BSC GROUP

MEMORANDUM

33 WALDO STREET, WORCESTER, MA 01608 - www.bscgroup.com
TEL 508-792-4500 - 800-288-8123

To:	John Hession, BSC Group, Inc.	**Date:**	October 19, 2020 **Revised January18, 2021**
From:	Gillian Davies and Susan McArthur, BSC Group, Inc.	**Proj. No.**	23407.00
Re:	Wetland Delineation, Thorndike Place, Arlington, MA		

INTRODUCTION

On January 15, October 15, December 22 of 2020, and January 5, 2021 BSC Group, Inc. (BSC) conducted field delineations of wetland resource areas regulated under the *Massachusetts Wetlands Protection Act* (*WPA*) and associated *regulations* (*310 CMR 10.00 et al*) and the Town of Arlington *Wetlands Protection Bylaw (Article 8)* (*Bylaw*) and associated *regulations* (*Sections 1 through 34*) dated June 4, 2015, at the Thorndike Place/Mugar Property located off of Dorothy and Parker Roads. This primarily forested property is located between Route 2, a single-family residential neighborhood, and a local park. Site topography is relatively flat. Trash piles and debris, as well as a homeless encampment occur on the property.

ENVIRONMENTAL RESOURCE AREA MAPPING

BSC reviewed existing mapping of environmental resources for the project site. The majority of the property is located within the FEMA 100-year floodplain and part of the site appears to be located within the floodway associated with the Little River (a Letter of Map Revision (LOMR) may be needed), as indicated on the attached Environmental Resources Map. NRCS soils maps (Web Soil Survey) indicate that Udorthents, wet substratum, Urban land, wet substratum, and Swansea muck occur on the site. According to the Massachusetts Natural Heritage and Endangered Species Program (NHESP) and the MassGIS data layer for the Massachusetts Natural Heritage Atlas, no areas of Estimated or Priority Habitat for Rare Wildlife or Certified or Potential Vernal Pools exist on the project site. BSC also reviewed the USGS topographic map.

WETLAND RESOURCE AREA FIELD DELINEATION

In addition to reviewing relevant resource area mapping for the project site, BSC conducted an initial wetland field delineation on January 15, 2020. This wetland delineation was conducted in accordance with the MA *WPA regulations*, the Massachusetts Department of Environmental Protection handbook on *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (March 1995), the *Bylaw regulations,* the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (January 2012), and the *Field Indicators for Identifying Hydric Soils in New England* (May, 2018). BSC evaluated onsite vegetation to determine areas where 50% or more of the vegetation qualify as wetland species according to the above-mentioned regulatory documents and according to wetland indicator status as described in the *State of Massachusetts 2016 Wetland Plant List* (http://wetland-plants.usace.army.mil/nwpl_static/data/DOC/lists_2016/States/pdf/MA_2016v1.pdf). In accordance with the above-mentioned soils guidance documents, BSC examined soils to determine where hydric soils occur, by auguring or digging a soil pit to evaluate the top 20 inches of soil for soil texture, color, horizon thickness and depth, and presence/absence of redoximorphic features. BSC also observed the site for evidence of wetland hydrology. Due to winter conditions (lack of growing season hydrology, lack of full suite of vegetation) a decision was made to re-evaluate the wetlands at the site during the growing season. Following the same methodology, the wetland delineation was re-evaluated on October 15, 2020 and a few of the wetland flags were adjusted to accommodate growing season conditions. Wetland flags C-10, C-15 through C-17, C-17A, were moved upgradient to include a pocket of spotted touch-me-not (*Impatiens capensis*), silver maple (*Acer saccharinum*), and green ash (*Fraxinus pennsylvanica*). In addition, wetland flag D-10 was removed and the

wetland line was revised to connect D-9 to D-11 based on the presence of cinnamon fern and hydric soils.

