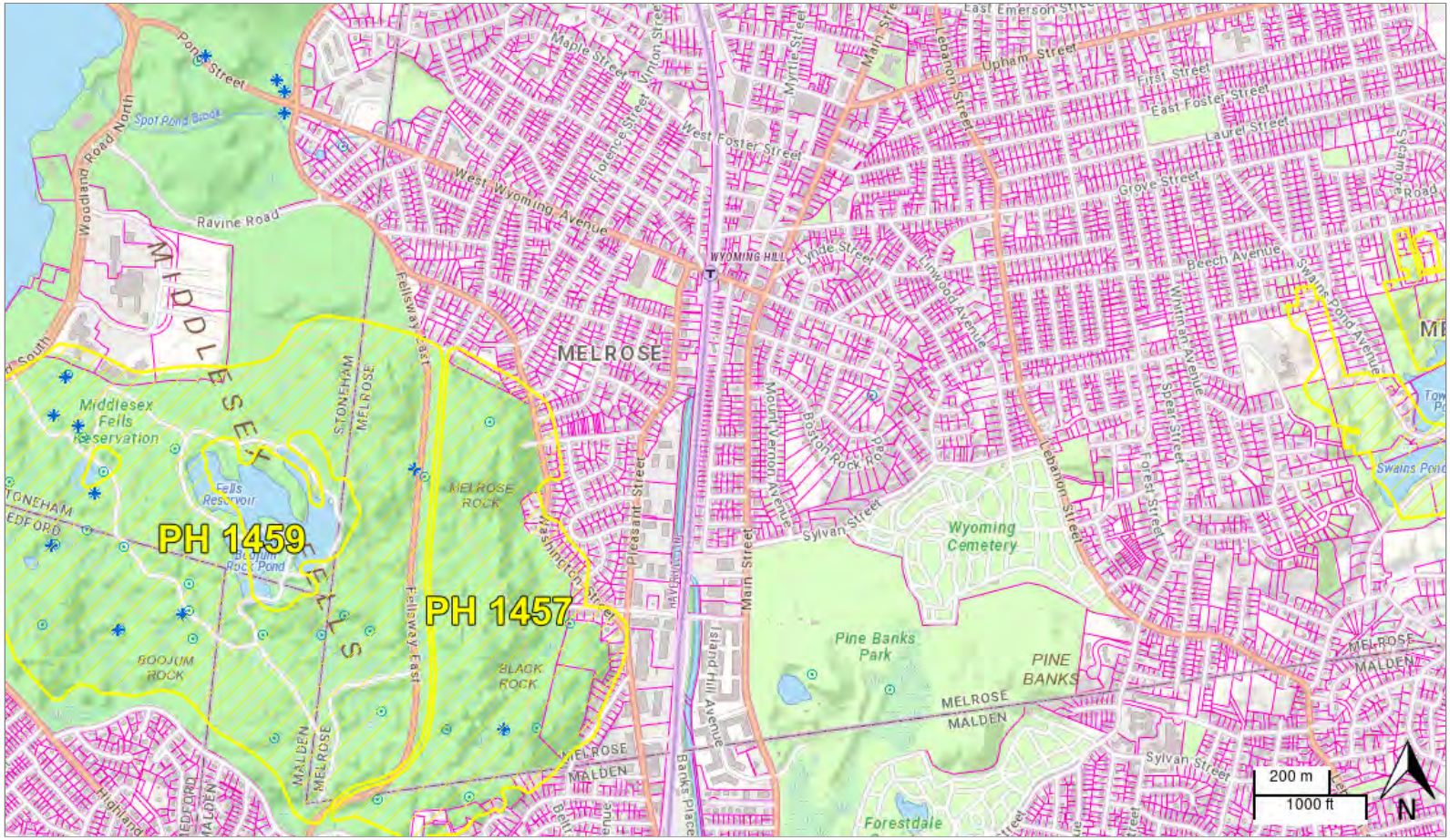
MassDEP Online Map Viewer

Priority Resource Map





Wildlife Habitat and Vernal Pools



NHESP Priority Habitats of Rare

NHESP Certified Vernal Pools

Potential Vernal Pools

Anadromous Fish by Natural Barriers
- BARRIER BEACH
- DRY RIVER BED
- GROUND ELEVATION
- LOW FLOW
- SAND BAR
- UNKNOWN

