To: Steve Kochis

Date: May 8, 2020

Project #: 42517.01

From: Brett Trowbridge, Senior Ecologist
Jeffrey Shamas, CSS, CE, PWS

Re: Vernal Pool Investigation
Greenskies Clean Energy LLC
Solar Development Project
233 Boombridge Rd
North Stonington, Connecticut

During delineation of wetlands on the above-referenced site during summer 2019, Wetland 1 was identified as potentially containing cryptic vernal pool breeding habitat. Connecticut's municipal inland wetlands agencies regulate any activities that are likely to impact or affect vernal pools. Therefore, in consideration of the proposed Site development, VHB conducted a seasonally appropriate investigation the property located at 233 Boombridge Road, Connecticut for vernal pools during spring 2020. This memorandum provides a summary of site conditions, criteria for identifying vernal pools, and the findings of VHB's investigation.

Site Description

233 Boombridge Road is a ±132-acre parcel of land located east of Boombridge Road and south of Interstate-95 near the southeastern Connecticut-Rhode Island border (see Figure 1). The southwestern portion of the Site is comprised of agricultural fields, the northeastern portion of the Site contains scrubby-primary regrowth from recent tree clearing, and various wetland features exist within and between these areas. A dirt and gravel drive provides access to the southwestern corner of the Site from Boombridge Road and a farm road/cart path extends across the Site generally from the southeast to northwest. A stockpile/staging area for farm and timber harvest operations exists near the center of the Site at the transition between agricultural field and scrub areas.

Topography on the Site is variable, ranging from gently rolling within field and scrub areas to steep along a ravine located along the southern property boundary. Elevations range roughly between 160 and 200 feet and surficial geology consists of stony to bouldery ablation till.

Agricultural Fields

The southwestern portions of the Site contain agricultural fields. The fields were still dormant during VHB's spring 2020 vernal pool investigation, however, residues from the 2019 corn crop were visible (see Photos 1 and 2).

Scrub-shrub Regrowth Areas

Based on aerial imagery, the northeastern portions of the Site were previously forested and clearing occurred during 2015-2016. These areas currently contain scrub-shrub cover that is re-growing from the cut stumps (see Photos 3-5). Vegetation composition includes a mix of oaks (*Quercus* spp.), birches (*Betula* spp.), American beech (*Fagus grandifolia*), sassafras (*Sassafras albidum*), and blackberries (*Rubus* sp.).

Wetlands

Five distinct wetland areas, each containing different physical properties and vegetation compositions, were identified during VHB's 2019 wetland delineation.

Wetland 1

Centrally located on the Site, Wetland 1 is situated in a valley that slopes gently to the north between two till hills. Wetland 1 is a palustrine forest/ shrub swamp with dominant canopy composed of red maple (*Acer rubrum*), and lesser coverage of yellow birch (*B. allegheniensis*). The shrubby understory consists primarily of sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), spicebush (*Lindera benzoin*), swamp azalea (*Rhododendron viscosum*), and green briar (*Smilax rotundifolia*). Herbaceous vegetation includes skunk cabbage (*Symplocarpus foetidus*), tussock sedge (*Carex stricta*), jewel weed (*Impatiens*

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capensis), cinnamon fern (*Osmundastrum cinnamomea*), common reed (*Phragmites australis*), marsh mermaid-weed (*Proserpinaca palustris*), and common water-primrose (*Ludwigia palustris*).

The Wetland 1 hydrology appears to be driven by the discharge of groundwater or a perched water table and tree tip-ups were found to be common throughout. Tree tip-ups interrupt the forest canopy and create pit and mound micro topography with shallow pockets of water. Variable saturated or inundated conditions exist throughout Wetland 1 (see Photo 6) and sheet flow or standing water of up to 30 inches deep were observed during spring 2020. Wetland 1 drains to the north via an intermittent watercourse and passes beneath Interstate-95 (see Photo 7).

Wetland 2

Wetland 2 is a small linear drainage feature is situated in sloping till uplands along the southwestern property boundary. It begins as a gully formed between two fields and flows offsite to the southwest (see Photo 8). Wetland 2 is crossed by a farm road with the with a reinforced concrete pipe. This watercourse and wetland appear to have been previously graded to convey water out of the field. Vegetation within Wetland 2 is predominantly herbaceous and includes soft rush (*Juncus effusus*), cattail (*Typha latifolia*), woolgrass (*Scirpus cyperinus*), and lurid sedge (*Carex lurida*).

Wetland 3

Wetland 3 is somewhat centrally located along the southern property boundary. It occurs within the tree clearing area and supports shrub and emergent vegetation cover types. The northern portion of Wetland 3 contains shallow marsh habitat (see Photo 9) which drains south to the south through an intermittent watercourse that spills into a steep ravine with exposed bedrock slopes (see Photo 10). Vegetation within Wetland 3 includes spicebush, multiflora rose (*Rosa multiflora*), sweet pepperbush, Bebb willow (*Salix bebbiana*), woolgrass, soft rush, meadow beauty (*Rhexia virginica*), and bristly dewberry (*Rubus hispidus*).

Wetland 4

Situated near the center of the Site, between Wetlands 1 and 3, Wetland 4 is a small area of compacted soil beneath a haul road. No live vegetation was observed within Wetland 4 during the spring 2020 vernal pool investigation (see Photo 11).

Wetland 5

Wetland 5, within the tree clearing area in the northern end of the Site, supports shrub and emergent vegetation cover types (see Photo 12). This wetland feature drains to the north towards Interstate-95. Standing water was observed within vehicles ruts located within haul roads or ATV trails that cut through Wetland 5 (see Photo 13). Vegetation within Wetland 5 includes red maple, sweet pepperbush, highbush blueberry, common winterberry, green briar, sensitive fern (*Onoclea sensibilis*), cinnamon fern, and bristly dewberry.

Surrounding Land Use

Land use surrounding the Site includes Interstate-95 to the north, mixed forest to the east, mixed forest, agricultural fields, and sparse residential development to the south and agricultural fields to the west along Boombridge Road. The Pawcatuck and Ashaway Rivers are located within Rhode Island approximately 1 km to the south and east of the Site, respectively.

Vernal Pool Identification and Assessment

Although Connecticut's municipal inland wetlands agencies regulate vernal pools, the Connecticut Department of Energy and Environmental Protection (CT DEEP) does not provide a formal definition of vernal pool (CT DEEP 2020). Acknowledging the lack of an official definition for vernal pools in Connecticut, in a technical paper addressing vernal pool considerations for site development, Calhoun and Klemens (2002) note that vernal pools generally occupy less than 2 acres and recommend following guidance provided by Donahue (1996), which is includes the following factors:

a) presence of one or more obligate species,
b) water for approximately 2 months during the growing season,
c) a confined depression that lacks a permanent outlet stream,
d) no fish, and
e) dries out in most years.

In addition, the Connecticut Association of Wetland Scientist (CAWS) Vernal Pool Monitoring webpage (CAWS 2020) cites the following vernal pool definition:

> *Vernal pool means a seasonal watercourse in a defined depression or basin, that lacks a fish population and supports or is capable of supporting breeding and development of amphibian or invertebrate species recognized as obligate to such watercourses. These species include spotted salamander, Jefferson salamander complex, marbled salamander, wood frog, and fairy shrimp*.

These criteria are similar, although the CAWS do not require the pool to dry in most years. The common and specific names for Connecticut species considered by Calhoun and Klemens (2002) to be obligate biological indicators of vernal pool habitat are listed within Table 1.

Table 1 Obligate Vernal Pool Species

Common Name	Scientific name
Jefferson Salamander	*Ambystoma jeffersonianum*
Blue-spotted Salamander complex	*Ambystoma laterale*
Spotted Salamander	*Ambystoma maculatum*
Marbled Salamander	*Ambystoma opacum*
Wood Frog	*Lithobates sylvaticus*
Eastern Spadefoot Toad	*Scaphiopus holbrookii*
Fairy Shrimp	*Eubranchipus spp.*

Furthermore, because vernal pool-breeding amphibians depend on terrestrial habitats as well as aquatic breeding habitats for survival, Calhoun and Klemens (2002) emphasize the importance of considering the surrounding upland areas, up to 750 feet from breeding pools. One hundred feet from the edge of the pool is considered the "vernal pool envelope" and the zone between 100 feet to 750 feet has been termed "critical upland habitat." The authors go on to provide a ranking methodology to assess the quality of each breeding area based on biological indicators and surrounding land use. This tool- a one-page form titled "Vernal Pool Assessment Sheet"- is specifically intended to be used for development planning purposes. Therefore, the purview of Connecticut's municipal inland wetlands agencies encompasses wetland vernal pool habitat and surrounding upland areas.

Survey Methodology

Two VHB biologists investigated the property for vernal pool indicators on April 1, 2020. During the investigations, the biologists targeted wetland areas that were previously identified during delineation of wetlands on the Site. Wading surveys were conducted within inundated depressions on the Site while wearing polarized glasses. A dip net was used to sample for biological indicators within inundated areas as well. Discretion was used during dipnet sweeps, such that small, shallow areas containing obligate vernal pool indicators were substantially disrupted (i.e., silting up of areas containing egg masses or spermatophores). Field notes and supporting photographs were taken for areas that were

found to meet the vernal pool criteria presented above. Blue and white, plastic flags were hung around the extents of onsite vernal pool-breeding habit based on the maximum observed extent of flooding. Flag locations were recorded using a global positioning device. Subsequently, CAWS Vernal Pool Data Sheets and Vernal Pool Assessment Sheets (Calhoun and Klemens 2002) were prepared for each vernal pool area. Geographic information system (GIS) tools and aerial imagery were used to determine land use surrounding breeding areas and calculate percentages of functional habitat.

Survey Findings

No evidence of vernal pool breeding was observed within Wetlands 2, 3, 4, or 5, however, Wetland 1 was found to contain thirteen (13) cryptic vernal pool breeding areas (see Figure 2). Observed obligate vernal pool species included wood frogs (see Photo 14), and spotted salamanders (see Photo 15). No fairy shrimp, marbled salamander larvae, or state-listed vernal pool breeding amphibians were observed. Each vernal pool area exhibits a soft, leafy, silty, peaty bottom and flood depths within the breeding areas ranged between 6 and 30 inches. The Vernal Pool (VP) 1 and VP 13 breeding areas were somewhat broad (see Photos 16 and 17), however, most pools were small, discrete pockets that exhibited slightly deeper inundation than the surrounding Wetland 1 areas (see Photos 18 and 19). All 13 breeding areas lack permanent outlets. Based on its deeper inundation and presence of 1-2 year-old green and/or bullfrog larvae (*Lithobates clamatans* and *L. catesbeianus*; see Photo 20), VP 13 may occasionally dry down completely, but likely experiences only partial drying during most years (i.e., semi-permanent). Table 2 summarizes obligate indicators observed within each vernal pool. The attached CAWS Vernal Pool Data Sheets provide further details and photographs specific to each pool.

