

## DRAINAGE REPORT

April 28, 2023

**Property Located at:**

Upper Walnut Hill and Holmes Rd.  
EAST LYME CT

**Prepared For:**

Port Side Holdings Inc. &  
English Harbour Capital Partners LLC  
Tenants in Common  
207 Clarendon Ave  
Southport, NC 28461

**Applicant:**

Nehantic Highlands Subdivision  
Kristen Clarke P.E. & Shelly Harney.

**Prepared By:**

Timothy A. May, P.E.  
May Engineering, LLC  
1297 Rte 163  
Oakdale, CT 03670



## **SITE DESCRIPTION:**

The site is a 12.39-acre parcel located on the east side of Upper Walnut Hill Road and the south side of Holmes Road in the Town of East Lyme, CT. The proposed site development is for 5 residential subdivision lots. The parcel was previously part of the Hathaway Farm property, and is an undeveloped wooded parcel with mature deciduous trees and dense brush understory, with slopes ranging from 3% to 10%. There are wetlands and water courses located on this parcel. The soil type is primarily a hydraulic soil group B consisting of Canton-Carlton fine sandy loams and Woodbridge fine sandy loam. The soil types were evaluated for their permeability and have a moderate infiltration rate throughout the site.

The existing stormwater drainage flow paths for proposed lots #1 & 2 flow across the parcels in a northeasterly direction to the existing drainage path along Holmes Road, and then into the wetlands on the south side of Holmes Road. Stormwater drainage flows for proposed lots #3 & 4 flow across the parcel in a northwestern direction into the existing drainage paths along Holmes Road and Upper Walnut Hill Road. Stormwater drainage flows for proposed lot #5 flow southwest across the parcel into wetlands on the east side of Upper Walnut Hill Road. The stormwater then flows onto the surrounding adjacent property as shallow concentrated flow, dispersing into the woods or wetland areas. No evidence of channelized flow is observed.

The proposed 5 residential subdivision lots will have less than 0.5 acre of disturbance for each lot. Water Quality Volumes (WQV) will be implemented by the use of rain gardens to capture the roof runoff and will reduce the Water Quality Flow (WQF). Rain garden are sized for 200cf of storage/infiltration to meet the WQV for 1" rainfall event; however the actual roof areas proposed are smaller making the proposed rain gardens capacity larger than needed. Each parcel will have a paved driveway and grassed lawn. Additional water quality measures are proposed to slow down stormwater velocities and reduce sediment loads prior to stormwater entering the wetlands. A sediment forebay along with a water quality berm are proposed to intercept stormwater flows from lots #1 & 2 and another is proposed to intercept flows from lot #5. The proposed sediment forebay and water quality berm are designed using the Connecticut Stormwater Quality Manual. Each sediment forebay is designed with a shallow basin, with 150 cf storage that will slow stormwater to settle out sediments. The water quality berm is a mound of 1-1/2" to 3" stones with geotextile & sand core filter, that is designed to reduce stormwater velocities to improve water quality.

## **METHODOLOGY AND RESULTS:**

The Rational Method was used to determine stormwater peak runoff flows for existing and proposed development for storm events. The results use an estimate of 0.5 acre as the amount of expected disturbed area for each lot. Each lot will contain approximately the same amount of proposed impervious areas (roofs and paved driveway), which is less than 5% impervious areas. The balance of the proposed area will be grassed lawn, which is 39% of the developed area, and undisturbed wooded forest, which is 53%. These percentages are used to develop the weighted Rational Runoff Coefficient (C). The existing runoff coefficient for wood forest Hydraulic soil group B with 3-10% slope I is 0.15. The Weighted C is used to model the proposed development, which is low density residential (0.5 acre developed). The Weighted C for the proposed developed lots is 0.21. Please note that the proposed rain gardens will effectively remove stormwater runoff from the impervious portion. The impact of the rain gardens and their removal of stormwater is not included in the tabulated results, but should be considered as a beneficial part of the Water Quality Volume reduction and stormwater management. The sediment forebay is design to reduce sediment loading by 90% and the water quality berm will slow stormwater velocities before stormwater enters the wetlands.

