

EcoTec, Inc.
ENVIRONMENTAL CONSULTING SERVICES
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March 22, 2024

Mr. Lou Petrozzi
Wall Street Development Corp.
2 Warthin Circle
Norwood, MA 02062

RE: Wetland Resource Evaluation, Lake Street and Lakeview Avenue, Bellingham & Prospect Street, Franklin, Massachusetts

Dear Mr. Petrozzi:

On June 29, 31, & July 3, 2019, 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”); and (2) the U.S. Clean Water Act (i.e., Section 404 and 401 wetlands). Arthur Allen, Scott Morrison, Scott Jordan, and Ben Galligan conducted the inspection.

On April 5th, and April 21st, 2022, and January 30, and February 6, 2024, Kate O’Donnell, WPIT, and Paul McManus, PWS of EcoTec, Inc., refreshed and verified the placement of the flagging referenced in the table below and flagged additional areas based upon an expanded locus (see attached locus). Flagging series DE and SE were the only wetland resources where the flagging was not refreshed as the lot where the DE wetland was located was already permitted and under construction and the area in the vicinity of flagging series SE was flooded due to beaver activity.

The subject site consists of several parcels (see attached locus) totaling approximately 72-acres located at the town line between Bellingham and Franklin, abutting Prospect Street and Lake Street. A portion of the project also abuts Lakeview Avenue in Bellingham. The upland portions of the site consist of hilled terrain with upland forest with evidence of a former gravel mining operation. Plant species observed include northern red oak (*Quercus rubra*), eastern white pine (*Pinus strobus*), red maple (*Acer rubrum*), lowbush blueberry (*Vaccinium angustifolium*), deerberry (*Vaccinium stamineum*), highbush blueberry (*Vaccinium corymbosum*), haircap moss (*Polytrichum commune*), partridge-berry (*Mitchella repens*), cinnamon fern (*Osmunda cinnamomea*), and tree clubmoss (*Lycopodium obscurum*). 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. The plant taxonomy used in this report 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 and Bank. Three sets of DEP Bordering Vegetated Wetland Delineation Field Data Forms completed for observation plots located in the wetlands and uplands near flag A-34, DD-44, and LA-11 are attached. The table below provides the Flag Numbers, Flag Type, and Wetland Types and Locations for the delineated wetland resources.

Flag Numbers	Flag Type	Wetland Types and Locations
Start A-1 to A-85 Stop	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Southwest portion of the site that is associated with a perennial stream and ponded wetlands located to the Southwest.
Start B-1 to B-23 Stop	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw and possible Isolated Land Subject to Flooding under the Act located in the Southwest portion of the site.
Connect to culvert Start C-1 to C-47 Stop Connect to Culvert	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Southern portion of the site that is associated with a perennial stream and a pond located to the South.
Connect to Culvert Start DA-1 to DA-64 Connect To Culvert	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Southern portion of the site that is associated with a perennial stream and a pond located to the South.
Start DB-1 to DB-4 Stop	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw located in the Southern portion of the site associated with an old sluiceway next to the pond dam.
Connect to Culvert Start DC-1 to DC-50 Connect To E-58	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Northeast portion of the site that is associated with an intermittent stream to the west.
Connect to Culvert Start DD-1 to DD-114	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Northeast portion of the site that is associated with an intermittent stream to the South.
Start DE-1 to DE-28 Stop, Connect DE-1 to DE-28	Blue Flags	Boundary of Isolated Land Subject to Flooding under the Act & Bylaw located in the easterly portion of the site.

Start DF-1 to DF-6 Stop	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw located in the northwesterly portion of the site.
Start AE-1 to AE-21 Stop	Blue Flags	Boundary of Isolated Land Subject to Flooding under the Act & Bylaw located in the northwesterly portion of the site.. Inadvertent duplicate use of E series. Change to AE series on plan.
Start E-1 to E-58 Stop, Connect E-58 to DC-50, Connect E-1 to EE-37	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Northeast portion of the site that is associated with an intermittent stream to the East.
Start EE-1 to EE-37 Stop, Connect E-1 to EE-37	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Northwest portion of the site that is associated with an intermittent stream to the East.
Start F-1 to F-16 Stop	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the Northeast portion of the site that is associated with an intermittent stream to the South of a partially blocked culvert.
Start G-1 to G-30 Stop Connect to G-1 (2024 additional flagging)	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw located in the northwestern portion of the site.
Start H-1 to H-11 Stop Connect to H-1 (2024 additional flagging)	Blue Flags	Boundary of Isolated Vegetated Wetland under the Bylaw located in the northwestern portion of the site.
Start IA-1 to IA-21	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the central portion of the site that is associated with a perennial stream to the south.
Start IB-1 to IB-4	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the central portion of the site that is associated with a perennial stream to the south.
Start LA-1 to LA-25 Stop (2024 additional flagging)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the westernmost portion of the site that associated with Silver Lake.
Start VW-1 to VW-13	Blue Flags	MAHWL of Possible Vernal Pool under the Bylaw located in the central portion of the site. Flag series not located on current site plan.
Start RA-1 to RA-18 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of a unnamed, mapped perennial stream located in the Southwest portion of the site.
Start RB-1 to RB-22 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of a unnamed, unmapped perennial stream located in the Southerly portion of the site.
Start RC-1 to RC-17 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of a unnamed, unmapped perennial stream located in the Southerly portion of the site.
Start RD-1 to RD-31 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of a unnamed, mapped perennial stream located in the central portion of the site.
Start RR-1 to RR-24 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of the

		downstream portion of an unnamed, mapped perennial stream located in the central portion of the site.
Start SE-1 to SE-11 Stop	Pink Flags	MAHWL of perennial stream located in the southeastern portion of the site. Flag series not refreshed in April 2022 due to flooding from beavers. Use 2019 flagging locations.