Table 2 Obligate Vernal Pool Species Indicators and Observations

Cryptic VP ID	Wood Frog Egg Masses	Spotted Salamander Egg Masses	Total Egg Mass Count	Other amphibians
VP 1	5	15	20	-
VP 2	2	13	15	-
VP 3	0	4	4	-
VP 4	1	5	6	-
VP 5	1	6	7	-
VP 6	0	1	1	-
VP 7	0	3	3	-
VP 8	0	2	2	-
VP 9	0	2	2	-
VP 10	0	3	3	-
VP 11	0	4	4	-
VP 12	0	1	1	-
VP 13	0	83	83	Green/bullfrog larvae

Terrestrial Vernal Pool Habitat

Figure 2 shows 100-foot "vernal pool envelopes" and 750-feet "critical upland habitats" surrounding vernal pool breeding areas. GIS aerial imagery were used to determine the land uses surrounding the breeding areas and GIS analysis were used to quantify potential habitat areas within 750 feet of the pools. Table 3 presents land use percentages for each habitat zone. Overall, suitable terrestrial habitat is very limited. In fact, upland forest totals no more than 7 percent for the vernal pool envelope or critical upland areas for any of the identified breeding areas. Although, substantial portions of each vernal envelop are "undeveloped", the surrounding cover includes palustrine forest (hydric marginal/ non-habitat), agricultural field (corn field; i.e., non-habitat), open scrub-shrub (marginal/non-habitat), there is little actual upland habitat.

The observation of 151 obligate vernal pool species egg masses (combined total of wood frogs and spotted salamanders) scattered within cryptic pockets within Wetland 1, coupled with the surrounding non-exemplary terrestrial habitat indicates atypical non-breeding distribution. The regularly plowed agricultural fields do not offer suitable habitat for wood frogs or spotted salamanders. Similarly, although the scrub-shrub areas likely provided terrestrial habitat prior to cutting approximately 4-5 years ago, these areas are too open and dry for extensive wood frog and spotted salamander use. It is therefore expected that actual habitat use includes the upper reaches of Wetland 1, the narrow strip of upland forest along Interstate-95, and the scrub-shrub areas along the northern edge of Wetland 1, which are partially shaded by the trees growing within Wetland 1. It is also expected that some wood frogs and spotted salamanders may migrate to Wetland 1 for breeding from upland forest located offsite to the south, greater than 750 feet away.

The attached Vernal Pool Assessment Sheets (Calhoun and Klemens 2002) present biological values, habitat conditions, and tier rankings for VPs 1-13. Table 4 lists square footages for each breeding area and summarizes vernal pool criteria for VPs 1-13 and tier rankings according to the Calhoun and Klemens (2002) Vernal Pool Assessment Sheets. Based on those sheets, VPs 1, 2, 4, and 5 are Tier I, VP 13 is Tier II, and VPs 3, 6, 7, 8, 9, 10, 11, and 12 are Tier III breeding areas. However, considering the agricultural field as non-habitat and the scrub-shrub and palustrine forest as not exemplary habitat, Tier I breeding areas do not actually exist on the Site and all rankings align best with Tier III classification.

Conclusions

During March 2020, VHB identified thirteen (13) vernal pools on the Site, which each occupy less than 2 acres (87,120 square feet) and:

- were documented as providing breeding habitat for one or more obligate vernal pool species,
- appeared to exhibit suitable hydrology for full larval development and metamorphosis of obligate vernal pool-breeding species,
- lack permanent stream outlets,
- do not contain fish, and
- appear to dry down entirely or substantially each year.

The land uses surrounding the small breeding pockets throughout Wetland 1 indicate that the Site and surrounding areas do not provide exemplary habitat for obligate vernal pool species. Actual habitat use is presumed to be limited to drier areas of Wetland 1, a narrow strip of upland forest along Interstate-95, the scrub-shrub areas along the northern edge of Wetland 1, and upland forest located offsite to the south.

Table 3 Upland Vernal Pool Habitat Percentages

Habitat Zone	Development Category	VP 1	VP 2	VP 3	VP 4	VP 5	VP 6	VP 7	VP 8	VP 9	VP 10	VP 11	VP 12	VP 13
Vernal Pool Envelope (0-100 ft)	Upland Forest	3%	2%	0%	0%	6%	4%	0%	0%	0%	0%	0%	0%	30%
	Forested Wetland	86%	89%	100%	100%	94%	96%	100%	97%	89%	76%	75%	77%	45%
	Interstate-95 Inaccessible	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%
	Scrub Shrub	7%	0%	0%	0%	0%	0%	0%	3%	11%	24%	25%	23%	14%
	Agricultural Field	5%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Critical Terrestrial Habitat (100-750 ft)	Upland Forest	5%	5%	6%	6%	6%	6%	7%	7%	7%	6%	7%	7%	6%
	Forested Wetland	5%	5%	6%	6%	5%	6%	6%	5%	6%	6%	6%	6%	5%
	Interstate-95 Inaccessible	7%	10%	19%	20%	21%	22%	23%	26%	29%	25%	27%	31%	41%
	Scrub Shrub	56%	49%	43%	41%	40%	38%	38%	37%	34%	40%	38%	34%	27%
	Agricultural Field	28%	30%	27%	27%	28%	28%	26%	25%	24%	23%	23%	22%	22%

Table 4 Summary of Onsite Vernal Pool Indicators

Pool ID	Approximate Breeding Area (Ft^2)	Permanent Outlet	Hydrology	Obligate Species	Fish Present	Vernal Pool Classification	Tier Rating*
VP 1	1,959	no	temporary	wood frog and spotted salamander	no	cryptic	I
VP 2	525	no	temporary	wood frog and spotted salamander	no	cryptic	I
VP 3	61	no	temporary	spotted salamander	no	cryptic	III
VP 4	66	no	temporary	wood frog and spotted salamander	no	cryptic	I
VP 5	415	no	temporary	wood frog and spotted salamander	no	cryptic	I
VP 6	13	no	temporary	spotted salamander	no	cryptic	III
VP 7	2	no	temporary	spotted salamander	no	cryptic	III
VP 8	105	no	temporary	spotted salamander	no	cryptic	III
VP 9	64	no	temporary	spotted salamander	no	cryptic	III
VP 10	198	no	temporary	spotted salamander	no	cryptic	III
VP 11	6	no	temporary	spotted salamander	no	cryptic	III
VP 12	25	no	temporary	spotted salamander	no	cryptic	III
VP 13	5,324	no	semi-permanent	spotted salamander	no	cryptic	II

Notes: *Tier ratings determined via completing Vernal Pool Assessment Sheets (Calhoun and Klemens 2002) for each vernal pool, however, Tier ratings due not accurately reflect habitat conditions (see Terrestrial Vernal Pool Habitat Section).

References:

Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

Connecticut Association of Wetland Scientists (CAWS). 2020. Vernal Pool Monitoring webpage: http://www.ctwetlands.org/vpmonitoring.html; last accessed 4/23/2020.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 2020. Vernal Pools webpage: https://portal.ct.gov/DEEP/Water/Wetlands/Vernal-Pools; last accessed 4/23/2020.

Donahue, D. F. 1996. A guide to the identification and protection of vernal pool wetlands in Connecticut. University of Connecticut Cooperative Extension Program.

Klemens, M. W. 1993. Amphibians and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut, Bulletin No. 112, Connecticut Department of Environmental Protection, Hartford, CT.

Figures

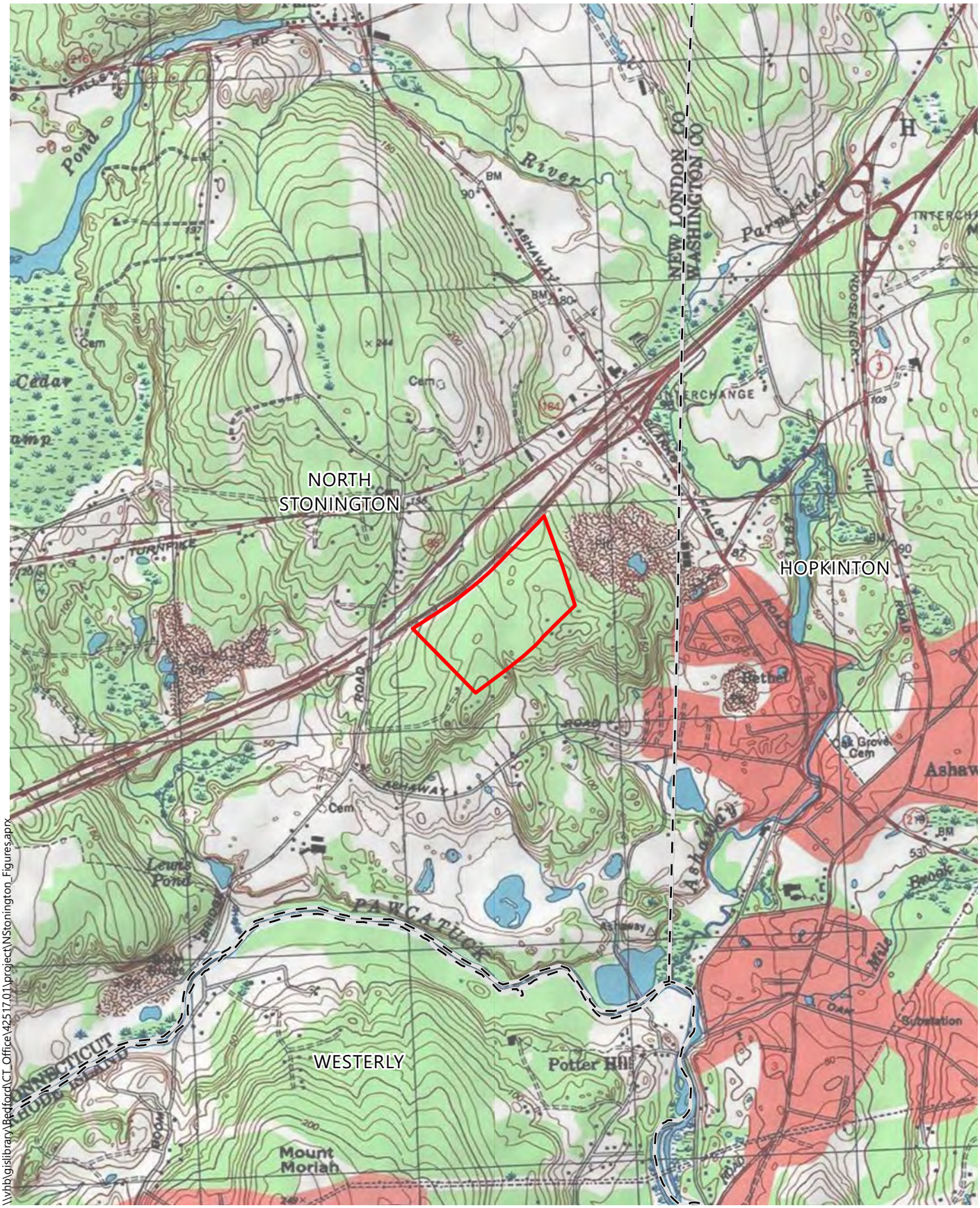
Figure 1 Site Locus
Figure 2 Vernal Pool Habitat Assessment Map

Attachments

Attachment 1 Vernal Pool Evaluation Photographs
Attachment 2 CAWS Vernal Pool Data Sheets and Vernal Pool Assessment Sheets (Calhoun and Klemens 2002; 13 sets of sheets: VPs 1-13)

