

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES

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Wetland Resource Area Restoration Protocol and Compliance Assessment

Proposed Single Family Home Project

6 Lanesboro Road

Worcester, Massachusetts

June 10, 2024

INTRODUCTION

The following descriptions and protocol were prepared by Scott Jordan of EcoTec, Inc. This information is based on an evaluation of the proposed temporary impact areas associated with a proposed sewer line connection at the 6 Lanesboro Road, Worcester site. The protocol has been designed in accordance with the General Performance Standards of the Massachusetts Wetlands Protection Act Regulations at 310 CMR 10.55(4)(b) and serve to protect the interests of the Wetlands Protection Act. The overall wetland delineation on this site was performed by EcoTec on May 13, 2024 and is described in a Wetland Resource Area report appended to the Notice of Intent. This protocol is based upon field evaluations performed by EcoTec on June 10, 2024, and the attached site plan prepared by D.J. & Associates.

DESCRIPTIONS

The project consists of the construction of a single family home within the Buffer Zone with associated grading and utilities. In order to avoid a permanent driveway wetland crossing, the project shall utilize the upland frontage along Kenmore Street at the east end of the site. As there is no sewer line within several hundred feet of Kenmore Street, and there is not enough room to construct a Title V compliant septic system on the site, the project proposes to construct a sewer line connection below the approximately 8.5 foot wide intermittent stream bed in the western portion of the site. The temporary alteration of approximately 12 linear feet of intermittent stream Bank and approximately 51 square feet of Land Under Water Bodies and Waterways (LUWW) shall be required to install the sewer line connection from the proposed house to the sewer line located within Lanesboro Road to the west. No Bordering Vegetated Wetland (BVW) shall be altered under the proposed project. A description of each resource area on the site is provided below.

Bank:

The stream Banks within the proposed impact area are abrupt and consist of boulders and cobbles. Sparse vegetation was observed upon the Banks and one northern spicebush (*Lindera benzoin*) shrub shall be removed from the westerly Bank during construction. No BVW is present above the Banks which are proposed to be temporarily impacted. A representative photo of the proposed Bank impact area is provided below:



View looking eastward showing intermittent stream Bank to be temporarily Impacted. Note wetland Bank flag BA6 in center of photo.

Land Under Water Bodies and Waterways (LUWW):

The stream bed (i.e., LUWW) within the proposed temporary impact area consists of stones, cobbles and boulders with a thin layer of medium/coarse sand. The channel bottom is firm and EcoTec was unable to penetrate the stream channel bottom with a hand auger due to the stony substrate. No emergent or submerged vegetation is present within the temporary impact area of the stream bed. On the date of inspection, base flows within the stream channel were approximately 1” to 3” deep. A representative photo of this area is provided below:



View looking southward showing stream bed (LUWW) in the vicinity of the temporary alteration.

SEWER LINE CONSTRUCTION & RESTORATION PROTOCOL

The following protocol conforms to the general performance standards in the MA Wetlands Protection Act Regulations, described below.

A qualified Wetland Scientist shall be present during the sewer line installation and stream channel and Bank restoration.

1. Prior to the start of earth-moving activities, an erosion control barrier of staked compost sock tubing or straw wattle and silt fence will be installed along the proposed limit of work as depicted on the site plans. A silt sack inlet protection device shall be installed within the catch basin located in front of 124 West Mountain Street, to the south of the work area.
2. The 6" sewer line construction shall commence in the eastern portion of the site and proceed westward to the connection within Lanesboro Road.
3. The trenching shall be conducted by a mini excavator and backfilled and stabilized immediately. Stockpiling shall occur within the designated stockpile areas, and may include a covered roll off container for the excavation required on the westerly side of the stream, at Lanesboro Road.
4. The proposed in-stream work shall occur during a low flow period and shall not occur when rain is forecasted within 48 hours.
5. A temporary coffer dam consisting of sandbags shall be installed upgradient of the work area. A dewatering pump shall be utilized to direct impounded water above the dam directly into the downstream culvert, or onto stones/boulders downstream of the work area to prevent erosion. The in-stream work shall be completed within one workday.
6. The stones, boulders and subgrade material along the stream Banks and stream bed shall be excavated within the sewer pipe layout and placed aside within the temporary stockpile area. The trench shall be excavated with a mini excavator to the specified depth (approximately 1.5 feet below channel bottom).
7. If necessary, dewatering within the trench shall be done by the contractor by pump. The effluents shall be pumped eastward into the vegetated uplands for a minimum of 50 feet from the stream to a temporary wattle barrier to provide filtration. If necessary, the pump shall discharge into a barrel or other vessel fitted with anionic flocculants specified and provided by a reputable supplier. Effluents shall be monitored and must be clean/clear before entering the resource areas.
8. The 6" sewer pipe shall then be installed, flowable fill placed as necessary to minimize inflow and leakage, and the trench backfilled.
9. The stream channel and stream Banks shall be immediately reconstructed with the stockpiled, indigenous materials under the supervision of the Wetland Scientist. If necessary, additional stones from the site may be utilized for the stream bed and Bank repair.
10. A compost sock tube or staked wattle shall be placed along the top of the Banks upon completion of the restoration. The trench shall be stabilized within the adjacent uplands with New England Erosion Control/Restoration seed mix and stapled biodegradable erosion control blanketing.
11. The roadway surface along Lanesboro Road shall be stabilized upon completion of backfilling with bituminous pavement. If repaving cannot be immediately completed, temporary stabilization may be provided with crushed stone.

