WRIGHT-PIERCE
Engineering a Better Environment

169 Main Street, 700 Plaza Middlesex
Middletown, CT 06457
860.343.8297 | wright-pierce.com

September 13, 2022

Town of Montville Planning and Zoning Commission
310 Norwich-New London Turnpike
Uncasville, CT 06382

**SUBJECT: Cook Hill Tank Replacement – Site Plan Application**
**50 Cook Drive, Montville, CT 06382**

Dear Chairman Lundy,

On behalf of the Town of Montville Water Pollution Control Authority (WPCA), we request the following application for Site Plan be accepted for site plan review: *Cook Hill Tank Replacement Project*.

Wright-Pierce has prepared this Application for the Cook Hill Tank Replacement Project. The project includes the construction of a new 531,200-gallon glass-fused-to-steel water storage tank approximately 105-ft tall at 50 Cook Drive in Montville, CT (the site). The new tank will be constructed adjacent to the existing 590,000-gallon welded steel tank built in 1999 on the same parcel. The existing tank is used by the Town of Montville Emergency Services to support communication equipment and antennas for the Town. The existing tank will remain in place pending a future project to demolish the tank and construct a dedicated antenna tower and equipment building on site.

The Zoning Board of Appeals as approved a variance for building setback at the September 7, 2022 hearing. The Certificate of Variance is included as an attachment to this application.

## Zoning

The parcel is located in the R20 Zone. See attached Zoning Map. Although located in the R20 Zone, the site is isolated from urban areas and is surrounded by trees with limited abutters. The proposed tank is located on the western side of the parcel. Ancillary structures consisting of equipment control enclosures, a pole-mounted site light, and a standby generator are proposed along the western side of the property. Site lighting will be shielded to prevent light from shining or reflecting on adjoining properties.

## Site

The parcel is owned by the Town of Montville and is 10,768-square feet (0.2472-acres) in area. The site is accessed by means of a Town-owned easement from the public right-of-way of Cook Drive. The project location is not within a FEMA flood hazard zone, as shown by the attached FIRMette. Additionally, the site was inspected by New England Environmental Services for wetlands or water courses, and none were identified. See the attached letter New England Environmental Services dated March 21, 2022. Finally, the site is located outside the Natural Diversity Data Base preliminary screening area. See attached NDDB map and NDDB Determination Letter dated February 4, 2022.

## Stormwater

The site is located at the top of a hill and sheds surface water to the east. The existing tank has an overflow pipe that outlets on the east side of the tank for the rare event of over-filling the tank. The proposed tank also has an overflow pipe that outlets at the base of the tank onto a concrete pad extending to a riprap channel approximately 4-ft wide which extends 110-ft towards the eastern property line ending at the small detention basin and level spreader BMP on the east end. This proposed channel will serve not only to direct flows from the rare event of a tank overflow, but also collect surface water runoff and provide detention for approximately 185-cf to address the additional surface water flow increase from the new impervious surfaces. The detention basin has been sized for the 25-yr storm event, as detailed on the attached Civil C-3 drawing and details on the mitigation stormwater controls.

The impervious area of the site is increasing by 710-sf with the new water storage tank and ancillary ground-mounted equipment adjacent to the tank. The runoff volume for the existing and proposed conditions under a 25-year design storm are listed in the table below. This net increase in stormwater runoff is 174 cf.

For the hydrologic calculations, we utilized HydroCAD modeling software and used the NOAA Atlas, Volume 10, Version 3 rainfall data. The rainfall amount of 6.15 inches was used for the 25-year, 24-hour storm event.

| | Impervious Area (sf) | 25-yr Storm Volume (af) | 25-yr Storm Volume (cf) | 25-yr Storm Peak Discharge (cfs) |
|---|---|---|---|---|
| Pre-Development | 710 | 0.064 | 2,788 | 0.61 |
| Post-Development | 1,420 | 0.068 | 2,962 | 0.64 |

Abbreviations:

1. Square-feet = sf
2. Acre-feet = af
3. Cubic-feet = cf
4. Cubic-feet per second = cfs
5. Feet = ft

Based upon the values below, the groundwater recharge volume is calculated to be 32 cf. This assumes the more conservative NRCS Hydrologic Soil Group of B, which corresponds to the Charlton-Chatfield complex (73E) identified in the attached Web Soil Survey. This volume of 32-cf is less than the volume of the 185-cf detention basin and therefore is satisfactory for the required groundwater recharge volume.

| | Drainage Area (sf) | Impervious Area (sf) | I (Impervious Ratio) | Groundwater Recharge Depth (ft) | Groundwater Recharge Volume (cf) |
|---|---|---|---|---|---|
| Cook Hill Tank | 10,148 | 1,550 | 0.153 | 0.25 | 32 |

The project will result in the disturbance of less than 1 acre of land; therefore, a Soil and Erosion and Sediment Control Plan is not included in this application. However, erosion and sedimentation controls will be implemented in the final project drawings.

Please contact Barry Parfitt, PE of Wright-Pierce at (860) 852-1914 or barry.parfitt@wright-pierce.com with any questions.

Sincerely,
**WRIGHT-PIERCE**

Barry Parfitt, PE
Lead Project Engineer
barry.parfitt@wright-pierce.com

Mariusz Jedrychowski, PE
Senior Project Manager
mariusz.jedrychowski@wright-pierce.com

Attachments:

- Site Plan Application
- Certificate of Variance
- List of Abutters
- Site Location Map (1" = 1,000')
- USGS Topography Map
- GIS Map
- Zoning Map
- Wetlands Inspection Letter
- NDDB Preliminary Screening Map & Determination Letter
- Stormwater HydroCAD Report
- FIRMette Map
- NRCS Web Soil Survey
- Site Plan (separate attachment)

# Application

**Town of Montville Planning & Zoning Commission**
**Site Plan or Special Permit Application**

☒ Site Plan Number _____ Plan Date August 2022
Revision _____
☐ Special Permit Fee paid _____ Revision _____

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Assessors Map _____ Lot 099/009/001
Project Address 50 Cook Drive, Uncasville, CT 06382

Name of Applicant Ron McDaniel c/o Montville WPCA
Address of Applicant 310 Norwich-New London Tpke, Uncasville, CT 06382
Project Name Cook Hill Tank Replacement
Tel # (860) 848-3030 Cell# _____
Fax # _____ Email rmcdaniel@montville-ct.org
Name of Property Owner Town of Montville
Name of Attorney _____
Tel # _____ Cell# _____
Fax # _____ Email _____
Name of Engineer Barry Parfitt, PE - Wright-Pierce
Tel # (860) 343-8297 Cell# _____
Fax # _____ Email barry.parfitt@wright-pierce.com

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**Zoning District** R-20 Lot Size 0.25 acres Total Acres 0.25 acres
☐ Yes ☒ No **Regulated Wetlands** **Acreage** _____ **Permit Date** _____
☐ Yes ☒ No Flood Plain Flood Hazard Area _____
☒ Yes ☐ No A-2 Survey Name of Surveyor Martinez Couch & Associates
Building size 950 s.f. Building height 100-ft
Number of acres to be disturbed 0.20 acres
Applicable Zoning Regulation(s) Section 9
Project description The project includes the construction of a new 531,200 gal glass fused to steel water storage tank approximately 105-ft tall and associated electrical service, equipment control panels, water main, tank overflow channel, detention basin, and chain link fence. The new tank will be constructed adjacent to the existing water storage tank on the same parcel. The existing tank will remain in place pending a future project to demolish and construct a dedicated antenna tower and equipment building on site. (See cover letter.)