2020 Vernal Pool Investigation
233 Boombridge Rd, North Stonington, CT

Figure 1 Site Locus



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0 1000 2000 4000 Feet

Limit of Investigation

Town Boundary

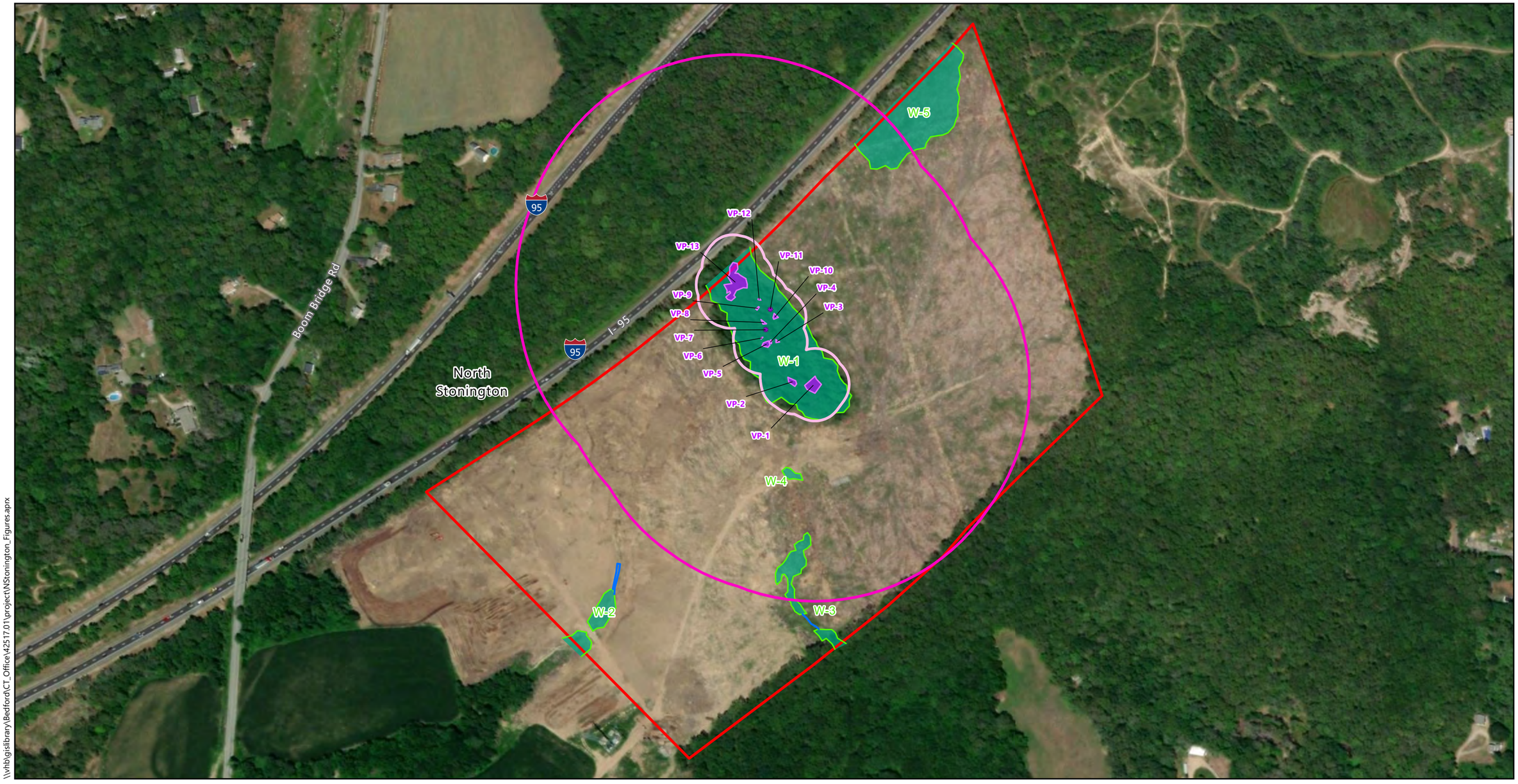
Clean Focus | North Stonington, Connecticut

Site Locus

Source: VHB, CTDEEP, USGS, ArcGIS Online

Figure 2

Vernal Pool Habitat Assessment Map



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0 175 350 700 Feet

Limit of Investigation
Delineated Wetland Edge
Delineated Intermittent Watercourse
Wetland Resource Area
Vernal Pool Point
Delineated Vernal Pool Edge
Vernal Pool Area
100-ft Vernal Pool Envelope
750-ft Critical Terrestrial Habitat Zone

Clean Focus | North Stonington, Connecticut

Vernal Pool Habitat Assessment Map

Source: VHB, CTDEEP, ArcGIS Online

2020 Vernal Pool Investigation
233 Boombridge Rd, North Stonington, CT

Attachment 1

Vernal Pool Evaluation Photographs

Photo 1.	Description:
	Westerly view of the agricultural field within the southwestern portions of the Site.
Photo 2.	Description:
	Easterly view from near the center of the Site. Agricultural fields are seen in the foreground. The forested Wetland 1 is located on the left. The stockpile/staging area is visible at center with scrub-shrub habitat behind it. Offsite forest is visible in the background.

Photo 3.	Description:
	Southerly view of the scrub-shrub cover within the northeastern portions of the Site.
Photo 4.	Description:
	Easterly view of the scrub-shrub cover in the eastern portion of the Site.

Photo 5.	Description:
	Southwesterly view of the cart path extending through scrub-shrub cover within the northeastern portions of the Site.
Photo 6.	**Description:**
	Easterly view of the northern portion of Wetland 1 with high ground water and pockets of shallow surface water.

Photo 7.	Description:
	Northerly view of the intermittent drainage extending toward Interstate-95 at the northern end of Wetland 1.

Photo 8.	Description:
	Southwesterly view of Wetland 2 located between agricultural fields along the southwestern Site boundary.

Photo 9.	Description:
	Northerly view of the shallow, marshy northern portion of Wetland 3.
Photo 10.	Description:
	Southwesterly view of Wetland 3 to the steep ravine that channels the drainage offsite. The bedrock ravine slopes are visible on the left in the background.

Photo 11.	Description:
	Easterly view of the northern portion of Wetland 4 near the stockpile/staging area.
Photo 12.	Description:
	Northerly view of the shrubby vegetation within Wetland 5, located along Interstate-95 in the northern portion of the Site.

Photo 13.	Description:
	Northeasterly view of ATV ruts within Wetland 5 along the Interstate-95 fence line.
Photo 14.	**Description:**
	Late-stage wood frog egg mass observed within Vernal Pool 1.

Photo 15.	Description:
	Spotted salamander egg mass observed within Vernal Pool 10.
Photo 16.	Description:
	Northeasterly view of VP 1, within the southern portion of Wetland 1.

Photo 17.	Description:
	Northeasterly view of VP 13 along Interstate-95, within the northern portion of Wetland 1. VP 13 is the largest and deepest vernal pool breeding area identified on the Site.
Photo 18.	**Description:**
	Southerly view of VP 7. This small pocket of standing water contained 3 spotted salamander egg masses (see Photo 19).

Photo 19.	Description:
	2 spotted salamander egg masses observed within VP 7, a third mass was found at the bottom of the small pool.
Photo 20.	Description:
	Green or bullfrog larvae dip-netted within Vernal Pool 13.

Attachment 2

CAWS Vernal Pool Data Sheets and Vernal Pool Assessment Sheets

(Calhoun and Klemens 2002; 13 sets of sheets: VP 1 – VP 13)

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP1	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road		Pool Type:	Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)		Investigator's Contact information: btrowbridge@vhb.com			

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1245H
End time: 1315H

Methods used:
- Visual ☑
- Dipnetting ☑

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☑ 1-25 ☐ 26-49

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50	☐	250-300	☐
	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
intact:	200-250	☐	1000-1250	☐
breaking up: 5			>1250	☐
hatching:				

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 15	20
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Dip net observations include amphipod, isopod, water strider and limnephiladae caddisfly.

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 50' wide by 40' long with a leafy, peaty, mucky soft bottom. VP1 contains mossy hummocks that appear to be suitable for 4-toed salamander breeding.

Pool was delineated with blue and white flags labeled VP1 through VP7.

CONDITIONS/OBSERVATIONS WITHIN POOL *(required data)*

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 15", Avg: 9"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed
- Percent tree canopy closure? 95%
- Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)
- Mud/muck ☑
- Leaf Litter ☑
- Sand/Silt ☐
- Silt/clay ☐
- Peat ☑
- Bedrock ☐
- Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.432459N, -71.806647E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL *(required data)*

Give approximate percentage or show on sketch on back

Landuses/conditions					
forest	89	shrubland	7	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	5
road ☐	busy (>1 car/10 min.)	yes ☐	no ☐		
parking lot ☐					

Comments:

89 % forest includes upland (3%) and wetland (86%). See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

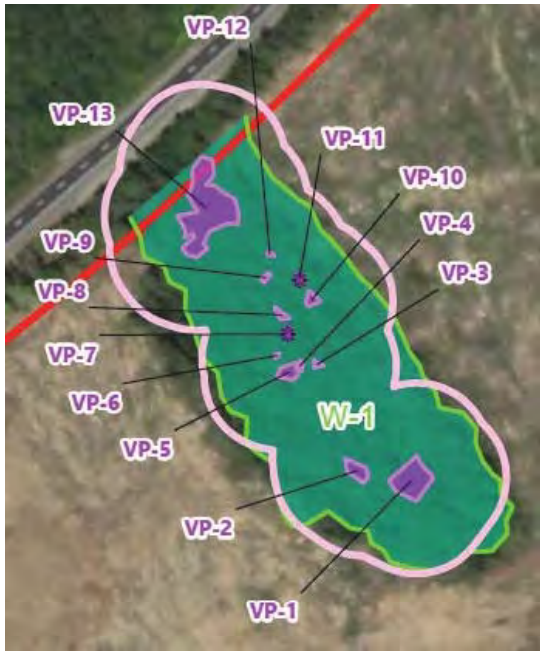
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP1	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northeasterly view of VP1.
Photo 2.	Description:
	Late-stage wood frog egg mass observed within VP1.

Photo 3.	Description:
	Spotted salamander egg mass observed within VP1.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes__x__ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 95% "undeveloped" (3% upland forest , 86% forested wetland, 7% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 66% "undeveloped" (5% upland forest , 5% forested wetland, 56% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP2	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road		Pool Type:	Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)		Investigator's Contact information: btrowbridge@vhb.com			

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1315H
End time: 1330H

Methods used:
- Visual ☑
- Dipnetting ☑

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☑ 1-25 ☐ 26-49

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	~~50~~	☐	250-300	☐
	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
intact:	200-250	☐	1000-1250	☐
breaking up:			>1250	☐
hatching: 2				

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 13	15
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Dip net observations include amphipod, isopod and fingernail clam.

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 18' wide by 40' long with a leafy, peaty, soft bottom.