BSC marked the boundaries of four Bordering Vegetated Wetland (BVW) areas (Series A, B, C and D) with sequentially numbered pink surveyor's tape. Additionally, BSC reviewed conditions at two potential Isolated Vegetated Wetlands (IVW) (H and I Series) that had been identified and flagged during a previous delineation at the site. Two other IVWs (F and G Series) had also been identified during the previous wetland delineation. Data plots performed on January 15th, 2020 and on October 15, 2020 did not meet criteria as wetlands (i.e. lacked either a predominance of wetland vegetation or lacked hydric soils and indicators of hydrology). Wetland data sheets for Transects #1, #2, and #3 have been prepared (attached).

After discussions with the Arlington Conservation Commission and the town engineer, BSC wetland scientists performed two additional site investigations on December 22, 2020 and January 5, 2021 to reevaluate the soils in and adjacent to the potential IVWs located in close proximity to Dorothy Road. BSC soil scientists performed extensive exploration of the soils just east of the original plot location, including soil excavation using a mattock due to stony conditions. Based on a review of historic aerial photographs, the soils in this area are comprised of fill from farming operations and disturbance when the adjacent residential neighborhood was constructed in the mid -1940s. BSC confirmed from data taken on these subsequent visits that two isolated vegetated wetlands are present in this location. These small depressional areas have herbaceous layers dominated by FACU species garlic mustard (*Alliaria petiolate*)) and a thick stand of Japanese knotweed (*Polygonum cuspidatum*), which obscured their depressional topography during previous visits. However, the FACU herbaceous layer was determined not to be dominant given the tree strata consisting of FAC species: American elm (*Ulmus Americana*)), eastern cottonwood (*Populus deltoides*), and box elder (*Acer negundo*). Hydric soils were identified at both of these areas. Two new transects were established to characterize these wetlands. Transect 4 was taken along the eastern boundary of the larger depression. Soils within this wetland consists of a dark surface horizon (10YR2/1) with a depleted subsoil (2.5Y 5/2 with 5% prominent redoximorphic features). Transect 5 was taken along the western boundary of the smaller depression. Soils within this depressional area consist of a thick dark upper 20" of soil (10YR2/1) with prominent redoximorphic features present as soft masses (4% 10YR 5/6). Wetland data sheets for Transects 4 and 5 have been prepared (attached).

Soils in these depressional areas consist of variable and interlayered Human Transported Material (HTM), commonly referred to as fill, including sandy topsoil material and gravel. In addition to HTM layers, mounds of fill material are also present. Given the mature age of tree species on the site, road base material and asphalt piles may represent historical filling from the multiple development phases the area has undergone with much of the adjacent residential neighborhood constructed in the mid-1940s. From investigations, the area appears to have been used more recently by neighborhood people as a dumping ground for yard waste material and trash and it now includes a homeless encampment with used medical needles, bags, clothing, bikes, old camping equipment etc. These materials can all be found inside or within close proximity to the wetlands. These impacted wetlands represent an opportunity for improving the existing site conditions. Improvements could be completed as part of the creation of compensatory flood storage during project construction. Improvements to the IVW areas could include the removal of invasive species as well as the plantings of native wetland species to create additional ecosystem functions and values. Additionally, trash and rubble removal from the wetland resource areas, buffer zones, and uplands could help improve their quality for wildlife species who use the wetlands as habitat.

BVW Series A and D are predominantly forested areas. BVW Series B is primarily forested with an area of herbaceous cover (predominantly common reed [*Phragmites australis*]), and BVW Series C is largely herbaceous common reed, with some forested area. Throughout the site, wetlands include the following tree species: red maple (*Acer rubrum*), box elder (*Acer negundo*), American elm (*Ulmus Americana*), white pine (*Pinus strobus*), ash (*Fraxinus sp.*), American Sycamore (*Plantanus occidentalis*), and black willow (*Salix*

nigra). Shrub and sapling species include silky dogwood (*Swida amomum*), and box elder saplings. Herbaceous species include common reed, cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), and goldenrod (*Solidago sp*.), and vines include poison ivy (*Toxicodendron radicans*), bittersweet (*Celastrus sp*.), greenbriar (*Smilax sp*.) and wild grape (*Vitis sp*.). In upland locations, tree species include red oak (*Quercus rubra*), white pine, cottonwood (*Populus deltoides*), box elder, and red maple. Shrubs and saplings include white pine, barberry (*Berberis sp*.), brambles (*Rubus sp*.), and multiflora rose. Herbaceous species include upland grasses and goldenrod (*Solidago sp*.), and vines include bittersweet, wild grape, greenbriar, and poison ivy.

