

EBT Environmental Consultants, Inc.
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September 26, 2023

Sturbridge Conservation Commission
301 Main Street
Sturbridge, MA 01566

Re. 263 New Boston Road, Sturbridge

Dear Commission,

Contained within this document is evidence that the thin layer of sand within a matrix of silt, clay and organics (see Exhibit 3A, Photo 3) did not drain the wetland between SCC Wet 1 through 5 and SCC Wet 101 through 105. This layer was not formed by a gravel pit, as the pit was located ~430 feet to the west - during the agricultural era there may have been erosion from the slope to the east. The peer reviewer's report did identify Eastern White Pine but did not identify the other dominant upland plants Black Birch, Witch Hazel, Mountain Laurel and Hay Scented Fern also growing within the narrow delineation the peer reviewer placed (SCC Wet 1 through 5 and SCC Wet 101 through 105). EBT, Inc. performed DEPs new 2023 BVW Determination Form (see Exhibit 1A), which indicates upland plants dominate the narrow glacial outwash feature and also indicates there was no water table (during this high-water table time of the year) within 30" of the mineral soil surface (see Exhibit 8A). The other exhibits listed below outline the historical sequence of the area through USGS mappings and aerial flyover (see Exhibit 4A to 7A). In addition, the somewhat excessively drained Merrimac soil types at the site are shown (see Exhibit 2A) overlying the application property and extending into the former gravel pit. The formation of the gravel pit with its 35' deep cut on its eastern flank is what caused the draining of the land to the east (and the potential vernal pool - see Exhibit 3A, Photos 1 & 2 and Exhibit 9A). The soils identified within the narrow ravine are relic hydric soils, meaning they were formed within the water table or under water but have been drained. This draining is what allowed the upland plants identified in the data form to dominate the narrow glacial outwash feature in contention.

EBT, Inc. has had 3 similar projects with relic hydric soils – one in Dedham, the second in Holden where the 1800s Wagner Farm had cut through 2-minute perc rate gravel and drained the former wetland leaving low chroma B horizon soils where the land is now dominated by upland plants due to the draining and the third is in Wellington Valley, Oxford where the farmer channeled through Hinkley soil and drained the shallow 5,000 foot long valley to grow canary grass (high yield bottom land forage crop) on the 10 to 12 foot deep peat soil. In the last case, lacustrine soils are also found in upgradient areas where the land is dominated by upland plants, due to the fact there is no water table in the upper reaches of the former ponding area.

Respectfully,



Glenn E. Krevosky, consultant

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Attached:

- 1A 2023 BVW Determination Form
- 2A Soil Mapping
- 3A Photo Exhibit
- 4A 1942 USGS Map
- 5A 1966 USGS Map
- 6A 1972 USGS Map
- 7A 1997 Aerial Flyover
- 8A East Brookfield Well Data
- 9A MassMapper on PVP

BORDERING VEGETATED WETLAND DETERMINATION FORM

Project/Site: 263 New Boston Road City/Town: Sturbridge Sampling Date: 9/22/2023
 Applicant/Owner: Kenneth Leblanc Sampling Point or Zone: TP-1U
 Investigator(s): Glenn E. Krevosky Latitude / Longitude: 42°8'45" N, 72°4'46" W
 Soil Map Unit Name: Canton fine sandy loam, 8 to 15% slopes, extremely stony 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"/>
Hydic Soils criterion met?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetlands hydrology present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks, Photo Details, Flagging, etc.:			
There has been more rain on average this summer - the "normal" rain for September is 3.36 inches and currently there has been 4.34 inches of rain (East Brimfield Lake NOAA data).			
The area is drained due to the 35± gravel pit cut directly to the west of the site.			

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 <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	Indicators that can be Reliable with Proper Interpretation <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	Indicators of the Influence of Water <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 checked="" 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):		
The area flagged as wetland by the peer reviewer is a depression at the toe of a slope.		
Test pit is located 70' north of WF 7A and is a linear plot ±10 feet wide.		