Pool was delineated with blue and white flags labeled VP2-1 through VP2-5.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 12", Avg: 9"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: yellow birch
- Shrubs/Vines: sweet pepperbush
- Herbs: skunk cabbage

Percent tree canopy closure? 100%

Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)
- Mud/muck ☐
- Sand/Silt ☐
- Peat ☑
- Bedrock ☐
- Leaf Litter ☑
- Silt/clay ☑
- Gravel/cobbles ☐

Water Quality:

ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐

Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐

turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐

Approximate % cover by algal mat or duckweed? ☐

GPS coordinates: 41.432359N, -71.806676E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions					
forest	91	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	9

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:

91 % forest includes upland (2%) and wetland (89%). See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

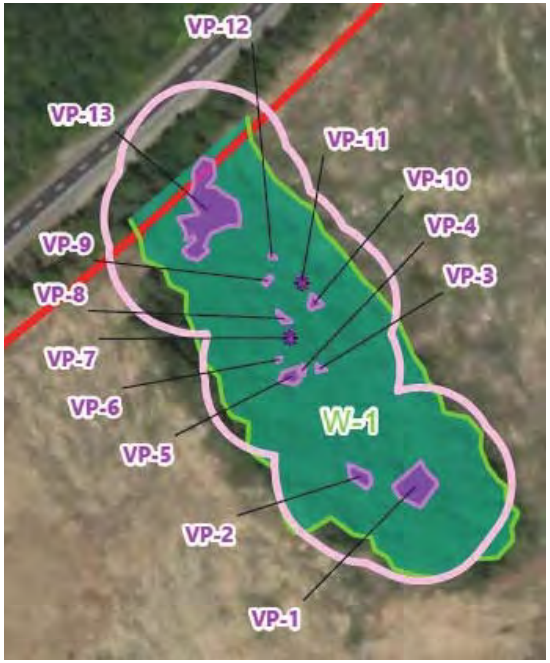
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP2	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northerly view of VP2.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP2.

Photo 3.	Description:
	Late-stage wood frog egg mass observed within VP2.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes__x__ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 91% "undeveloped" (2% upland forest , 89% forested wetland)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 59% "undeveloped" (5% upland forest , 5% forested wetland, 49% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP3	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1330H
End time: 1345H

Methods used:
- Visual ☑
- Dipnetting ☑

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition
If condition mixed, note "some","many" or "most"
intact:
breaking up:
hatching:

Abundance categories

~~50~~	☐	250-300	☐
50-75	☐	300-400	☐
75-100	☐	400-500	☐
100-150	☐	500-750	☐
150-200	☐	750-1000	☐
200-250	☐	1000-1250	☐
		>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

intact:	4
breaking up:	
hatching:	

Total Number: 4

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 10' wide by 10' long with a leafy, peaty, soft bottom.

Pool was delineated with blue and white flags labeled VP3-1 through VP3-4.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 12", Avg: 6"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings:
- Shrubs/Vines: sweet pepperbush
- Herbs: royal fern
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☐ Low ☑

Pool Substrate: (top three)
- Mud/muck ☐
- Sand/Silt ☐
- Peat ☑
- Bedrock ☐
- Leaf Litter ☑
- Silt/clay ☐
- Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.432783N, -71.806970E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	100	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:
Forest is 100% wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

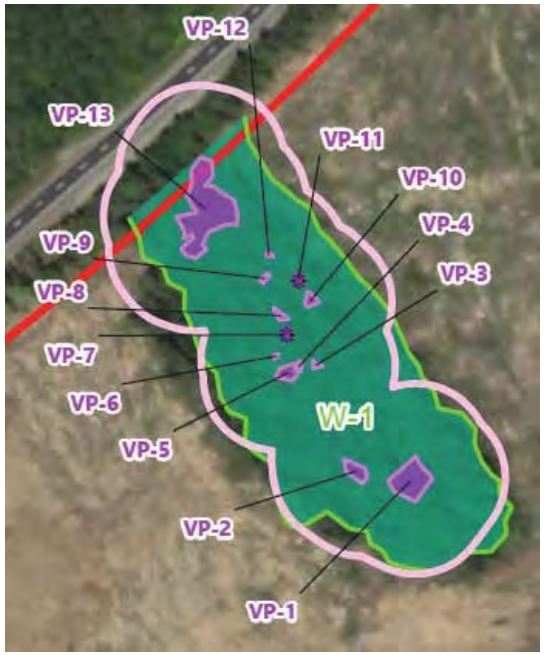
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP3	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northeasterly view of VP3.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP3.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (100% forested wetland)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 55% "undeveloped" (6% upland forest , 6% forested wetland, 43% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP4	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1345H
End time: 1400H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☑ 1-25 ☐ 26-49

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	~~50~~	☐	250-300	☐
	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
intact: 1	200-250	☐	1000-1250	☐
breaking up:			>1250	☐
hatching:				

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:	Total Number
intact: 5	6
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 6' wide by 10' long with a leafy, silty, peaty bottom.

Pool was delineated with blue and white flags labeled VP4-1 through VP4-4.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 12", Avg: 6"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings:
- Shrubs/Vines: sweet pepperbush
- Herbs:
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☐ Low ☑

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☑	Peat ☑
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.432724N, -71.807004E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	100	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:
Forest is 100% wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

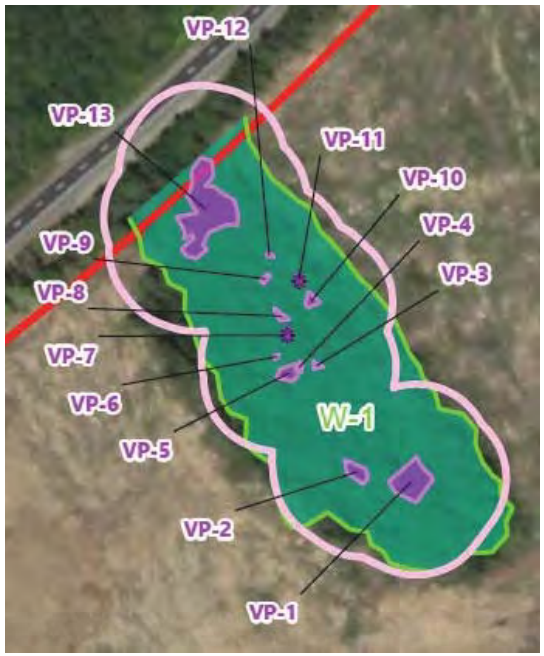
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP4	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northeasterly view of VP4.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP4.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes__x__ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (100% forested wetland)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 53% "undeveloped" (6% upland forest , 6% forested wetland, 41% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP5	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1400H
End time: 1415H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☑ 1-25 ☐ 26-49 ~~50~~ ☐

condition

If condition mixed, note "some","many" or "most"

intact:
breaking up:
hatching: 1

Abundance categories

50-75	☐	250-300	☐
75-100	☐	300-400	☐
100-150	☐	400-500	☐
150-200	☐	500-750	☐
200-250	☐	750-1000	☐
		1000-1250	☐
		>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

intact: 6
breaking up:
hatching:

Total Number: 7

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 20' wide by 20' long with a silty, leafy bottom.

Pool was delineated with blue and white flags labeled VP5-1 through VP5-5.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 15", Avg: 12"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed

Percent tree canopy closure? 100%

Woody debris content? High ☑ Med. ☐ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☑	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:

ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐

Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐

turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐

Approximate % cover by algal mat or duckweed? ☐

GPS coordinates: 41.432663N, -71.807046E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	100	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:

100% forest includes upland (6%) and wetland (94%). See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	x	
high:		

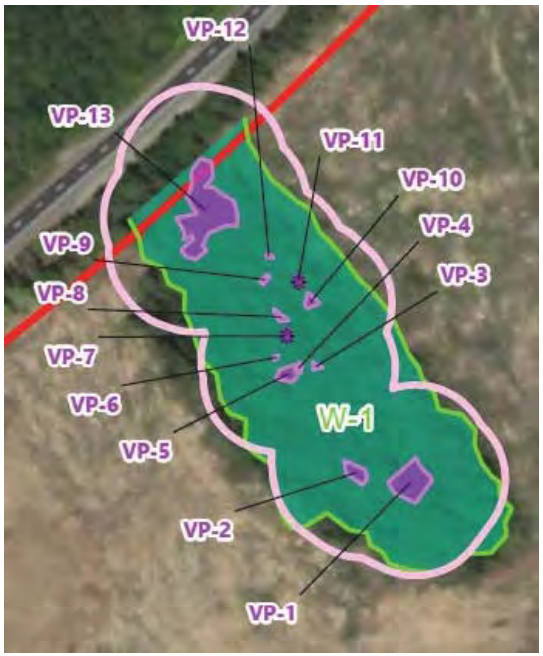
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP5	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northerly view of VP5.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP5.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes__x__ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (6% upland forest and 94% forested wetland)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 51% "undeveloped" (6% upland forest , 5% forested wetland, 40% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP6	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐ Reference: ☐	
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1415H
End time: 1420H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	250-300	☐
	75-100	☐	300-400	☐
	100-150	☐	400-500	☐
	150-200	☐	500-750	☐
intact:	200-250	☐	750-1000	☐
breaking up:			1000-1250	☐
hatching:			>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 1	1
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 4' wide by 3' long with a leafy bottom.

Pool was delineated with blue and white flags labeled VP6-1 through VP6-3.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 12", Avg: 12"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: Red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed

Percent tree canopy closure? 100%

Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☐	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:

ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐

Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐

turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐

Approximate % cover by algal mat or duckweed? ☐

GPS coordinates: 41.432802N, -71.807190E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions					
forest	100	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:

100% forest includes upland (6%) and wetland (94%). See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	x	
high:		

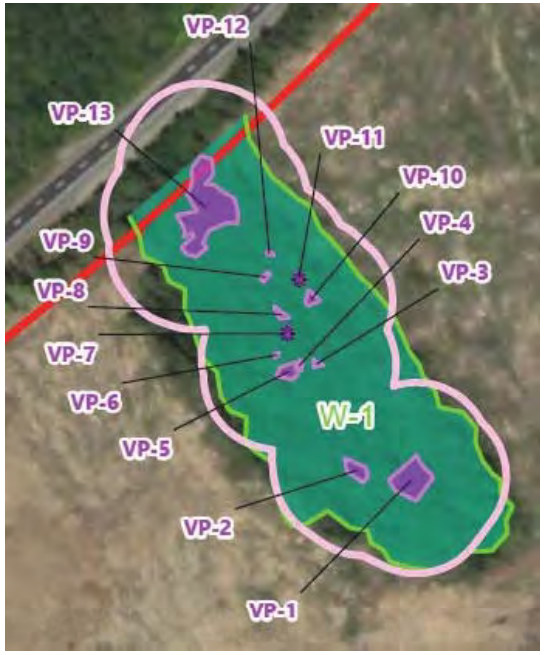
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP6	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Aerial view of VP6.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP6.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (4% upland forest and 96% forested wetland)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 50% "undeveloped" (6% upland forest , 6% forested wetland, 38% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP7	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐ Reference: ☐	
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1420H
End time: 1425H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
intact:	200-250	☐	1000-1250	☐
breaking up:			>1250	☐
hatching:				

250-300 ☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 3	3
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 24" wide by 18" long with a leafy bottom. The pool is a hole at the base of a 30" DBH red maple.