Findings

Wetlands DC, DD, E, EE, and F consists of wooded swamps located in multiple portions of the site that are associated with intermittent streams. Plant species observed include red maple (*Acer rubrum*), northern red oak (*Quercus rubra*), common winterberry (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), northern spicebush (*Lindera benzoin*), marsh fern (*Thelypteris thelypteroides*), skunk-cabbage (*Symplocarpus foetidus*), and spotted touch-me-not (*Impatiens capensis*). Evidence of wetland hydrology, including hydric soils, and evidence of flooding were observed within the delineated wetland. These vegetated wetlands border 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. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands under the Act.

Wetlands A, C, DA, IA, and IB consist of wooded swamps located in multiple portions of the site that are associated with perennial streams. Plant species observed include red maple (*Acer rubrum*), eastern white pine (*Pinus strobus*), highbush blueberry (*Vaccinium corymbosum*), sphagnum moss (*Sphagnum sp.*), and royal fern (*Osmunda regalis*). Evidence of wetland hydrology, including hydric soils, and evidence of flooding, were observed within the delineated wetland. This vegetated wetland borders a perennial stream; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetlands and the perennial stream would be regulated as Bank and Land Under Water Bodies and Waterways under the Act. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands under the Act.

Parts of wetlands C and DA consist of a millpond and associated wooded wetland located in the southeast portion of the site that is associated with a pond. Plant species observed include red maple (*Acer rubrum*), eastern white pine (*Pinus strobus*), highbush blueberry (*Vaccinium corymbosum*), sphagnum moss (*Sphagnum sp.*), and royal fern (*Osmunda regalis*). Evidence of wetland hydrology, including hydric soils, and evidence of flooding, was observed within the delineated wetland. This vegetated wetland borders a pond; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetlands and the pond would be regulated as Bank and Land Under Water Bodies and Waterways under the Act. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated under the Act.

Wetland LA (flags LA1-LA25) consists of the upper boundary of Bank and a wooded swamp, located in the western-most portion of the site that is associated with Silver Lake. Plant species observed include similar species to those listed above. Evidence of wetland hydrology, including

hydric soils, saturated soils, evidence of flooding, and drainage patterns, was observed within the delineated wetland. The vegetated wetland borders Silver Lake, a mapped pond; accordingly, the vegetated wetlands would be regulated as Bordering Vegetated Wetland and Silver Lake would be regulated as Bank and Land Under Water Bodies and Waterways under the Act and Bylaw. A 100-foot Buffer Zone extends horizontally outward from the edge of Bordering Vegetated Wetlands and Bank under the Act and Bylaw.

Wetlands B, AE/(E), and DE consists of an isolated vegetated wetland located in the southwest and northeast portions of the site. Plant species observed in this isolated wetland include red maple (*Acer rubrum*), northern red oak (*Quercus rubra*), common winterberry (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), northern spicebush (*Lindera benzoin*), marsh fern (*Thelypteris thelypteroides*), skunk-cabbage (*Symplocarpus foetidus*), and spotted touch-me-not (*Impatiens capensis*). Hydric soils and other evidence of wetland hydrology, including evidence of flooding, was observed within the delineated wetland. This wetland does not border a creek, stream, river, pond, or lake; accordingly, it would not be regulated as Bordering Vegetated Wetlands under the Act. Section 10.57(2)(b)1. states that “Isolated Land Subject to Flooding is an isolated depression or closed basin without an inlet or an outlet. It is an area that at least once per year confines standing water to a volume of at least ¼ acre-feet and to an average depth of at least six inches.” Engineering calculations should be performed in accordance with 310 CMR 10.57(2)(b) and the ILSF Definition Policy issued January 25, 1985 and revised March 1, 1995 to determine if this area meets the definition of Isolated Land Subject to Flooding under the Act. If the calculations demonstrate that this area qualifies, it would be regulated as Isolated Land Subject to Flooding under the Act. Section 10.57(2)(b)3. states that “The boundary of Isolated Land Subject to Flooding is the perimeter of the largest observed or recorded volume of water confined in said area. In the event of a conflict of opinion regarding the extent of water confined in an Isolated Land Subject to Flooding, the applicant may submit an opinion by a registered professional engineer, supported by engineering calculations, as to the probable extent of said water.” If this area does not qualify as Isolated Land Subject to Flooding, it would not be subject to jurisdiction under the Act. Isolated Land Subject to Flooding does not have a 100-foot Buffer Zone under the Act. EcoTec assumes that the Bellingham and Franklin Conservation Commission would regulate these isolated vegetated wetlands with a 100-foot Buffer Zone.