Listed are the tabulated results for the existing and proposed development conditions for lots #1-5.

Rational Equation:  $Q=CiA$

Q = Peak discharge, cfs

c = Rational method runoff coefficient

i = Rainfall intensity, inch/hour

A = Drainage area, acre

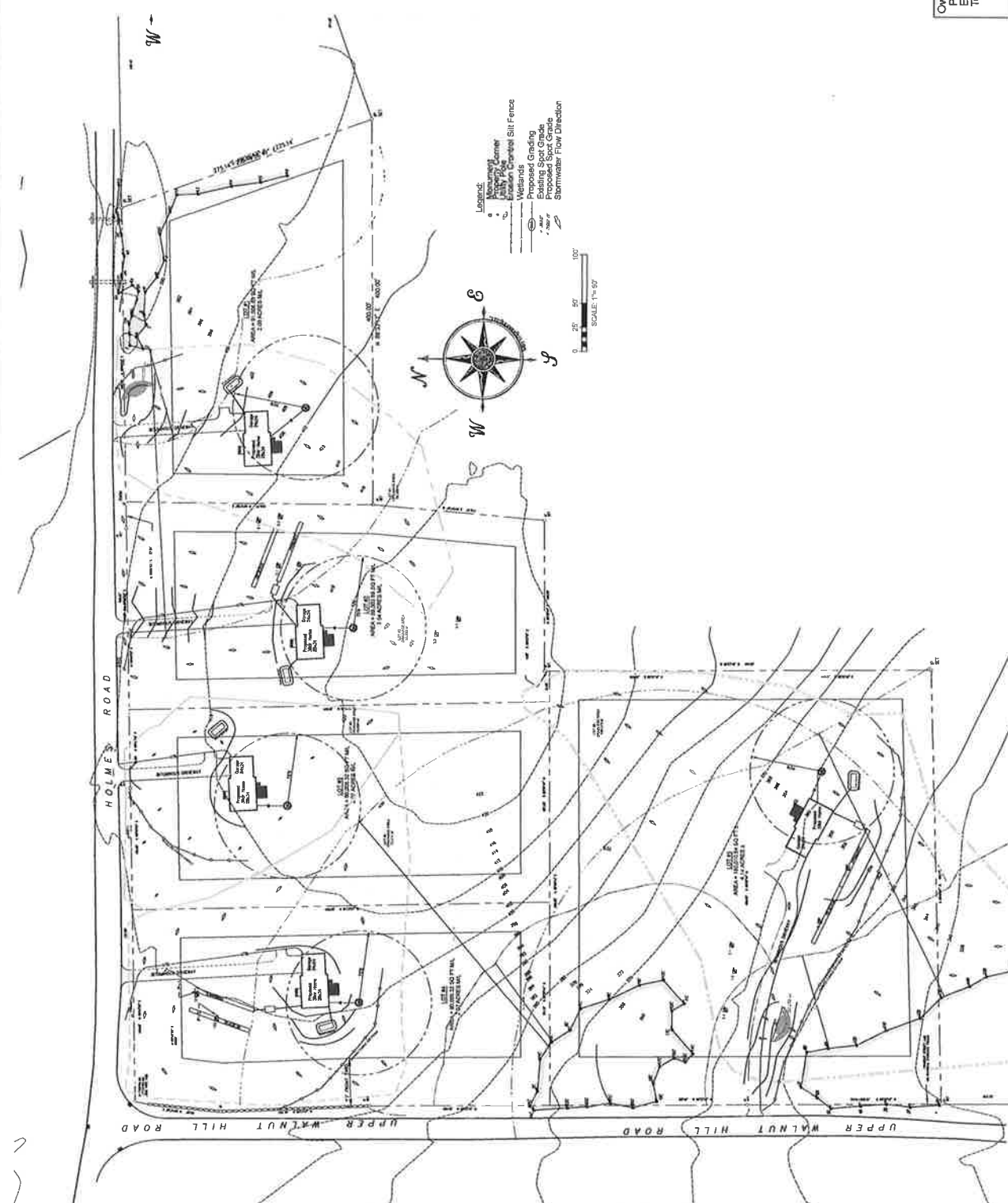
soil type HSG B (with 2-7% slope)