PERFORMANCE STANDARDS COMPLIANCE ASSESSMENT

The proposed project consists of the temporary construction of a sewer line upon approximately 12 linear feet of intermittent stream Bank and approximately 51 square feet of Land Under Water Bodies and Waterways (LUWW). There is no Bordering Land Subject to Flooding (BLSF), Riverfront Area (RFA), or Bordering Vegetated Wetland (BVW) within the proposed impact area. The proposed alterations to LUWW and Bank shall be temporary, and all of the resource areas shall be restored, in-kind, upon completion of the project. The project has been designed to meet the pertinent performance standards of the Mass WPA Regulations. A required Appendix A: Simplified Wildlife Habitat Evaluation has been prepared under separate cover for the proposed impacts and is appended to the Notice of Intent application. A review of the Natural Heritage and Endangered Species Program Online Data Viewer indicates that the project is not located within a Priority or Estimated habitat. A copy of this map is included within the appended Wetland Resource Evaluation report.

The General Performance Standards for the resource areas proposed to be temporarily impacted are addressed below. Although the project would qualify as a limited project under the limited project provisions of the Mass WPA Regulations at 310 CMR 10.53 (3)(d), the project has been designed to meet the pertinent performance standards below.

310 CMR 10.53(3) states that:

“Notwithstanding the provisions of 310 CMR 10.54 through 10.58 and 10.60, the Issuing Authority may issue an Order of Conditions and impose such conditions as will contribute to the interests identified in M.G.L. c. 131, § 40 permitting the following limited projects (although no such project may be permitted which will have any adverse effect on specified habitat sites of Rare Species, as identified by procedures established under 310 CMR 10.59). In determining whether to exercise its discretion to approve the limited projects listed in 310 CMR 10.53(3), the Issuing Authority shall consider the following factors: the magnitude of the alteration and the significance of the project site to the interests identified in M.G.L. c. 131, § 40, the availability of reasonable alternatives to the proposed activity, the extent to which adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, § 40.”

310 CMR 10.53 (3)(d) includes:

“The construction, reconstruction, operation and maintenance of underground and overhead public utilities, such as electrical distribution or transmission lines, or communication, sewer, water and natural gas lines, may be permitted, in accordance with the following general conditions and any additional conditions deemed necessary by the issuing authority:

- 1. the issuing authority may require a reasonable alternative route with fewer adverse effects for a local distribution or connecting line not reviewed by the Energy Facilities Siting Council;*
- 2. best available measures shall be used to minimize adverse effects during construction;*
- 3. the surface vegetation and contours of the area shall be substantially restored; and*

4. all sewer lines shall be constructed to minimize inflow and leakage.”

Bank Performance Standards

The project proposes to temporarily alter approximately 12 l.f. of the Bank associated with an intermittent stream.

Bank [310 CMR 10.54(4)]

(a) *Where the presumption set forth in 310 CMR 10.54(3) is not overcome, any proposed work on a Bank shall not impair the following:*

1. *The physical stability of the Bank;*

The physical stability of the Bank shall be maintained upon installation of the 6” sewer line and Bank restoration.

2. *The water carrying capacity of the Bank;*

The water carrying capacity of the Bank shall not be altered under the proposed project.

3. *Ground and surface water quality;*

The surface water quality will be maintained upon installation of the 6” sewer line and restoration.

4. *The capacity to provide breeding habitat, escape cover and food for fisheries:*

Any temporary impacts to the stony Bank shall be repaired with the replacement of the stones/boulders which confine the Bank, thus preserving any crevices which may provide wildlife opportunities.

5. *The capacity of the Bank to provide important wildlife habitat functions. A project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 50 feet (whichever is less) of the length of the bank found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

The project shall alter approximately 12 linear feet, or 7.7% of the Bank on the site, and therefore shall not be deemed to impair its capacity to provide important wildlife habitat functions.

(b) *Notwithstanding the provisions of 310 CMR 10.54(4)(a), structures may be permitted in or on a Bank when required to prevent flood damage to facilities, buildings and roads constructed prior to the effective date of 310 CMR 10.51 through 10.60 or constructed pursuant to a Notice of Intent filed prior to the effective date of 310 CMR 10.51 through 10.60 (April 1, 1983), including the renovation or reconstruction (but not substantial enlargement) of such facilities, buildings and roads, provided that the following requirements are met:*

No structures are proposed on the Banks.

(c) Notwithstanding the provisions of 310 CMR 10.54(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.

As noted above, there are no Estimated Habitats [for use with the Act and Regulations (310 CMR 10.00 *et seq.*)], Priority Habitats [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; “MESA”) and MESA Regulations (321 CMR 10.00 *et seq.*)], or Certified Vernal Pools on the site.