Pool was marked with a single blue and white flag labeled VP7.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 9", Avg: 9"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: Red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed

Percent tree canopy closure? 100%

Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☐	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:

ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐

Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐

turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐

Approximate % cover by algal mat or duckweed? ☐

GPS coordinates: 41.432871N, -71.807098E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	100	shrubland		meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:

Forest is 100% wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	x	
high:		

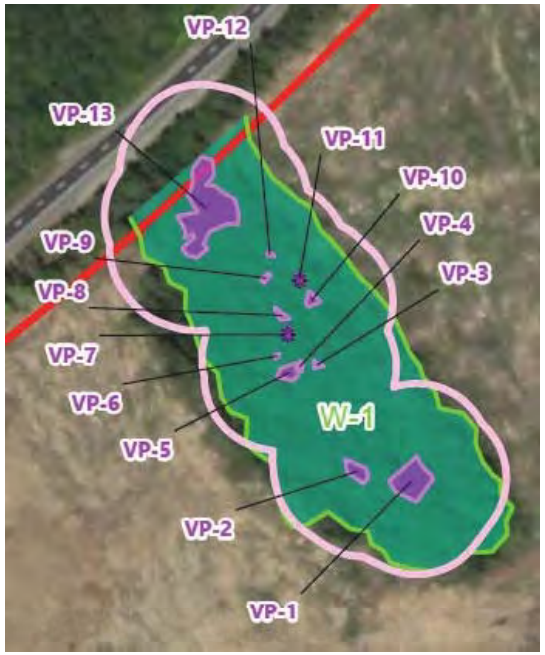
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	**CAWS Pool #:**	VP7	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Southerly view of VP 7.
Photo 2.	Description:
	Spotted salamander egg masses observed within VP7.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (100% forested wetland)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 51% "undeveloped" (7% upland forest , 6% forested wetland, 38% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP8	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road		Pool Type:	Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)		Investigator's Contact information: btrowbridge@vhb.com			

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1425H
End time: 1435H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
intact:	200-250	☐	1000-1250	☐
breaking up:			>1250	☐
hatching:				

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 2	2
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 6' wide by 18' long with a leafy, silty bottom.

Pool was delineated with blue and white flags labeled VP8-1 through VP8-3.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 12", Avg: 6"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: Red maple
- Shrubs/Vines: epperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☑	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.432886N, -71.807288E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	97	shrubland	3	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	
road ☐	busy (>1 car/10 min.)	yes ☐	no ☐		
parking lot ☐					

Comments:
97% forest is entirely wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

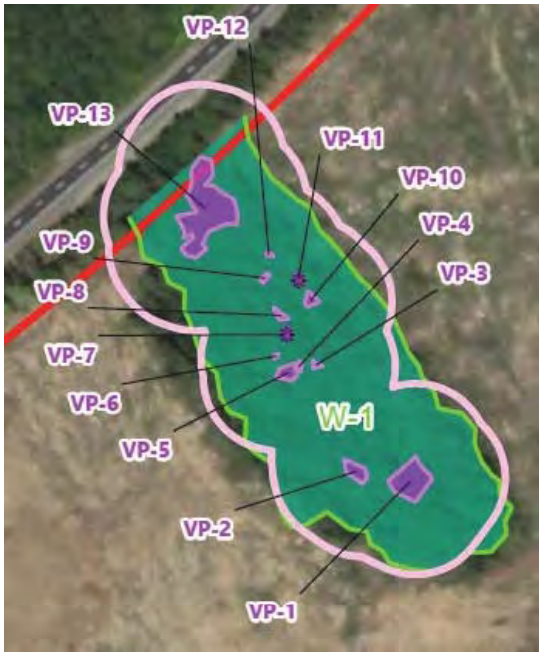
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	**CAWS Pool #:** VP8	CAWS Project #:
Project/property name: 223 Boombridge Road			Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Southeasterly view of VP8.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP8.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (97% forested wetland, 3% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_____ No__x__ 49% "undeveloped" (7% upland forest , 5% forested wetland, 37% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP9	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1435H
End time: 1440H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	250-300	☐
	75-100	☐	300-400	☐
	100-150	☐	400-500	☐
	150-200	☐	500-750	☐
intact:	200-250	☐	750-1000	☐
breaking up:			1000-1250	☐
hatching:			>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 2	2
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 6' wide by 10' long with a leafy, silty bottom.

Pool was delineated with blue and white flags labeled VP9-1 through VP9-4.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 9", Avg: 6"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☑	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.433027N, -71.807288E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	89	shrubland	11	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	
road ☐	busy (>1 car/10 min.)	yes ☐	no ☐		
parking lot ☐					

Comments:
89% forest is entirely wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

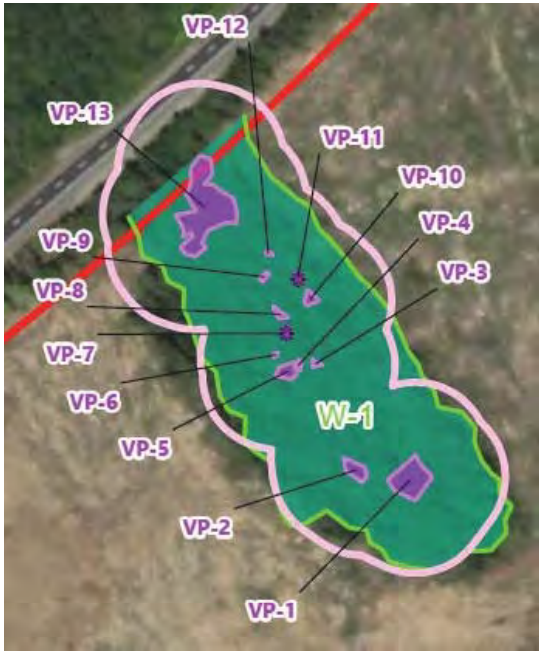
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP9	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Southerly view of VP9.
Photo 2.	Description:
	Spotted salamander egg masses observed within VP9.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (89% forested wetland, 11% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_____ No__x__ 47% "undeveloped" (7% upland forest , 6% forested wetland, 34% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP10	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road		Pool Type:	Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)		Investigator's Contact information: btrowbridge@vhb.com			

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1440H
End time: 1450H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	300-400	☐
	75-100	☐	400-500	☐
	100-150	☐	500-750	☐
	150-200	☐	750-1000	☐
intact:	200-250	☐	1000-1250	☐
breaking up:			>1250	☐
hatching:				

250-300 ☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 3	3
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 20' wide by 20' long with a mucky, leafy, silty bottom.

Pool was delineated with blue and white flags labeled VP10-1 through VP10-4.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 15", Avg: 9"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings:
- Shrubs/Vines: sweet pepperbush, greenbrier
- Herbs: royal fern, sensitive fern

Percent tree canopy closure? 100%

Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☑	Sand/Silt ☑	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:

ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐

Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐

turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐

Approximate % cover by algal mat or duckweed? ☐

GPS coordinates: 41.432994N, -71.806977E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions					
forest	76	shrubland	24	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	
road ☐	busy (>1 car/10 min.)	yes ☐	no ☐		
parking lot ☐					

Comments:

76% forest is entirely wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

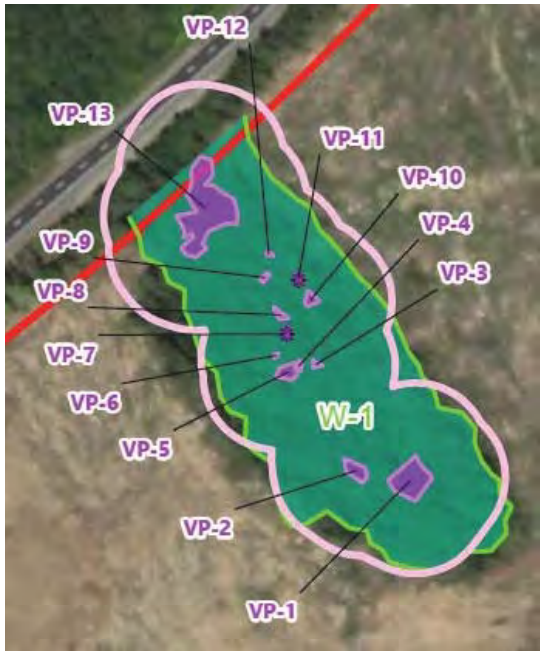
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP10	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northeasterly view of VP10.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP10.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (76% forested wetland, 24% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 52% "undeveloped" (6% upland forest , 6% forested wetland, 40% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP11	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1450H
End time: 1455H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	250-300	☐
	75-100	☐	300-400	☐
	100-150	☐	400-500	☐
	150-200	☐	500-750	☐
intact:	200-250	☐	750-1000	☐
breaking up:			1000-1250	☐
hatching:			>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 4	4
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 2' wide by 3' long with a leafy bottom. The pool is a buttressed root pocket at the base of a 4" DBH yellow birch.

Pool was marked with a single blue and white flag labeled VP11.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 15", Avg: 15"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☐	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.433100N, -71.807075E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	75	shrubland	25	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	
road ☐	busy (>1 car/10 min.)	yes ☐	no ☐		
parking lot ☐					

Comments:

75% forest is entirely wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

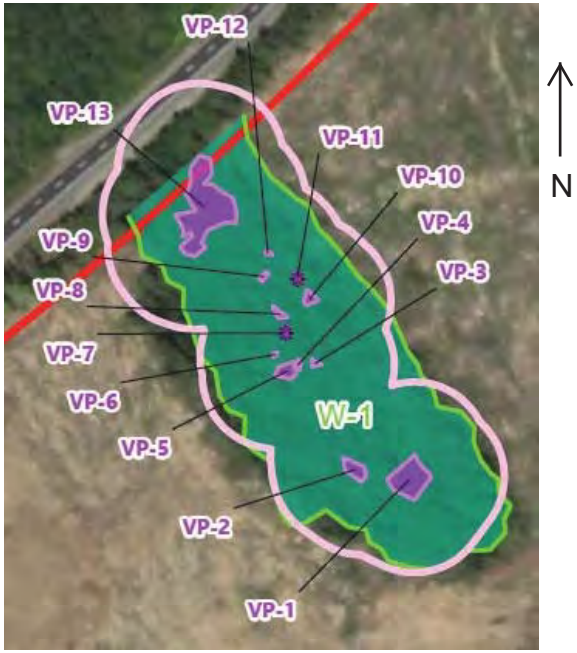
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP11	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northwesterly view of VP11.
Photo 2.	Description:
	Spotted salamander egg masses observed within VP11.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (75% forested wetland, 25% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__x__ No_____ 51% "undeveloped" (7% upland forest , 6% forested wetland, 38% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP12	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road		Pool Type:	Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)		Investigator's Contact information: btrowbridge@vhb.com			

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1455H
End time: 1500H

Methods used:
- Visual ☑
- Dipnetting ☐

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	250-300	☐
	75-100	☐	300-400	☐
	100-150	☐	400-500	☐
	150-200	☐	500-750	☐
intact:	200-250	☐	750-1000	☐
breaking up:			1000-1250	☐
hatching:			>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 1	1
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Pool is a cryptic pocket within a larger forested wetland system. Breeding pocket is approximately 3' wide by 8' long with a leafy bottom.

Pool was delineated with blue and white flags labeled VP12-1 through VP12-4.