The project includes the construction of a new water storage tank and associated electrical service, water main, tank overflow channel, detention basin, and chain link fence.

This project will use:
☐ Septic system ☐ Municipal sewer
☐ Individual well ☐ Public water supply well ☐ SCWA well ☒ Municipal water

☐ Yes ☒ No This project is located in a **Public Water Supply Watershed**
☐ Yes ☒ No This project has received approval from the Uncas Health District
☐ Yes ☐ No This project has received approval from the appropriate Water Authority
Pending WPCA Approval

** **Attach Copy of All Approvals**

☐ Yes ☒ No This project requires a State General Stormwater Quality Permit. Registration # _____

☐ Yes ☒ No This project requires a permit from the Army Corps of Engineers.

☐ Yes ☒ No This project requires a Water Diversion Permit.

☐ Yes ☒ No This project requires a Dam Permit.

☐ Yes ☒ No This property is subject to a Conservation Restriction and/or a Preservation Restriction. If yes, attach a copy of certified notice.

☒ Yes ☐ No Drainage calculations submitted: Date 8/11/22 Rev. date _____ Rev. date _____

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☐ Yes ☒ No This project requires a OSTA (Office of State Traffic Commission) Permit.

☐ Yes ☒ No This project requires a DOT Encroachment Permit.

☐ Yes ☒ No The plan has been submitted to the DOT District 2 Office.

Number of parking spaces provided _____

Number of vehicle trips per day generated by this project _____

☐ Yes ☒ No A determination of applicability of of the following Zoning Regulations Sections _____

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Signature of Applicant _____ Date 9/13/22

Signature of Owner _____ Date _____

---

## OFFICE USE ONLY

| Review | Date Sent | Date Received |
|---|---|---|
| Town Engineer | | |
| Uncas Health District | | |
| Fire Marshal | | |
| Building Official | | |
| Mayor | | |
| WPCA | | |
| DOT District 2 | | |
| N.L. Water | | |
| Other | | |

Date of Receipt _____ Date of Public Hearing _____ Date Hearing Closed _____

Date of Extension #1 _____ Date of Extension # 2 _____ Terminal Date _____

# Site Plan Review Checklist

Site plans are required for all commercial and industrial uses and residential special permits. Site plans shall comply with Section 17 of the Zoning Regulations and shall be drawn at a scale of 1"=40' or at a scale approved by the Planning Director. (Maximum size 24" x 36")

☒ A written statement describing the proposed use or uses in sufficient detail will be submitted with each site plan to determine compliance with the permitted uses or special permits in the applicable district.

☒ A location map at a scale of one inch (1") equals 1,000 feet shall be submitted showing the subject property, streets, lot lines, and zoning district boundaries within 1,000 feet of the subject property. If space permits, the location map may be included as an insert on the site plan as required in section 17.4. An 8-½ x 11 inch photocopy of a USGS quad map with the project outlined must accompany the site plan.

☒ The name and address of the applicant and owner of record.

☒ North arrow, scale, date of the drawing or its revision and the name(s) and seal(s) of those persons preparing the site plan.

☒ Property boundaries, dimensions, and area in acres and square feet and all existing monuments, pipe markers and other physical evidence concerning property boundaries.

☒ Zoning districts and dimensions of all yards as required by these regulations. This information will be shown in both mapped and tabular form.

☒ Existing and proposed contour lines at 5 ft. Intervals. The Town Planner may require a 2 ft. Contour interval in order to clearly show topography and drainage.

☒ Location, width, and purpose of all existing and proposed easements and rights-of-way on the property.

☒ Location of all existing watercourses, wetlands, public water supply watershed boundaries, bedrock outcrops, and where appropriate, the mean high water line, flood hazard areas, and channel encroachment lines.

☒ Location and size in square feet of all existing and proposed structures including underground storage tanks and uses on the property and the approximate locations and size of all existing structures on the abutting properties which are within 100 feet of the property lot lines.

☒ Location of all storage areas for materials, supplies, products, vehicles and equipment that will not be kept inside a structure as required by the zoning regulations.

☒ Location, size, and arrangement of all parking and loading areas including existing and proposed driveway entrances and exits. The Town Planner may require the applicant to submit a traffic evaluation report or pedestrian report prepared by an engineer, licensed in the State of Connecticut, if the proposed development has the potential to impact traffic flow or significantly impact peak traffic counts.

N/A Location, size, and arrangement of all pedestrian walkways and sidewalks.

☒ Location, layout, type, and size of buffer or landscape area, plant materials, fencing, screening devices, or other materials proposed for use.

N/A Location, size, height, lighting, and orientation of all signs.

☒ Location, size, height, and orientation of all outdoor lighting facilities.

N/A The stormwater drainage system, including the location and elevations of all existing and proposed street drainage facilities within 100 feet of the property. The Town Planner of Town Engineer may require additional information and/or details regarding off-site drainage features affected by, or impacting upon the proposed development. Stormwater management systems shall be designed in accordance with the 2004 Connecticut Stormwater Quality Manual as may be amended from time to time.

N/A Location, size, and type of all water and fire protection facilities.

N/A Location, size, and type of all sewerage disposal facilities.

☒ Building elevations or preliminary architectural drawings showing the general type of building proposed for construction.

N/A In cases where the applicant intends to develop in stages, an overall site and staging plan shall be required.

☒ The Commission may require the applicant to submit an environmental evaluation report for a proposed development located in an environmentally sensitive area. Evaluation reports by independent professionals and other experts such as hydrologists, geologists and soil scientists may be required at the expense of the applicant.

☒ All signature and waiver blocks must be located in the lower right corner.

N/A Certificate of Public Convenience and Necessity in accordance with Section 4.10.8 of the Zoning Regulations.

N/A Sanitary Waste Disposal Plan. For any site which is to be served , and is capable of being served, by an operational public sanitary sewer line prior to occupancy, the site plan shall depict the sewer lateral and other engineering information suitable to determine that connection to an operational sanitary sewer line is feasible. In addition, the applicant shall provide evidence from the Montville Water Pollution Control Authority that it is capable of providing sanitary sewer service to the subject site. If the applicant proposes to utilize a community sewerage system, as defined in C.G.S. Section 7-245 as may be amended from time to time, a report from the Montville Water Pollution Control Authority indicating that all requirements of C.G.S. Section 7-246 as may be amended from time to time have been satisfied shall be provided.

N/A An Erosion and Sediment Control Plan designed in accordance with Section 15.1 of the Zoning Regulations.

N/A **Special Requirements for Uses in Public Drinking Water Supply Watersheds** The following special requirements shall apply to all Special Permit uses located within the Lake Konomoc and Stony Brook Reservoir watershed:

1. All septic systems shall be designed by a Sanitary Engineer registered in the State of Connecticut, and shall include a renovation analysis demonstrating compliance with current standards adopted by the DEEP.
2. No stormwater discharge from parking areas, roadways, rooftops or areas covered with similar impervious surfaces shall be deposited directly into any wetland or watercourse, nor discharged directly into the ground. Suitable surface and/or subsurface measures shall be taken to detain, filter, renovate and otherwise improve the quality of any such waters before discharge to surface or subsurface waters on or off the site. Existing wetlands may be employed for final treatment of stormwaters to the extent of their capacity to do so, but only after initial treatment by new wetlands or structural filtration methods.

N/A Digital data for Special Permits and Resubdivisions/Subdivisions shall be provided to the Planning Office after the recording of the final mylars on the land records. For Site Plans, the data shall be provided to the office after all signatures have been obtained by the appropriate authorities and prior to the issuance of a Zoning Permit.

