

## **APPENDIX C WETLAND DELINATION REPORT**



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November 30, 2023

Burns & McDonnell

Attn: Jin Tao (JTao@burnsmcd.com)

Adam Erney (AErney@bmcd.com)

RE: **Bristol Landfill Wetland Delineation Report**

Lake Avenue

Bristol, CT

Mr. Tao and Mr. Erney,

At the request of Burns & McDonnell (herein BMCD), I conducted an inspection of the area demarcated on the mapping provided in the request for a proposal for the above-referenced project. Two sketch maps of flagged locations are provided in Attachment A: Wetland Sketch Maps. The purpose of the inspection was to delineate federal and State of Connecticut jurisdictional wetlands and watercourses and was conducted by myself, a soil scientist as defined in the Connecticut General Statutes, Title 22a, Chapter 440, Inland Wetlands and Watercourses Act, Section 22a-38.

### **Regulated Wetlands and Watercourses**

In Connecticut wetlands are defined as "land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service of the United States Department of Agriculture."

Watercourses are defined as being "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation."

Federal Wetlands are defined as "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Federal wetlands are delineated based on three-parameters looking at soils, vegetation, and hydrology.

State and federal wetland resource areas were delineated by examining the upper 18 - 24" of the soil profile and those areas that met the criteria noted above were demarcated in the field with sequentially numbered pink and black flagging.

### **Site Description and Wetlands**

The delineation was focused on the Bristol landfill property (herein the Site) located between Enterprise Drive to the east and Lake Avenue to the west in the Town of Bristol, Connecticut. The landfill property functions as an active transfer station and landfill and included a mix of paved and developed infrastructure and outbuilding as well as capped, vegetated landfill and undeveloped forest. Within the delineation area, State and federal wetlands were consistent.

Delineated wetland resources at the Site include two areas located predominantly in the Town-owned parcel south of the active landfill nearest to Lake Avenue and the Lake Compounce Campground access road as shown in Attachment A: Wetland Sketch Maps. A description of each resource area is provided below.

#### **Wetland W1 (Flags W1-1 to W1-24)**

This wetland is located at the toe-of-slope south of the active transfer station portion of the landfill and is hydrologically supported by stormwater runoff. Although soils within the upper 12-18" would be classified as well-drained, sandy material, the underlying substrate and an otherwise restrictive layer retains water within the topographical depression thus resulting in the development and establishment of hydric soils, vegetation and hydrology. Although the wetland is dominated by non-native common reed (*Phragmites australis*), other invasive vegetation such as Asiatic bittersweet (*Celastrus orbiculatus*), autumn olive (*Elaeagnus umbellata*) and multiflora rose (*Rosa multiflora*) were also observed. Although the wetland limit was flagged within the delineation area, the wetland system continues off-Site to the south between flags W1-18 and W1-17. Very dense, nearly impenetrable vegetation and steep slopes were observed along the northern wetland boundary near the toe-of-slope.

Two culverts that emerge from the base of the slope as shown in Attachment A discharge directly into the wetland and contribute to the wetland's hydrology. Although their primary function is likely stormwater conveyance, active flow from both culverts, though diminutive, was observed at the time of the delineation over 24 hours post-rain event.

#### **Mix Brook (Flags WC1-1 through WC1-6 and WC1-1A through WC1-6A)**

Mix Brook flows from west to east beneath Lake Avenue in the southwestern corner of the delineation area. The substrate throughout the brook is predominantly sand and gravel. At the time of the delineation, the water level was low to average, ranging from 4 to 12 inches, consisting primarily of runs and riffles with few pools. The Brook is likely influenced by stormwater runoff that result in highly variable and high-energy flows throughout the year. The Brook is classified by the Connecticut Department of Energy and Environmental Protection (CT DEEP) as a Class 2 watercourse meaning that it is a minimally altered, free-flowing stream.

### **Wetland Soil Types**

To aid in the evaluation of wetland soils which may occur in the project area, digitally available soil survey information was obtained from the Natural Resources Conservation Service (Attachment B: Soils Map). Although the NRCS soil data is not representative of exact, on-site conditions, it provides a

general representation of soil characteristics and the soil catena present in the region. The following is a description of wetland and upland soil types observed on the site.

The NRCS Soil Survey Geographic Database (SSURGO) maps the soils within most of the landfill property as Udorthents Urban Land Complex. Soils within the mapped wetland areas include Scarboro muck, Windsor loamy sand, Rippowam fine, sandy loam and Saco silt loam, all of which are described below:

Udorthents urban land complex:

Udorthent mapping units contain miscellaneous soil types that are present on the landscape in a complex pattern that is not practical or necessary to separate. These soils are used to denote moderately well to well drained earthen material which has been so disturbed by cutting, filling, or grading, that the original soil profile can no longer be discerned and are co-associated with buildings, roads, parking lots and landscaping of developed areas.