Anadromous Fish Presence

Anadromous Fish by Manmade Barriers
- CULVERT
- DITCH
- SLUICEWAY
- TIDEGATE

DFW Coldwater Fisheries Resources

Shellfish Suitability Areas
- [ ] AMERICAN OYSTER
- [ ] BAY SCALLOP
- [ ] BLUE MUSSEL
- [ ] EUROPEAN OYSTER
- [ ] OCEAN QUAHOG
- [x] QUAHOG
- [ ] RAZOR CLAM
- [ ] SEA SCALLOP
- [ ] SOFT-SHELLED CLAM
- [ ] SURF CLAM

Tax Parcels for Query

Detailed Features

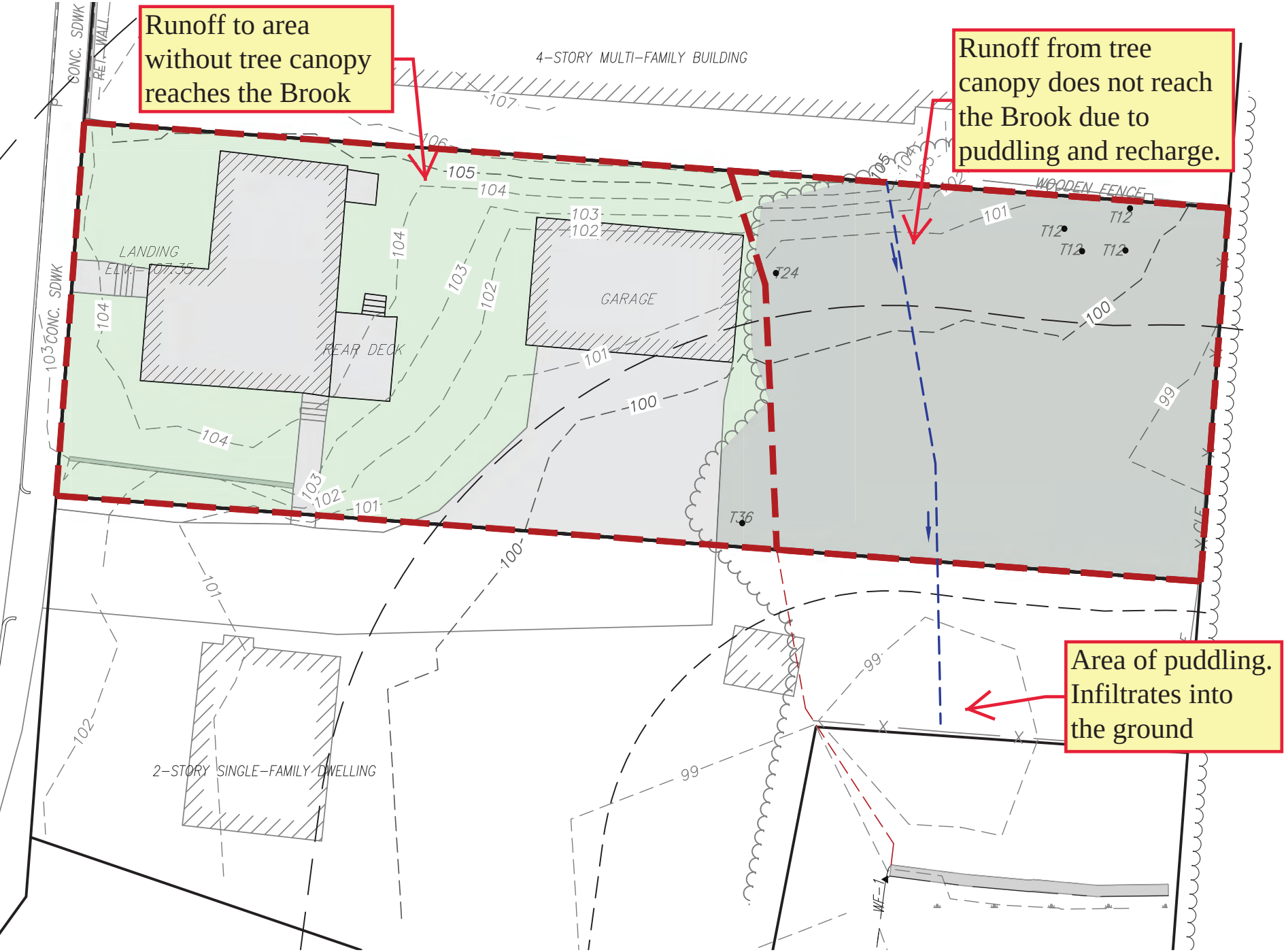
Tax Parcels for Display

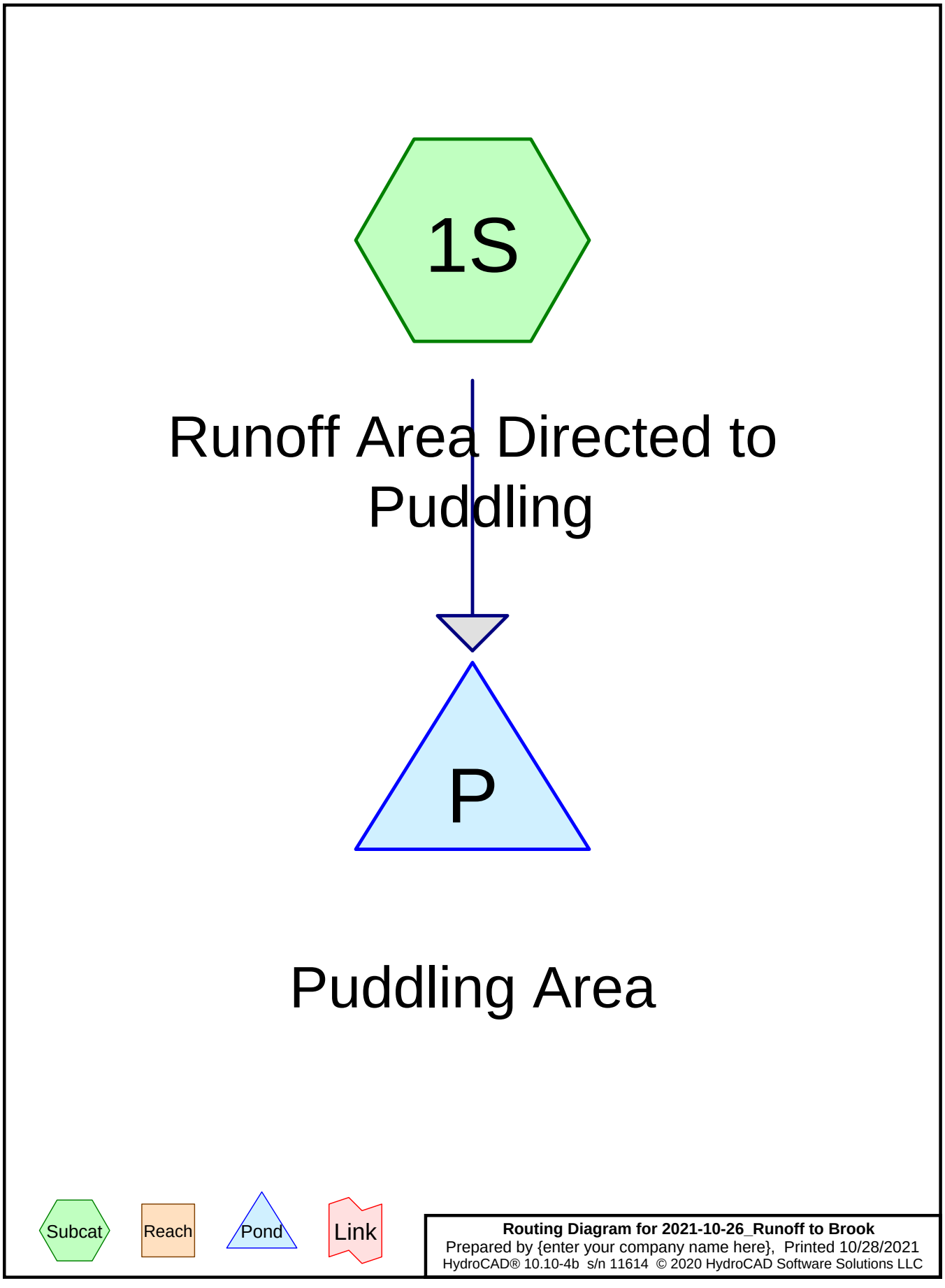
Structures

MassGIS Topographic Features Basemap

APPENDIX C

Map of Existing Runoff and Puddling
Puddling Calculations for 100-year Storm
Pollutant Removal Calculations with Equivalent 100' Naturally Vegetated Buffer
MA Stormwater Handbook Vegetated Filter Strip
Operation and Maintenance Log





Routing Diagram for 2021-10-26_Runoff to Brook
Prepared by {enter your company name here}, Printed 10/28/2021
HydroCAD® 10.10-4b s/n 11614 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Runoff Area Directed to Puddling

Runoff = 0.03 cfs @ 12.34 hrs, Volume= 262 cf, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.10 hrs
Type III 24-hr 100-Year Rainfall=8.15"

Area (sf)	CN	Description
88	39	>75% Grass cover, Good, HSG A
5,102	32	Woods/grass comb., Good, HSG A
5,190	32	Weighted Average
5,190		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	50	0.0500	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.40"
0.5	28	0.0400	1.00		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.8	78	Total			

Summary for Pond P: Puddling Area

Inflow Area = 5,190 sf, 0.00% Impervious, Inflow Depth = 0.60" for 100-Year event
Inflow = 0.03 cfs @ 12.34 hrs, Volume= 262 cf
Outflow = 0.01 cfs @ 14.15 hrs, Volume= 262 cf, Atten= 67%, Lag= 108.5 min