Wetland DB, DF, G, and H consists of an isolated vegetated wetland located in multiple portions of the site. Plant species observed in these isolated wetlands include red maple (*Acer rubrum*), northern red oak (*Quercus rubra*), common winterberry (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), northern spicebush (*Lindera benzoin*), marsh fern (*Thelypteris thelypteroides*), skunk-cabbage (*Symplocarpus foetidus*), and spotted touch-me-not (*Impatiens capensis*). Hydric soils and other evidence of wetland hydrology, including evidence of flooding, were observed within the delineated wetland. This wetland does not border a creek, stream, river, pond, or lake; accordingly, it would not be regulated as Bordering Vegetated Wetlands under the Act. Section 10.57(2)(b)1. states that “Isolated Land Subject to Flooding is an isolated depression or closed basin without an inlet or an outlet. It is an area that at least once per year confines standing water to a volume of at least ¼ acre-feet and to an average depth of at least six inches.” Based upon field observations, the potential ponding area appears to be too small to

hold the requisite volume and depth of water to be regulated as Isolated Land Subject to Flooding under the Act. Accordingly, this area would not be subject to jurisdiction under the Act. In light of the recent Sackett vs. EPA Supreme Court Decision, it appears that these small, isolated wetland area would not qualify as a jurisdictional federal wetland. EcoTec assumes that the Bellingham and Franklin Conservation Commission would regulate these isolated vegetated wetlands with a 100-foot Buffer Zone.

Flagging series VW (i.e., VW1-VW13) delineates the apparent high-water line of the ponded area within the IA and IB flagging series that has the potential to qualify as a Vernal Pool under the bylaw.

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.” 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., Franklin Quadrangle, dated 1987, attached), one stream that is shown as perennial is located on the western side of the site. Streams that are shown as perennial on the current USGS map are designated perennial under the Massachusetts Wetlands Protection Act regulations. A second stream that is not shown on the current USGS Map is located below the millpond in the southeastern portion of the site. The watershed area for this stream at the site was determined to be 1.23 square miles, which is greater than or equal to one square mile (see attached watershed map). Accordingly, the stream would be designated perennial under the Massachusetts Wetlands Protection Act regulations. Unless this perennial designation is overcome, Riverfront Area is presumed to extend 200 feet horizontally upgradient from the mean annual high-water line of the stream. Section 10.58(2)(a)2. states that the “Mean annual high-water line of a river is the line that is apparent from visible markings or changes in the character of soils or vegetation due to prolonged presence of water and that distinguishes between predominantly aquatic and predominantly terrestrial land. Field indicators of bankfull conditions shall be used to determine the mean annual high-water line. Bankfull field indicators include but are not limited to: changes in slope, changes in vegetation, stain lines, top of pointbars, changes in bank materials, or bank undercuts.” Section 10.58(2)(a)2.a. states that “In most rivers, the first observable break in slope is coincident with bankfull conditions and the mean annual high-water line.” The mean annual high-water line of the streams at the site were delineated in the field with flag series RA, RB, RC, RD, RR, and SE based upon the above-referenced regulation. Furthermore, based upon a

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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, except as noted above, Riverfront Area would not occur on the site. Riverfront Area does not have a Buffer Zone under the Act, but may overlap other wetland resources and their Buffer Zones.

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*, 14th edition, Priority Habitats and Estimated Habitats from the NHESP Interactive Viewer, valid from August 1, 2017, and Certified Vernal Pools from MassGIS, the site is not located within an Estimated Habitat [for use with the Act and Regulations (310 CMR 10.00 *et seq.*)] or a Priority Habitat [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; “MESA”) and regulations (321 CMR 10.00 *et seq.*; the “MESA Regulations”)]. However, one Certified Vernal Pool is located on 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. Brief descriptions of our experience and qualifications are attached. If you have any questions, please feel free to contact me at any time.

Cordially,
ECOTEC, INC.



Paul McManus, PWS
President



Kate O'Donnell, WPIT
Environmental Scientist

Attachments (36 pages)

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lake St and Prospect ST City/Town: Bellingham and Franklin Sampling Date: 6/27/2019
 Applicant/Owner: _____ Sampling Point or Zone: A-34 - UPLAND
 Investigator(s): Art Allen, EcoTec, Inc. 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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soils criterion met?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetlands hydrology present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks, Photo Details, Flagging, etc.:			

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> Depth (inches) _____
Water Table Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/> 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 <u>30</u>				
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)	
Common name	Scientific name					
1. white pine	Pinus strobus	FACU	100.0	Yes	No	
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
			<u>100.0</u> = Total Cover			
<u>Shrub/Sapling Stratum</u>		Plot size <u>15</u>				
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)	
Common name	Scientific name					
1. white pine	Pinus strobus	FACU	10.0	Yes	No	
2. highbush blueberry	Vaccinium corymbosum	FACW	5.0	Yes	Yes	
3.						
4.						
5.						
6.						
7.						
8.						
9.						
			<u>15.0</u> = Total Cover			
<u>Herb Stratum</u>		Plot size <u>5</u>				
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)	
Common name	Scientific name					
1. hair-cap moss	Polytrichum sp.		10.0	Yes	No	
2. partridge-berry	Mitchella repens	FACU	5.0	Yes	No	
3. red maple	Acer rubrum	FAC	5.0	Yes	Yes	
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
			<u>20.0</u> = Total Cover			

VEGETATION – continued.