- The Digital Data shall include:
    a. One (1) PDF copy of the project
    b. Copy of the project in ArcView (GIS) format or AutoCAD
        - Shapefile (.shp)
        - Geodatabase (.mdb)
        - Export file (.e00)
        - AutoCAD.dwg
- Having all features in a single AutoCAD layer or GIS file will not be accepted. For example, there must be separate layers/files for text, buildings, roads, wetlands, etc
- All data represented in a digitally submitted AutoCAD or GIS drawing must be registered to the CT State Plane Coordinate System Using NAD 1983 datum.
- Data can be submitted to the Planning Office via a flash-drive or CD.

**DETERMINATION OF APPLICABILITY**

The Commission may determine that one (1) or more of the site plan ingredient requirements of Section 17.4 is not necessary or required to reach a decision on the application. A determination of applicability of the applicable section(s) must be requested in writing by the applicant.

**Please refer to the Zoning Regulations to insure that you meet all requirements for setbacks, parking, signs, etc.**

# Certificate of Variance

TOWN OF MONTVILLE
*ZONING BOARD OF APPEALS*
310 NORWICH NEW LONDON TURNPIKE
UNCASVILLE, CT 06382
TELEPHONE: (860) 848-6779

## CERTIFICATE OF NOTICE OF DECISION

| | |
|---|---|
| **DATE OF HEARING:** | September 7, 2022 |
| **APPLICATION NUMBER:** | #22ZBA2 |
| **APPLICANT:** | Town of Montville WPCA |
| **PROPERTY OWNER:** | Town of Montville |
| **LOCATION OF PROPERTY:** | 50 Cook Drive, Uncasville, CT |
| **MAP/BLOCK/LOT:** | 099-009-001 |

**APPLICANT'S REQUEST:**
1. Tank: A 22.6' variance of the required 40' R20 front yard setback; and a 27' variance of the required 40' R20 rear yard setback.
2. Equipment boxes: A 25' variance of the required 40' front yard setback; a 7.8' variance of the required 10' west side yard setback; and a 19' variance of the required 40' rear yard setback.
3. Standby Generator: A 3' variance of the required 10' side yard setback and 34' variance of the required 40' rear yard setback.

to allow the construction of a required new 531,200 gallon water storage tank and ancillary structures due to the small size of the parcel and needed access for maintenance to the existing and future infrastructure and the connection point to the existing Town of Montville water distribution system.

**APPLICABLE REGULATION**: Zoning Regulation Section 9.6 (R-20 Minimum Setbacks)

**DECISION: GRANTED**
**DATE OF DECISION: September 7, 2022**

**CONDITION(S) OF GRANTING VARIANCES**: None

**FINDINGS:** The variance would be in harmony with the general intent & purpose of the Montville Zoning Regulations & would conserve the public health, safety, convenience, welfare.

**HARDSHIP**: The hardship is the existing 10,768SF lot utilized for the Town of Montville water distribution system is undersized and limits any location of the structures on the lot that meet R20 required setbacks.

**DATED at Montville, Connecticut this 8th day of September 2022.**

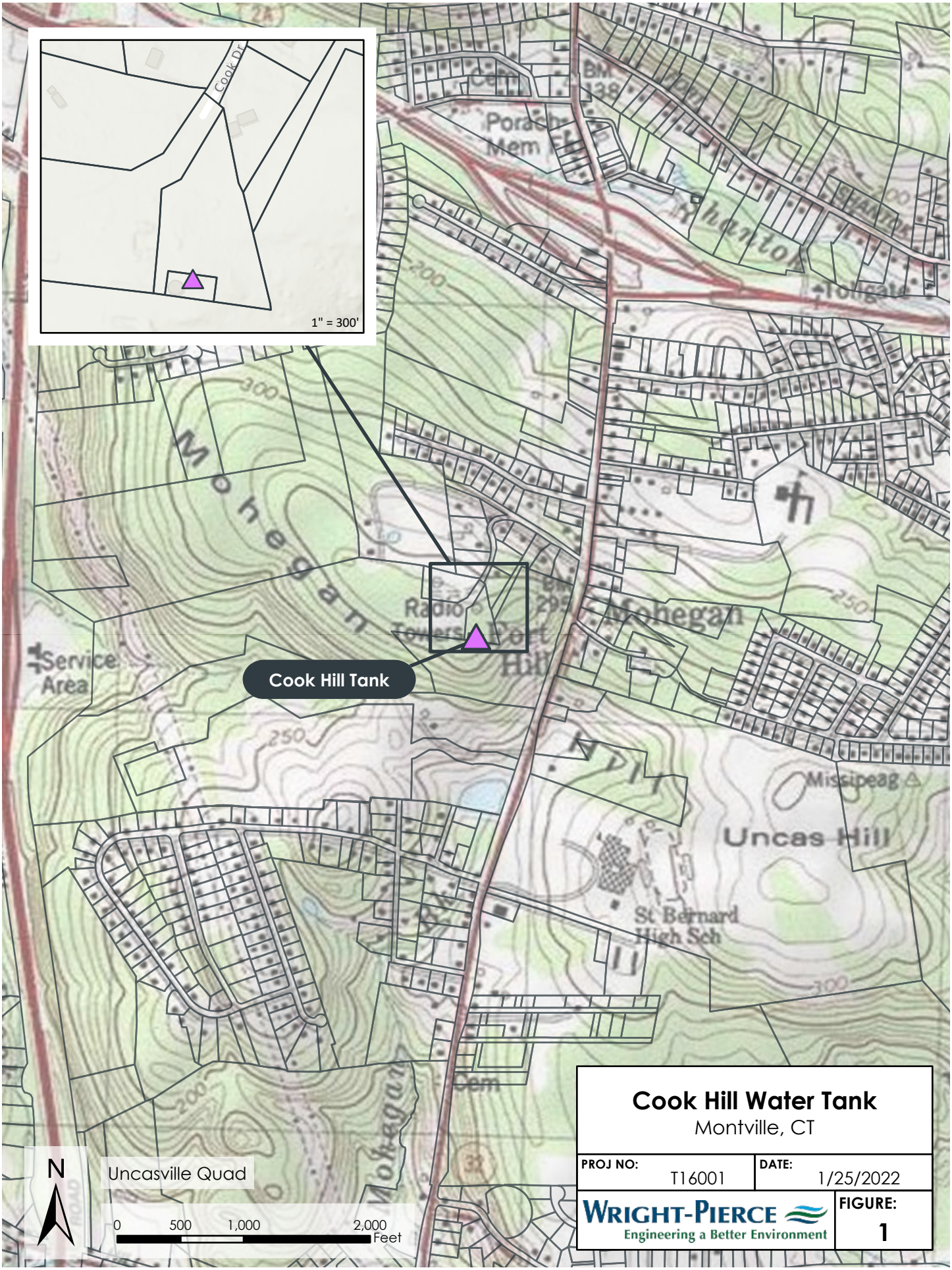
**BY:** Meredith Badalucca
**Meredith Badalucca, Zoning Officer**

# List of Abutting Properties

# Site Plan Application
# Montville Planning and Zoning Commission

| Abutter's List for Lot 099/009/001 (50 Cook Drive) | | | |
|---|---|---|---|
| **Street #** | **Street Name** | **Owner** | **Parcel ID** |
| 48 | Cook Drive | WICH Inc. | 099/009/000 |
| 1758 | Route 32 | Vizion Enterprises | 094/029/000 |

Site Location Map (1” = 1,000’)