CONDITIONS/OBSERVATIONS WITHIN POOL

(required data)

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☑	Yes ☐	☐	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 12", Avg: 9"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: red maple
- Shrubs/Vines: Pepperbush, spicebush, greenbrier, swamp azalea
- Herbs: Tussock sedge, skunk cabbage, common reed, marsh mermaid-weed
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☐	Peat ☐
Leaf Litter ☑	Silt/clay ☐	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.433215N, -71.807202E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL

(required data) *Give approximate percentage or show on sketch on back*

Landuses/conditions

forest	77	shrubland	23	meadow	
pasture		lawn		building	
exposed soil		grading		ag. field	
road ☐	busy (>1 car/10 min.)	yes ☐	no ☐		
parking lot ☐					

Comments:

77% forest is entirely wetland. See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

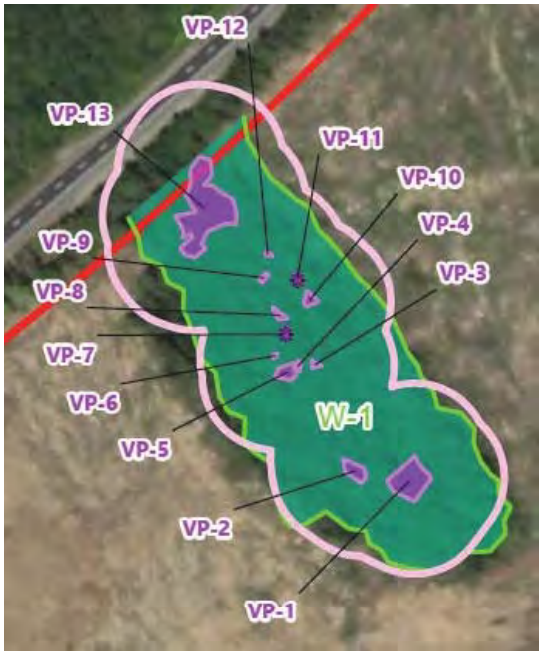
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP12	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northwesterly view of VP12.
Photo 2.	Description:
	Spotted salamander egg mass observed within VP12.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__x__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 100% "undeveloped" (77% forested wetland, 23% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_____ No__x__ 47% "undeveloped" (7% upland forest , 6% forested wetland, 34% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL DATA SHEET

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	CAWS Pool #:	VP13	CAWS Project #:
Town Staff Contacted? Yes ☐ No ☑	Project/property name: 223 Boombridge Road			Pool Type: Development: ☐	Reference: ☐
Address/location (*or include annotated map*): 223 Boombridge Road (see Figures 1 and 2)			Investigator's Contact information: btrowbridge@vhb.com		

SEARCH CONDITIONS AND METHODS *(required)*

WEATHER:

Precipitation:

Current	Within last 24 hours
0"	0"

Cloud Cover:
- clear ☐
- partly cloudy ☑
- mostly cloudy ☐
- full cloud cover ☐

Start time: 1500H
End time: 1600H

Methods used:
- Visual ☑
- Dipnetting ☑

Type of Inspection:
- baseline ☑
- during construction ☐
- post construction ☐

Polarized sunglasses used? Yes ☑ No ☐

Comments:

Temporary flagging used to mark egg masses? Yes ☐ No ☑

AMPHIBIAN EGG MASS COUNTS *(required)*

Wood frogs: ☐ 1-25 ☐ 26-49 ~~50~~

condition	Abundance categories			
If condition mixed, note "some","many" or "most"	50-75	☐	250-300	☐
	75-100	☐	300-400	☐
	100-150	☐	400-500	☐
	150-200	☐	500-750	☐
intact:	200-250	☐	750-1000	☐
breaking up:			1000-1250	☐
hatching:			>1250	☐

Describe estimation method used for a large raft:

Spotted Salamanders:

Condition:

	Total Number
intact: 83	83
breaking up:	
hatching:	

ADDITIONAL NOTES: *(optional)*

Dip net observations include a green and/or bullfrog larvae, isopods and amphipods.

Pool is a cryptic pocket within a larger forested wetland system and drains to a culvert under I-95. The pool is semi-permanent and hummocky, containing multiple tip-ups. Breeding pocket is approximately 75' wide by 75' long with a soft, silty, leafy bottom.

Pool was delineated with blue and white flags labeled VP13-1 through VP13-25.

CONDITIONS/OBSERVATIONS WITHIN POOL *(required data)*

			Flowing	Not flowing
Inlet observed?	No ☑	Yes ☐	☐	☐
Outlet observed?	No ☐	Yes ☑	☑	☐
finfish observed?	No ☑	Yes ☐		

Estimated water depth range? Max: 30", Avg: 15"

Optional Data (see also back of sheet)

Other Vernal Pool Species:
- fairy shrimp present? Yes ☐ No ☑
- marbled salamander larvae present? Yes ☐ No ☑

Vegetation (within or overhanging pool):
- Trees/Saplings: black gum,
- Shrubs/Vines: sweet pepperbush
- Herbs: common water-primrose, sweet wood-reed, marsh mermaid-weed, American bur-reed
- Percent tree canopy closure? 100%
- Woody debris content? High ☐ Med. ☑ Low ☐

Pool Substrate: (top three)

Mud/muck ☐	Sand/Silt ☐	Peat ☐
Leaf Litter ☑	Silt/clay ☑	Bedrock ☐
		Gravel/cobbles ☐

Water Quality:
- ph ☐ conductivity(uS/cm) ☐ temperature (°C) ☐
- Nitrate-N (mg/l) ☐ Total P (ug/l) ☐ DO(mg/l) ☐
- turbidity(NTU's) ☐ Sulphidic odor? No ☐ Yes ☐
- Approximate % cover by algal mat or duckweed? ☐
- GPS coordinates: 41.433249N, -71.807640E

CONDITIONS IN ENVELOPE WITHIN 100 FT OF POOL *(required data)*

Give approximate percentage or show on sketch on back

Landuses/conditions

forest	75	shrubland	14	meadow	
pasture		lawn		building	8
exposed soil		grading		ag. field	4

road ☐ busy (>1 car/10 min.) yes ☐ no ☐

parking lot ☐

Comments:

75% forest includes upland (30%) and wetland (45%). See sketch.

Leaf Litter:	*If variable, note location (e.g. "N. shore")*
none/low:	
moderate:	
high:	

Cover Objects:	*Logs*	*Rocks*
none:		
low:		
moderate:	X	
high:		

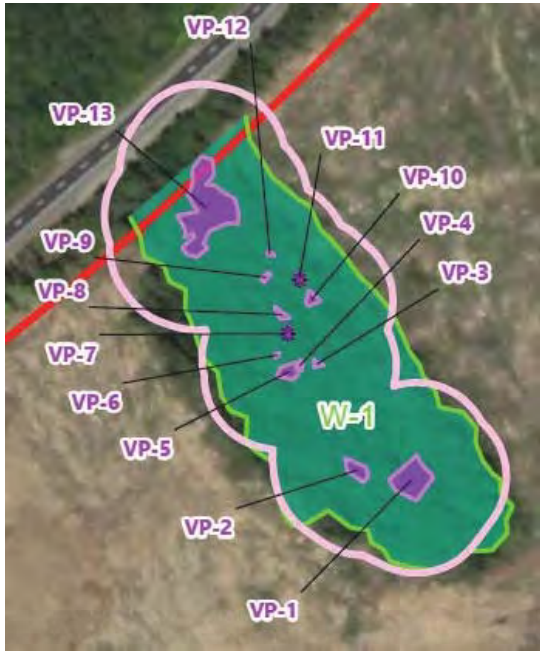
Dominant vegetation *(optional)*
- Trees/saplings: red maple
- Shrubs/Vines: sweet pepper bush, high bush blueberry
- Herbs: royal fern, sweet wood-reed,skunk cabbage, common reed, marsh marigold, golden-saxifrage

VERNAL POOL DATA SHEET, *p. 2*

Survey Date: 4/1/2020	Investigator(s): B. Trowbridge, E. Martin	Town: N. Stonington	***CAWS Pool #:***	VP13	CAWS Project #:
Project/property name: 223 Boombridge Road				Pool Type:	Development: ☐ Reference ☐

*Draw a **rough, quick** sketch of the pool showing **approximate locations of egg mass rafts & clusters** in relation to pool features, like logs, algal mats, and islands. Show inlet/outlet if present. Include north arrow and approxImate scale.*

SKETCH OF POOL *(required)*



WILDLIFE OBSERVATIONS: *(optional)*

Checklist of Facultative Herptile Fauna (Pool & Fringe):

Green Frog	☐	Spring Peeper	☐
Pickerel Frog	☐	Gray Tree Frog	☐
Bull Frog	☐	Pickerel Frog	☐
Eastern Toad	☐	Painted Turtle	☐
Spotted Turtle	☐	Snapping Turtle	☐
N. Water Snake	☐	Blue-spot. salam.	☐

Other Observed Fauna (Pool & Fringe):

*Draw a **rough, quick** sketch of the pool's **terrestrial envelope,** extending at least 200' from pool in all directions. Provide **detail on conditions & landuses within 100 feet of edge of pool.** Include north arrow and approxImate scale.*

SKETCH OF TERRESTRIAL ENVELOPE AROUND POOL *(required)*

Circle any of the following factors that impaired your ability to observe egg masses, and indicate severity of impairment.

Factor	Severity (Low/Mod./High)
1. Surface algae	☐
2. Surface pollen	☐
3. Dark, tannin-colored water	☐
4. Deep water	☐
5. Turbidity	☐
6. Dense shrubs	☐
7. Other (specify)	☐

ADDITIONAL NOTES: *(optional)*

Photo 1.	Description:
	Northerly view of a western lobe of VP13.
Photo 2.	Description:
	Northeasterly view of the southern portion of VP13.

Photo 3.	Description:
	Spotted salamander egg mass observed within VP13.
Photo 4.	Description:
	Late-stage wood frog egg mass observed within VP13.

Photo 5.	Description:
	Green or bullfrog larvae dip-netted within Vernal Pool 13.

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__x__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__x__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes__x__ No_____

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__x__ No_____ 88% "undeveloped" (45% forested wetland, 30 upland forest, 14% scrub)

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_____ No__x__ 38% "undeveloped" (6% upland forest , 5% forested wetland, 27% scrub)

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
(1-3)	(1)	(Tier II)
0	1-2	Tier III
1-3	0	Tier III

Recommend Tier III ranking. Actual envelope and critical terrestrial habitat are poor. Upland forest is limited; migration from off site uplands beyond 750' is expected.

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

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WETLANDS DELINEATION REPORT

Date: July 25, 2019

Project No.: 42517.00

Prepared For: Clean Focus Renewables, Inc

Site Location: Boom Bridge Road, North Stonington, CT

Site Map: Wetland Delineation GIS Figure, dated July 15, 2019

Inspection Dates: June 27, July 10, 11, and 15, 2019

Field Conditions: Weather: Sunny to Partly Cloudy 80s to 90s General Soil Moisture: moist to dry
Snow Depth: 0 inches Frost Depth: 0 inches

Type of Wetlands Identified and Delineated:

Connecticut Inland Wetlands and Watercourses	☒
Tidal Wetlands	☐
U.S. Army Corps of Engineers	☐

Local Regulated Upland Review Areas: Wetlands: 100 feet Watercourses: 100 feet

Field Numbering Sequence of Wetlands Boundary: Connecticut - WF 1-100 to 1-165, WF 2-100 WF 2-109, WF 2-200 to IWC 2-209 to IWC 2-212 to 2-221, WF 3A-100 to WF 3A- 206 to IWC 3B-206 to IWC 3B-209 to WF 3A-207 to WF 3A-137 to WF 3B-220 to WF 3B-210 to IWC 3B-209 to IWC 3B-206 to WF 3B-205 to WF 3B-200, WF 4-100 to 4-108, WF 5-100 to 5-133 *[as depicted on attached inland wetland delineation plan]*

The classification systems of the National Cooperative Soil Survey, the U.S. Department of Agriculture, Natural Resources Conservation Service, County Soil Survey Identification Legend, and the Connecticut Department of Energy and Environmental Protection were used in this investigation.