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

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
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 <input type="checkbox"/> No <input checked="" type="checkbox"/>
	6	2		
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species	0	X 1	= 0.00
	FACW species	5	X 2	= 10.00
	FAC species	5	X 3	= 15.00
	FACU species	115	X 4	= 460.00
	UPL species	0	X 5	= 0.00
	Column Totals	(A) 125		(B) 485
Prevalence Index		B/A = 3.88		Is the Prevalence Index ≤ 3.0? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland vegetation criterion met? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				

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 %

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		
Leaf Litter: 2"								
O: 2"								
A: 0-6"	10R 3/2						gravely loamy sand	
Bw: 6-14"+	10YR 5/4	90.00	10YR 4/6	10.00	C	M	gravely loamy sand	

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 ☒

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lake Street and Prospect Street City/Town: Bellingham and Franklin Sampling Date: 6/27/2019
 Applicant/Owner: _____ Sampling Point or Zone: A-34 - WETLAND
 Investigator(s): Art Allen, EcoTec, Inc. 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soils criterion met?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetlands hydrology present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks, Photo Details, Flagging, etc.:		

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches) <u>0.00</u>
Saturation Present (including capillary fringe)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches) <u>0.00</u>
Wetland Hydrology Indicators		
Reliable Indicators of Wetlands Hydrology	Indicators that can be Reliable with Proper Interpretation	Indicators of the Influence of Water
<input checked="" 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 checked="" type="checkbox"/> Free water in a soil test hole <input checked="" 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 <u>30</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. red maple	Acer rubrum	FAC	50.0	Yes	Yes
2. white pine	Pinus strobus	FACU	50.0	Yes	No
3.					
4.					
5.					
6.					
7.					
8.					
9.					
<u>100.0</u> = Total Cover					
<u>Shrub/Sapling Stratum</u> Plot size <u>15</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. highbush blueberry	Vaccinium corymbosum	FACW	20.0	Yes	Yes
2. red maple	Acer rubrum	FAC	10.0	Yes	Yes
3.					
4.					
5.					
6.					
7.					
8.					
9.					
<u>30.0</u> = Total Cover					
<u>Herb Stratum</u> Plot size <u>5</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. sphagnum moss	Sphagnum sp.	FACW	40.0	Yes	Yes
2. royal fern	Osmunda regalis	OBL	5.0	No	Yes
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
<u>45.0</u> = Total Cover					

VEGETATION – continued.

<u>Woody Vine Stratum</u>		Plot size <u>30</u>			
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1.					
2.					
3.					
4.					
<u>0.0</u> = Total Cover					

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>
	5	4		
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species	5	X 1	= 5.00
	FACW species	60	X 2	= 120.00
	FAC species	60	X 3	= 180.00
	FACU species	50	X 4	= 200.00
	UPL species	0	X 5	= 0.00
	Column Totals	(A) 175		(B) 505
Prevalence Index		B/A = 2.89		Is the Prevalence Index ≤ 3.0? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland vegetation criterion met? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

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		
Leaf Litter: 4"								
Oa: 0-8"								
A: 8-16"	10YR 2/1	100.00						

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 checked="" 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 ☐

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lake Street and Prospect Street City/Town: Bellingham and Franklin Sampling Date: 7/3/2019
 Applicant/Owner: _____ Sampling Point or Zone: DD-44 UPLAND
 Investigator(s): Art Allen, EcoTec, Inc. 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soils criterion met?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetlands hydrology present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks, Photo Details, Flagging, etc.:			

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	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 <u>30</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. red oak	Quercus rubra	FACU	60.0		
2. red maple	Acer rubrum	FAC	40.0		
3.					
4.					
5.					
6.					
7.					
8.					
9.					
<u>100.0</u> = Total Cover					
<u>Shrub/Sapling Stratum</u> Plot size <u>15</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. white pine	Pinus strobus	FACU	30.0	Yes	No
2. lowbush blueberry	Vaccinium angustifolium	FACU	30.0	Yes	No
3. deerberry	Vaccinium stamineum	FACU	10.0	Yes	No
4.					
5.					
6.					
7.					
8.					
9.					
<u>70.0</u> = Total Cover					
<u>Herb Stratum</u> Plot size <u>5</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. cinnamon fern	Osmunda cinnamomea	FACW	15.0	Yes	Yes
2. yellow sedge	Carex flava	OBL	15.0	Yes	Yes
3. dewberry	Rubus flagellaris	FACU	15.0	Yes	No
4. tree clubmoss	Lycopodium obscurum	FACU	10.0	No	No
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
<u>55.0</u> = Total Cover					

VEGETATION – continued.