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> (linear)				
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)	
Common name		Scientific name				
1.	Black Birch	Betula lenta	FACU	10.5	Yes	No
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
<u>10.5</u> = Total Cover						
<u>Shrub/Sapling Stratum</u>		Plot size <u>15'</u> (linear)				
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)	
Common name		Scientific name				
1.	Witch Hazel	Hamamelis virginiana	FACU	38.0	Yes	No
2.	Eastern White Pine	Pinus strobus	FACU	10.5	Yes	No
3.	Mountain Laurel	Kalmia latifolia	FACU	20.5	No	No
4.	Shagbark Hickory	Carya ovata	FACU	3.0	No	No
5.	Canadian Serviceberry	Amelanchier canadensis	FAC	3.0	No	Yes
6.	Highbush Blueberry	Vaccinium corymbosum	FACW	3.0	No	Yes
7.	Common Winterberry	Ilex verticillata	FACW	3.0	No	Yes
8.	White Oak	Quercus alba	FACU	3.0	No	No
9.						
<u>84.0</u> = Total Cover						
<u>Herb Stratum</u>		Plot size <u>5'</u> (linear)				
		Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)	
Common name		Scientific name				
1.	Hay Scented Fern	Dennstaedtia punctilobula	FACU	10.5	Yes	No
2.	Royal Fern	Osmunda regalis	OBL	10.5	Yes	Yes
3.	Canada Mayflower	Maianthemum canadense	FACU	3.0	No	No
4.	Mountain Laurel	Kalmia latifolia	FACU	10.5	Yes	No
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
<u>34.5</u> = Total Cover						

VEGETATION – continued.

<u>Woody Vine Stratum</u>	Plot size <u>30'</u> (linear)				
Common name	Scientific name	Indicator Status	Absolute % Cover	Dominant? (yes/no)	Wetland Indicator? (yes/no)
1. None					
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 <u>6</u>	Number of dominant species that are wetland indicator plants <u>0</u>	Do wetland indicator plants make up ≥ 50% of dominant plant species? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Prevalence Index:		Total % Cover (all strata)	Multiply by:
	OBL species	11	X 1 = 10.50
	FACW species	6	X 2 = 12.00
	FAC species	3	X 3 = 9.00
	FACU species	110	X 4 = 438.00
	UPL species	0	X 5 = 0.00
	Column Totals	(A) 129	(B) 469.5
Prevalence Index		B/A = 3.64	
			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

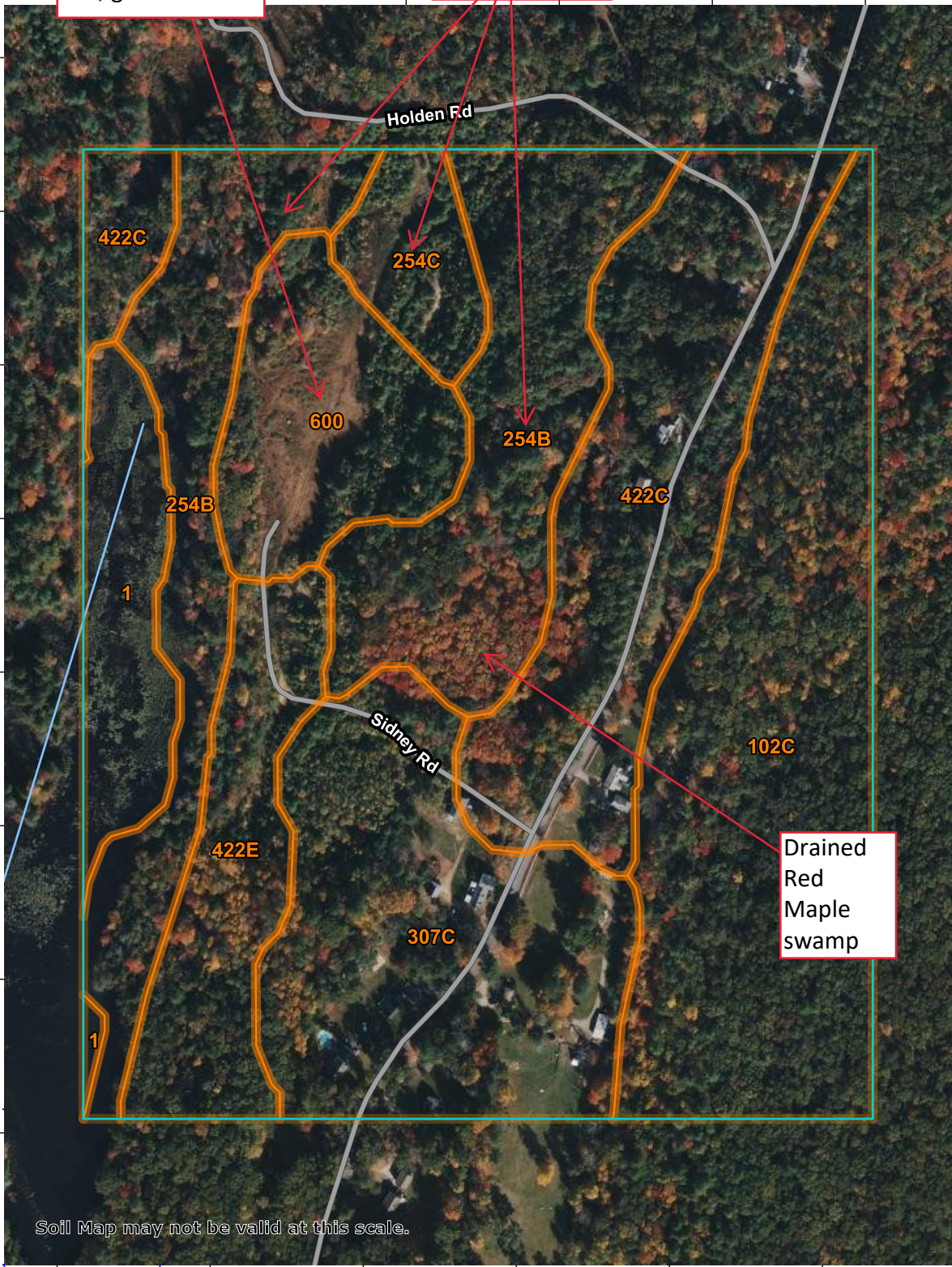
- Tree - Woody plants 3 in. (7.62 cm) or more in diameter at breast height (DBH), regardless of height
- Shrub / Sapling - Woody plants less than 3 in. (7.62 cm) DBH and greater than or equal to 3.3 ft. (1 m) tall
- Herb - All herbaceous (non-woody plants, regardless of size, and woody plants less than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