# Cook Hill Water Tank

Montville, CT

| PROJ NO: | DATE: |
|---|---|
| T16001 | 1/25/2022 |

WRIGHT-PIERCE
Engineering a Better Environment

FIGURE: 1

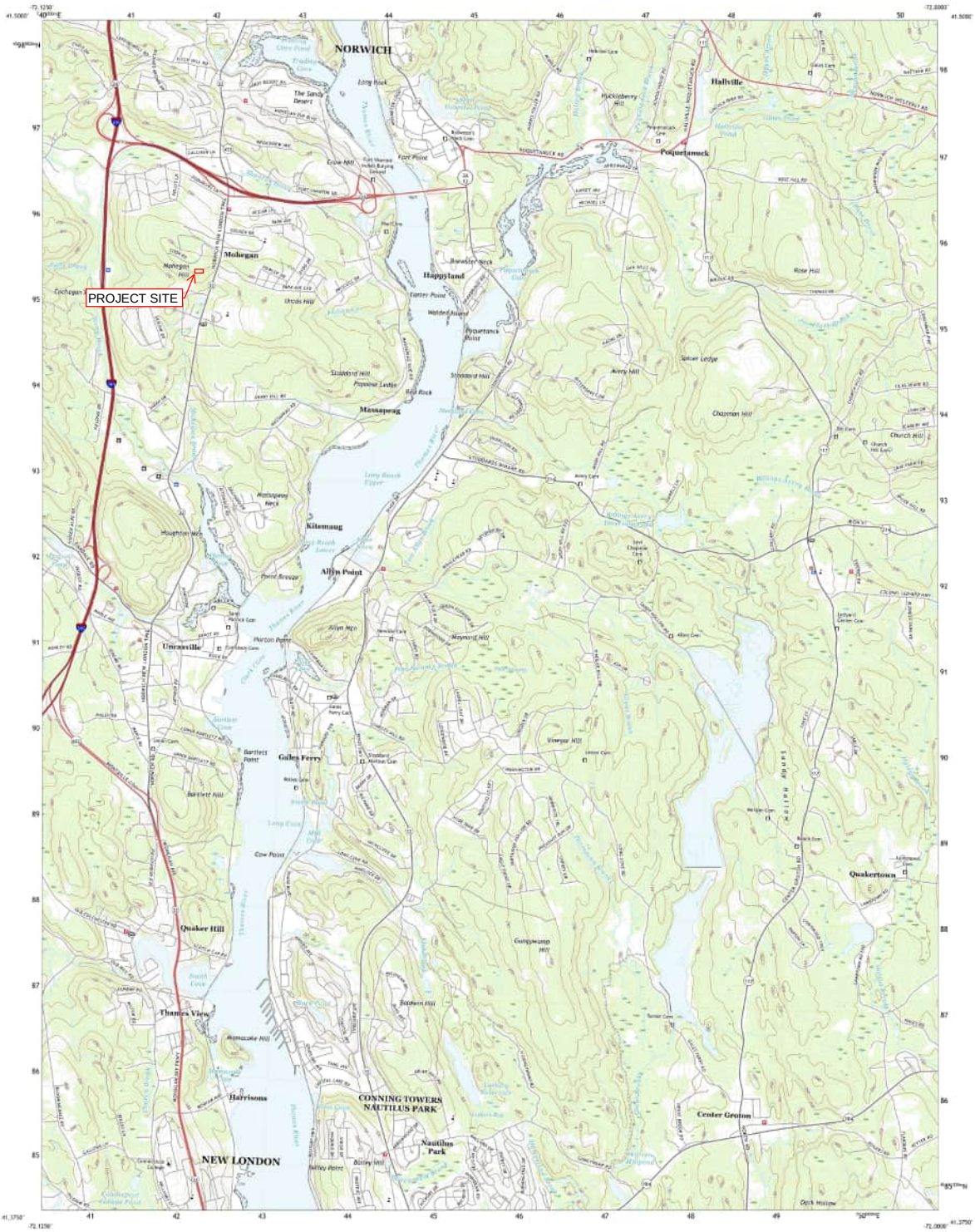
JMN W:\GIS_Development\Projects\CT\Montville\T16001_CookHillWaterTank\MXDs\CookHillTank.aprx - Topo Map

# USGS Topography Map

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

UNCASVILLE QUADRANGLE
CONNECTICUT - NEW LONDON COUNTY
7.5-MINUTE SERIES




Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000 meter grid Universal Transverse Mercator, Zone 18T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government boundaries may not be shown. Obtain permission before entering private lands.

Images ..... NAIP, July 2016 - September 2016
Roads ..... U.S. Census Bureau, 2016
Names ..... GNIS, 1979 - 2016
Hydrography ..... National Hydrography Dataset, 2016 - 2017
Contours ..... National Elevation Dataset, 2012
Boundaries ..... Multiple sources; see publication info, 1976 - 2017