<u>Woody Vine Stratum</u>		Plot size <u>30</u>			
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1.					
2.					
3.					
4.					
<u>0.0</u> = Total Cover					

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
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 <input type="checkbox"/> No <input checked="" type="checkbox"/>
	8	3		
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species	15	X 1	= 15.00
	FACW species	15	X 2	= 30.00
	FAC species	40	X 3	= 120.00
	FACU species	155	X 4	= 620.00
	UPL species	0	X 5	= 0.00
	Column Totals	(A) 225		(B) 785
Prevalence Index		B/A = 3.49		Is the Prevalence Index ≤ 3.0? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland vegetation criterion met? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				

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 %

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		
Leaf Litter: 1 inch								
O: 2"								
A: 0-6"	10YR 2/2							
Bw: 6-14	7.5YR 4/6							
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains					² Location: 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>					

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lake Street and Prospect Street City/Town: Bellingham and Franklin Sampling Date: 7/3/2019
 Applicant/Owner: _____ Sampling Point or Zone: DD44 - WETLAND
 Investigator(s): Art Allen, EcoTec, Inc. 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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soils criterion met?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetlands hydrology present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks, Photo Details, Flagging, etc.:			

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	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 checked="" 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 <u>30</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. red maple	Acer rubrum	FAC	60.0	Yes	Yes
2. red oak	Quercus rubra	FACU	40.0	Yes	No
3.					
4.					
5.					
6.					
7.					
8.					
9.					
<u>100.0</u> = Total Cover					
<u>Shrub/Sapling Stratum</u> Plot size <u>15</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. winterberry	Ilex verticillata	FACW	30.0	Yes	Yes
2. highbush blueberry	Vaccinium corymbosum	FACW	10.0	Yes	Yes
3. northern spicebush	Lindera benzoin	FACW	10.0	Yes	Yes
4.					
5.					
6.					
7.					
8.					
9.					
<u>50.0</u> = Total Cover					
<u>Herb Stratum</u> Plot size <u>5</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. marsh fern	Thelypteris thelypteroides	FACW	15.0	Yes	Yes
2. skunk cabbage	Symplocarpus foetidus	OBL	10.0	Yes	Yes
3. jewelweed	Impatiens capensis	FACW	10.0	Yes	Yes
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
<u>35.0</u> = Total Cover					

VEGETATION – continued.

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

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>
	8	7		
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species	10	X 1	= 10.00
	FACW species	75	X 2	= 150.00
	FAC species	60	X 3	= 180.00
	FACU species	40	X 4	= 160.00
	UPL species	0	X 5	= 0.00
	Column Totals	(A) 185		(B) 500
Prevalence Index		B/A = 2.70		Is the Prevalence Index ≤ 3.0? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland vegetation criterion met? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

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 %

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

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

Hydric Soils criterion met?	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lakeview Avenue, City/Town: Bellingham Sampling Date: January 30, 2024
 Applicant/Owner: _____ Sampling Point or Zone: LA-11 UPLAND
 Investigator(s): Paul McManus, EcoTec, Inc. 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soils criterion met?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetlands hydrology present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks, Photo Details, Flagging, etc.:			

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	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 <u>30</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. red oak	Quercus rubra	FACU	30.0	Yes	No
2. white pine	Pinus strobus	FACU	30.0	Yes	No
3. red maple	Acer rubrum	FAC	20.0	Yes	Yes
4.					
5.					
6.					
7.					
8.					
9.					
<u>80.0</u> = Total Cover					
<u>Shrub/Sapling Stratum</u> Plot size <u>15</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. multi-flora rose	Rosa multiflora	FACU	30.0	Yes	No
2. sweetfern	Comptonia peregrina		20.0	Yes	No
3. red oak	Quercus rubra	FACU	10.0	No	No
4.					
5.					
6.					
7.					
8.					
9.					
<u>60.0</u> = Total Cover					
<u>Herb Stratum</u> Plot size <u>5</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. Pennsylvania/upland sedge	Carex pensylvanica		40.0	Yes	No
2. wintergreen/teaberry	Gaultheria procumbens	FACU	10.0	Yes	No
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
<u>50.0</u> = Total Cover					

VEGETATION – continued.

<u>Woody Vine Stratum</u>		Plot size <u>30</u>			
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name			
1.	greenbrier	Smilax rotundifolia	FAC	10.0	
2.					
3.					
4.					
			<u>10.0</u> = Total Cover		

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
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 <input type="checkbox"/> No <input checked="" type="checkbox"/>
	8	2		
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species	0	X 1	= 0.00
	FACW species	0	X 2	= 0.00
	FAC species	20	X 3	= 60.00
	FACU species	110	X 4	= 440.00
	UPL species	0	X 5	= 0.00
	Column Totals	(A) 130		(B) 500
Prevalence Index		B/A = 3.85		Is the Prevalence Index ≤ 3.0? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland vegetation criterion met? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				

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 %

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

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

Remarks:

Hydric Soils criterion met? Yes ☐ No ☒

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: Lakeview Ave, City/Town: Bellingham Sampling Date: 1/30/2024
 Applicant/Owner: _____ Sampling Point or Zone: LA-11 - WETLAND
 Investigator(s): Paul McManus, EcoTec, Inc. 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soils criterion met?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Wetlands hydrology present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Remarks, Photo Details, Flagging, etc.:			