Discarded = 0.01 cfs @ 14.15 hrs, Volume= 262 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.10 hrs
Peak Elev= 98.64' @ 14.15 hrs Surf.Area= 385 sf Storage= 46 cf

Plug-Flow detention time= 62.9 min calculated for 261 cf (100% of inflow)
Center-of-Mass det. time= 62.8 min (1,022.0 - 959.2)

Volume	Invert	Avail.Storage	Storage Description
#1	98.40'	2,883 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.40	1	0	0
99.00	968	291	291
99.50	9,400	2,592	2,883

Device	Routing	Invert	Outlet Devices
#1	Discarded	98.40'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	99.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)**
			Head (feet) 0.00 0.40
			Width (feet) 0.00 30.00

Discarded OutFlow Max=0.01 cfs @ 14.15 hrs HW=98.64' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=98.40' (Free Discharge)
└**2=Custom Weir/Orifice** (Controls 0.00 cfs)

1. Management Objective			
Select Pollutant Type ->	TP	Total BMP Cost ($)	$7,070
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	95.3%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	4,238

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

The purpose of this tool is to provide decision-makers a comprehensive overview of stormwater management opportunities in a given watershed. The tool will characterize the watershed characteristics and opportunities for applying a variety of BMP technologies to various source areas based on land use, soils, and impervious cover. There are two approaches of the planning-level analysis tool:

1: BMP Storage Capacity – to evaluate the changes in hydrologic and water quality benefits as the BMP/LID sizes are increased in fixed increments; and
2: BMP Drainage Area – to determine how much impervious area would require treatment if specified BMP design capacities are selected for each HRU type to be treated.

5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	567	$ 7,070	0.16	-	0.36	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	TP	Total BMP Cost ($)	$9,453
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	97.3%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	5,666

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

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5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	757	$ 9,453	0.21	-	0.48	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	TN	Total BMP Cost ($)	$7,070
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	96.0%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	4,238

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

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Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	567	$ 7,070	0.16	-	2.20	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	TN	Total BMP Cost ($)	$9,453
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	97.2%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	5,666

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

The purpose of this tool is to provide decision-makers a comprehensive overview of stormwater management opportunities in a given watershed. The tool will characterize the watershed characteristics and opportunities for applying a variety of BMP technologies to various source areas based on land use, soils, and impervious cover. There are two approaches of the planning-level analysis tool:

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2: BMP Drainage Area – to determine how much impervious area would require treatment if specified BMP design capacities are selected for each HRU type to be treated.