All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

The wetlands delineation was conducted and reviewed by:

_____

Jeffrey Peterson
Certified Professional Soil Scientist

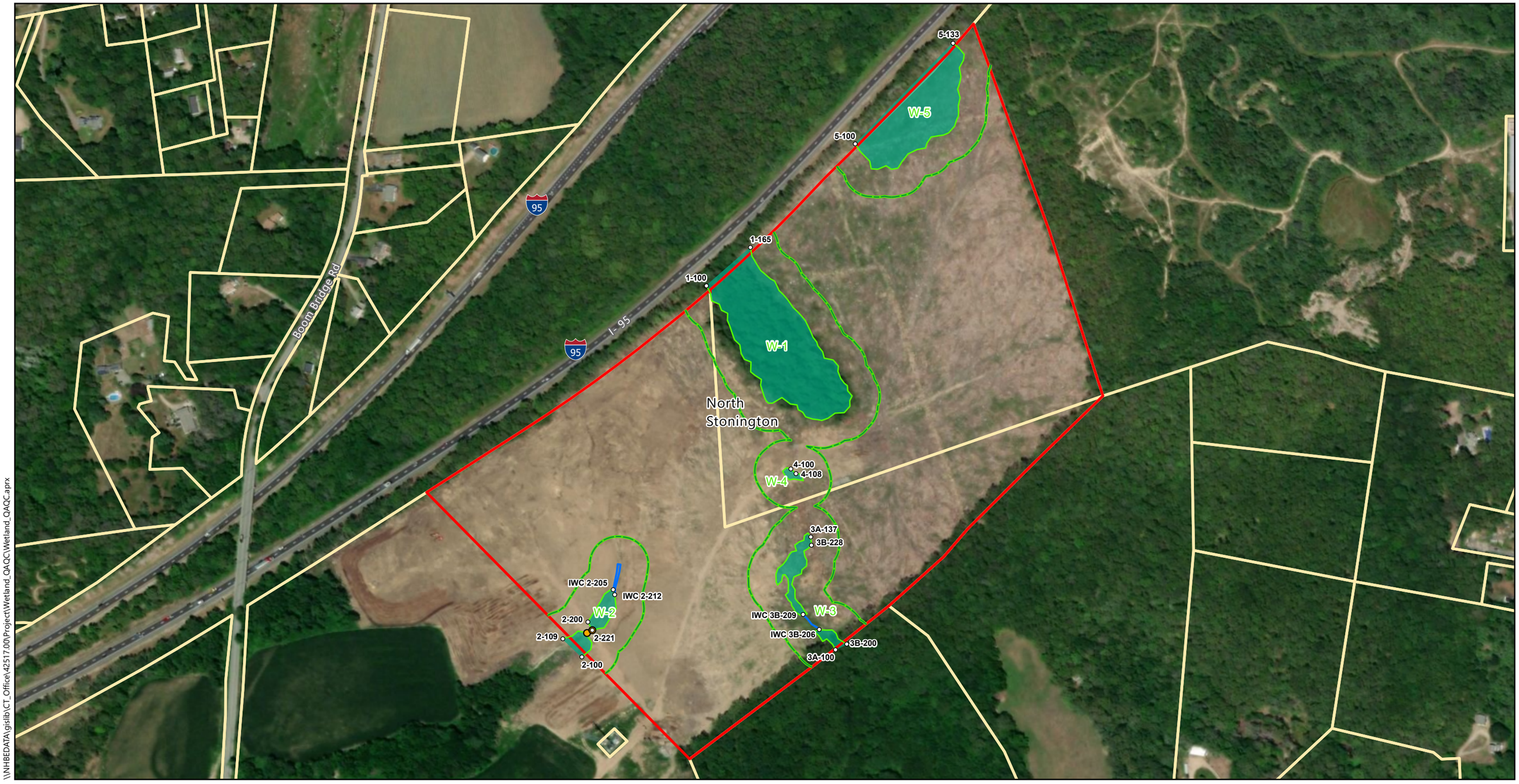
Enclosures

Engineers | Scientists | Planners | Designers

1 Cedar Street
Suite 400
Providence, RI 02903
P 401.272.8100
F 401.277.8400

Attachments

- Wetland Delineation Map
- Wetland Delineation Field Forms
- NRCS Soil Reports and Soil Maps



Clean Focus | North Stonington, Connecticut

Wetland Delineation

Source: VHB, CTDEEP, ArcGIS Online

Wetland Delineation Field Form

Project Address:	Boom Bridge Road, North Stonington, CT	Project Number:	42517.00
Inspection Date:	6/27/2019	Inspector:	Jeffrey Peterson, CPSS
Wetland I.D.:	Wetland 1		

Field Conditions:	Weather: Sunny, 80s – 90s, humid	Snow Depth: 0 inches
	General Soil Moisture: moist to dry	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 1-100 to 1-165.		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☒	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Surficial geology consists of very stony to bouldery ablation till. Farm field modifications to drainage are located along parts of the western wetland edge.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: Forest broad-leaf deciduous.		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments: No permanent open water in wetland.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☐	Tidal ☐
Comments:		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A wetland delineation conducted to late in the summer to reliably identify vernal pools. Only cryptic pools may be present in Wetland 1. Do not appear to be present in other wetlands.		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3)	☒	☐	☐	☒
Sutton fine sandy loam, 0 to 8 percent slope, very stony (51B)	☐	☒	☐	☒
Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	☐	☒	☒	☒

DOMINANT WETLAND PLANTS:

Red maple (*Acer rubrum*)	Sensitive fern (*Onoclea sensibilis*)
Tupelo (Nyssa sylvatica)	Skunk cabbage (*Symplocarpus foetidus*)
	Cinnamon fern (*Osmundastrum cinnamomeum*)
Highbush blueberry (*Vaccinium corymbosum*)	Poison ivy (*Toxicodendron radicans*)
Winterberry (*Ilex verticillata*)	Jewelweed (*Impatiens capensis*)
Spicebush (*Lindera benzoin*)	
Multiflora rose (*Rosa multiflora*)	
Pepperbush (*Clethra alnifolia*)	

DOMINANT UPLAND PLANTS:

Red maple (*Acer rubrum*)	Pokeweed (*Phytolacca americana*)
Red Oak (*Quercus rubra*)	Pennsylvania sedge (*Carex pensylvanica*)
	Hay-scented fern (*Dennstaedtia punctilobula*)
Sassafras (*Sassafras albidum*)	
Blackberry (*Rubus allegheniensis*)	
Hazelnut (*Corylus americana*)	
Pepperbush (*Clethra alnifolia*)	

WETLAND NARRATIVE:

Wetland 1 is situated in a valley that slopes gently to the north between two till hills. The surficial deposit consists of stony ablation till. Wetland 1 is an unmapped inclusion in the NRCS soil survey. Soils along the wetland edge are similar to the poorly drained Leicester series. The central part of the wetland is very poorly drained and includes area of Whitman soils. The hydrology of the wetland is driven by the discharge of groundwater or perhaps through flow trapped above bedrock.

The vegetation in and around the wetland is very thick as outside of the wetland perimeter the site has been recently clear cut. Rank growth of coppicing trees, pepperbush (*Clethra alnifolia*), blackberry (*Rubus allegheniensis*) and other form nearly impenetrable thickets.

The wetland drains north towards Interstate-95 northbound, which is in a cut. The presence of the highway cut may have partially drained the lowest part of the wetland above the cut.

Wetland Delineation Field Form

Project Address:	Boom Bridge Road, North Stonington, CT	Project Number:	42517.00
Inspection Date:	7/10/19	Inspector:	Jeffrey Peterson, CPSS
Wetland I.D.:	Wetland 2		

Field Conditions:	Weather: 90s, partly cloudy humid	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 2-100 to 2-109, WF 2-200 to IWC 2-209 to IWC 2-212 to 2-221		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Delineation included partially buried wetland south in the corn field on the south side of the wetland. Vegetation in wetland has been periodically mowed to facilitate farming operations		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☐
Open Water ☐	Disturbed ☐	Wet Meadow ☒
Comments: Vegetation periodically mowed in agricultural field drain.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☒	Tidal ☐
Comments: The feature originates as an intermittent watercourse with a defined channel and wetland vegetation at the northern end of the wetland. The defined channel continues upgradient of the watercourse but does not support wetland vegetation.		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3)	☒	☐	☐	☒
Sutton fine sandy loam, 0 to 8 percent slope, very stony (51B)	☐	☒	☒	☒
Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	☒	☐	☒	☒

DOMINANT WETLAND PLANTS:

Soft rush (*Juncus effusus*)	Cattail (*Typha latifolia*)
Woolgrass (*Scirpus cyperinus*)	
Lurid sedge (*Carex lurida*)	

DOMINANT UPLAND PLANTS:

Field corn (*Zea mays*)	Fall panic grass (Panicum dichotomiflorum)
Crab grass (*Digitaria* sp.)	

WETLAND NARRATIVE:

This small linear wetland is an unmapped inclusion in the published cooperative soil survey. The feature is situated in sloping till uplands. It begins as a gully formed between two fields and flows to the southwest. The first regulated area is an intermittent watercourse which flows into the wetland. The wetland is crossed by a farm road with the with a reinforced concrete pipe. This watercourse and wetland appear to have been "improved" by grading to convey water out of the field rapidly.

Wetland Delineation Field Form

Project Address:	Boom Bridge Road, North Stonington, CT	Project Number:	42517.00
Inspection Date:	7/11/2019	Inspector:	Jeffrey Peterson, CPSS
Wetland I.D.:	Wetland 3		

Field Conditions:	Weather: Clear 80s, partly cloudy, humid	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 3A-100 to WF 3A- 206 to IWC 3B-206 to IWC 3B-209 to WF 3A-207 to WF 3A-137 to WF 3B-220 to WF 3B-210 to IWC 3B-209 to IWC 3B-206 to WF 3B-205 to WF 3B-200		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Wetland was clear cut and northern most portion rutted by logging trucks.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☐	Scrub-shrub ☒	Forested ☐
Open Water ☐	Disturbed ☒	Wet Meadow ☒
Comments: Corn field. Corn failed in wet depression		

WATERCOURSE TYPE:

Perennial	Intermittent ☒	Tidal ☐
Comments: Connects two wetland polygons within the subject property		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: NA		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3)	☒	☐	☐	☒
Sutton fine sandy loam, 0 to 8 percent slope, very stony (51B)	☐	☒	☐	☒
Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	☐	☒	☒	☒
Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky (73E)	☐	☒	☒	☒

DOMINANT WETLAND PLANTS:

Spicebush (*Lindera benzoin*)	Soft rush (*Juncus effusus)*
Pepperbush (*Clethra alnifolia*)	Meadow beauty (*Rhexia virginica*)
Multiflora rose (*Rosa multiflora*)	Woolgrass (*Scirpus cyperinus*)
Bebb willow (*Salix bebbiana*)	Bristly dewberry (*Rubus hispidus*)

DOMINANT UPLAND PLANTS:

Autumn olive (*Elaeagnus umbellata*)	Hay-scented fern (*Dennstaedtia punctilobula*)
Black birch (*Betula lenta*)	Dewberry (*Rubus ideaus*)
Blackberry (*Rubus allegheniensis*)	Low-bush blueberry (*Vaccinium pallidum*)
	Black huckleberry (*Gaylussacia baccata*)

WETLAND NARRATIVE:

This wetland was clear cut and now supports shrub and emergent cover types. The northern part of the wetland is situated in a depression that collects surface runoff and perhaps throughflow held above shallow bedrock. This feature drains south through an intermittent watercourse that spills into a steep ravine with exposed bedrock slopes. The northern part of the wetland is mostly characterized by poorly drained soils and includes areas that were rutted and compacted by logging equipment near the wetland edge. The southern part of the wetland includes very poorly drained soils which are kept saturated by groundwater discharge from cracks in the bedrock.