Wetlands ..... FWS National Wetlands Inventory 2000

UTM ZONES AND 2016 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

UNCASVILLE, CT
2021

# GIS Map

# Cook Water Storage Tank

Montville, CT

January 25, 2022

1 inch = 141 Feet

0 141 282 423

www.cai-tech.com

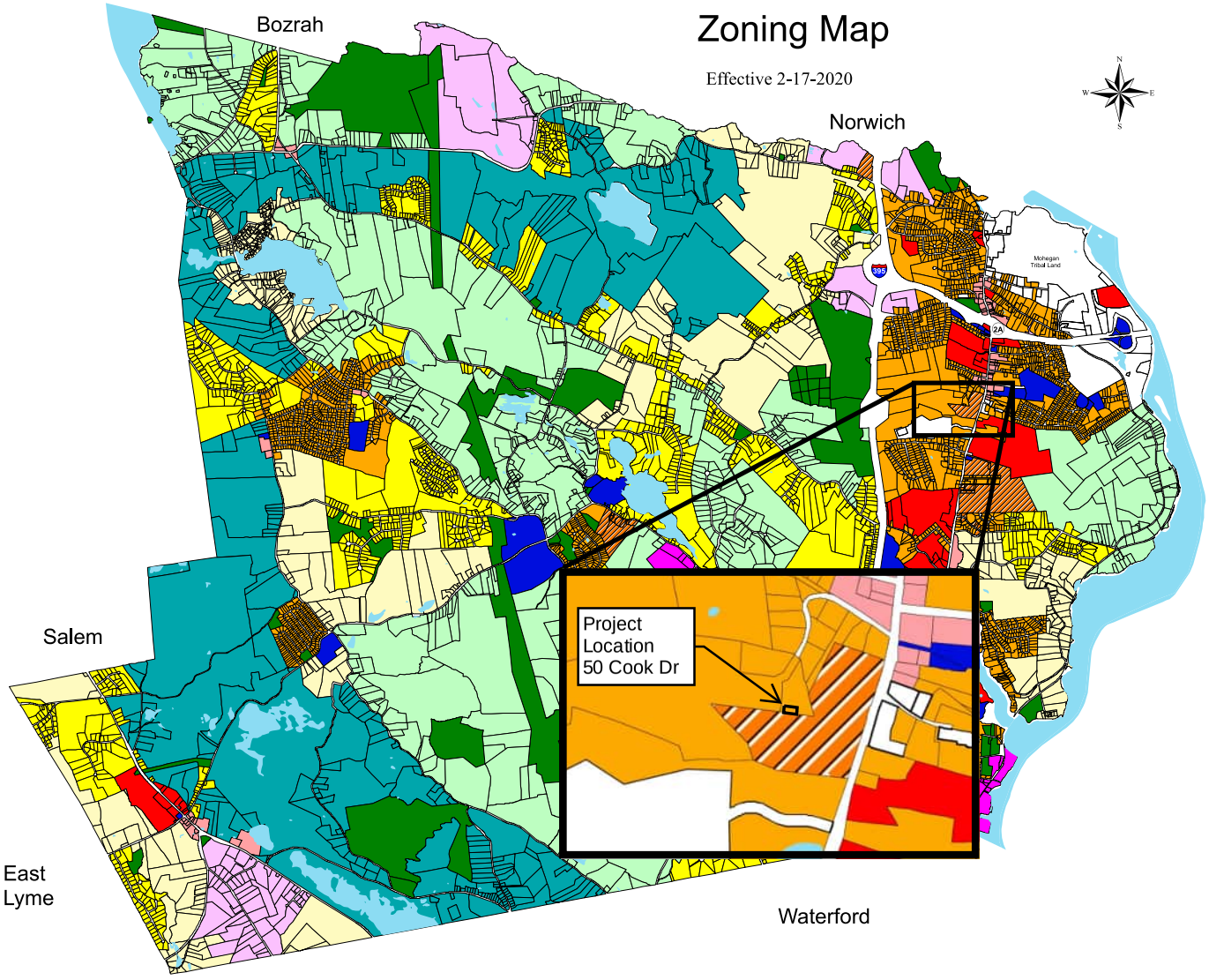

Parcel Lines - Ortho

Lot and Ac - anno

# Zoning Map

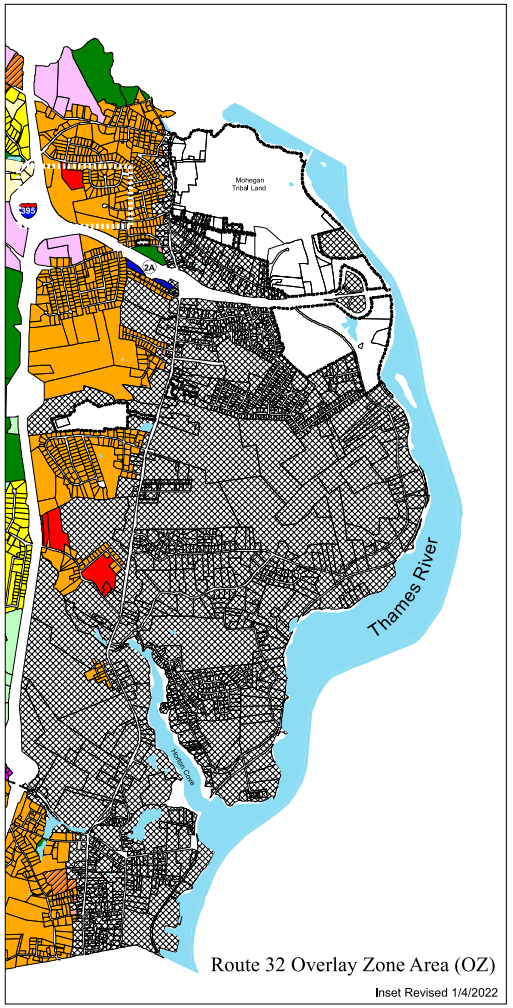
# Town of Montville
# Zoning Map

Effective 2-17-2020




**Legend**

- Land Held In Trust by the United States of America
- Annex
- C1
- C2
- GOV
- I
- LI
- OS
- R120
- R20
- R-20-M
- R40
- R80
- WRP-160
- HOD Overlay
- Route 32 OZ




Created By
Town of Montville Planning Dept
For Informational Purposes Only

# Wetlands Inspection Letter

**NEW ENGLAND ENVIRONMENTAL SERVICES**
*Wetland Consulting Specialists Since 1983*

March 21, 2022

Mr. Jason P. Berasi, P.L.S.
Martinez Couch & Associates, LLC
1084 Cromwell Avenue, Suite A2
Rocky Hill, CT 06067

Re: Cook Drive
Montville, Connecticut

Dear Mr. Berasi:

On February 28, 2022, I inspected the land on Cook Drive in Montville, which is shown on the attached map in red. There are no wetlands or watercourses present in the land outlined in red.

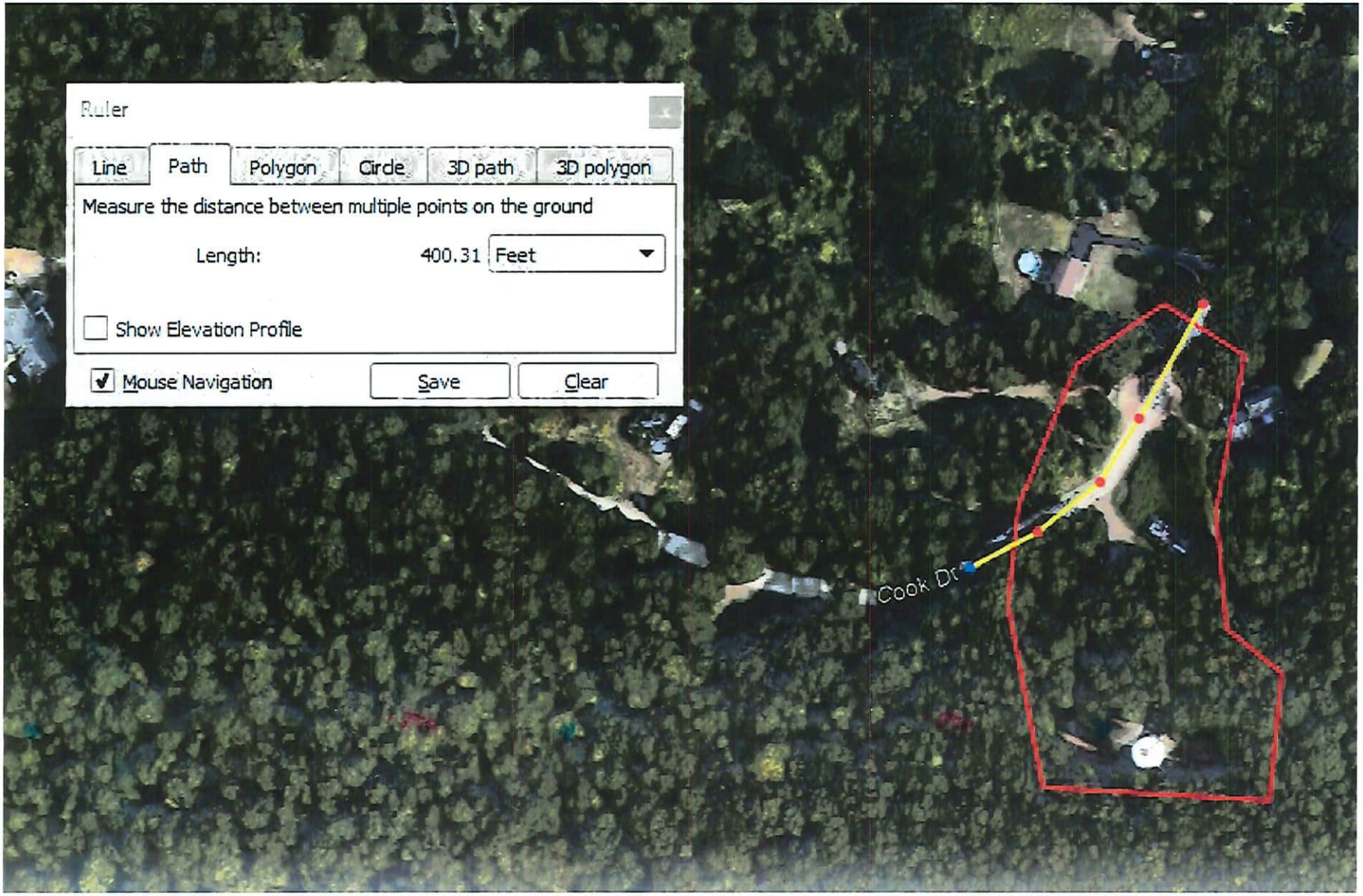
If you have any questions, feel free to contact me.