Scarboro muck:

Consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions with slopes ranging from 0 through 3 percent.

Windsor loamy sand:

Consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms with slopes ranging from 0 to 60 percent.

Saco silt loam:

Consists of very deep, very poorly drained soils formed in silty alluvial deposits. They are nearly level soils on flood plains, subject to frequent flooding with slopes ranging from 0 to 2 percent. Permeability is moderate in the silty layers and rapid or very rapid in the underlying sandy materials.

Rippowam fine, sandy loam:

Consists of very deep, poorly drained loamy soils formed in alluvial sediments. They are nearly level soils on flood plains subject to frequent flooding with slopes ranging from 0 to 3 percent.

According to the Soil Survey Geographic Database made available through CT DEEP, only soils within the far western portion of wetland W1 are mapped as inland wetland soils.

If you have any questions regarding the concerns, please do not hesitate to contact me by email at [michelle@ecomapsllc.com](mailto:michelle@ecomapsllc.com) or by phone at 248-885-5477.

Regards,

*Michelle Ford*

Michelle Ford, PWS, CWB®, CESSWI  
Registered Professional Soil Scientist  
EcoMaps, LLC.

(cont.)

*Attachments:*

Attachment A: Wetland Sketch Maps

Attachment B: Soils Map

Attachment C: Site Photographs

# Attachment A

## Wetland Sketch Maps





Enterprise Dr.

Lake Ave.

Field Sketch Map - Overview  
Bristol Landfill Solar  
Lake Avenue  
Bristol, CT

#### Legend

- Culvert
- Wetland Flag
- Wetland Boundary
- 100ft Wetland Buffer
- Parcel Boundaries (approx.)

#### Map Notes:

1. Wetland flags GPS located with sub-meter accurate Trimble Catalyst GPS. Accuracy may vary slightly based on satellite reception at time of survey.
2. Wetlands delineated by M. Ford on Nov. 28, 2023.