Land Under Water Bodies and Waterways (LUWW) Performance Standards

The trenching associated with the 6” sewer line installation shall temporarily alter approximately 51 square feet of LUWW. An assessment of the LUWW performance standards is provided below:

Land Under Water Bodies and Waterways [310 CMR 10.56(4)]

(a) Where the presumption set forth in 310 CMR 10.56(3) is not overcome, any proposed work within LUW shall not impair the following:

1. *Water carrying capacity within the defined channel;*
The water carrying capacity shall not be altered as a result of the project.
2. *Ground and surface water quality;*
Surface water quality will be maintained upon completion of the 6” sewer line.
3. *The capacity to provide breeding habitat, escape cover and food for fisheries;*
Any habitat features present shall be restored upon restoration of the temporarily impacted LUWW.
4. *The capacity of said land to provide important wildlife habitat functions. A project for which a Notice of Intent is filed on or after November 1, 1987, that cumulatively alters up to 10% or 5,000 sf (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions.*

The project shall only temporarily alter approximately 51 s.f. of LUWW, or approximately 8% of the LUWW on the site, and is therefore not deemed to impair its capacity to provide important wildlife habitat functions.

(b) Notwithstanding the provisions of 310 CMR 10.56(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.

As noted above, there are no Estimated Habitats [for use with the Act and Regulations (310 CMR 10.00 *et seq.*)], Priority Habitats [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; “MESA”) and MESA Regulations (321 CMR 10.00 *et seq.*)], or Certified Vernal Pools on the site.

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June 10, 2024

Benn Kloczkowski
P.O. Box 575
Sterling, MA 01564

RE: Wetland Resource Evaluation, 6 Lanesboro Road, Worcester, Massachusetts

Dear Mr. Kloczkowski:

On May 13, 2024, EcoTec, Inc. inspected the above-referenced property for the presence of wetland resources as defined by: (1) the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40; the “Act”) and its implementing regulations (310 CMR 10.00 *et seq.*; the “Regulations”); (2) the City of Worcester Wetlands Protection Ordinance, and (3) and (2) the U.S. Clean Water Act (i.e., Section 404 and 401 wetlands). Scott Jordan conducted the inspection.

The subject site consists of a 10,750 square foot parcel located at 6 Lanesboro Road in Worcester. The upland portions of the site consist of upland forest. The wetland resources observed on the site are described below.

Methodology

The site was inspected, and areas suspected to qualify as wetland resources were identified. The boundary of Bordering Vegetated Wetlands or, in the absence of Bordering Vegetated Wetlands, Bank was delineated in the field in accordance with the definitions set forth in the regulations at 310 CMR 10.55(2)(c) and 310 CMR 10.54(2). Section 10.55(2)(c) states that “The boundary of Bordering Vegetated Wetlands is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist.” Section 10.54(2)(c) states that “The upper boundary of Bank is the first observable break in the slope or the mean annual flood level, whichever is lower.” The methodology used to delineate Bordering Vegetated Wetlands is further described in the *Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands*, Second Edition, produced by the Massachusetts Department of Environmental Protection, dated September 2022. As recommended by the Department, the plant taxonomy used in this letter is based on the *National List of Plant Species that Occur in Wetlands: Massachusetts* (Fish and Wildlife Service, U.S. Department of the Interior, 1988). Federal wetlands were presumed to have boundaries conterminous with the delineated Bordering Vegetated Wetlands. One set of *Bordering Vegetated Wetland Determination Forms* completed for observation plots located in the wetlands and uplands near flag A-3 is attached. The table below provides the Flag Numbers, Flag Type, and Wetland Types and Locations for the delineated wetland resources.

NAME

DATE, 2023

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Flag Numbers	Flag Type	Wetland Types and Locations
Start A1 to A4 Stop	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the western portion of the site that is associated with an intermittent stream.
Start BA1 to BA15 Stop	Red Flags	Boundary of the Bank of an intermittent stream located in the western portion of the site.

Findings

Wetland A / BA (i.e., flags A1 to A4 and BA1 to BA15) consists of a narrow fringe of shrub swamp or the boundary of the Bank located in the western portion of the site that is associated with an intermittent stream. Plant species observed include red maple (*Acer rubrum*) trees and/or saplings; highbush blueberry (*Vaccinium corymbosum*) and sweet pepper-bush (*Clethra alnifolia*) shrubs; and cinnamon fern (*Osmunda cinnamomea*) ground cover. Evidence of wetland hydrology, including hydric soils, and saturated soils, was observed within the delineated wetland. This vegetated wetland borders an intermittent stream; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetlands and the intermittent stream would be regulated as Bank under the Act and Ordinance. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Act and Ordinance.

Bordering Land Subject to Flooding is an area that floods due to a rise in floodwaters from a bordering waterway or water body. Where flood studies have been completed, the boundary of Bordering Land Subject to Flooding is based upon flood profile data prepared by the National Flood Insurance Program. Section 10.57(2)(a)3. states that “The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm.” Based upon a review of the Flood Insurance Rate Map, Worcester County, Massachusetts, Map Number 25027C0610E, Effective Date 7/4/2011, there are no mapped Zone A or Zone AE floodplains located on or near the site. The project engineer should evaluate the most recent National Flood Insurance Program flood profile data to determine if Bordering Land Subject to Flooding occurs on the site. Bordering Land Subject to Flooding would occur in areas where the 100-year flood elevation is located outside of or upgradient of the delineated Bordering Vegetated Wetlands or Bank boundary. Bordering Land Subject to Flooding does not have a Buffer Zone under the Act.

The Massachusetts Rivers Protection Act amended the Act to establish an additional wetland resource area: Riverfront Area. Based upon a review of the current USGS Map (i.e., Worcester North Quadrangle, dated 1983, attached) and observations made during the site inspection, a stream that is not shown on the USGS Map is located in the western portion of the site. The watershed area for this stream at the site was determined to be 0.13 square miles, which is less than 0.5 square miles (see attached watershed calculations). As such, the stream would be designated intermittent under the Massachusetts Wetlands Protection Act regulations. Furthermore, based upon a review of the current USGS Map and observations made during the site inspection, there are no other mapped or unmapped streams located within 200 feet of the site. Accordingly, Riverfront Area would not occur on the site. Riverfront Area does not have a Buffer Zone under the Act.