Merrimac -
Hydrologic Soil
Group A

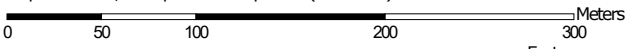
Pits, gravel

Drained
Red
Maple
swamp



Soil Map may not be valid at this scale.

Map Scale: 1:4,000 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils




 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Worcester County, Massachusetts, Southern Part
 Survey Area Data: Version 15, Sep 9, 2022

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

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

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



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	4.3	5.3%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	17.7	22.0%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	17.2	21.2%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	2.5	3.1%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	13.0	16.1%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	14.0	17.4%
422E	Canton fine sandy loam, 15 to 35 percent slopes, extremely stony	6.0	7.4%
600	Pits, gravel	6.1	7.5%
Totals for Area of Interest		80.8	100.0%





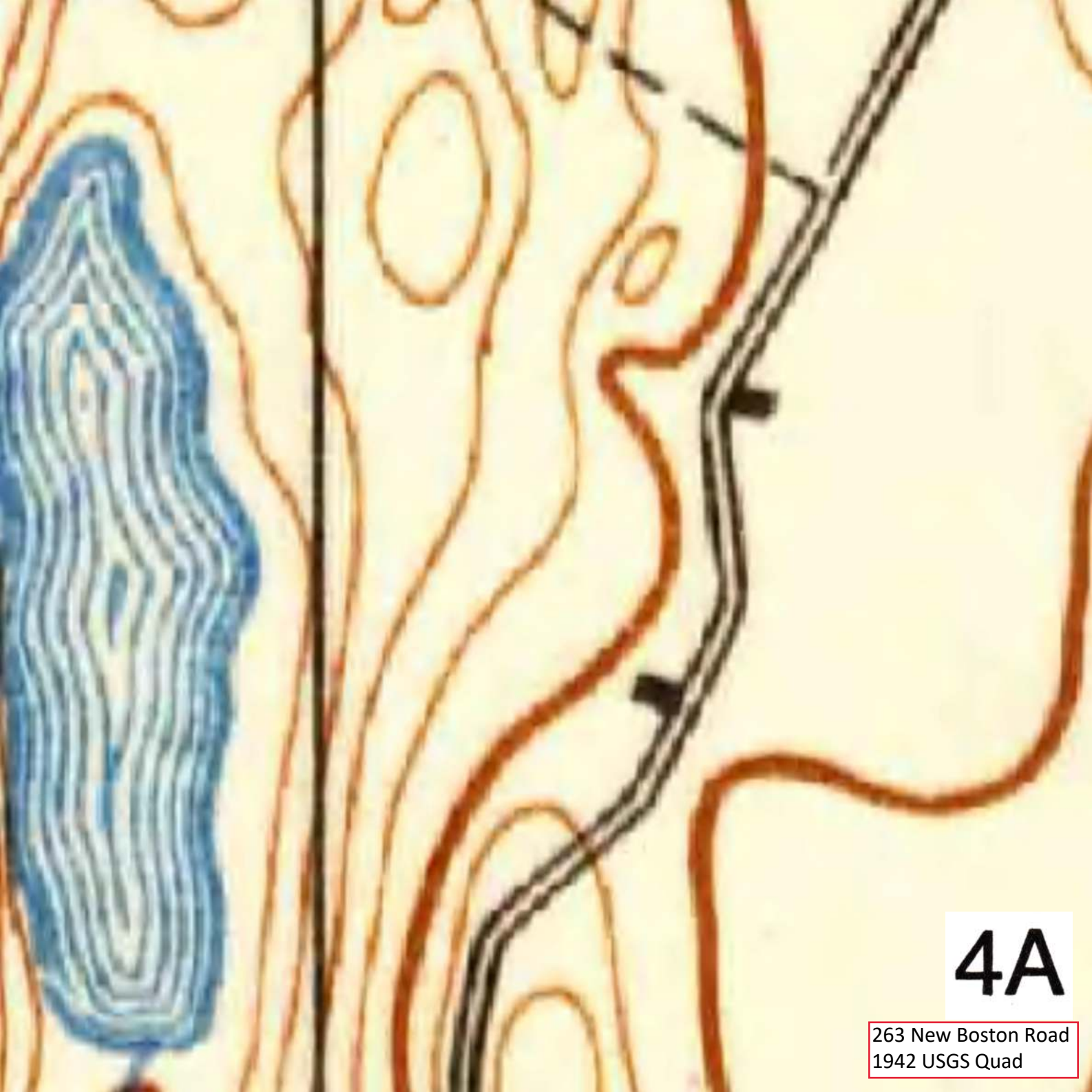
Photo 1 taken by EBT, Inc. on 4/9/2021 – Showing FE+2 to FE+3 significant ground water discharge at the western base of the 35± foot cut abutting the applicant’s property – the steep cut drained the Merrimac soil water table to the east bringing water soluble FE+2 with it.