HYDROLOGY

Field Observations:		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches) _____
Saturation Present (including capillary fringe)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches) <u>0.00</u>
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 checked="" 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 <u>30</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. white pine	Pinus strobus	FACU	20.0	Yes	
2. red maple	Acer rubrum	FAC	10.0	Yes	
3.					
4.					
5.					
6.					
7.					
8.					
9.					
<u>30.0</u> = Total Cover					
<u>Shrub/Sapling Stratum</u> Plot size <u>15</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. sweet pepperbush	Clethra alnifolia	FAC	30.0	Yes	
2. multi-flora rose	Rosa multiflora	FACU	20.0	Yes	
3. red maple	Acer rubrum	FAC	10.0	No	
4.					
5.					
6.					
7.					
8.					
9.					
<u>60.0</u> = Total Cover					
<u>Herb Stratum</u> Plot size <u>5</u>		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name	Scientific name				
1. broad leaf cattail	Typha latifolia	OBL	30.0	Yes	
2. tussock sedge	Carex stricta	OBL	20.0	Yes	
3. bulrush	Scirpus sp.	OBL	10.0	No	
4. purple loosestrife	Lythrum salicaria	FACW	10.0	No	
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
<u>70.0</u> = Total Cover					

VEGETATION – continued.

<u>Woody Vine Stratum</u>		Plot size <u>30</u>			
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
Common name		Scientific name			
1.					
2.					
3.					
4.					
<u>0.0</u> = Total Cover					

Rapid Test: Do all dominant species have an indicator status of OBL or FACW? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>
	6	4		
Prevalence Index:		Total % Cover (all strata)	Multiply by:	Result
	OBL species	60	X 1	= 60.00
	FACW species	10	X 2	= 20.00
	FAC species	50	X 3	= 150.00
	FACU species	40	X 4	= 160.00
	UPL species	0	X 5	= 0.00
	Column Totals	(A) 160		(B) 390
Prevalence Index		B/A = 2.44		Is the Prevalence Index ≤ 3.0? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland vegetation criterion met? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

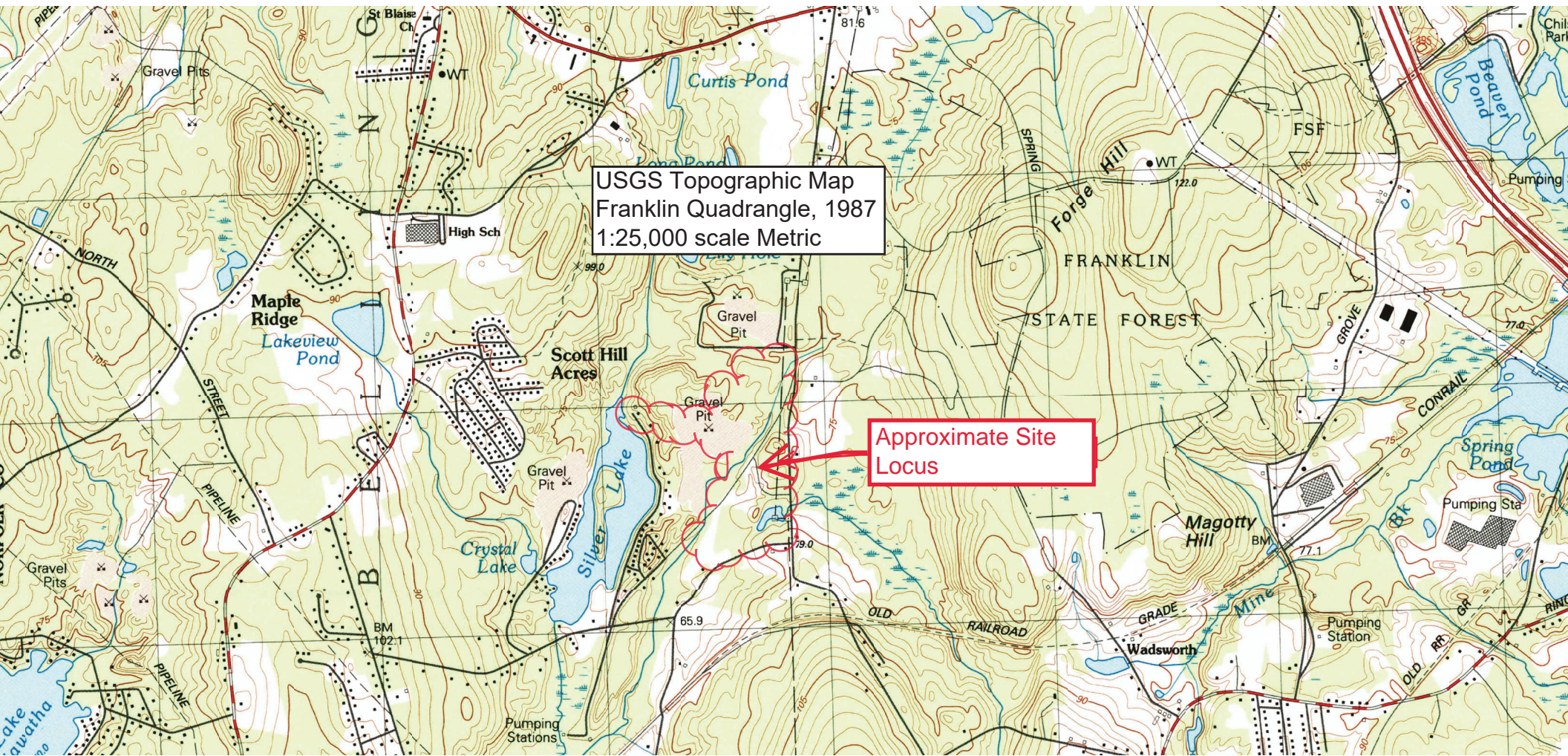
Definitions of Vegetation Strata

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- Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall
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- 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