NAME
DATE, 2023
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The Regulations require that no project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures set forth at 310 CMR 10.59. Based upon a review of the *Massachusetts Natural Heritage Atlas*, 15th edition, Priority Habitats and Estimated Habitats from the NHESP Interactive Viewer, valid from August 1, 2021, and Certified Vernal Pools from MassGIS, there are no Estimated Habitats [for use with the Act and Regulations (310 CMR 10.00 *et seq.*)], Priority Habitats [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; “MESA”) and MESA Regulations (321 CMR 10.00 *et seq.*)], or Certified Vernal Pools on or in the immediate vicinity of the site. A copy of this map is attached.

The reader should be aware that the regulatory authority for determining wetland jurisdiction rests with local, state, and federal authorities. A brief description of my experience and qualifications is attached. If you have any questions, please feel free to contact me at any time.

Cordially,
ECOTEC, INC.



Scott Jordan
Senior Environmental Scientist

Attachments (12 pages)

11/w/WorcesterLanesboroRd6 Report

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: _____ City/Town: _____ Sampling Date: _____

Applicant/Owner: _____ Sampling Point or Zone: _____

Investigator(s): _____ Latitude / Longitude: _____

Soil Map Unit Name: _____ NWI or DEP Classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? (If yes, explain in Remarks)

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If yes, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc.

Wetland vegetation criterion met?	Yes _____ No _____	Is the Sampled Area within a Wetland?	Yes _____ No _____
Hydric Soils criterion met?	Yes _____ No _____		
Wetlands hydrology present?	Yes _____ No _____		
Remarks, Photo Details, Flagging, etc.:			

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes _____ No _____	Depth (inches) _____
Water Table Present?	Yes _____ No _____	Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes _____ No _____	Depth (inches) _____
Wetland Hydrology Indicators		
Reliable Indicators of Wetlands Hydrology	Indicators that can be Reliable with Proper Interpretation	Indicators of the Influence of Water
<input type="checkbox"/> Water-stained leaves <input type="checkbox"/> Evidence of aquatic fauna <input type="checkbox"/> Iron deposits <input type="checkbox"/> Algal mats or crusts <input type="checkbox"/> Oxidized rhizospheres/pore linings <input type="checkbox"/> Thin muck surfaces <input type="checkbox"/> Plants with air-filled tissue (aerenchyma) <input type="checkbox"/> Plants with polymorphic leaves <input type="checkbox"/> Plants with floating leaves <input type="checkbox"/> Hydrogen sulfide odor	<input type="checkbox"/> Hydrological records <input type="checkbox"/> Free water in a soil test hole <input type="checkbox"/> Saturated soil <input type="checkbox"/> Water marks <input type="checkbox"/> Moss trim lines <input type="checkbox"/> Presence of reduced iron <input type="checkbox"/> Woody plants with adventitious roots <input type="checkbox"/> Trees with shallow root systems <input type="checkbox"/> Woody plants with enlarged lenticels	<input type="checkbox"/> Direct observation of inundation <input type="checkbox"/> Drainage patterns <input type="checkbox"/> Drift lines <input type="checkbox"/> Scoured areas <input type="checkbox"/> Sediment deposits <input type="checkbox"/> Surface soil cracks <input type="checkbox"/> Sparsely vegetated concave surface <input type="checkbox"/> Microtopographic relief <input type="checkbox"/> Geographic position (depression, toe of slope, fringing lowland)
Remarks (describe recorded data from stream gauge, monitoring well, aerial photos, previous inspections, if available):		

This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

VEGETATION – Use both common and scientific names of plants.

<u>Tree Stratum</u>		Plot size _____					
				Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
				_____ = Total Cover			
<u>Shrub/Sapling Stratum</u>		Plot size _____					
				Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
				_____ = Total Cover			
<u>Herb Stratum</u>		Plot size _____					
				Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
				_____ = Total Cover			

VEGETATION – continued.

<u>Woody Vine Stratum</u>		Plot size _____		Indicator	Absolute	Dominant?	Wetland
Common name		Scientific name		Status	% Cover	(yes/no)	Indicator?
							(yes/no)
1.							
2.							
3.							
4.							
				_____ = Total Cover			

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes _____ No _____				
Dominance Test:	Number of dominant species	Number of dominant species that are wetland indicator plants	Do wetland indicator plants make up ≥ 50% of dominant plant species? Yes _____ No _____	
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species		X 1	=
	FACW species		X 2	=
	FAC species		X 3	=
	FACU species		X 4	=
	UPL species		X 5	=
	Column Totals	(A)		(B)
Prevalence Index		B/A =		Is the Prevalence Index ≤ 3.0? Yes _____ No _____
Wetland vegetation criterion met? Yes _____ No _____				

Definitions of Vegetation Strata

- Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height
- Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall
- Herb - All herbaceous (non-woody plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall
- Woody vines - All woody vines greater than 3.3 ft. (1 m) in height

Cover Ranges	
Range	Midpoint
1-5 %	3.0 %
6-15 %	10.5 %
15-25 %	20.5 %
26-50 %	38.0 %
51-75 %	63.0 %
76-95 %	85.5 %
96-100 %	98.0 %

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Location ²		

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

Hydric Soil Indicators (Check all that apply)	Indicators for Problematic Hydric Soils
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Other (Include Explanation in Remarks)
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	

Restrictive Layer (if observed) Type: _____ Depth (inches): _____

Remarks:

Hydric Soils criterion met? Yes _____ No _____

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: _____ City/Town: _____ Sampling Date: _____

Applicant/Owner: _____ Sampling Point or Zone: _____

Investigator(s): _____ Latitude / Longitude: _____

Soil Map Unit Name: _____ NWI or DEP Classification: _____

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? (If yes, explain in Remarks)

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If yes, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map and photograph log showing sampling locations, transects, etc.

