



December 19, 2023

Ref: 43362.00

Mr. James Cerkanowicz
Verogy
150 Trumbull Street, 4th Floor
Hartford, CT 06103

Re: Wetland & Watercourse Delineation Report
Castle Rock Road, Woodstock, Connecticut

Dear Mr. James Cerkanowicz,

VHB completed an on-site investigation to determine the presence or absence of state and/or federally regulated wetlands and/or watercourses at a ±36-acre property located at 11 Castle Rock Road (Woodstock Assessor's (M/B/L 6395-64-08) in Woodstock, Connecticut (Figure 1) as requested and authorized. This investigation encompassed the entire parcel (herein referred to as the Project site) and was completed by a Certified Professional Soil Scientist in accordance with the principles and practices noted in the United States Department of Agriculture (USDA) Soil Survey Manual (2017). The soil classification system of the National Cooperative Soil Survey was used in this investigation to identify the soil map units present on the Project site.

This delineation report includes descriptions of site conditions, photographic documentation (Appendix A), a (Natural Resources Conservation Service) NRCS Soils Report for the site (Appendix B) and a Delineated Wetland Sketch (Figure 2) displaying delineated wetland/watercourse resources within the Project site.

INVESTIGATION & METHODOLOGY

The Project site was investigated on October 10th and 23rd, 2023, under normal seasonal weather conditions. No rain event occurred within four days prior to the site visit. A residential house with a gravel parking area is present onsite, but the site is otherwise undeveloped and currently used as an agricultural farming field. The surrounding area is primarily forested with residential neighborhoods and agricultural farm fields present.

Soil types are identified by observing soil morphology (soil texture, color, structure, etc.). Soil morphology is evaluated through numerous test pits and/or hand borings (generally to a depth of at least two feet). If a wetland and/or watercourse were determined to be present, their boundaries are identified with flags and hung from vegetation or small wire stakes if in fields or grass communities. For wetlands, these flags are labeled "Wetland Delineation" and are generally spaced 25 to 50 feet apart. It is important to note that

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flagged wetland and watercourse boundaries are subject to change until verified by local, state, or federal regulatory agencies.

REGULATORY INFORMATION

Wetlands and watercourses are regulated by both state and federal laws each with different criteria for establishing regulatory limits. Accordingly, the State may regulate waters that fall outside of federal jurisdiction; however, where federal jurisdiction exists concurrent State jurisdiction is almost always present. For this project, federal and state wetland boundaries are coincident.

State Regulation

Wetland determinations are based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land. Drainage class identifies the natural drainage condition of the soil (USDA-NRCS 2014). It refers to the frequency and duration of wet periods under conditions similar to those under which the soil developed. Drainage class is inferred from observation of landscape position and relies principally on presence or absence of features in the soil profile associated with soil development under saturated conditions.

Watercourses are defined as "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 the state or any portion thereof." *Intermittent watercourse* determinations are made based on the presence of a defined permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus, (2) the presence of standing or flowing water for a duration longer than a particular storm incident, and (3) the presence of hydrophytic vegetation (See Inland Wetlands and Watercourses Act §22a-38 CGS).

Federal Regulation

Federal wetlands were delineated in accordance with the Corps of Engineers 1987 Manual (Environmental Lab. 1987) in conjunction with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, January 2012). This method relies on the documentation of the presence of three parameters 1) wetland soils, 2) hydrophytic vegetation, and 3) wetland hydrology for an area to be mapped as a wetland. Field Indicators for Identifying Hydric Soils in New England- Version 4 and by inference Field Indicators of Hydric Soils in the United States A Guide for Identifying and Delineating Hydric Soils Version 8.2 were used to document the presence of hydric soils.



WETLAND AND WATERCOURSE SITE DESCRIPTION

Wetland classifications used to identify the type of wetland(s) occurring on the Project site are based on guidance from the U.S. Fish and Wildlife Service (USFWS) (Cowardin et.al. 1979) and the Hydrogeomorphic Classification of Wetlands (HGM) (Brinson, 1993).