Photo 2 taken by EBT, Inc. on 4/18/2021 – Showing western slope of gravel pit abutting the Ken Leblanc property.

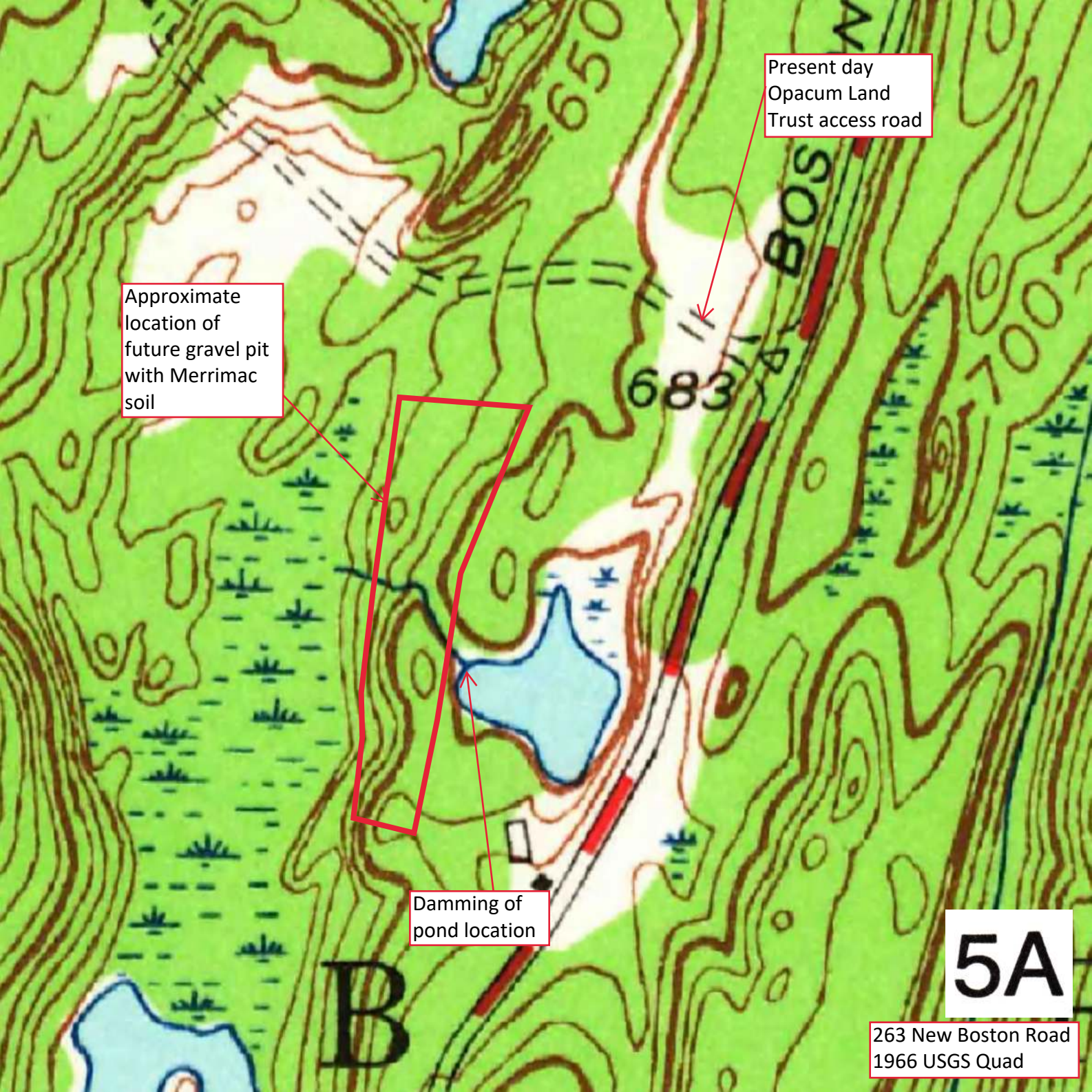


Photo 3 taken by EBT, Inc. on 9/22/2023 – Showing what was described in the peer reviewer’s letter as a sand