Wetland vegetation criterion met?	Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Hydric Soils criterion met?	Yes _____ No _____	
Wetlands hydrology present?	Yes _____ No _____	
Remarks, Photo Details, Flagging, etc.:		

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes _____ No _____	Depth (inches) _____
Water Table Present?	Yes _____ No _____	Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes _____ No _____	Depth (inches) _____
Wetland Hydrology Indicators		
Reliable Indicators of Wetlands Hydrology ___ Water-stained leaves ___ Evidence of aquatic fauna ___ Iron deposits ___ Algal mats or crusts ___ Oxidized rhizospheres/pore linings ___ Thin muck surfaces ___ Plants with air-filled tissue (aerenchyma) ___ Plants with polymorphic leaves ___ Plants with floating leaves ___ Hydrogen sulfide odor	Indicators that can be Reliable with Proper Interpretation ___ Hydrological records ___ Free water in a soil test hole ___ Saturated soil ___ Water marks ___ Moss trim lines ___ Presence of reduced iron ___ Woody plants with adventitious roots ___ Trees with shallow root systems ___ Woody plants with enlarged lenticels	Indicators of the Influence of Water ___ Direct observation of inundation ___ Drainage patterns ___ Drift lines ___ Scoured areas ___ Sediment deposits ___ Surface soil cracks ___ Sparsely vegetated concave surface ___ Microtopographic relief ___ Geographic position (depression, toe of slope, fringing lowland)
Remarks (describe recorded data from stream gauge, monitoring well, aerial photos, previous inspections, if available):		

This form is only for BVW delineations. Other wetland resource areas may be present and should be delineated according to the applicable regulatory provisions.

VEGETATION – Use both common and scientific names of plants.

<u>Tree Stratum</u>		Plot size _____					
				Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
				_____ = Total Cover			
<u>Shrub/Sapling Stratum</u>		Plot size _____					
				Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
				_____ = Total Cover			
<u>Herb Stratum</u>		Plot size _____					
				Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name					
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
				_____ = Total Cover			

VEGETATION – continued.

<u>Woody Vine Stratum</u>		Plot size _____		Indicator	Absolute	Dominant?	Wetland
Common name		Scientific name		Status	% Cover	(yes/no)	Indicator?
							(yes/no)
1.							
2.							
3.							
4.							
				_____ = Total Cover			

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes _____ No _____				
Dominance Test:	Number of dominant species	Number of dominant species that are wetland indicator plants	Do wetland indicator plants make up ≥ 50% of dominant plant species? Yes _____ No _____	
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species		X 1	=
	FACW species		X 2	=
	FAC species		X 3	=
	FACU species		X 4	=
	UPL species		X 5	=
	Column Totals	(A)		(B)
Prevalence Index		B/A =		Is the Prevalence Index ≤ 3.0? Yes _____ No _____
Wetland vegetation criterion met? Yes _____ No _____				

Definitions of Vegetation Strata

- Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height
- Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall
- Herb - All herbaceous (non-woody plants, regardless of size, and woody plants less than 3.3 ft. (1 m) tall
- Woody vines - All woody vines greater than 3.3 ft. (1 m) in height

Cover Ranges	
Range	Midpoint
1-5 %	3.0 %
6-15 %	10.5 %
15-25 %	20.5 %
26-50 %	38.0 %
51-75 %	63.0 %
76-95 %	85.5 %
96-100 %	98.0 %

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Location ²		

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

Hydric Soil Indicators (Check all that apply)		Indicators for Problematic Hydric Soils
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Mesic Spodic (A17)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		
<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Other (Include Explanation in Remarks)
<input type="checkbox"/> Stripped Matrix (S6)		
<input type="checkbox"/> Dark Surface (S7)		