Wetland/Watercourse Descriptions

Wetland 1: Wetland Flag Series W1-100 to W1-181

Wetland 1 is a single contiguous wetland that occurs across the northern boundary of the site with two linear 'fingers' that extend south. The western portion of Wetland 1 is a forested wetland dominated by mature canopy trees (USFWS: Palustrine Forested (PFO)). This portion of Wetland 1 is sloped from the south to the north for approximately 500 feet, then transitions to a depressional wetland. Soils in this area are very poorly drained, with redoximorphic characteristics present within ± 8 inches below ground surface. Standing water is present throughout this wetland, and saturation was encountered at ground surface. The understory within this portion of Wetland 1 is limited to saplings and minor groupings of shrubs, but the herbaceous layer appears sparse, likely due to sheet flow across the surface. A dilapidated pathway partially bisects this portion of Wetland 1, but an intermittent stream has overtopped the pathway and flows from the south to the north where Wetland 1 continues to the east. This stream is located along the western boundary of Wetland 1 and varies between a well-defined stream channel and a diffuse flow across the wetland. Dominant vegetation present includes red maple (*Acer rubrum*), grey birch (*Betula populifolia*), northern spicebush (*Lindera benzoin*) and the invasive Japanese barberry (*Berberis thunbergia*).

During the delineation a potential vernal pool was observed that may allow for amphibian breeding and is located near Wetland Flag W1-162 and identified on the attached Figure 2. This pool appears to be the result from a berm constructed around the wetland. It is recommended that a biological survey of this pool be conducted in the spring to confirm if amphibians are using this pool for breeding as well as identify the species that may occur in this location.

Wetland 2: Wetland Flag Series W2-100 to W2-102

Wetland 2 is a small portion of a much larger wetland system in the northern portion of the Project site. This wetland is a continuation of Wetland 1 as Wetland 1 continues off site to the north. This wetland is where Wetland 1 turns back south onto the Project site. We have identified this as a separate wetland number due to the separation from the Project site boundaries. This northern wetland is a forested wetland depression and, it is densely vegetated with a diverse understory. The vegetation present is similar to Wetland 1, however northern spicebush, skunk cabbage (*Symplocarpus foetidus*), and multiple fern species are dominant understory vegetation. Soils at this location are also similar to the central portion. Soils are poorly drained with saturation present at ground surface, and redoximorphic characteristics observed within $\pm 7-8$ inches below ground surface.

Wetland 3: Wetland Flag Series W3-100 to W3-144

Wetland 3 is located on the eastern portion of the Project site and is associated with a drainage swale feature that flows south to north through an active agricultural field and extends out into the field where



soils are heavily disturbed. This wetland is connected to Wetland 1 and Wetland 2 to the north of the site. This wetland is classified as an emergent wetland system (USFWS: Palustrine Emergent (PEM)). Saturation of the soil profile was observed at ground surface, the water table was observed within $\pm 1-2$ inches below ground surface, and redoximorphic characteristics were observed within ± 10 inches below ground surface. Dominant vegetation present at this location include northern spicebush, beard grass (*Schizachyrium scoparium*), fox grape (*Vitis labrusca*) and stinging nettle (*Urtica dioica*).

Dominant vegetation observed throughout the Project site is presented in Table 1 below.

TABLE 1: Dominant Vegetation Onsite

TREES & SAPLINGS				
Scientific	Common	Indicator	Upland	Wetland
<i>Acer rubrum</i>	Red maple	FAC	X	X
<i>Betula populifolia</i>	Grey birch	FAC	X	X
<i>Betula alleghaniensis</i>	Yellow birch	FAC	X	X
<i>Carya ovata</i>	Shagbark hickory	FACU	X	-
<i>Alnus incana</i>	Grey alder	FACW	-	X
<i>Pinus strobus</i>	Eastern white pine	FACU	X	-
<i>Fagus grandifolia</i>	American beech	FACU	X	X

SHRUBS				
Scientific	Common	Indicator	Upland	Wetland
<i>Lindera benzoin</i>	Northern spicebush	FACW	-	X
<i>Berberis thunbergia</i> *	Japanese barberry	FACU	X	-