wooded  
0.15  
developed  
0.21  
Residential Low  
density Devl

		Storm Event (New London Co)						
		Acre	1 year	2 year	10 Year	25 Year	50 year	100 Year
<b>Lot 1</b>	Drainage area	1.26						
	Existing		0.51	0.64	0.95	1.08	1.16	1.34
	Developed		0.71	0.90	1.32	1.51	1.63	1.88
	increase		0.20	0.26	0.38	0.43	0.46	0.54
	Q = Peak discharge, cfs							
<b>Lot 2</b>	Drainage area	1.27						
	Existing		0.51	0.65	0.95	1.09	1.17	1.35
	Developed		0.72	0.91	1.33	1.52	1.64	1.89
	increase		0.21	0.26	0.38	0.43	0.47	0.54
	Q = Peak discharge, cfs							
<b>Lot 3</b>	Drainage area	1.00						
	Existing		0.41	0.51	0.75	0.86	0.92	1.07
	Developed		0.57	0.71	1.05	1.20	1.29	1.49
	increase		0.16	0.20	0.30	0.34	0.37	0.43
	Q = Peak discharge, cfs							
<b>Lot 4</b>	Drainage area	1.66						
	Existing		0.67	0.85	1.25	1.42	1.53	1.77
	Developed		0.94	1.19	1.74	1.99	2.14	2.48
	increase		0.27	0.34	0.50	0.57	0.61	0.71
	Q = Peak discharge, cfs							
<b>Lot 5</b>	Drainage area	3.35						
	Existing		1.36	1.71	2.51	2.86	3.09	3.57
	Developed		1.90	2.39	3.52	4.01	4.33	4.99
	increase		0.54	0.68	1.01	1.15	1.24	1.43
	Q = Peak discharge, cfs							

## SUMMARY

The development of subdivision lots #1,2,3,4 & 5 will result in small increases in the stormwater peak flow as compared to the existing peak flows. However, rain gardens will collect roof runoff to infiltrate that increased portion and will also provide a WQV reduction for the roof area runoff. The sediment forebay is a BMP targeted to reduce sediment loading along with the water quality berm that will slow stormwater velocities before stormwater enters the wetlands, resulting in reducing the WQF. The grassed lawns will reduce WQF by decreasing water velocities, filtering the stormwater runoff of debris and reducing soil erosion as compared to the existing forested areas. This will also improve water quality. The proposed stormwater flow path will remain the same as existing development, but the overall water quality will be improved by the removal of suspended solids and reduced stormwater velocity.