Restrictive Layer (if observed) Type: _____ Depth (inches): _____

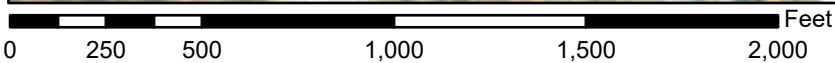
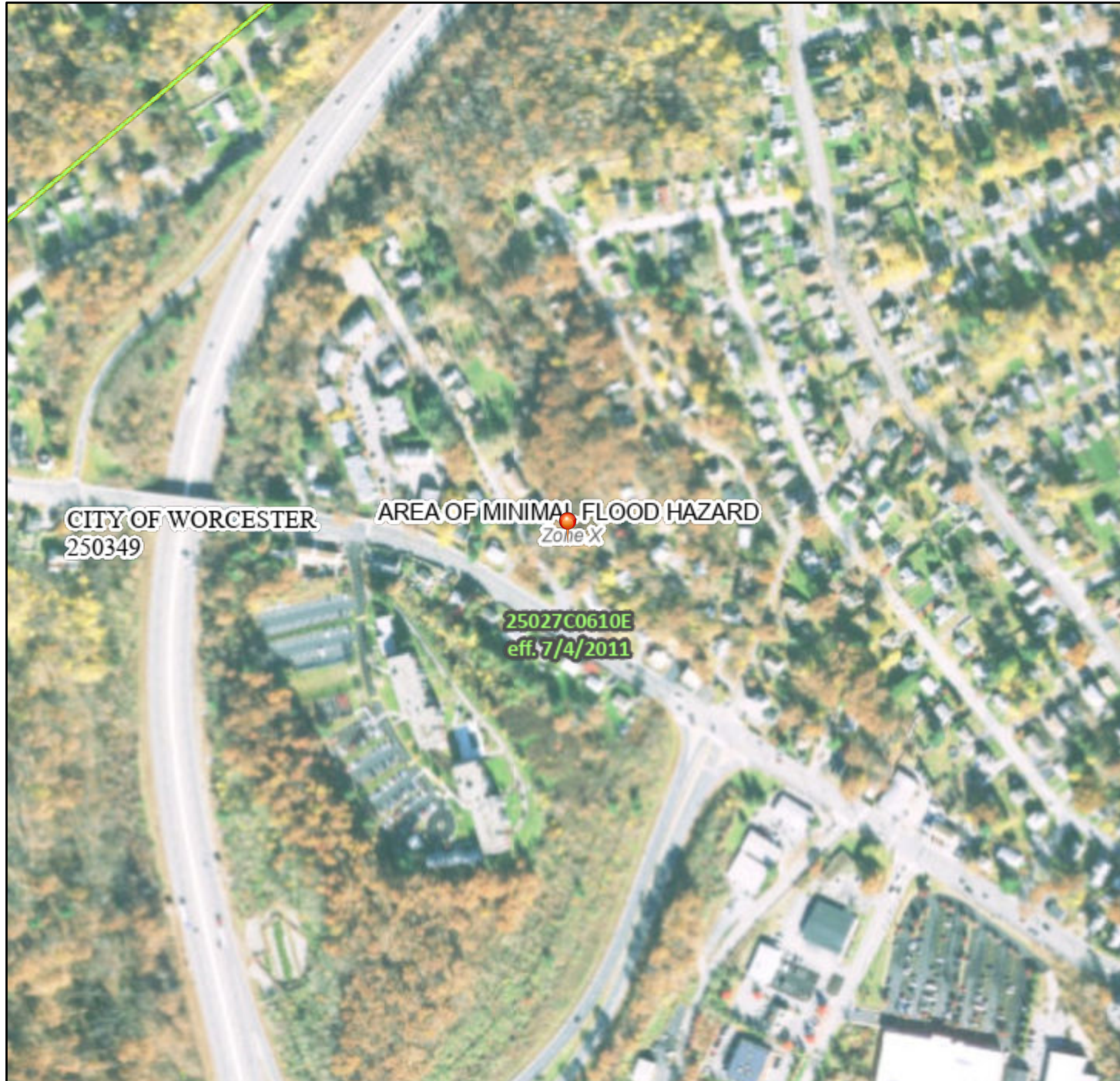
Remarks:

Hydric Soils criterion met? Yes _____ No _____

National Flood Hazard Layer FIRMette



71°48'21"W 42°19'50"N



1:6,000

71°47'44"W 42°19'23"N

Basemap Imagery Source: USGS National Map 2023

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		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 <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		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
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