5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	757	$ 9,453	0.21	-	2.94	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	Zn	Total BMP Cost ($)	$7,070
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	95.1%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	4,238

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

The purpose of this tool is to provide decision-makers a comprehensive overview of stormwater management opportunities in a given watershed. The tool will characterize the watershed characteristics and opportunities for applying a variety of BMP technologies to various source areas based on land use, soils, and impervious cover. There are two approaches of the planning-level analysis tool:

1: BMP Storage Capacity – to evaluate the changes in hydrologic and water quality benefits as the BMP/LID sizes are increased in fixed increments; and
2: BMP Drainage Area – to determine how much impervious area would require treatment if specified BMP design capacities are selected for each HRU type to be treated.

5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	567	$ 7,070	0.16	-	0.11	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	Zn	Total BMP Cost ($)	$9,453
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	97.5%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	5,666

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

The purpose of this tool is to provide decision-makers a comprehensive overview of stormwater management opportunities in a given watershed. The tool will characterize the watershed characteristics and opportunities for applying a variety of BMP technologies to various source areas based on land use, soils, and impervious cover. There are two approaches of the planning-level analysis tool:

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5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	757	$ 9,453	0.21	-	0.15	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	TSS	Total BMP Cost ($)	$7,070
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	94.2%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	4,238

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

The purpose of this tool is to provide decision-makers a comprehensive overview of stormwater management opportunities in a given watershed. The tool will characterize the watershed characteristics and opportunities for applying a variety of BMP technologies to various source areas based on land use, soils, and impervious cover. There are two approaches of the planning-level analysis tool:

1: BMP Storage Capacity – to evaluate the changes in hydrologic and water quality benefits as the BMP/LID sizes are increased in fixed increments; and
2: BMP Drainage Area – to determine how much impervious area would require treatment if specified BMP design capacities are selected for each HRU type to be treated.

5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	567	$ 7,070	0.16	-	68.50	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

1. Management Objective			
Select Pollutant Type ->	TSS	Total BMP Cost ($)	$9,453
Enter Target Load Reduction (%) ->	65.0%	Total Pollutant Load Reduction (%)	97.1%

2. Optimization Target			
Select an option ->	BMP Storage Capacity	Total BMP Storage Capacity (gal)	5,666

3. Watershed Information			
Enter Land Use Area ->	Click Here	Total Impervious Area (ac)	0.2

4. BMP Information			
Enter Drainage Area ->	Click Here	Total Treated Impervious Area (ac)	0.2

Planning Level Analysis

The purpose of this tool is to provide decision-makers a comprehensive overview of stormwater management opportunities in a given watershed. The tool will characterize the watershed characteristics and opportunities for applying a variety of BMP technologies to various source areas based on land use, soils, and impervious cover. There are two approaches of the planning-level analysis tool:

1: BMP Storage Capacity – to evaluate the changes in hydrologic and water quality benefits as the BMP/LID sizes are increased in fixed increments; and
2: BMP Drainage Area – to determine how much impervious area would require treatment if specified BMP design capacities are selected for each HRU type to be treated.

5. Optimal Solution

BMP Type	Design Storage Capacity (ft^3)	BMP Cost ($)	Treated Impervious Area (ac)	O&M (hr/yr)	Load Reduction (lbs)	Treated Runoff Depth (in)
Biofiltration with ISR	-	$ -	-	-	-	-
Bioretention	-	$ -	-	-	-	-
Dry Pond	-	$ -	-	-	-	-
Grass Swale*	-	$ -	-	-	-	-
Gravel Wetland	-	$ -	-	-	-	-
Infiltration Basin	757	$ 9,453	0.21	-	91.59	1.00
Infiltration Chambers*	-	$ -	-	-	-	-
Infiltration Trench	-	$ -	-	-	-	-
Porous Pavement*	-	$ -	-	-	-	-
Sand Filter	-	$ -	-	-	-	-
Wet Pond	-	$ -	-	-	-	-

Note:Only fill in the yellow highlighted cells.