layer which is a layer with some sand in it and silts and clays. This layer is not as porous as to what was alluded to.



4A

263 New Boston Road
1942 USGS Quad



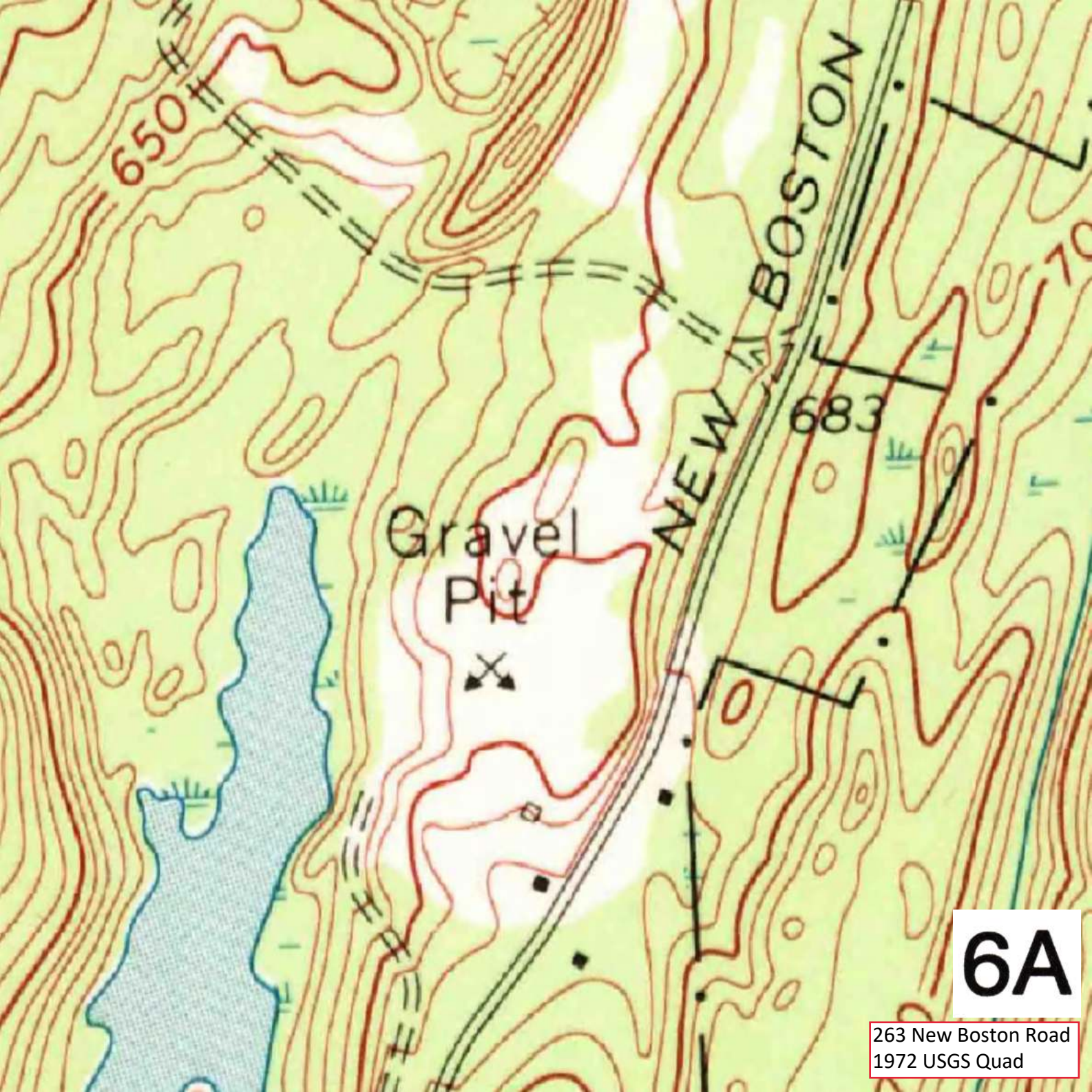
Approximate location of future gravel pit with Merrimac soil