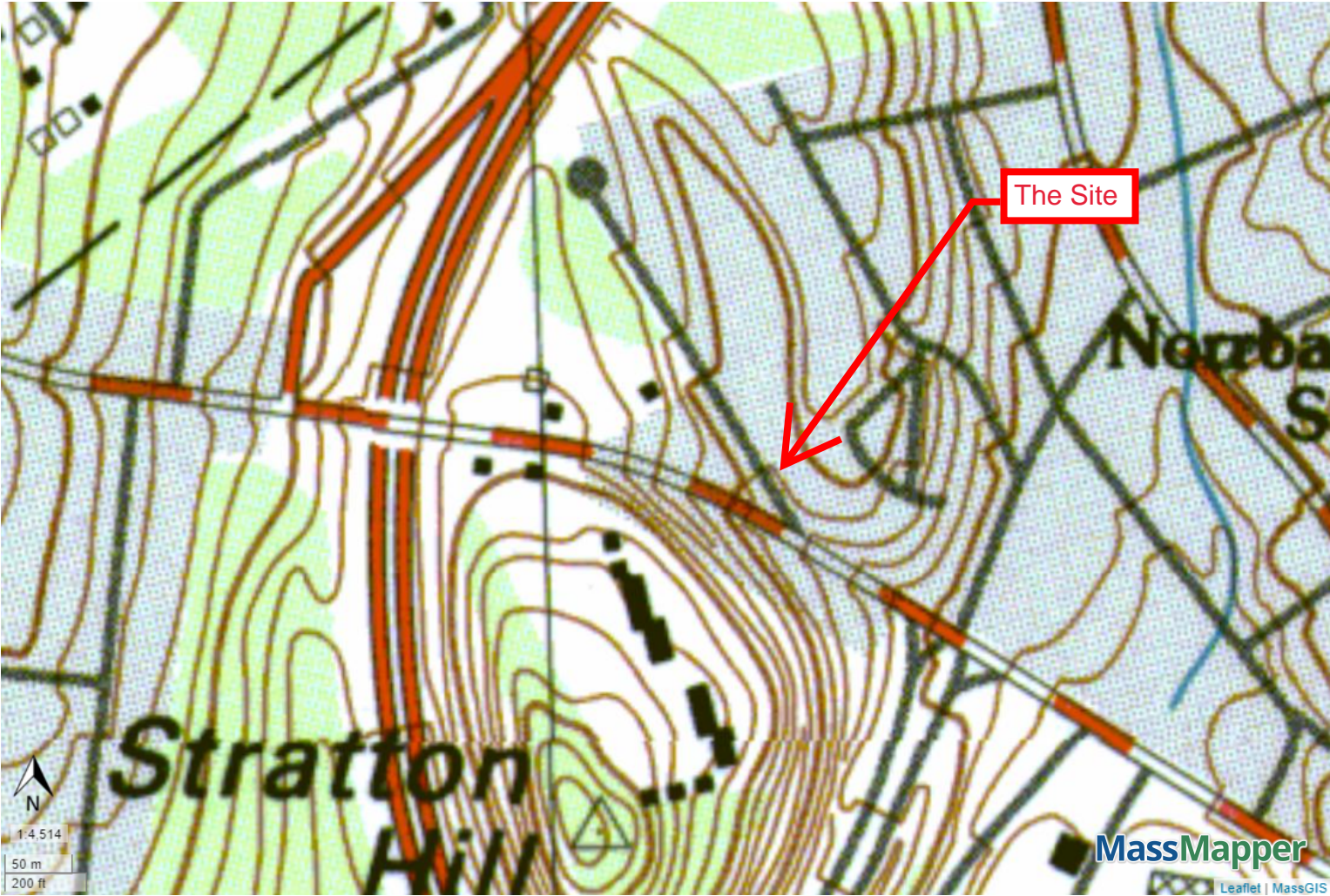


This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **5/2/2024 at 2:57 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.

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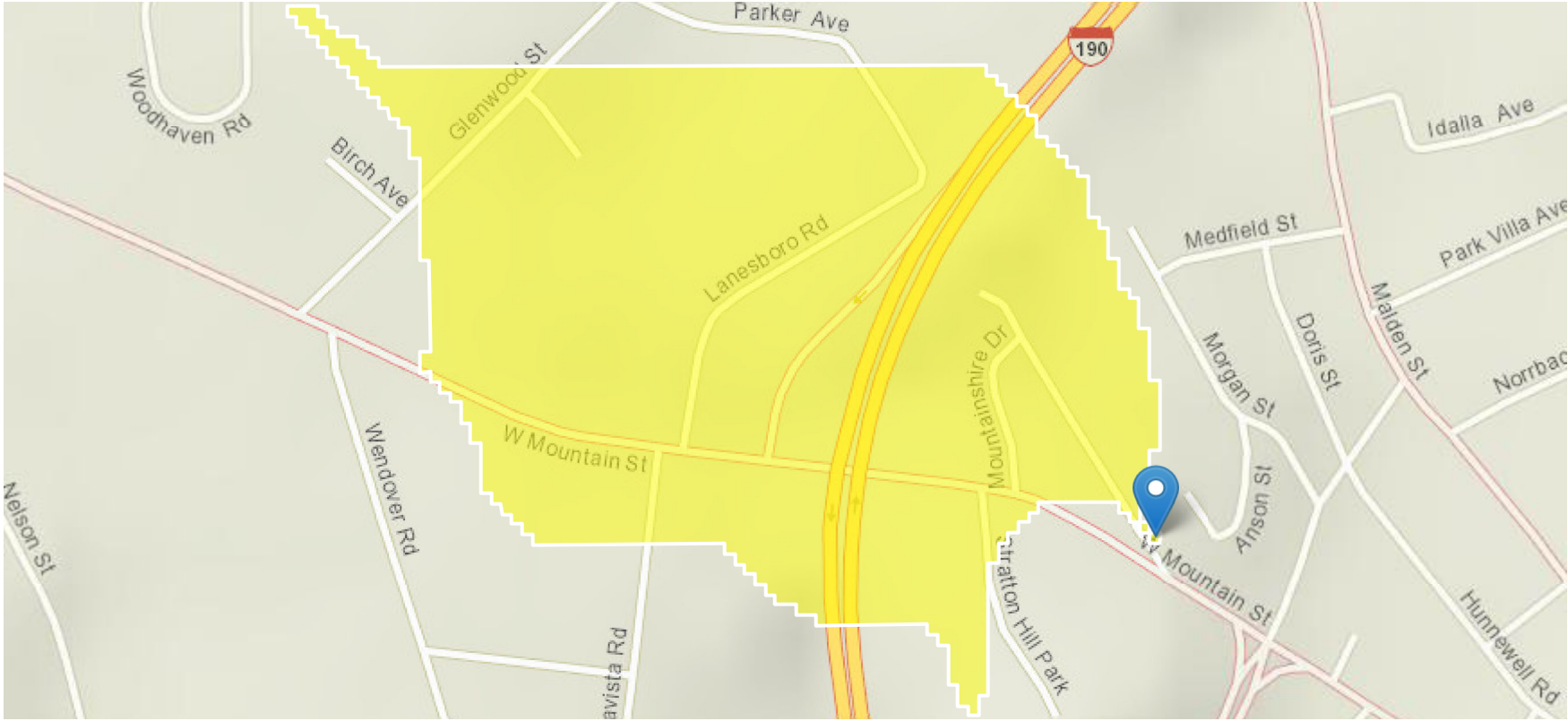
USGS Topographic Map - 6 Lanesboro Road, Worcester