* Place holder for future option (not implemented)

Run Single Scenario

Run Optimize Scenario

Return to Home Page

Vegetated Filter Strips

Description: Vegetated filter strips, also known as filter strips, grass buffer strips and grass filters, are uniformly graded vegetated surfaces (i.e., grass or close-growing native vegetation) that receive runoff from adjacent impervious areas. Vegetated filter strips typically treat sheet flow or small concentrated flows that can be distributed along the width of the strip using a level spreader. Vegetated filter strips are designed to slow runoff velocities, trap sediment, and promote infiltration, thereby reducing runoff volumes.

Ability to meet specific standards

Standard	Description
2 - Peak Flow	Provides some peak flow attenuation but usually not enough to achieve compliance with Standard 2
3 - Recharge	No recharge credit
4 - TSS Removal	If greater than or equal to 25' and less than 50' wide, 10% TSS removal. If greater than or equal to 50' wide, 45% TSS removal.
5 - Higher Pollutant Loading	May be used as part of a pretreatment train if lined
6 - Discharges near or to Critical Areas	May be used as part of a pretreatment train if lined. May be used near cold-water fisheries.
7 - Redevelopment	Suitable for pretreatment or as a stand-alone practice if sufficient land is available.

Advantages/Benefits:

- Reduces runoff volumes and peak flows.
- Slows runoff velocities and removes sediment.
- Low maintenance requirements.
- Serves as an effective pretreatment for bioretention cells
- Can mimic natural hydrology
- Small filter strips may be used in certain urban settings.
- Ideal for residential settings and to treat runoff from small parking lots and roads.
- Can be used as part of runoff conveyance system in combination with other BMPs
- Little or no entrapment hazard for amphibians or other small creatures

Disadvantages/Limitations:

- Variability in removal efficiencies, depending on design
- Little or no treatment is provided if the filter strip is short-circuited by concentrated flows.
- Often a poor retrofit option due to large land requirements.
- Effective only on drainage areas with gentle slopes (less than 6 percent).
- Improper grading can greatly diminish pollutant removal.

Pollutant Removal Efficiencies

• TSS (if filter strip is 25 feet wide)	10% assumed (Regulatory)
• TSS (if filter strip is 50 feet wide)	45% assumed (Regulatory)
• Nutrients (Nitrogen, phosphorus)	Insufficient data
• Metals (copper, lead, zinc, cadmium)	Insufficient data
• Pathogens (coliform, e coli)	Insufficient data

OPERATION & MAINTENANCE LOG

Inspection Date:_____

Inspector's Name:_____

System Inspected	Finding of Inspection	Actions Made for Maintenance
Catch Basin / Inlets: Inspect at least once per year and cleaned when the sump has accumulated to a depth of one (1) foot of sediment.		
Subsurface Infiltration and Isolator Row: Inspect through inspection port as detailed in the Long-Term Operation and Maintenance Plan, and/ or as detailed in the StormTech® Isolator Row O&M Manual.		

APPENDIX D

NRCS Map of Hydrologic Soils Group

On-Site Soil Testing Results

Hydrologic Soil Group—Middlesex County, Massachusetts

Map Scale: 1:4,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		1.2	1.2%
603	Urban land, wet substratum		64.6	66.4%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	A	31.5	32.4%
Totals for Area of Interest			**97.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

SOIL SUITABILITY ASSESSMENT REPORT

COMMONWEALTH OF MASSACHUSETTS

MELROSE, MASSACHUSETTS

SOIL EVALUATION FOR DETERMINATION OF SOIL TYPE AND GROUNDWATER TABLE ELEVATIONS

SITE INFORMATION

Street Address: 373 Pleasant Street Town: Melrose State: Massachusetts Zip Code: 02176 County: Middlesex

Land Use: Residential Latitude: ~42° 26' 57.7" N Longitude: ~71° 04' 13.6" W

PUBLISHED SOIL DATA AND MAP UNIT DESCRIPTION

Physiographic Division: Appalachian Highlands Province: New England Section: Seaboard lowland section