Present day Opacum Land Trust access road

Damming of pond location

5A

263 New Boston Road
1966 USGS Quad



Gravel
Pit

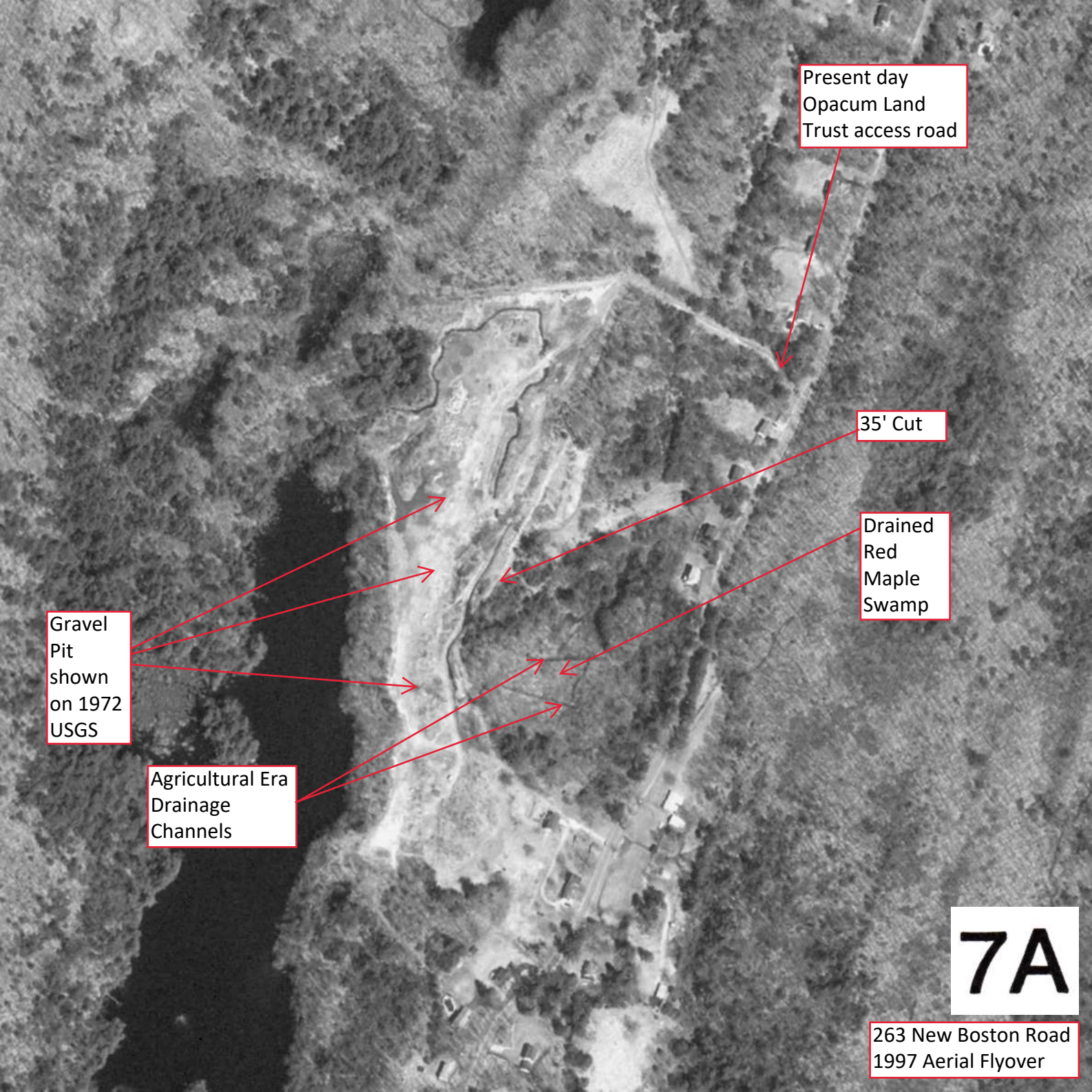
NEW BOSTON

650

683

6A

263 New Boston Road
1972 USGS Quad



Present day
Opacum Land
Trust access road