HERBS & VINES				
Scientific	Common	Indicator	Upland	Wetland
<i>Cardamine impatiens</i>	Narrowleaf bittercress	FAC	X	-
<i>Impatiens capensis</i>	Jewelweed	FACW	-	X
<i>Juncus effusus</i>	Common rush	OBL	-	X
<i>Osmunda claytoniana</i>	Interrupted fern	FAC	X	X
<i>Osmundastrum cinnamomeum</i>	Cinnamon fern	FACW	-	X
<i>Polystichum acrostichoides</i>	Christmas fern	FACU	X	-
<i>Schizachyrium scoparium</i>	Beard grass	FACU	X	-
<i>Symplocarpus foetidus</i>	Skunk cabbage	OBL	-	X
<i>Parathelypteris noveboracensis</i>	New York fern	FAC	X	X



HERBS & VINES				
Scientific	Common	Indicator	Upland	Wetland
<i>Urtica dioica</i>	Stinging nettle	FAC	X	X
<i>Vitis labrusca</i>	Fox grape	FACU	X	-

*Denotes state-listed non-native invasive species

SOIL MAP TYPES

The Cooperative Soil Survey used three map units when they mapped the Site. Uplands were mapped Udorthents-Urban land complex; uplands and wetlands are included in the mapped Windsor loamy sand area, and the southwest corner of the property was mapped as Walpole sandy loam. Descriptions of the named series which make up these map units are presented below including information from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Official Series Descriptions. Mapping from the NRCS Web Soil Survey tool is included in Appendix B. For further information on these and other soils, please refer to the internet site at <http://soils.usda.gov/technical/classification/osd/index.html>.

Upland Soils

The following soil series or their similar analogs were observed in the field.

Woodbridge fine sandy loam, 3 to 8 percent slopes - 45b:

The Gloucester component makes up 80 percent of the map unit. Slopes are 3 to 15 percent. This component is on hills on uplands. The parent material consists of sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. This component is in the F144AY032NH Dry Till Uplands ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Wetland Soils

Ridgebury, Leicester and Whitman Complex (3), stony fine sandy loam

Ridgebury Soils

The Ridgebury complex is a very deep poorly drained soil that includes poorly drained Leicester, and very poorly drained Whitman soils formed in till derived mainly from granite, gneiss and schist. Ridgebury soils on the landscape are in slightly concave areas and shallow drainageways of till uplands with slopes that range from 0-8 percent. Depth to the perched seasonal high water table from November to May, or longer,



is perched above the densic materials. The soils diagnostic horizons include an ochric epipedon (0 to 5 inches (A horizon)), aeric feature 100 percent of the zone from 5 to 9 inches (Bw1 horizon), and a cambic horizon (5 to 18 inches (Bw and Bg horizons)). Densic contact root limiting material begins at 18 inches (Cd). Endosaturation occurs within the zone from 9 to 18 inches and is saturated above the densic contact (Bw2 horizon).

Leicester Soils

The Leicester series consists of very deep, poorly drained loamy soils formed in friable till. They are nearly level or gently sloping soils in drainage ways and low-lying positions on hills. Slope ranges from 0 to 8 percent. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderate to rapid in the substratum. The horizons and features recognized in this pedon are an ochric epipedon in the zone from 1 to 7 inches (A horizon) and a cambic horizon in the zone from 7 to 23 inches (Bg and BC horizons). There is also an aquic moisture regime as indicated by chroma of 2 in Bg horizon but with chroma too high within 30 inches (chroma 3 in BC horizon) to qualify for Typic Endoaquepts. This series also contains an endoaquepts subgroup based on saturation to a depth of 200 cm from the mineral soil surface. There is an aeric great group based on matrix color and a chroma of 3 or more in one subhorizon between the Ap and 75 cm. (BC horizon) and the particle-size class in control section ranges from 10 to 40 inches and is considered coarse loamy type of soil.