Soil survey area: Middlesex County, Massachusetts Series name: 603 – Urban land

Soil Order: _____ Soil Suborder: _____ Soil Family: _____

Soil moisture regime: Udic Soil temperature regime: Mesic Land Cover: Grass lawn Runoff class: Low

Soil hydric or upland: Upland Average depth to water table: > 80" Depth to restrictive feature: > 80"

Frequency of flooding: None Frequency of ponding: None Available water capacity: _____

Drainage Class: _____ Hydrologic Soil Group: ___ Ksat: _____

Ecological site: Well drained outwash

WETLAND AREA & USGS WELL MEASUREMENTS

National Wetland Inventory Map: NA Wetlands Conservancy Program: NA Bordering vegetative wetland: NA

Current Water Resource Condition (USGS*):* Well Site # 423115071032001- MA-WAW 38 Wakefield, MA

Middlesex County, Massachusetts, Hydrologic Unit 01090001 Latitude: ~42° 31 '00.2" N Longitude: ~71° 02' 54.4" W

Well depth: 25.5 feet Borehole depth: 28.2 feet Land surface altitude: 80.00 feet above NGVD29

Most recent data value: 5.50' on 07/22/2021 (depth to water level in feet below land surface). Range: High

SURFICIAL GEOLOGY

Surficial Geology: Qcs: Collapsed stratified sand deposits

Geologic parent material: Glaciofluvial outwash deposits Geomorphic landform: Outwash plain

Slope aspect: Southerly Landform position (2D): Backslope Landform position (3D): Side slope

Slope gradient: ~0-2% Down slope shape: Convex Across slope shape: Linear Slope complexity: Simple

Bedrock outcropping in vicinity: None observed Glacial erratics in vicinity: None observed

Bedrock Type: Lynn Volcanic Complex; Rhyolite, agglomerate and tuff.

TP 21-1 DEEP OBSERVATION HOLE

373 Pleasant Street, Melrose, Massachusetts

Date: Thursday, July 22, 2021 Time: 08:38 Weather: Sunny, ~75-80ºF, still and humid

Landscape: Upland Landform: Outwash plain Position on landscape: Side slope

Slope aspect: Southerly Slope (%): 00- 02% Slope complexity: Simple Land Cover: Grass lawn

Property line: 10^{+} feet Drainage way: 50^{+} feet Drinking water well: 100^{+} feet Abutting septic system: 50^{+} feet

Wetlands: 100^{+} feet Public water supply reservoir: 400^{+} feet Tributary to reservoir: 200^{+} feet

SOIL PROFILE ► TP 21-1

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00" → 16"	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine grass roots; free of clasts; clear wavy boundary.
16" → 21"	B_W	Sandy Loam	10YR 5/8 yellowish brown	none observed	Very friable; moderate-grade, fine, sub-angular blocky structure; non-cohesive; mixed medium to mostly fine-grained mineral content; slightly damp; non-sticky; non-plastic; few fine grass roots; ~05% rounded to sub-rounded gravel content of mixed lithology; gradual wavy boundary.
21" → 120"	2C	Sand	5Y 5/2 olive gray	100" (m,2-3,p) 2.5YR 4/6 10YR 7/1	Very friable; structureless; non-cohesive matrix; mixed medium to fine-grained mineral content; slightly damp matrix; non-sticky; non-plastic; poorly graded/ well sorted; high and low chroma colors dispersed within matrix at 100"; apparent water observed at 106"; no bedrock refusal at test hole depth.