Overall, BVW boundaries flagged on January 15, 2020, adjusted on October 15 and December 22, 2020 and IVW boundaries flagged on January 5, 2021 are similar to the boundaries flagged when wetlands were delineated previously in 2009. In some areas, the 2009 delineation extends upgradient of the BSC delineation, and in some areas the BSC delineation extends upgradient of the 2009 delineation. As the BSC delineation is the most recent, and wetland conditions can shift over time, BSC is of the opinion that this most recent delineation most accurately reflects conditions as they exist in the present.

REGULATORY REVIEW

The project site contains state and locally regulated BVW and associated 100-foot buffer zones. In addition, two locally regulated IVWs are located at the site near Dorothy Road. BSC notes that the local *Bylaw regulations* identify the 100-foot buffer zone as a regulated resource area, the Adjacent Upland Resource Area (AURA). Further, the *Bylaw regulations* establish a 25-foot "No-Disturbance Zone" where no activities or work is permitted. The *Bylaw regulations* also establish a 75-foot "Restricted Zone" where impacts should be avoided and reasonable alternatives pursued.

The Bylaw regulations define Land Subject to Flooding (LSTF), as noted in *Bylaw Section 4.B. Definition number 35* and *Section 23*. Section 23 specifies that, "Compensatory flood storage shall be at a 2:1 ratio, minimum, for each unit volume of flood storage lost at each elevation.

SUMMARY

BSC has conducted a wetland delineation at the Thorndike Place/Mugar Property that is similar in extent to the previous delineation conducted in 2009. BSC notes that the site is largely within floodplain or floodway. Additional soil investigations revealed that the two isolated depressional areas near Dorothy Road are considered IVW and as such, now have a 25-foot No Disturb Zone and a 100-foot Adjacent Upland Resource Areas as shown on the site plan.

cc: Marleigh Sullivan, BSC Group, Inc.
Ethan Sneesby, BSC Group, Inc.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Thorndike Place Prepared by: BSC Group, Inc. (SMM & EPS) Project location: Isolated Area, behind houses DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ❑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: 1 (Upland)		Transect Number: 1	Date of Delineation: 10/15/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
Ailanthus altissima / Tree of Heaven	63%	52%	Yes	NI
**Acer rubrum*/ Red maple	38%	31%	Yes	FACW+
**Acer negundo*/ Box elder	10.5%	9%	No	FAC+
**Ulmus rubra*/ Slippery elm	10.5%	9%	No	FAC
Total Percent Cover: 122%				
Shrubs/ Saplings				
**Acer negundo*/ Box elder	10.5%	100%	Yes	FAC+
Total Percent Cover: 10.5%				
Herbaceous				
Fallopia japonica/ Japanese knotweed	63%	86%	Yes	FACU-
Alliaria petiolata/ Garlic mustard	10.5%	14%	No	FACU-
Total Percent Cover: 73.5%				
Vines				
Celastrus orbiculatus/ Asian bittersweet	10.5%	50.00%	Yes	FACU
Vitis labrusca/ Fox grape	10.5%	50.00%	Yes	FACU
Total Percent Cover: 21%				

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 2 Number of dominant non-wetland indicator plants: 3

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes (no)

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: WebSoil Survey/ 2020
map number: 655
soil type mapped: Udorthents, wet substratum
hydric soil inclusions: Yes

Are field observations consistent with soil survey? (yes) no
Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color	Texture
Ap	0-14”	10YR 2/1 (60%)	-	Sandy loam
		10YR 2/2 (40%)	-	
B	14”+	2.5YR 8/4 (90%)	-	Sandy loam
		10YR 7/8 (10%)	-	