USGS Topographic Maps
Property Tax Parcels

StreamStats Report

Region ID: MA
Workspace ID: MA20240318195306397000
Clicked Point (Latitude, Longitude): 42.32646, -71.80068
Time: 2024-03-18 15:54:55 -0400



6 Lanesboro Road, Worcester

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLDEM250	Mean basin slope computed from 1:250K DEM	4.472	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	-100000	square mile per mile
DRNAREA	Area that drains to a point on a stream	0.13	square miles
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

➤ Flow-Duration Statistics

Flow-Duration Statistics Parameters [Statewide Low Flow WRIR00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.13	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	-100000	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	4.472	percent	0.32	24.6

Flow-Duration Statistics Disclaimers [Statewide Low Flow WRIR00 4135]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors. Equation D60 in GC320 could not be calculated due to undefined basin characteristic. Equation D70 in GC320 could not be calculated due to undefined basin characteristic. Equation D75 in GC320 could not be calculated due to undefined basin characteristic. Equation D80 in GC320 could not be calculated due to undefined basin characteristic. Equation D85 in GC320 could not be calculated due to undefined basin characteristic. Equation D90 in GC320 could not be calculated due to undefined basin characteristic. Equation D95 in GC320 could not be calculated due

to undefined basin characteristic. Equation D98 in GC320 could not be calculated due to undefined basin characteristic. Equation D99 in GC320 could not be calculated due to undefined basin characteristic.

Flow-Duration Statistics Flow Report [Statewide Low Flow WRIR00 4135]

Statistic	Value	Unit
50 Percent Duration	0.119	ft ³ /s
60 Percent Duration	undefined	ft ³ /s
70 Percent Duration	undefined	ft ³ /s
75 Percent Duration	undefined	ft ³ /s
80 Percent Duration	undefined	ft ³ /s
85 Percent Duration	undefined	ft ³ /s
90 Percent Duration	undefined	ft ³ /s
95 Percent Duration	undefined	ft ³ /s
98 Percent Duration	undefined	ft ³ /s
99 Percent Duration	undefined	ft ³ /s

Flow-Duration Statistics Citations

Ries, K.G., III, 2000, Methods for estimating low-flow statistics for Massachusetts streams: U.S. Geological Survey Water Resources Investigations Report 00-4135, 81 p. (<http://pubs.usgs.gov/wri/wri004135/>)

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Application Version: 4.19.4

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

Natural Heritage Atlas Online Data Viewer Output 3/22/2024



Potential Vernal Pools



NHESP Priority Habitats of Rare Species



NHESP Estimated Habitats of Rare Wildlife



NHESP Certified Vernal Pools



Areas of Critical Environmental Concern
ACECs



Property Tax Parcels

MassMapper

Leaflet | MassGIS

EcoTec, Inc.

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508-752-9666 – Fax: 508-752-9494

Scott Jordan **Senior Environmental Scientist**

Scott Jordan is an Environmental Scientist with EcoTec, Inc. Since joining EcoTec in 2000, Mr. Jordan's duties have included wetland resource evaluation and delineation; erosion and sediment control planning and monitoring, environmental monitoring, including water quality analysis, sediment analysis and wildlife habitat impact analysis; environmental permitting at local, state, and federal level; pond and stream evaluation; wildlife habitat evaluation, vernal pool evaluation; and wetland restoration and replication design and oversight. He has served as an environmental consultant to the development community, engineering firms, municipalities, and conservation commissions. Prior to joining EcoTec, Mr. Jordan was the Senior Laboratory Technician for GeoComp Corporation where he performed numerous physical properties analysis of soils and geosynthetic materials in accordance with ASTM, and AASHTO specifications. His seven years experience evaluating New England soils includes soil analysis and classification of site-remediated soils with oil and hazardous material contamination. His educational background includes courses in organic and inorganic chemistry, biology, botany and comparative vertebrate physiology, with extensive coursework in ecology and wildlife biology; and he has completed several professional training seminars including erosion and sediment control, soil evaluation, wildlife habitat evaluation, wetland mitigation, vernal pool evaluation, water quality assessment using macro-invertebrates, and river morphology and functions. He has participated in several rare species and wildlife monitoring and inventory projects, including marsh bird surveys, marbled salamander (*Ambystoma opacum*) survey, great laurel (*Rhododendron maximum*) survey, wood turtle (*Glyptemys insculpta*) habitat assessments and sweeps, eastern box turtle (*Terrapene carolina*) habitat assessments, and greater black-backed gull (*Larus marinus*) inventory. His prior research experience includes behavioral and acoustic studies of the common loon (*Gavia immer*) in northwestern Maine.

Education: Bachelor of Science: Biology - Wildlife and Environmental, *Cum Laude*
Framingham State College, 2000
Biotechnology Certificate
Middlesex Community College, 1994

Professional

Affiliations: Massachusetts Association of Conservation Commissioners
Association of Massachusetts Wetland Scientists
Society of Wetland Scientists
Society of Soil Scientists of Southern New England