Respectively Submitted,

New England Environmental Services
R. Richard Snarski
R. Richard Snarski
Professional Wetlands Scientist #1391
Registered Professional Soil Scientist
Consulting Botanist

RRS/srh

30 GINA LANE, MARLBOROUGH, CONNECTICUT 06447
*richsnarski@gmail.com • 860-918-1970 • www.richsnarski.com*


Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the distance between multiple points on the ground
Length:
400.31
Feet
Show Elevation Profile
Mouse Navigation
Save
Clear
Cook Dr

# NDDB Preliminary Screening Map

# Natural Diversity Data Base Areas

## MONTVILLE, CT

June 2021

State and Federal Listed Species

Critical Habitat

Town Boundary

NOTE: This map shows general locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a variety of data sources . Exact locations of species have been buffered to produce the generalized locations.

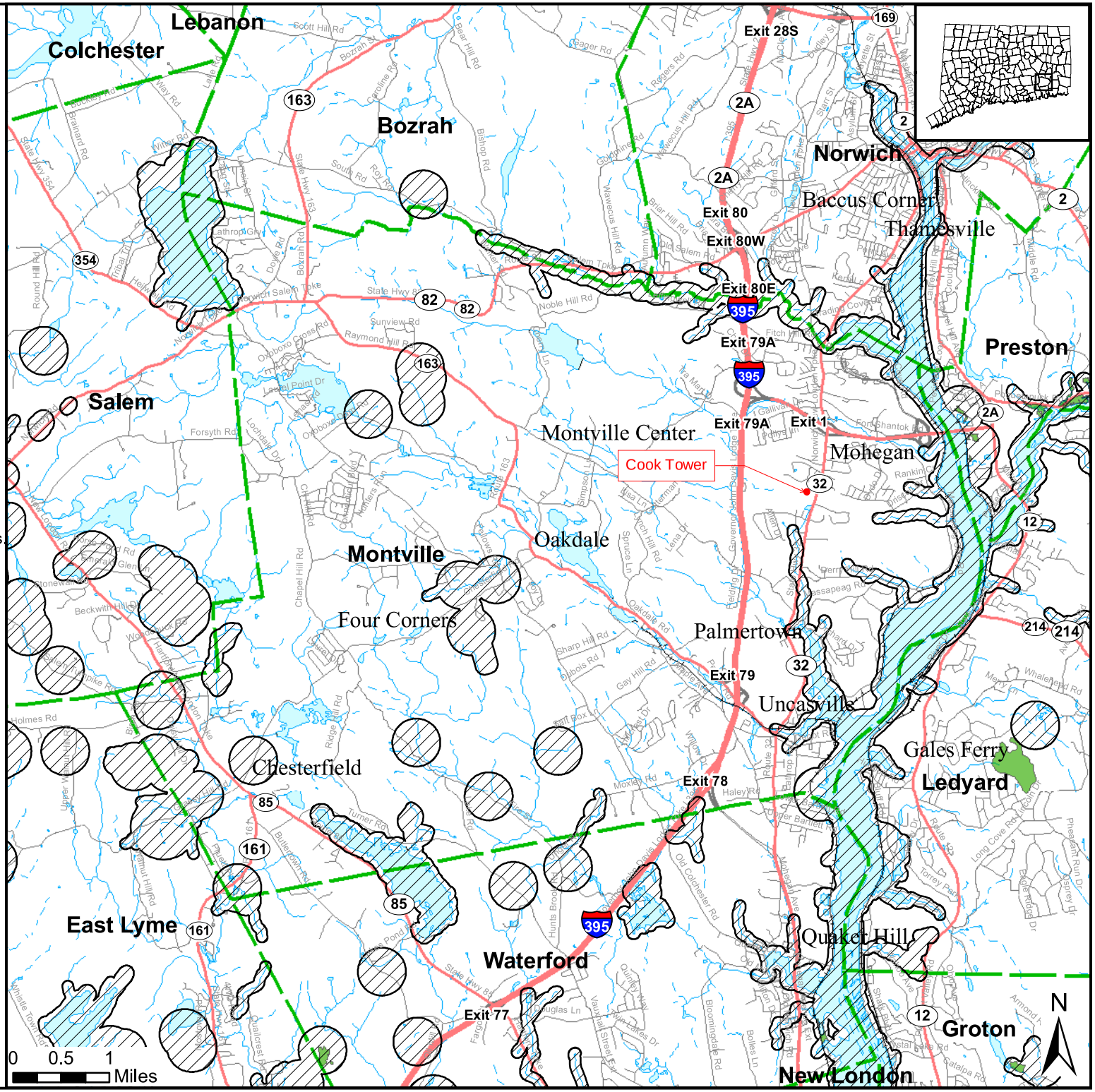
This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a hatched area there may be a potential conflict with a listed species. For more information, complete a Request for Natural Diversity Data Base State Listed Species Review form (DEP-APP-007), and submit it to the NDDB along with the required maps and information. More detailed instructions are provided with the request form on our website.

www.ct.gov/deep/nddbrequest

Use the CTECO Interactive Map Viewers at http://cteco.uconn.edu to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011

Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division



Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

February 4, 2022

Mia Jordan
Wright-Pierce
169 Main St, 700 Plaza Middlesex
Middletown CT 06457
Mia.jordan@wright-pierce.com

Project: Cook Hill Water Tower Replacement, 50 Cook Dr, Montville, CT
NDDB Determination No.: 202201074

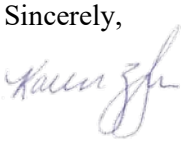
Dear Mia Jordan,

I have reviewed Natural Diversity Database (NDDB) maps and files regarding the area provided for the proposed replacement of the Cook Hill Water Tower in Montville, Connecticut. According to our records there are no reported populations of state or federal listed species in the vicinity of this property. We have not visited this site. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits. Contact NDDB to report the presence of any listed species and for more detailed guidance. This determination is good for two years. Please re-submit a new NDDB Request for Review if the scope of work changes or if work has not begun on this project by February 4, 2024.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey, cooperating units of DEEP, landowners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substitutes for on-site surveys necessary for a thorough environmental impact assessment. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the database as it becomes available.