Remarks: Area previously disturbed

3. Other:

Conclusion: Is soil hydric? yes (no)

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
- ❑ Other: _Buttressing of *Ailanthus altissima*

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants		X
Wetland hydrology present:		
Hydric soil present		X
Other indicators of hydrology present	X	
Sample location is in a BVW		X

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Thorndike Place Prepared by: BSC Group, Inc. (SMM & EPS) Project location: Isolated Area, behind houses DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ❑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: 2 (Upland)		Transect Number: 1	Date of Delineation: 10/15/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
**Acer negundo/* Box elder	85.5%	64%	Yes	FAC+
Ailanthus altissima/ Tree of Heaven	38%	28%	No	NI
Quercus alba/ Northern white oak	10.5%	8%	No	FACU-
Total Percent Cover: 134 %				
Shrubs/ Saplings				
**Acer negundo/* Box elder	63%	52%	Yes	FAC+
Rosa multiflora/ Multiflora rose	38%	31%	Yes	FACU
**Ulmus rubra/* Slippery elm	20.5%	17%	No	FAC
Total Percent Cover: 121.5%				
Herbaceous				
Alliaria petiolate/ Garlic mustard	85.5%	100%	Yes	FACU-
Total Percent Cover: 85.5%				
Vines				
Absent				
Total Percent Cover: 0%				

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 2 Number of dominant non-wetland indicator plants: 2

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: WebSoil Survey/ 2020
map number: 655
soil type mapped: Udorthents, wet substratum
hydric soil inclusions: Yes

Are field observations consistent with soil survey? (yes) no
Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color	Texture
Oe	1-0”			
HTM1	0-3”	10YR 2/2	-	Sandy loam
HTM2^	3-9”	10YR 3/3	-	Sandy loam

Remarks: Area previously disturbed

Soil sample location is inconclusive

3. Other:

Conclusion: Is soil hydric? yes (no)

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
- ❑ Other: _

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	X	
Wetland hydrology present:		
Hydric soil present		X
Other indicators of hydrology present		X
Sample location is in a BVW		X

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Thorndike Place Prepared by: BSC Group, Inc. (SMM & EPS) Project location: Arlington- Near flag D-18 DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ❑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: 1 (Wetland)		Transect Number: 2	Date of Delineation: 10/15/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
**Acer negundo/* Boxelder	20.5%	32%	Yes	FAC+
**Acer saccharinum/* Silver maple	20.5%	32%	Yes	FACW
Populus tremulas/ Quaking aspen	20.5%	32%	Yes	FACU
Prunus serotina/ Black cherry	3%	5%	No	FACU
Total Percent Cover: 64.5%				
Shrubs/ Saplings				
**Rhamnus frangula/* Glossy buckthorn	20.5%	55%	Yes	FAC
**Acer saccharinum/* Silver maple	10.5%	28%	Yes	FACW
**Fraxinus pennsylvanica/* Green ash	3%	8%	No	FACW
Rubus strigosus/ Common red raspberry	3%	8%	No	FAC-
Total Percent Cover: 37%				
Herbaceous				
*Onoclea sensibilis/ Sensitive fern	85.5%	100%	Yes	FACW
Total Percent Cover: 89%				
Vines				
Absent				
Total Percent Cover: 0%				

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 4 Number of dominant non-wetland indicator plants: 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: WebSoil Survey/ 2020
map number: 51A
soil type mapped: Swansea muck
hydric soil inclusions: Yes

Are field observations consistent with soil survey? (yes) no
Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color	Texture
Oe	0-0.5”			
A	0-1”	10YR2/1	-	Mucky modified SL
AE	1-4”	10YR 4/2	5YR3/4 (5%)	Mucky modified sandy loam
Bg	4-14”	2.5YR 6/3	7.5YR 4/6 (12%)	sandy loam

Remarks:

3. Other:

Conclusion: Is soil hydric? (yes) no

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- (❑) Oxidized rhizospheres: _____yes_____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
- ❑ Other: _

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	X	
Wetland hydrology present:		
Hydric soil present	X	
Other indicators of hydrology present	X	
Sample location is in a BVW	X	