[illegible]



USGS Topographic Map
Franklin Quadrangle, 1987
1:25,000 scale Metric

Approximate Site
Locus

National Flood Hazard Layer FIRMette



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		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

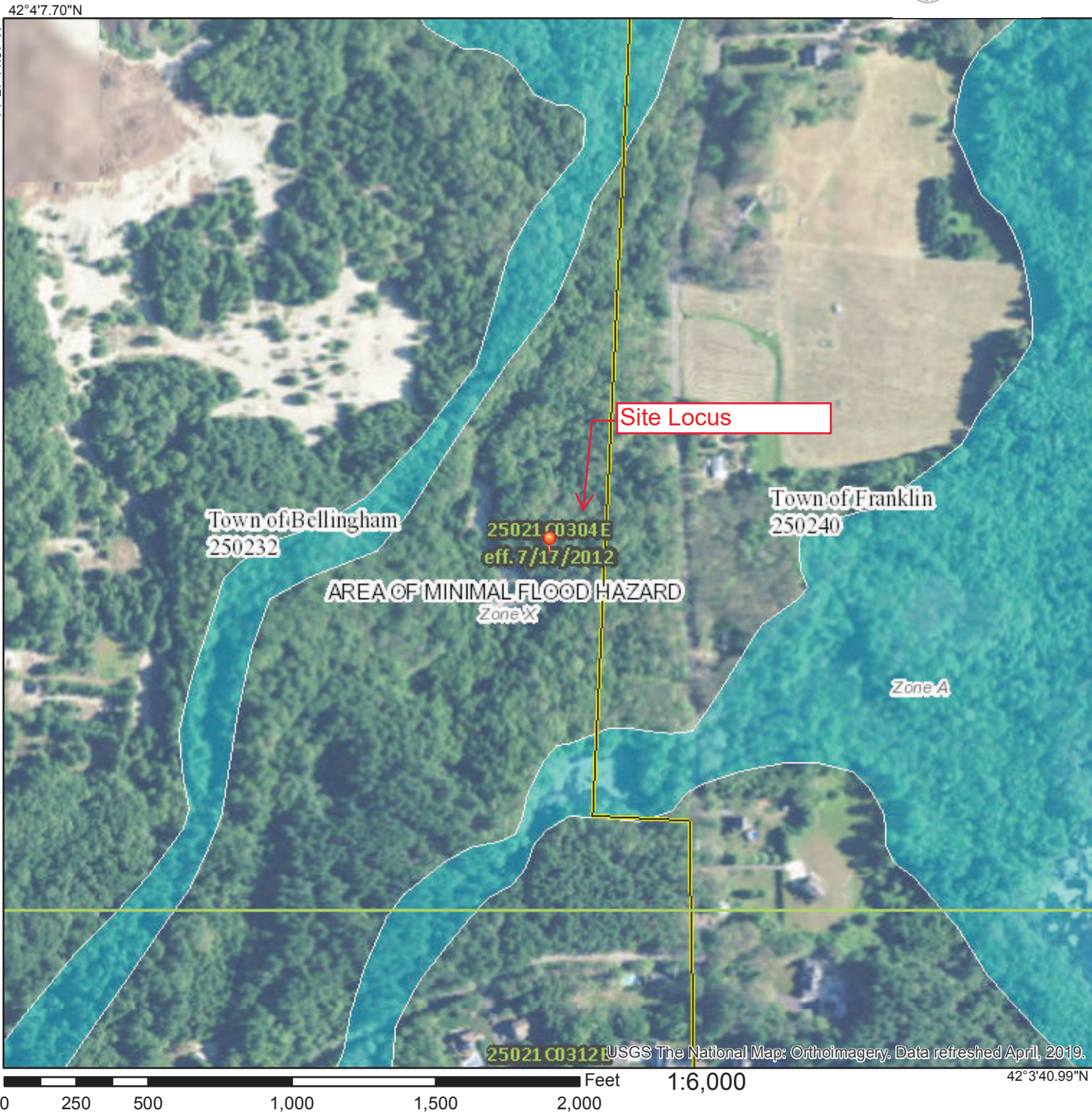


The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 5/28/2019 at 3:54:48 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.



National Flood Hazard Layer FIRMMette



71°27'47"W 42°4'17"N



1:6,000

71°27'9"W 42°3'50"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) 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 Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		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 3/22/2024 at 12:52 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.