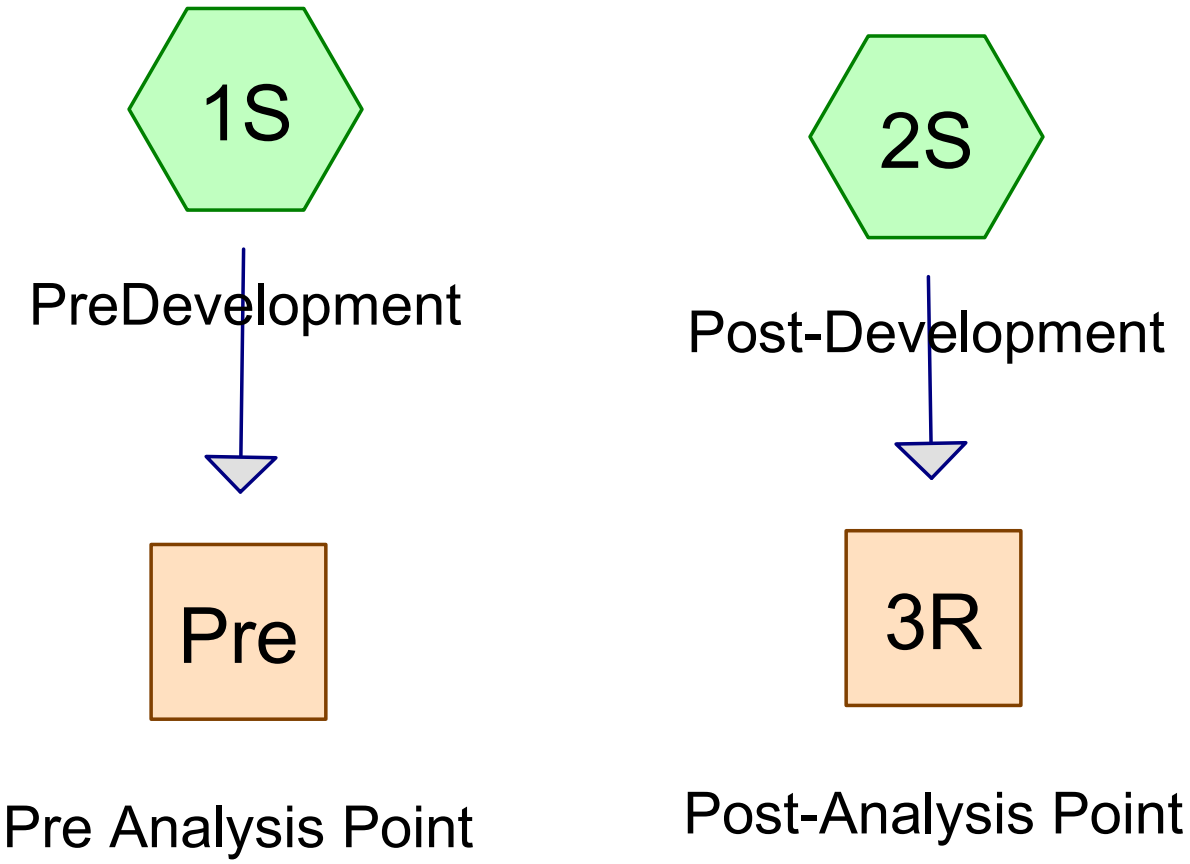
Please contact me if you have further questions at (860) 424-3378, or karen.zyko@ct.gov . Thank you for consulting the Natural Diversity Database.

Sincerely,



Karen Zyko
Environmental Analyst

# Stormwater HydroCAD Report




Subcat Reach Pond Link

**Routing Diagram for Cook_Hill_Tank**
Prepared by {enter your company name here}, Printed 8/11/2022

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.373 | 79 | 50-75% Grass cover, Fair, HSG C (1S, 2S) |
| 0.033 | 98 | Existing Tank, HSG C (1S, 2S) |
| 0.016 | 98 | Proposed, HSG C (2S) |
| **0.422** | **81** | **TOTAL AREA** |

## Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|---|---|---|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 0.422 | HSG C | 1S, 2S |
| 0.000 | HSG D | |
| 0.000 | Other | |
| **0.422** | | **TOTAL AREA** |

## Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 0.373 | 0.000 | 0.000 | 0.373 | 50-75% Grass cover, Fair | 1S, 2S |
| 0.000 | 0.000 | 0.033 | 0.000 | 0.000 | 0.033 | Existing Tank | 1S, 2S |
| 0.000 | 0.000 | 0.016 | 0.000 | 0.000 | 0.016 | Proposed | 2S |
| **0.000** | **0.000** | **0.422** | **0.000** | **0.000** | **0.422** | **TOTAL AREA** | |

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment 1S: PreDevelopment** Runoff Area=9,191 sf 7.72% Impervious Runoff Depth>3.65"
Flow Length=152' Slope=0.0050 '/' Tc=22.9 min CN=80 Runoff=0.61 cfs 0.064 af

**Subcatchment 2S: Post-Development** Runoff Area=9,194 sf 15.44% Impervious Runoff Depth>3.86"
Flow Length=152' Slope=0.0050 '/' Tc=22.9 min CN=82 Runoff=0.64 cfs 0.068 af

**Reach 3R: Post-Analysis Point** Inflow=0.64 cfs 0.068 af
Outflow=0.64 cfs 0.068 af

**Reach Pre: Pre Analysis Point** Inflow=0.61 cfs 0.064 af
Outflow=0.61 cfs 0.064 af

**Total Runoff Area = 0.422 ac Runoff Volume = 0.132 af Average Runoff Depth = 3.76"**
**88.41% Pervious = 0.373 ac 11.59% Impervious = 0.049 ac**

## Summary for Subcatchment 1S: PreDevelopment

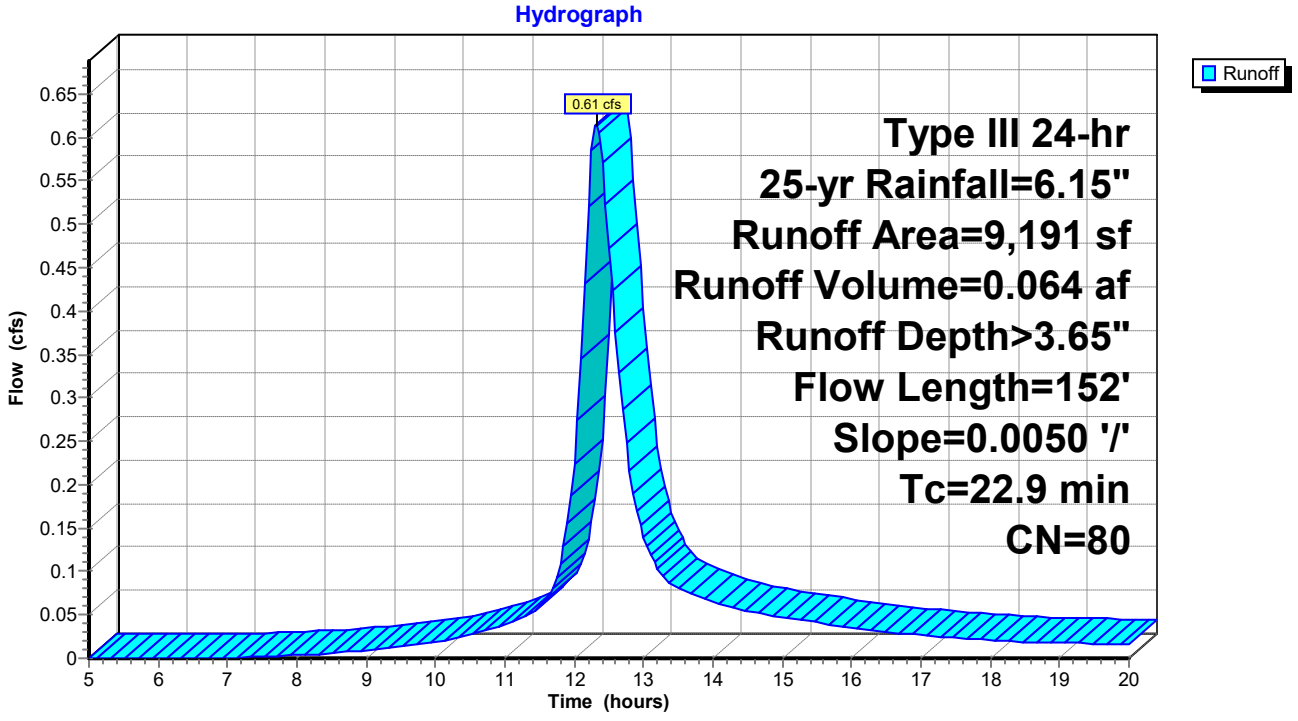
Runoff = 0.61 cfs @ 12.31 hrs, Volume= 0.064 af, Depth> 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.15"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 8,481 | 79 | 50-75% Grass cover, Fair, HSG C |
| * | 710 | 98 | Existing Tank, HSG C |
| | 9,191 | 80 | Weighted Average |
| | 8,481 | | 92.28% Pervious Area |
| | 710 | | 7.72% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 22.9 | 152 | 0.0050 | 0.11 | | **Sheet Flow, Grassy Area** Grass: Short n= 0.150 P2= 3.46" |