Wetland Delineation Field Form

Project Address:	Lantern Hill Road, Stonington, CT	Project Number:	42517.00
Inspection Date:	7/11/2019	Inspector:	Jeffrey Peterson, CPSS
Wetland I.D.:	Wetland 4		

Field Conditions:	Weather: Partly cloudy, 80s, humid	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 4-100 to 4-108		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☐	Seasonally Saturated - perched ☒
Comments: Ponded depression in haul road created in uplands.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☒	Scrub-shrub ☐	Forested ☐
Open Water ☐	Disturbed ☒	Wet Meadow ☐
Comments:		

WATERCOURSE TYPE:

Perennial	Intermittent ☐	Tidal ☐
Comments: NA		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments:		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony (61C)	☐	☒	☒	☒
Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3)	☒	☐	☐	☒

DOMINANT WETLAND PLANTS:

American barnyard grass (*Echinochloa muricata*)	Lady's thumb (*Persicaria maculosa*)
Devil's beggarticks (*Bidens frondosa*)	
Broom sedge (Carex scoparia)	
Woolgrass (*Scirpus cyperinus*)	

DOMINANT UPLAND PLANTS:

Autumn olive (*Elaeagnus umbellata*)	American burn (*Erechtites hieracifolia*)
Black birch (*Betula lenta*)	Yellow loosestrife (*Lysimachia quadrifolia*)
Blackberry (*Rubus allegheniensis*)	Crabgrass (*Digitaria* sp.)

WETLAND NARRATIVE:

This wetland was created by compacting soil beneath a hall road. Strong evidence of prolonged inundation was noted including the remains of algal mats, water stained leaves and saturated soils. The soil profiles examined showed strong platy structure and many prominent redoximorphic depletions and concentrations to a depth of 10 inches. The plant species within this feature have strong affinities of wetland sites (hydrophytes).

Wetland Delineation Field Form

Project Address:	Lantern Hill Road, Stonington, CT	Project Number:	42517.00
Inspection Date:	7/11/2019	Inspector:	Jeffrey Peterson, CPSS
Wetland I.D.:	Wetland 5		

Field Conditions:	Weather: Partly cloudy, 80s, humid	Snow Depth: 0 inches
	General Soil Moisture: moist	Frost Depth: 0 inches
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☐	
	Tidal ☐	
Field Numbering Sequence: WF 5-100 to 5-133		

WETLAND HYDROLOGY:

NONTIDAL

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☒
Comments: Ponded depression in haul road created in uplands.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments:		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☐
Open Water ☐	Disturbed ☒	Wet Meadow ☐
Comments:		

WATERCOURSE TYPE:

Perennial	Intermittent ☐	Tidal ☐
Comments: NA		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments:		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES (Map Unit Symbol)	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony (3)	☒	☐	☐	☒
Sutton fine sandy loam, 0 to 8 percent slope, very stony (51B)	☐	☒	☒	☒
Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	☐	☒	☒	☒

DOMINANT WETLAND PLANTS:

Red maple (*Acer rubrum*)	Sensitive fern (*Onoclea sensibilis*)
Pepperbush (*Clethra alnifolia*)	Bristly dewberry (*Rubus hispidus*)
Highbush blueberry (*Vaccinium corymbosum*)	Cinnamon fern (*Osmundastrum cinnamomeum*)
Winterberry (*Ilex verticillata*)	

DOMINANT UPLAND PLANTS:

Sassafras (*Sassafras albidum*)	Pennsylvania sedge (*Carex pensylvanica*)
Blackberry (*Rubus allegheniensis*)	Hay-scented fern (*Dennstaedtia punctilobula*)
Hazelnut (*Corylus americana*)	Low-bush blueberry (*Vaccinium pallidum*)
Pepperbush (*Clethra alnifolia*)	Black huckleberry (*Gaylussacia baccata*)
Autumn olive (Elaeagnus umbellata)	Dangleberry (*Gaylussacia frondosa*)
Black birch (Betula lenta)	

WETLAND NARRATIVE:

Wetland 5 occupies a depression in the northeastern part of the study area and drains towards Interstate-95. The surficial deposit consists of stony or bouldery ablation till. Wetland 5 is an unmapped inclusion in the NRCS soil survey. Soils along the wetland edge are similar to the poorly drained Leicester series, but show signs of Spodic development. The wetland may have been partially drained when the highway cut removed the northern part of the wetland. The hydrology of the wetland is driven by the discharge of groundwater or through flow perhaps trapped above bedrock.

The vegetation in the wetland is very thick as the site has been recently clear cut. Rank growth of coppicing trees, pepperbush (*Clethra alnifolia*), blackberry (*Rubus allegheniensis*) and other form dense thickets.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

Clear Focus Solar Site, Boom Bridge Road, N. Stonington, CT

July 25, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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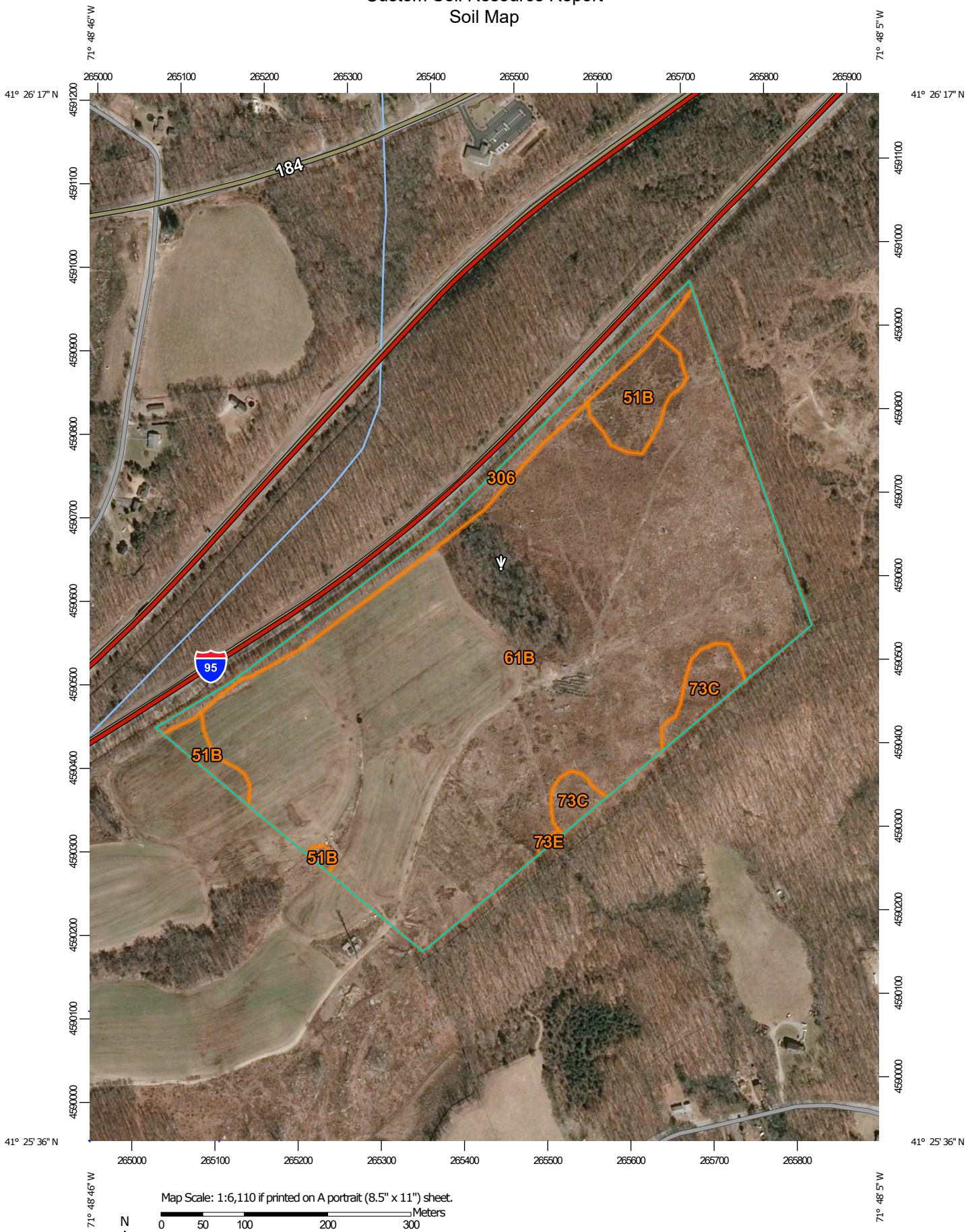
Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:6,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N 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 1:12,000.

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
Survey Area Data: Version 18, Dec 6, 2018

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

Date(s) aerial images were photographed: Mar 20, 2019—Mar 27, 2019

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
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	3.3	4.7%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	60.9	87.3%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	2.1	3.0%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	0.1	0.1%
306	Udorthents-Urban land complex	3.4	4.9%
Totals for Area of Interest		**69.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

51B—Sutton fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xfff
Elevation: 0 to 1,410 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Sutton, very stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sutton, Very Stony

Setting

Landform: Hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: fine sandy loam
Bw1 - 7 to 19 inches: fine sandy loam
Bw2 - 19 to 27 inches: sandy loam
C1 - 27 to 41 inches: gravelly sandy loam
C2 - 41 to 62 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 12 to 27 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B/D

Hydric soil rating: No

Minor Components

Charlton, very stony

Percent of map unit: 7 percent
Landform: Hills, ground moraines, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Canton, very stony

Percent of map unit: 4 percent
Landform: Ridges, hills, moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Leicester, very stony

Percent of map unit: 3 percent
Landform: Hills, drainageways, ground moraines, depressions
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman, very stony

Percent of map unit: 1 percent
Landform: Depressions, drainageways, hills, ground moraines, drumlins
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

61B—Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w81v
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton, very stony, and similar soils: 50 percent
Charlton, very stony, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Charlton, Very Stony

Setting

Landform: Hills, ground moraines, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Chatfield, very stony

Percent of map unit: 5 percent
Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, very stony

Percent of map unit: 5 percent
Landform: Ground moraines, depressions, drainageways, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

73C—Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2w698
Elevation: 0 to 1,550 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton, very stony, and similar soils: 50 percent
Chatfield, very stony, and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Sutton, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hollis, very stony

Percent of map unit: 5 percent

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, very stony

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 9lql
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 45 percent
Chatfield and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 45 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 15 inches: gravelly fine sandy loam
Bw2 - 15 to 29 inches: gravelly fine sandy loam
2R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Hydric soil rating: No

Sutton

Percent of map unit: 5 percent

Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Leicester

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Hollis

Percent of map unit: 3 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed, sandy subsoil

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, red parent material

Percent of map unit: 1 percent
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

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