35' Cut

Drained
Red
Maple
Swamp

Gravel
Pit
shown
on 1972
USGS

Agricultural Era
Drainage
Channels

7A

263 New Boston Road
1997 Aerial Flyover

7 days 30 days 1 year

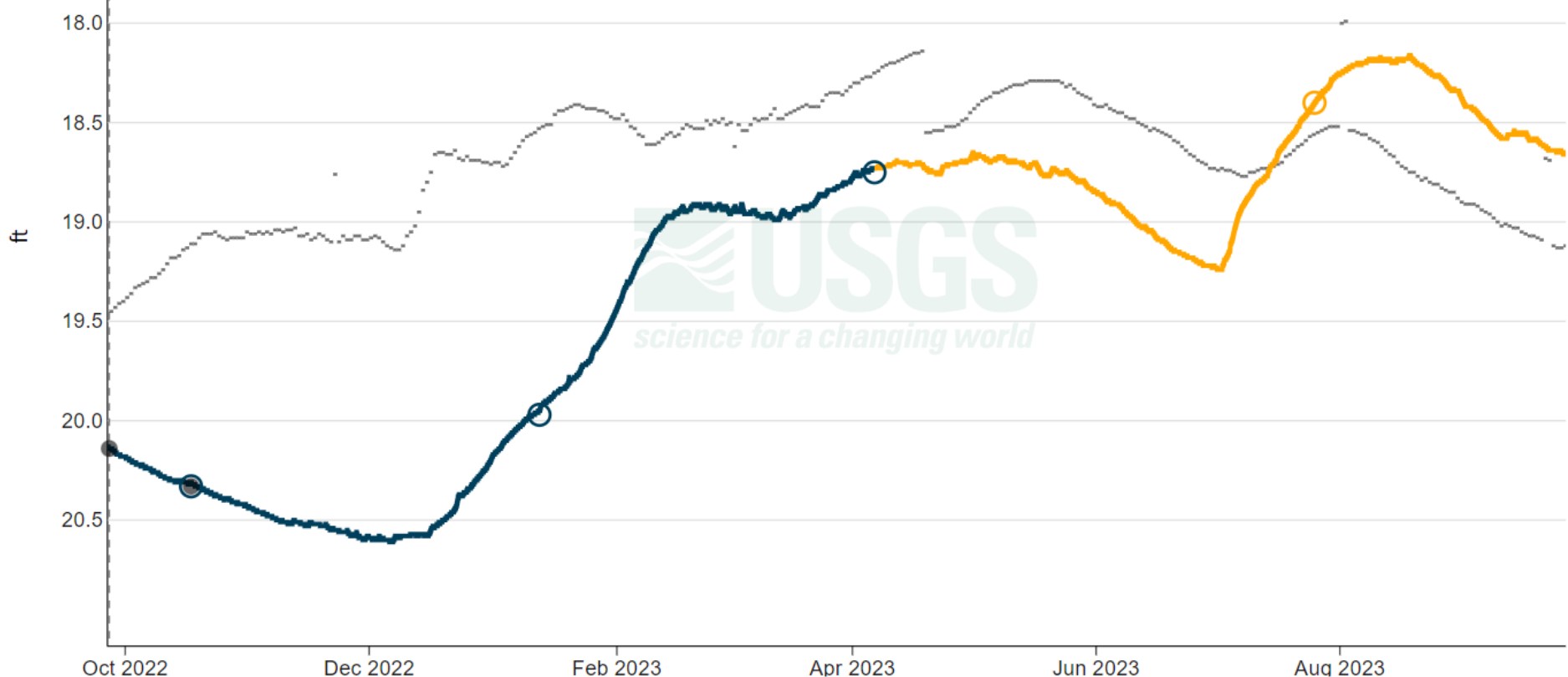
Ma-Wuw 2R West Brookfield, MA - 421410072081101