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Thorndike Place Prepared by: BSC Group, Inc. (SMM & EPS) Project location: Arlington- Near flag D-18 DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ❑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: 2 (Upland)		Transect Number: 2	Date of Delineation: 10/15/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
Prunus serotina/ Black cherry	63%	75%	Yes	FACU
Ailanthus altissima/ Tree of Heaven	20.5%	25%	Yes	NI
Total Percent Cover: 83.5%				
Shrubs/ Saplings				
Rhus hirta/ Staghorn sumac	20.5%	49%	Yes	NI
Prunus serotina/ Black cherry	10.5%	25%	Yes	FACU
Rubus strigosus/ Common red raspberry	10.5%	25%	Yes	FAC-
Total Percent Cover: 41.5%				
Herbaceous				
Solidago canadensis/ Canada goldenrod	38%	65%	Yes	FACU
Phytolacca americana/ American pokeweed	20.5%	35%	Yes	FACU+
Total Percent Cover: 58.8%				
Vines				
Absent				
Total Percent Cover: 0%				

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 0 Number of dominant non-wetland indicator plants: 6

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes (no)

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: WebSoil Survey/ 2020
map number: 51A
soil type mapped: Swansea muck
hydric soil inclusions: Yes

Are field observations consistent with soil survey? yes (no)
Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color	Texture
A	0-1”	10YR 2/2		
AB	1-6”	10YR 3/3	-	Sandy loam
BA	6-12”	10YR 4/4	-	Sandy loam

12”+ soil refusal

Remarks:

3. Other:

Conclusion: Is soil hydric? yes (no)

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
- ❑ Other: _

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants		X
Wetland hydrology present:		
Hydric soil present		X
Other indicators of hydrology present		X
Sample location is in a BVW		X

form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Thorndike Place Prepared by: BSC Group, Inc. (SMM & EPS) Project location: Arlington- Near flag C-14 DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ❑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: 1 (Wetland)		Transect Number: 3	Date of Delineation: 10/15/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Trees				
**Populus deltoides/* Eastern cottonwood	20.5%	40%	Yes	FAC
Ailanthus altissima/ Tree of Heaven	20.5%	40%	Yes	NI
**Fraxinus pennsylvanica/* Green ash	10.5%	20%	Yes	FACW
Total Percent Cover: 51.5 %				
Shrubs/ Saplings				
Rhus hirta/ Staghorn sumac	20.5%	60%	Yes	NI
**Populus deltoides/* Eastern cottonwood	10.5%	31%	Yes	FAC
Rosa multiflora/ Multiflora rose	3%	9%	No	FACU
Total Percent Cover: 34%				
Herbaceous				
**Solidago patula/* Rough stem goldenrod	38%	53%	Yes	OBL
Phytolacca americana/ American pokeweed	20.5%	28%	Yes	FACU+
**Rubus hispidus/* Creeping dewberry	10.5%	15%	No	FACW
**Phragmites australis/* Common reed	3%	4%	No	FACW
Total Percent Cover: 72%				
Vines				
Absent				
Total Percent Cover: 0%				

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 4 Number of dominant non-wetland indicator plants: 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: WebSoil Survey/ 2020
map number: 655
soil type mapped: Udorthents, wet substratum
hydric soil inclusions: Yes

Are field observations consistent with soil survey? yes (no)
Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color	Texture
A	0-1”	10YR 2/1	-	Sandy loam
Bwg	1-14”+	10YR 4/2	Depletion: 7.5YR 4/6 (12%) 10YR 6/2 (10%)	Sandy loam

Remarks:

3. Other:

Conclusion: Is soil hydric? (yes) no

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ❑ Depth to soil saturation in observation hole: _____
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- (❑) Drainage patterns in BVW: __Present_____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
- ❑ Other: _

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	X	
Wetland hydrology present:		
Hydric soil present	X	
Other indicators of hydrology present	X	
Sample location is in a BVW	X	