Whitman Soils

The Whitman series consists of very deep, very poorly drained soils formed in glacial till derived mainly from granite, gneiss, and schist. They are shallow to a densic contact. These soils are nearly level or gently sloping soils in depressions and drainageways on uplands. Permeability is moderate or moderately rapid in the solum and slow or very slow in the substratum. The diagnostic horizons and features in this pedon include an umbric epipedon in the zone from the soil surface to a depth of 10 inches (Ap horizon) and a cambic horizon in the zone from 10 to 18 inches (Bg horizon). This soil also has aquic conditions as evidenced by a chroma of 1 in the Bg horizon. A densic contact is also present with the root limiting layer beginning at 18 inches. Whitman soils are considered to have a shallow depth class because the depth to the densic contact is less than 20 inches (Cd1 is at 18 inches).

REFERENCES

1. Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Tech. Rpt.WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
2. Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service. Washington, D.C. FWS/OBS-79/31.
3. United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil descriptions. Internet site: <http://soils.usda.gov/technical/classification/osd/index.html>.



CLOSING

Thank you for the opportunity to work with you on this Project. Please contact Jeffrey Shamas at 860-807-4388 if you have any questions or require additional assistance.

Sincerely,

Vanasse Hangen Brustlin, Inc.

A handwritten signature in black ink, appearing to read "Sf".

Sara Berryman, CSS
Wetland Scientist
Sberryman@vhb.com

A handwritten signature in black ink, appearing to read "J. Shamas".

Jeffrey R. Shamas, CE, CSS, ENV SP, SPWS
Director, Energy & Natural Sciences
Jshamas@vhb.com

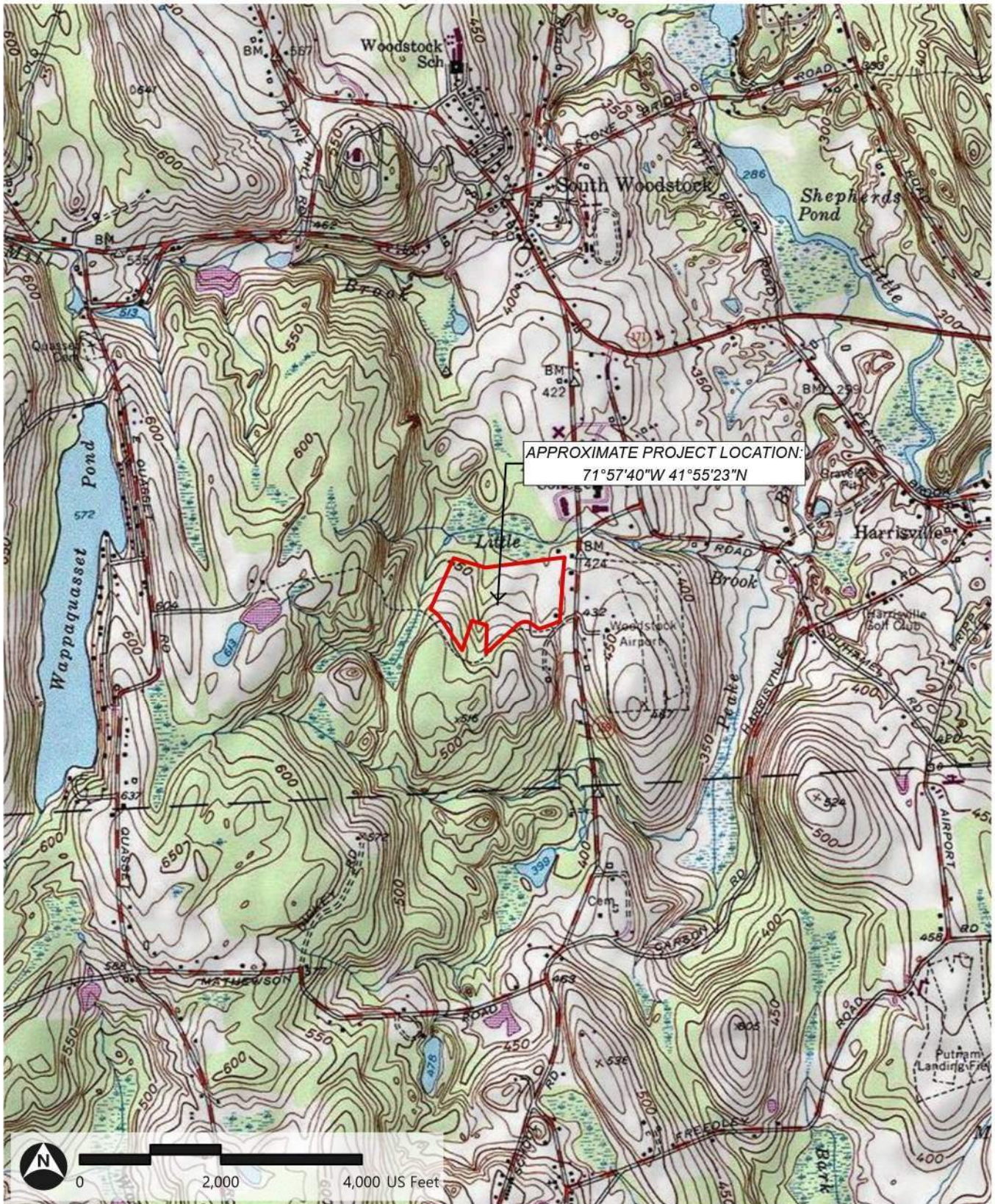
Attachments:

- Figure 1 – USGS Site Location Map
- Figure 2 – Delineated Wetland and Watercourse Map
- Appendix A – Site Photograph Log
- Appendix B – NRCS Web Soil Survey Map



Figure 1 USGS Site Location Map

Figure 1: USGS Site Location Map
Verogy Woodstock | Woodstock, CT



 Project Site

Source: USGS, VHB

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Figure 2 Delineated Wetland and Watercourse Map

Figure 2: Wetlands and Watercourse Delineation Sketch

Verogy Woodstock | Woodstock, CT



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- Project Site
- ★ Potential Vernal Pool
- 10' Contour
- Wetland Delineation Flag
- Delineated Wetland Edge
- Estimated Offsite Wetlands
- Delineated Wetland

Source: CTDEEP, VHB



Appendix A Site Photograph Log

Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 1

Date: 10/10/2023

Description: Facing west, a view of Wetland 1 in the foreground, and the grassing agricultural field uplands in the background.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 2

Date: 10/10/2023

Description: Facing south, a view of Wetland 1.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 3

Date: 10/10/2023

Description: Facing southeast, a view of a potential vernal pool located within Wetland 1.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 4

Date: 10/10/2023

Description: Facing west in Wetland 1, a view of a stream channel in the foreground, and a boulder stockpile in the background.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 5

Date: 10/10/2023

Description: Facing east in Wetland 1, a view of the forested wetland area.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 6

Date: 10/10/2023

Description: Facing south in Wetland 1, a view of the forested stream.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 7

Date: 10/10/2023

Description: Facing west in Wetland 1, a view of the compacted pathway bisecting the wetland area.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 8

Date: 10/10/2023

Description: Facing east in Wetland 1, a view of the compacted pathway bisecting the wetland area.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 9

Date: 10/10/2023

Description: Facing north in Wetland 1, a view of the wetland adjacent to the pathway.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 10

Date: 10/10/2023

Description: Facing west, a view of a continuation of Wetland 3 through a vegetated portion of the agricultural field. The agricultural field is in the background.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 11

Date: 10/10/2023

Description: Facing south at the northern property boundary, a view of a continuation of Wetland 3 through a vegetated portion of the agricultural field.