N  
W  
E  
S  
1 inch = 400 feet

Delineation & Mapping by:  
**ECOmaps LLC**  
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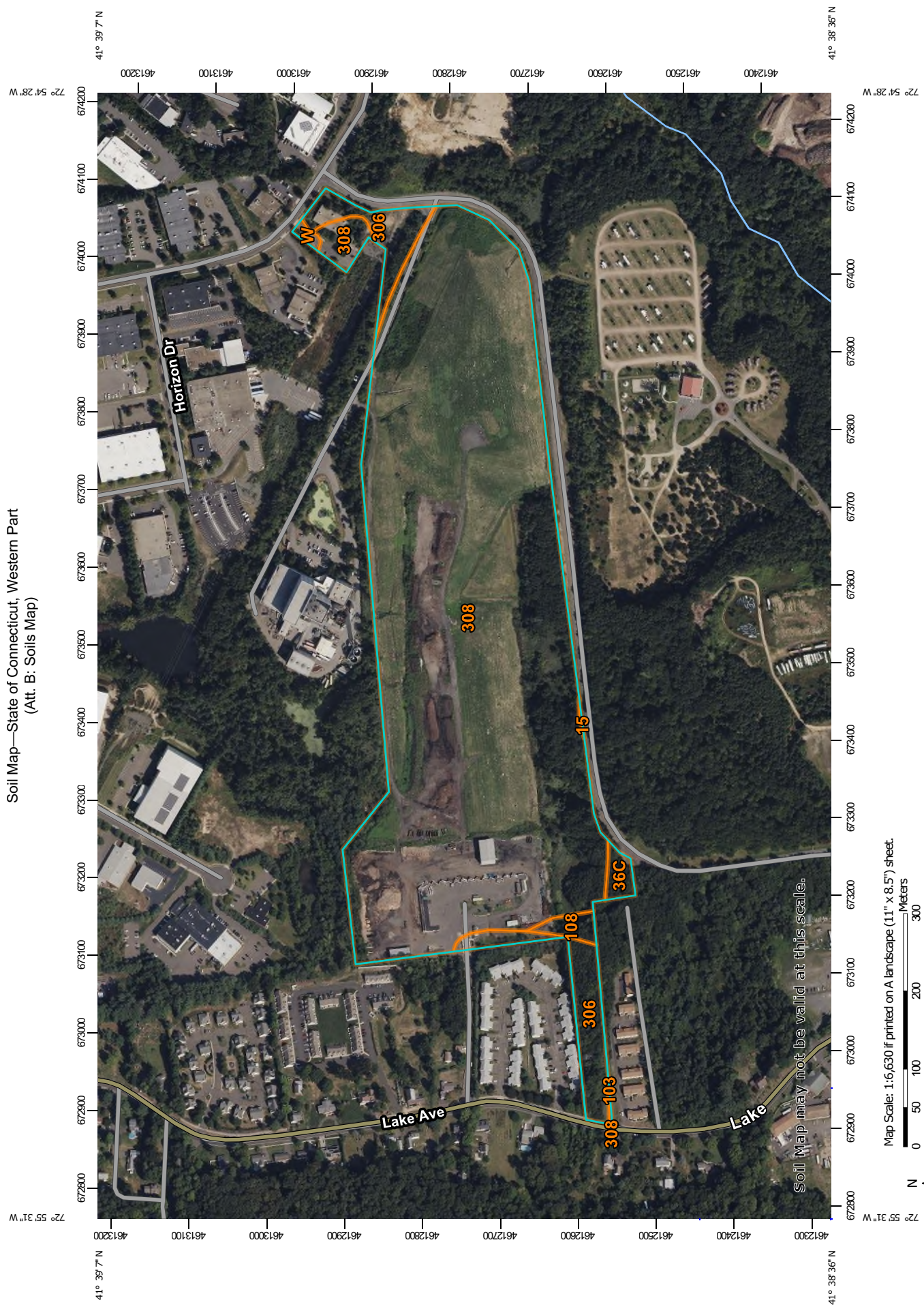
<b>Field Sketch Map - Wetland Flags</b> Bristol Landfill Solar Lake Avenue Bristol, CT	<b>Legend</b> <ul style="list-style-type: none"><li>Culvert</li><li>Wetland Flag</li><li>Wetland Boundary</li><li>100ft Wetland Buffer</li><li>Parcel Boundaries (approx.)</li></ul>	<b>Map Notes:</b> 1. Wetland flags GPS located with sub-meter accurate Trimble Catalyst GPS. Accuracy may vary slightly based on satellite reception at time of survey. 2. Wetlands delineated by M. Ford on Nov. 28, 2023.	<b>Map Notes:</b> 1. Wetland flags GPS located with sub-meter accurate Trimble Catalyst GPS. Accuracy may vary slightly based on satellite reception at time of survey. 2. Wetlands delineated by M. Ford on Nov. 28, 2023.	 1 inch = 150 feet	Delineation & Mapping by:  www.ecomapsllc.com
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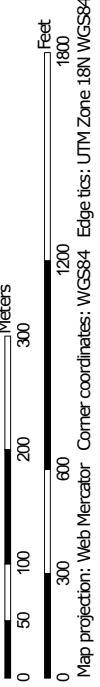
# Attachment B

## Soils Map

# Soil Map—State of Connecticut, Western Part (Att. B: Soils Map)



Map Scale: 1:6,630 if printed on A landscape (11" x 8.5") sheet.



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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: State of Connecticut, Western Part  
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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 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

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
15	Scarboro muck, 0 to 3 percent slopes	0.0	0.0%
36C	Windsor loamy sand, 8 to 15 percent slopes	0.5	0.8%
103	Rippowam fine sandy loam	0.0	0.0%
108	Saco silt loam, frequently ponded, 0 to 2 percent slopes, frequently flooded	0.5	0.8%
306	Udorthents-Urban land complex	4.3	6.9%
308	Udorthents, smoothed	57.2	91.2%
W	Water	0.2	0.2%
<b>Totals for Area of Interest</b>		<b>62.7</b>	<b>100.0%</b>



# Attachment C: Site Photographs



Photo 1. View facing the eastern end of wetland W1. Photo facing southeast toward the toe-of-slope adjacent to the landfill.



Photo 2. View facing the southern edge of the landfill east of wetland W1. Photo facing east.





Photo 3. Overview of a portion of wetland W1 from the top of the slope near the active transfer station. Photo facing southwest.



Photo 4. Small, embedded intermittent watercourse located at the eastern end of wetland W1 near flag W1-8. Photo facing northeast.





Photo 5. Eastern-most culvert at the base of the active transfer station that discharges into wetland W1. Photo facing northeast.



Photo 6. Discharge and debris from within the eastern-most culvert flowing into wetland W1. Photo facing south.





Photo 7: Rip-rap immediately downgradient of the western-most culvert flowing from beneath the active transfer station into the western end of wetland W1. Photo facing south.



Photo 8. View of Mix Brook which flows southwest of the Bristol landfill. Photo facing southeast.





Photo 9. View of a portion of Mix Brook southwest of the landfill. Photo facing northwest.