Depth to bedrock: > 120" Seasonal High Groundwater Table: 100" Apparent water table: 106"

TP 21-1 DEEP OBSERVATION HOLE

373 Pleasant Street, Melrose, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE:

Apparent water seeping from pit face: 106" (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp to wet

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth below grade to observed Estimated Seasonal High Groundwater Table: 100"

Kind: Iron concentrations; iron coating on sand grains Location: 2C matrix Shape: Amorphous

Hardness: Soft Boundary: Diffuse Abundance: Many Size: Medium to coarse Contrast: Prominent

Concentration color: 2.5YR 4/6 red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 100" inches below grade

Observed water weeping from side of deep hole: 106" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 8.66 feet

Depth of naturally occurring pervious material in TP21-1 Upper boundary: 16"
Lower boundary: 120"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* June 1998

Massachusetts Evaluator & Certification number Date of Soil Evaluator Certification

TP 21-2 DEEP OBSERVATION HOLE

373 Pleasant Street, Melrose, Massachusetts

Date: Thursday, July 22, 2021 Time: 09:19 Weather: Sunny, ~75-80°F, still and humid

Landscape: Upland Landform: Outwash plain Position on landscape: Side slope

Slope aspect: Southerly Slope (%): 00- 02% Slope complexity: Simple Land Cover: Grass lawn

Property line: 10^{+} feet Drainage way: 50^{+} feet Drinking water well: 100^{+} feet Abutting septic system: 50^{+} feet

Wetlands: 100^{+} feet Public water supply reservoir: 400^{+} feet Tributary to reservoir: 200^{+} feet

SOIL PROFILE ► TP 21-2

Depth below land surface (inches)	Soil Horizon/ Layer	Soil Texture (USDA/ NRCS)	Soil Color (Munsell)	Redoxomorphic Features/ ESHGWT	Consistence, grade, size, structure, grain size, soil moisture state, roots, horizon boundary, clasts, stratification, artifacts, restrictive features, etc.
00" → 22"	A_P	Sandy Loam	10YR 3/2 very dark grayish brown	none observed	Very friable; moderate-grade; fine-to-medium granular structure; somewhat cohesive; fine grained mineral content; slightly damp; non-sticky; non-plastic; many fine grass roots; some loam added as fill material; free of clasts; clear wavy boundary.
22" → 28"	B_W	Sandy Loam	10YR 5/8 yellowish brown	none observed	Very friable; moderate-grade, fine, sub-angular blocky structure; non-cohesive; mixed medium to mostly fine-grained mineral content; slightly damp; non-sticky; non-plastic; few fine grass roots; ~05% rounded to sub-rounded gravel content of mixed lithology; gradual wavy boundary.
28" → 120"	2C	Sand	5Y 5/2 olive gray	89" (m,2-3,p) 2.5YR 4/6 10YR 7/1	Very friable; structureless; non-cohesive matrix; mixed medium to fine-grained mineral content; slightly damp matrix; non-sticky; non-plastic; poorly graded/ well sorted; high and low chroma colors dispersed within matrix at 89"; apparent water observed at 95"; no bedrock refusal at test hole depth.

Depth to bedrock: > 120" Seasonal High Groundwater Table: 89" Apparent water table: 95"

TP 21-2 DEEP OBSERVATION HOLE

373 Pleasant Street, Melrose, Massachusetts

DEPTH TO APPARENT/ PHREATIC GROUNDWATER TABLE:

Apparent water seeping from pit face: 95" (below land surface) Depth to stabilized apparent water: ___ (below land surface)

Soil moisture state: Damp to wet

ESTIMATED SEASONAL HIGH GROUNDWATER TABLE:

Depth below grade to observed Estimated Seasonal High Groundwater Table: 89"

Kind: Iron concentrations; iron coating on sand grains Location: 2C matrix Shape: Amorphous

Hardness: Soft Boundary: Diffuse Abundance: Many Size: Medium to coarse Contrast: Prominent

Concentration color: 2.5YR 4/6 red Reduction color: 10YR 7/1 light gray Moisture state: Damp

DETERMINATION OF HIGH GROUNDWATER ELEVATION

Observed depth to redoximorphic features: 89" inches below grade

Observed water weeping from side of deep hole: 95" inches below grade

Observed depth to stabilized phreatic water: ___ inches below grade

DEPTH OF NATURALLY OCCURRING PERVIOUS MATERIAL: ► 8.16 feet

Depth of naturally occurring pervious material in TP21-2 Upper boundary: 22"
Lower boundary: 120"

Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.017.

Alexander F. Parker *#1848* June 1998

Massachusetts Evaluator & Certification number Date of Soil Evaluator Certification