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Thorndike Place Prepared by: Ethan Sneesby Project location: Dorothy Road, Arlington DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ◉ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: Wetland (1)		Transect Number: 4	Date of Delineation: 12/23/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree Layer:				
Eastern cottonwood (*Populus deltoides*)	3%	12.7%	no	FAC
Box Elder (*Acer negundo*)	20.5%	87.2%	yes	FAC*
Saplings and Shrubs:				
Box Elder (*Acer negundo*)	10.5%	100%	yes	FAC*
Herbaceous:				
Japanese knotweed (*Polygonum cuspidatum*)	85.5%	100%	yes	FACU
Vine:				
Wild grape (*Vitis vinifera*)	10.5%	100%	yes	NI

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 2 Number of dominant non-wetland indicator plants:1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes**

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes**
soil type mapped:655
hydric soil inclusions: yes

Are field observations consistent with soil survey? **no**
Remarks:
Soils in the field consist of multiple depositions of historic fill material

2. Soil Description

Horizon	texture	Depth	Matrix Color	Mottles Color
Oe		1-0		
HTM1	SL	0-11	10YR 2/1	4% 10YR 5/6 as soft masses
HTM2	GrSL	11-13	10YR 2/1	
HTM3	SL	13-20+	10YR 2/1	

Remarks:

3. Other:

Conclusion: Is soil hydric? **yes**

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ■ Depth to free water in observation hole: _____11 inches_
- ■ Depth to soil saturation in observation hole: _____6 inches_
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ■ Drainage patterns in BVW: _____yes_____
- ■ Oxidized rhizospheres: _____yes_____
- ■ Water-stained leaves: _____yes_____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
  _____
  _____
  _____
- ❑ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	__X__	____
Wetland hydrology present:		
Hydric soil present	__X__	_____
Other indicators of hydrology present	__X__	_____
Sample location is in a BVW	____	___X__
Sample location is in an IVW	__X__	_____

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant:___Thorndike Place____ Prepared by: Ethan Sneesby Project location: Dorothy Road, Arlington DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ◉ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: Upland		Transect Number: 4	Date of Delineation: 1/05/2021
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree Layer:				
Eastern cottonwood (*Populus deltoides*)	38%	78.4%	yes	FAC*
Box elder (*Acer negundo*)	10.5%	21.6%	yes	FAC*
Shrubs and Saplings:				
Box elder (*Acer negundo*)	10.5%	100%	yes	FAC*
Herbaceous:				
Japanese knotweed (*Polygonum cuspidatum*)	63%	100%	yes	FACU
Vine:				
Wild grape (*Vitis vinifera*)	10.5%	100%	yes	NI

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 Number of dominant non-wetland indicator plants:1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes**

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Inten

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes**
soil type mapped:655
hydric soil inclusions: yes

Are field observations consistent with soil survey? **no**
Remarks:
Soils in the field consist of multiple depositions of historic fill material

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
Oe	1-0		
HTM1^	0-21	Variable colors: 80% 10YR 2/1 20% 10YR 3/3	
HTM2^	21-24+	Variable colors: 5YR 4/4, 10YR 8/1, 10YR 2/1	

Remarks:
Soil is considered to be upland soil because no redoximorphic features were observed in the top 20 inches. If redoximorphic features were there, we would have anticipated seeing them in the HTM1^ horizon.

3. Other:

Conclusion: Is soil hydric? **no**

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ■ Depth to soil saturation in observation hole: ____24 inches
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
  _____
  _____
  _____
- ❑ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	__X__	____
Wetland hydrology present:		
Hydric soil present	____	__X___
Other indicators of hydrology present	____	__X___
Sample location is in a BVW	____	__X___
Sample location is in an IVW	____	__X___

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant:____Thorndike Place_____ Prepared by: Ethan Sneesby Project location: Dorothy Road, Arlington DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ◉ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: Wetland		Transect Number: 5	Date of Delineation: 12/23/2020
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree Layer:				
American elm (*Ulmus americana*)	20.5%	33%	yes	FACW*
Eastern cottonwood (*Populus deltoides*)	3%	5%	no	FAC
Box elder (*Acer negundo*)	38%	62%	yes	FAC*
Saplings and Shrubs:				
Box elder (*Acer negundo*)	5%	100%	yes	FAC*
Herbaceous:				
Garlic mustard (*Alliaria petiolata*)	38%	31%	yes	FACU
Japanese knotweed (*Polygonum cuspidatum*)	85.5%	69%	yes	FACU