September 26, 2022 - September 26, 2023

Depth to water level, feet below land surface

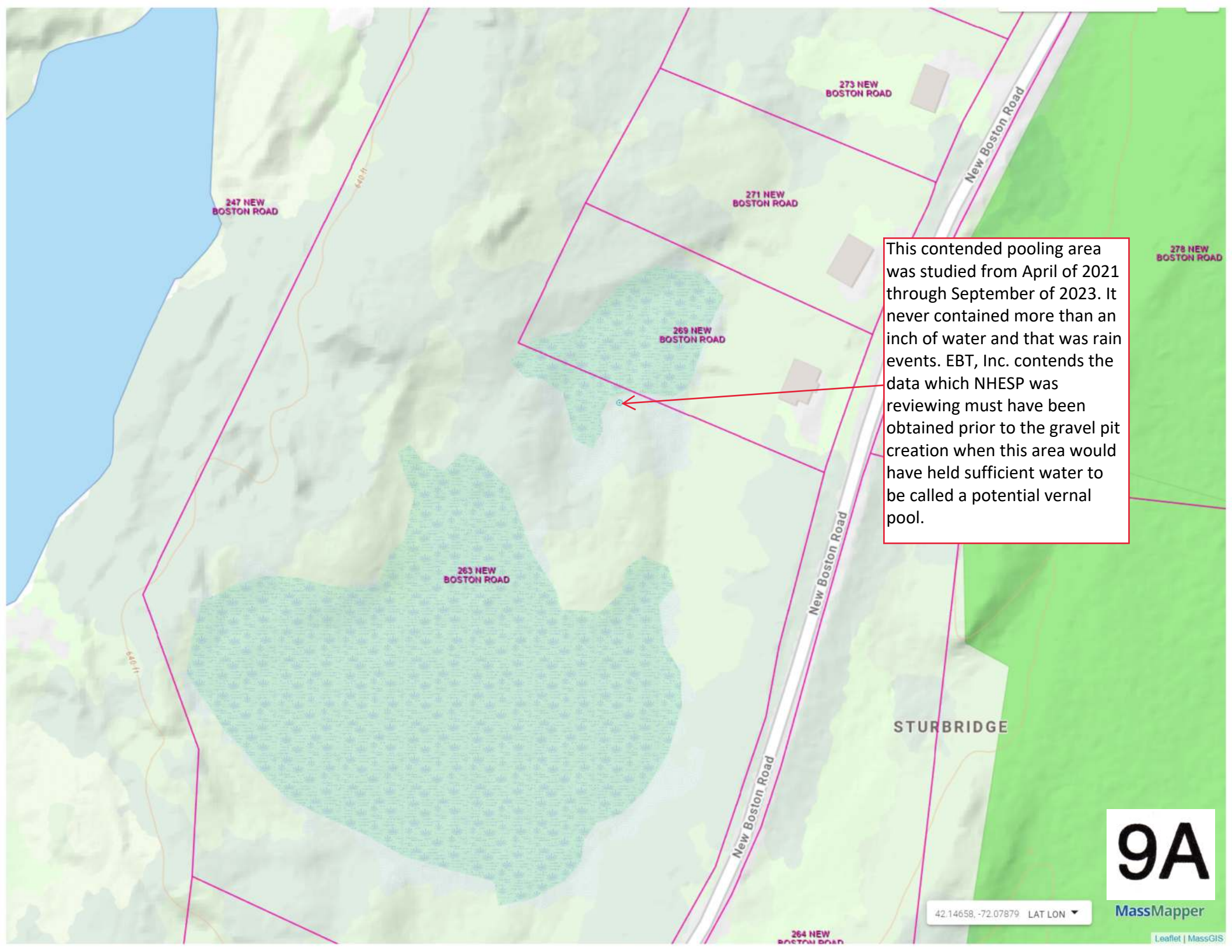
20.14 ft - Sep 27, 2022 12:00:00 AM EDT

20.33 ft - Oct 17, 2022 11:19:00 AM EDT



IMPORTANT Data may b

Show **8A**



247 NEW BOSTON ROAD

269 NEW BOSTON ROAD

263 NEW BOSTON ROAD

271 NEW BOSTON ROAD

273 NEW BOSTON ROAD

278 NEW BOSTON ROAD

This contended pooling area was studied from April of 2021 through September of 2023. It never contained more than an inch of water and that was rain events. EBT, Inc. contends the data which NHESP was reviewing must have been obtained prior to the gravel pit creation when this area would have held sufficient water to be called a potential vernal pool.

STURBRIDGE

9A

42.14658, -72.07879 LAT LON

MassMapper

Leaflet | MassGIS