Client Name: Verogy

Site Location: Woodstock, CT

Project No: 43362.00

Photo No.: 12

Date: 10/10/2023

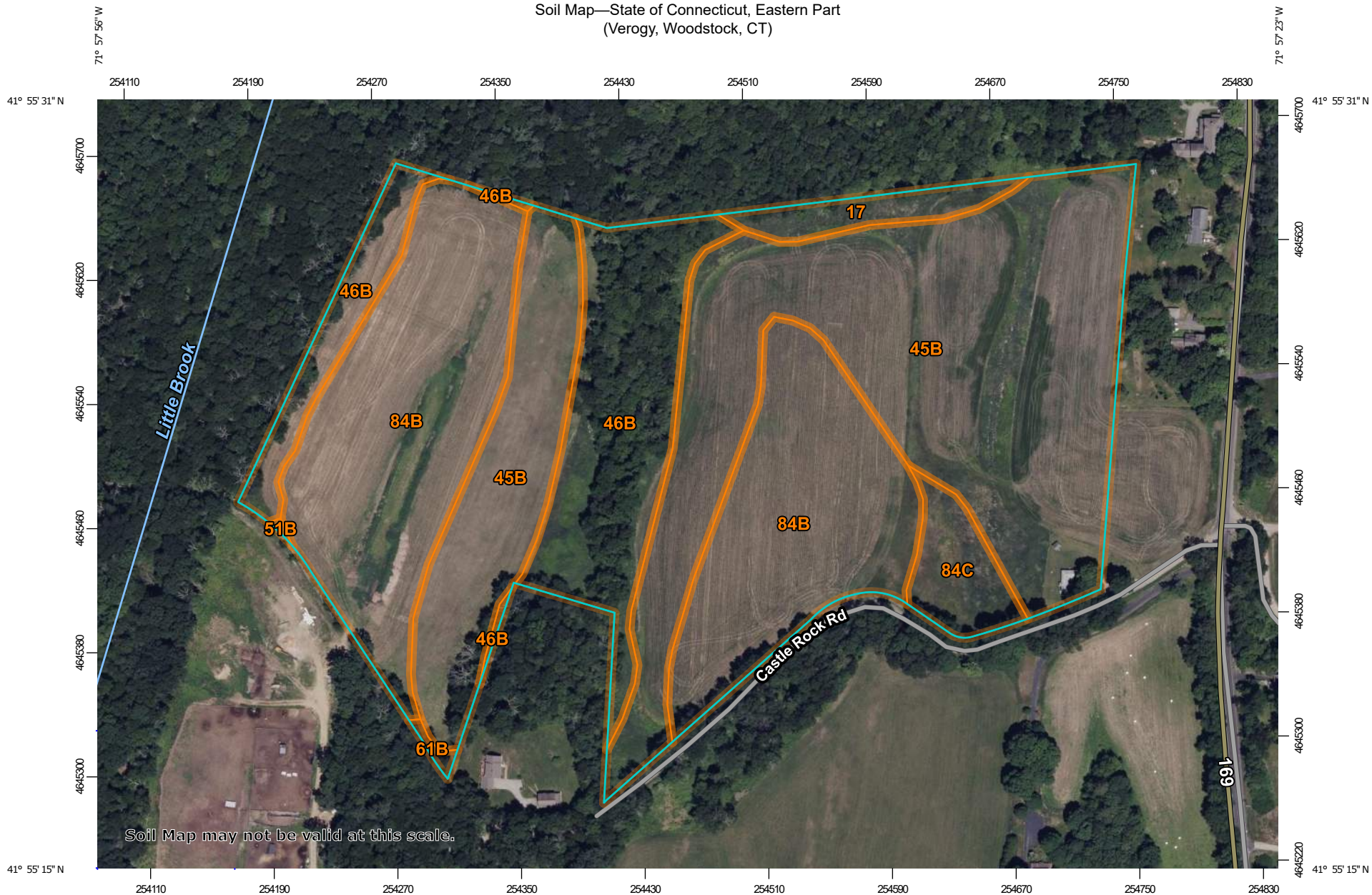
Description: Facing southwest at the northern property boundary, a view of a continuation of Wetland 3 through a vegetated portion of the agricultural field.



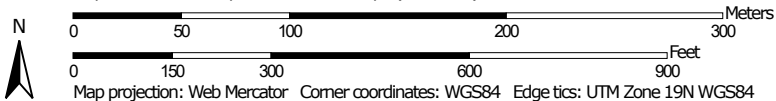


Appendix B NRCS Web Soil Survey Map

Soil Map—State of Connecticut, Eastern Part
(Verogy, Woodstock, CT)



Map Scale: 1:3,490 if printed on A landscape (11" x 8.5") sheet.



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 1:12,000.

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, Eastern 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—Jul 1, 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 Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	0.8	2.2%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	17.5	45.8%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	6.1	16.0%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	0.0	0.0%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	0.1	0.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	12.5	32.7%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	1.1	3.0%
Totals for Area of Interest		38.1	100.0%