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 Number of dominant non-wetland indicator plants:2

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes**

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes**
soil type mapped:655
hydric soil inclusions: yes

Are field observations consistent with soil survey? **no**
Remarks:
Soils in the field consist of multiple depositions of historic fill material

2. Soil Description

Horizon	texture	Depth	Matrix Color	Mottles Color
HTM1	SL	0-11	10YR 2/1	none visible
HTM2^	LS	11-20+	2.5YR 5/2	5% 10YR 5/8 As soft masses

Remarks:

3. Other:

Conclusion: Is soil hydric? **yes**

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ■ Depth to free water in observation hole: _____11 inches___
- ■ Depth to soil saturation in observation hole: _____6 inches_
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ■ Drainage patterns in BVW: _____yes_____
- ■ Oxidized rhizospheres: _____yes_____
- ■ Water-stained leaves: _____yes_____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
  _____
  _____
  _____
- ❑ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	__X__	____
Wetland hydrology present:		
Hydric soil present	__X__	_____
Other indicators of hydrology present	__X__	_____
Sample location is in a BVW	____	___X__
Sample location is in an IVW	__X__	_____

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant:____Thorndike Place____ Prepared by: Ethan Sneesby Project location: Dorothy Road, Arlington DEP File #:_____

Check all that apply:

- ❑ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ◉ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ❑ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: Upland		Transect Number: 5	Date of Delineation: 1/05/2021
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree Layer:				
Sweet birch (*Betula lenta*)	20.5	37.6%	yes	FACU
Ash *(Fraxinus sp.)*	20.5%	37.6%	yes	FACU (White) or FACW (Green)
Unknown	10.5%	19%	no	Unknown
Grey birch (*Betula populifolia*)	3%	6%	no	FAC
Saplings and Shrubs:				
Unknown	3%	50%	yes	Unknown
Sweet Birch (*Betula lenta*)	3%	50%	yes	FACU
Herbaceous:				
Garlic mustard (*Alliaria petiolate*)	85.5%	69%	yes	FACU
Japanese knotweed (*Polygonum cuspidatum*)	38%	31%	yes	FACU

* *Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.*

Vegetation conclusion:

Number of dominant wetland indicator plants: 0-1 depending on the ash species Number of dominant non-wetland indicator plants:4 or 5, depending on ash species

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **no**

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes**
soil type mapped:655
hydric soil inclusions: yes

Are field observations consistent with soil survey? **no**
Remarks:
Soils in the field consist of multiple depositions of historic fill material

2. Soil Description

Horizon	Depth	Matrix Color	texture	Mottles Color
Oe	1-0			
HTM1	0-7	10YR 3/3	SL	none visible
HTM2	7-24	10YR 5/6	LS	none visible
HTM3	24+	2.5YR 5/2	LS	5% 10YR 5/8 As soft masses

Remarks:

3. Other:

Conclusion: Is soil hydric? **no**

Other Indicators of Hydrology: (check all that apply & describe)

- ❑ Site Inundated: _____
- ❑ Depth to free water in observation hole: _____
- ■ Depth to soil saturation in observation hole: ____24 inches_
- ❑ Water marks: _____
- ❑ Drift lines: _____
- ❑ Sediment Deposits: _____
- ❑ Drainage patterns in BVW: _____
- ❑ Oxidized rhizospheres: _____
- ❑ Water-stained leaves: _____
- ❑ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):
  _____
  _____
  _____
- ❑ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	____	__X__
Wetland hydrology present:		
Hydric soil present	____	__X__
Other indicators of hydrology present	____	__X__
Sample location is in a BVW	____	__X__
Sample location is in an IVW	____	__X___

Submit this form with the Request for Determination of Applicability or Notice of Intent.