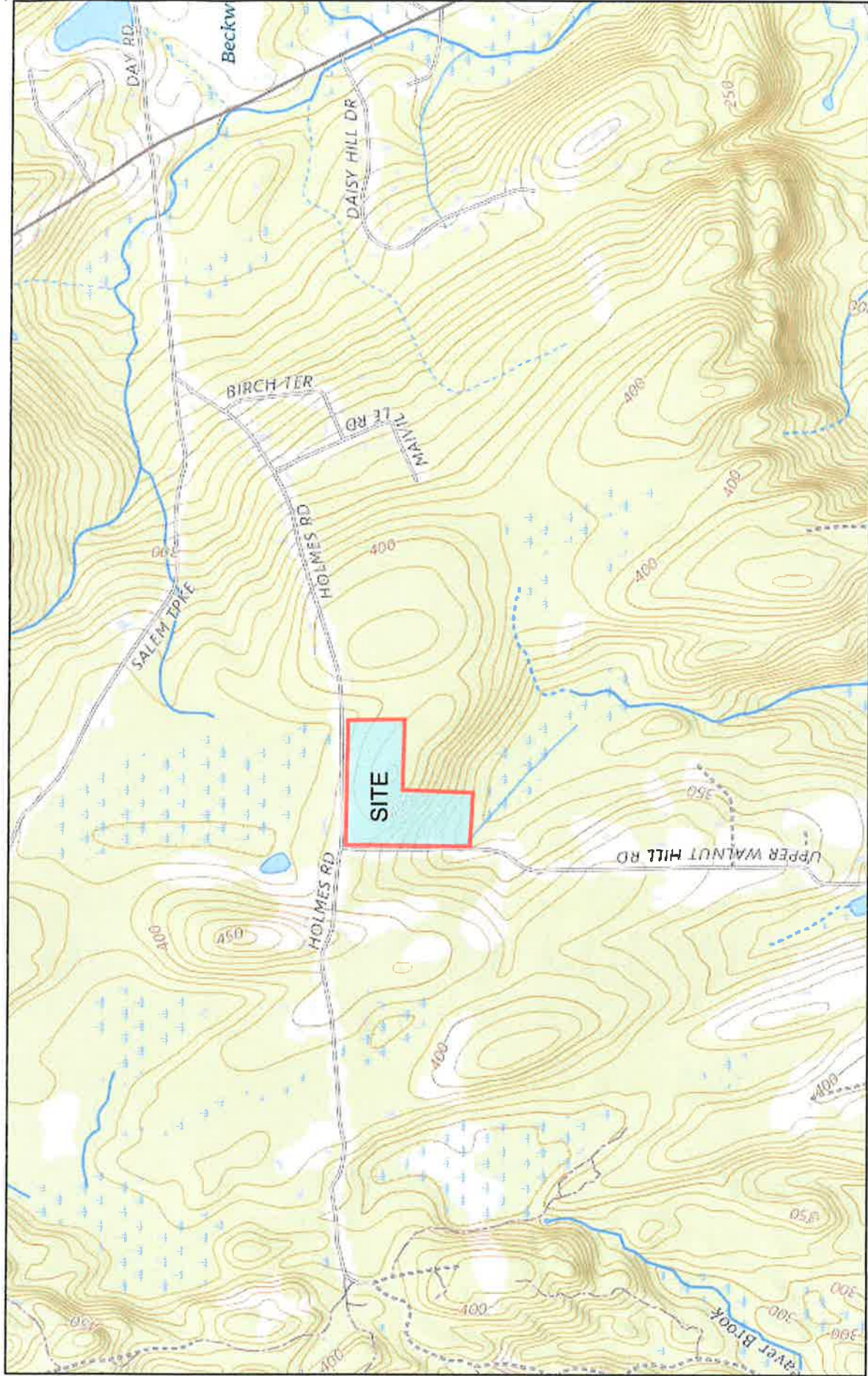


<b>May Engineering LLC</b> Civil Engineering and Site Planning 129/ RT 153 Osdale, CT 06370 860-994-9671
Applicant: <b>Nehantic Highlands Subdivision</b> Kristen Clarke P.E. & Shelly Harney
<b>HOLMES ROAD</b> EAST LYME, CT
SCALE: 1"=50'
DATE: 29 April 2023
JOB NUMBER: SHEET
1 of 1

Owner: <b>Port Side Holdings Inc. &amp; English Harbour Capital Partners LLC</b> Tenants in Common 207 Clarendon Ave Sourport, NC 28661
Site Development and Stormwater Drainage Flow Paths



# The National Map Advanced Viewer



4/26/2023, 12:41:47 PM

1:18,056

0 500 1,000 2,000 ft

0 190 380 760 m

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography






































USGS

2021 USGS





## MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soil Map Unit Polygons	 Stony Spot
 Soil Map Unit Lines	 Very Stony Spot
 Soil Map Unit Points	 Wet Spot
 Blowout	 Other
 Borrow Pit	 Special Line Features
 Clay Spot	 Streams and Canals
 Closed Depression	 Rails
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	 Background
 Mine or Quarry	 Aerial Photography
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

## 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 22, Sep 12, 2022

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

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

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	118.3	8.5%
12	Raypol silt loam	2.1	0.1%
15	Scarboro muck, 0 to 3 percent slopes	0.6	0.0%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	57.6	4.1%
18	Catden and Freetown soils, 0 to 2 percent slopes	92.4	6.6%
23A	Sudbury sandy loam, 0 to 5 percent slopes	2.9	0.2%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	1.9	0.1%
38A	Hinckley loamy sand, 0 to 3 percent slopes	0.0	0.0%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	8.3	0.6%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	13.3	0.9%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	117.7	8.4%
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	71.5	5.1%
50A	Sutton fine sandy loam, 0 to 3 percent slopes	3.1	0.2%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	29.0	2.1%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	55.1	3.9%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	2.7	0.2%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	97.8	7.0%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	20.5	1.5%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	5.1	0.4%