Prospect St., Lake St, Bellingham and Franklin - NHESP



NHESP Priority Habitats of Rare Species



NHESP Estimated Habitats of Rare Wildlife



NHESP Certified Vernal Pools



Property Tax Parcels

approximate site
locus

Natural Heritage Atlas
Online Data Viewer,
15th edition, valid
August 1, 2021
created: 3/22/2024

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Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

Paul J. McManus, LSP, PWS
President

Paul McManus is the President and owner of EcoTec, Inc., which he founded in 1990. He has received certification as a Professional Wetlands Scientist (PWS) from the International Society of Wetlands Scientists (SWS), the leading professional organization in the field. He was elected President of the New England Chapter of SWS, and represented the Chapter on the International Board of Directors for several years, and currently serves as Chapter Past President and Treasurer. Mr. McManus is also a Massachusetts-certified Licensed Site Professional with experience that has included a wide range of site assessment and remediation projects, focused on the field of ecological risk assessment at contaminated sites. Prior to the founding of EcoTec, Mr. McManus was employed as the Senior Scientist at Harborline Engineering Inc. of New Bedford, MA and served for several years as a project manager at the Gulf of Maine Research Center Inc. in Salem, MA. His experience also includes employment as an aquatic ecologist at the Massachusetts Division of Water Pollution Control. Mr. McManus brings a wide variety of environmental consulting experience to EcoTec, including wetland evaluation and delineation, lake and stream assessment, wildlife habitat evaluation, oil and hazardous materials assessment and ecological risk assessment, as well as a variety of other types of environmental impact assessment. Included among the major wetland projects he has completed are detailed wetland community surveys and impact restoration specifications for lengthy pipeline crossings of the Fowl Meadow "Area of Critical Environmental Concern" (ACEC). At the MWRA's Norumbega Reservoir property in Weston, he conducted the state and federal wetland delineations, was project manager for the related town-wide off-site vernal pool mitigation evaluation, and authored the project's wetland mitigation program, including vernal pool replication in support of a Wetlands Protection Act Variance and other environmental permits. He has directed hundreds of other wetlands projects at sites including large and small residential and commercial developments. He has completed all phases of environmental permitting work, including wetland delineation, replication and mitigation design, implementation, and monitoring in freshwater wetlands and salt marsh, as well as general wildlife and rare species assessments and trapping, including marbled salamander, 4-toed salamander, spotted turtle, and eastern box turtle, under the MA Wetlands and Endangered Species Act Regulations. Permitting efforts regularly include federal, local and state permitting, including filings under the Massachusetts Environmental Policy Act (MEPA) regulations. Additional projects he has directed include major biological and chemical marine sampling programs; he has been involved in a variety of freshwater system evaluations, and conducted evaluations and sampling for proposed fresh water and marine dredging projects. He has conducted ecological risk assessments for aquatic and terrestrial biota, including state-listed species, at numerous locations of contamination by oil and hazardous materials. Mr. McManus serves as a consultant on behalf of government, business, major utility companies, the development community, conservation commissions, and concerned citizens' groups. He presently serves on a regular basis as technical wetlands consultant for the Town of Dover Conservation Commission, and works regularly for other Commissions providing peer review expertise on a wide variety of projects.

Education: Master of Science: Applied Marine Ecology - University of Massachusetts/Boston, 1988
Bachelor of Arts: Biology (Ecology emphasis) – College of the Holy Cross, Worcester, MA, 1984
U.S. Fish and Wildlife Service: Habitat Evaluation Procedure (HEP) Certification
Massachusetts Division of Water Pollution Control: Algal Assay (eutrophication) Short Course

Professional Affiliations: Massachusetts Association of Conservation Commissioners
(Partial list) Society of Wetland Scientists (Past President of the New England Chapter)
Association of Massachusetts Wetlands Scientists
Society of Environmental Toxicology and Chemistry

Certifications: Society of Wetlands Scientists Professional Wetlands Scientist # 962
Commonwealth of Massachusetts Licensed Site Professional # 5711
OSHA Health & Safety Hazardous Waste Safety Training, 29 CFR 1910.120 (40 hr & refresher)

EcoTec, Inc.

ENVIRONMENTAL CONSULTING SERVICES

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Worcester, MA 01605-2629
508-752-9666 – Fax: 508-752-9494

Kate O'Donnell, WPIT Environmental Scientist

Kate O'Donnell is an Environmental Scientist at EcoTec, Inc. Since joining EcoTec in June of 2021, her project experience includes wetland resource evaluation and delineation, as well as environmental permitting at the local, state, and federal level. She received certification as a Wetland Professional In Training (WPIT) from the International Society of Wetland Scientists (SWS) in September of 2021. Additionally, Ms. O'Donnell has experience in turbidity and erosion control monitoring, salinity sampling, wildlife habitat evaluation, stream evaluation, vernal pool evaluation and certification, preconstruction sweeps for rare species including the eastern box turtle, Stormwater Pollution Prevention Plan (SWPPP) preparation, Turtle Protection Plan preparation, Massachusetts Endangered Species Act (MESA) Project Review Checklists, and Massachusetts Environmental Policy Act (MEPA) documentation. Prior to starting at EcoTec, Ms. O'Donnell was a student at the College of the Holy Cross, where she received degrees in Biology and Environmental Studies. Her educational background includes with extensive coursework in ecology and environmental science, as well as courses in geoscience, biology, chemistry, and environmental law. During her time at Holy Cross, she conducted hydrologic and water quality research to investigate the impacts of road salt on the salinity of the Middle River in Worcester, MA.

Education:

Bachelor of Arts in Biology (Ecology emphasis) and Bachelor of Arts in Environmental Studies, College of the Holy Cross, 2021

Professional Affiliations:

Society of Wetland Scientists
Massachusetts Association of Conservation Commissioners

Certifications:

Society of Wetland Scientists Wetland Professional In Training
EPA Construction General Permit Site Inspector Certification