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	20.9	1.5%
71E	Nipmuck-Brimfield-Rock outcrop complex, 15 to 45 percent slopes	75.8	5.4%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	148.1	10.6%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	50.0	3.6%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	35.8	2.6%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	28.1	2.0%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	30.8	2.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	134.9	9.6%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	25.1	1.8%
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	8.3	0.6%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	85.3	6.1%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	39.0	2.8%
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony	13.1	0.9%
306	Udorthents-Urban land complex	3.0	0.2%
<b>Totals for Area of Interest</b>		<b>1,398.2</b>	<b>100.0%</b>

**EXHIBIT B**



## Joseph R. Theroux

~ Certified Forester/ Soil Scientist ~  
Phone 860-428-7992~ Fax 860-376-6842  
P.O. Box 32, Voluntown, CT. 06384  
Forestry Services ~ Environmental Impact Assessments  
Wetland Delineations and Permitting ~ E&S/Site Monitoring  
Wetland function and value assessments

6/28/2022

Mr. Paul M. Geraghty  
38 Granite Street  
New London, CT 06320

Re: Wetland delineation, Parcel #1, Upper Walnut Hill Road & Holmes Rd. East Lyme, CT.

Dear Mr. Geraghty,

At your request I have delineated the inland wetlands and watercourses on the 12.4 acre above referenced property.

These wetlands have been delineated in accordance with the standards of the National Cooperative Soil Survey and the definitions of wetlands as found in the Connecticut Statutes, Chapter 440, Sections 22A-38.

Fluorescent pink flags with a corresponding location number delineate the boundary between the upland soils and the inland wetlands and watercourses that were found.

Flag numbers WF-1 through WF-22 and WF-1A through WF-10A delineate the western boundary of a palustrine forested wetland and intermittent watercourse found in the northeast portion of the property adjacent to Holmes Road.

Flag numbers WF-1B through WF-19B delineate the northeast boundary of a palustrine forested wetland in the southwestern portion of the property adjacent to Upper Walnut Hill Road.

Flag Numbers WF-1C through WF-23C delineate the perimeter of a small palustrine forested wetland which also lies adjacent to Upper Walnut Hill Road.

These wetlands have formed due to the persistent wetness from the seasonally high and/or perched water tables and groundwater breakout.

These delineated wetland soils are characterized by organic "A" horizons, shallow redoximorphic features and low chroma colors within 20 inches of the soil surface.



In conclusion, if you have any questions concerning the delineation or this report, please feel free to contact me.

Thank you,

**Joseph R. Theroux**

Joseph R. Theroux  
Certified Soil Scientist  
Member SSSSNE, NSCSS, SSSA.

**EXHIBIT 3**

**THE INLAND WETLANDS IMPACT REPORT PREPARED BY JOSEPH  
THEROUX IS BEING SUBMITTED UNDER SEPARATE COVER.**



**EXHIBIT C**

**PROPOSED NEHANTIC HIGHLANDS SUBDIVISION  
AJACENT PROPERTY OWNERS  
HOLMES ROAD/UPPER WALNUT HILL ROAD**

**1) Federal Home Loan Mortgage Corporation  
8200 Jones Beach Drive  
McLean, VA 22102-3110**

**2) Sheila Burke, Trustee  
11 Smith Avenue  
Niantic, CT 06357**

**3) Carol Giese  
49 Holmes Road  
East Lyme, CT 06333**

**4) Terrence & Virginia Casey  
65 Holmes Road  
East Lyme, CT 06333**

**5) Holmes Road Reserve LLC  
121 Rhode Island Avenue  
Washington, D.C. 20002**

**6) Paul & Dorothy Smith  
17 Faulkner Drive  
Quaker Hill, CT 06375**

**7) East Lyme Land Trust, Inc.  
P.O. Box 831  
East Lyme, CT 06333**