## Subcatchment 1S: PreDevelopment



## Summary for Subcatchment 2S: Post-Development

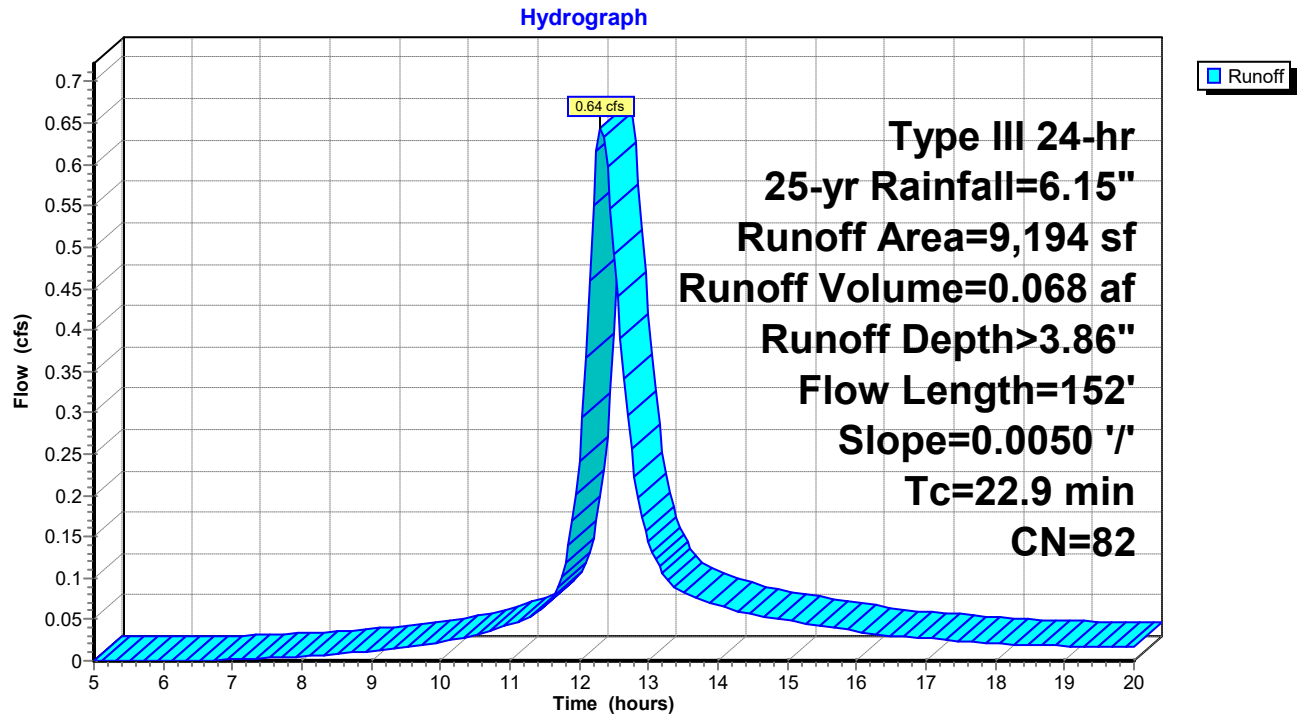
Runoff = 0.64 cfs @ 12.31 hrs, Volume= 0.068 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=6.15"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 7,774 | 79 | 50-75% Grass cover, Fair, HSG C |
| * | 710 | 98 | Existing Tank, HSG C |
| * | 710 | 98 | Proposed, HSG C |
| | 9,194 | 82 | Weighted Average |
| | 7,774 | | 84.56% Pervious Area |
| | 1,420 | | 15.44% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 22.9 | 152 | 0.0050 | 0.11 | | **Sheet Flow, Grassy Area** Grass: Short n= 0.150 P2= 3.46" |

## Subcatchment 2S: Post-Development



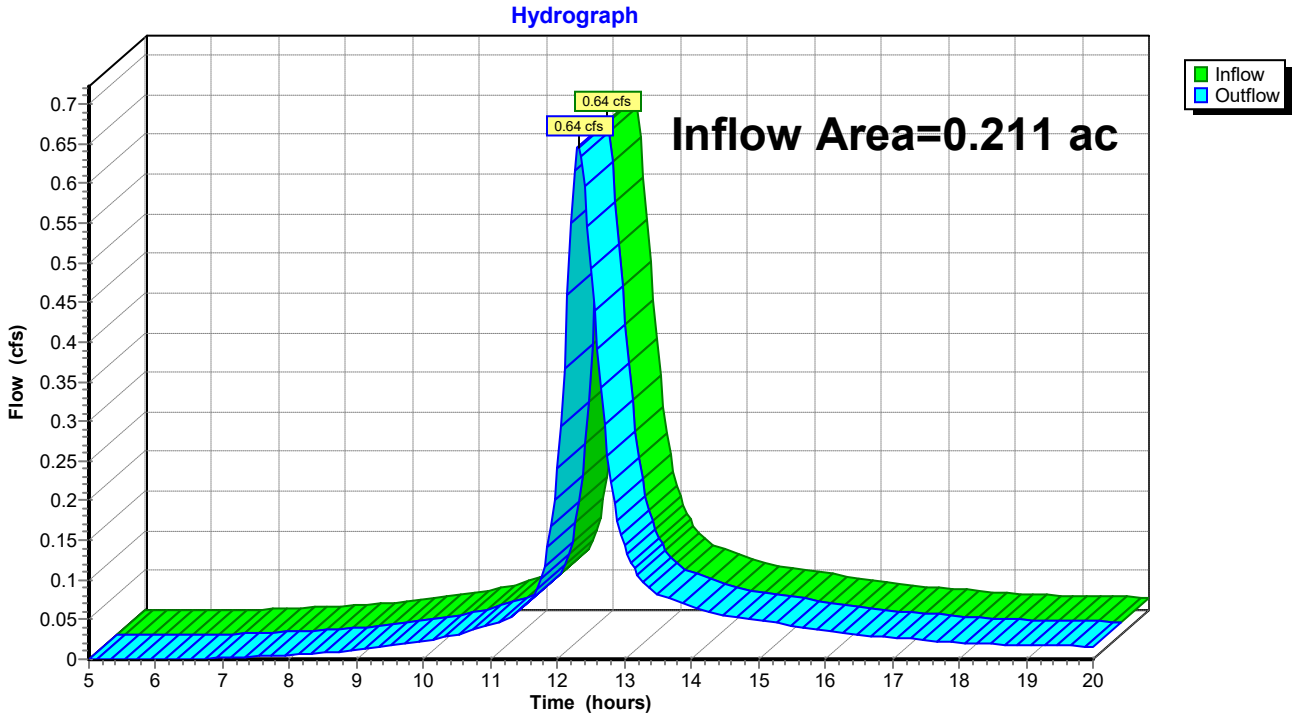
## Summary for Reach 3R: Post-Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.211 ac, 15.44% Impervious, Inflow Depth > 3.86" for 25-yr event
Inflow = 0.64 cfs @ 12.31 hrs, Volume= 0.068 af
Outflow = 0.64 cfs @ 12.31 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach 3R: Post-Analysis Point



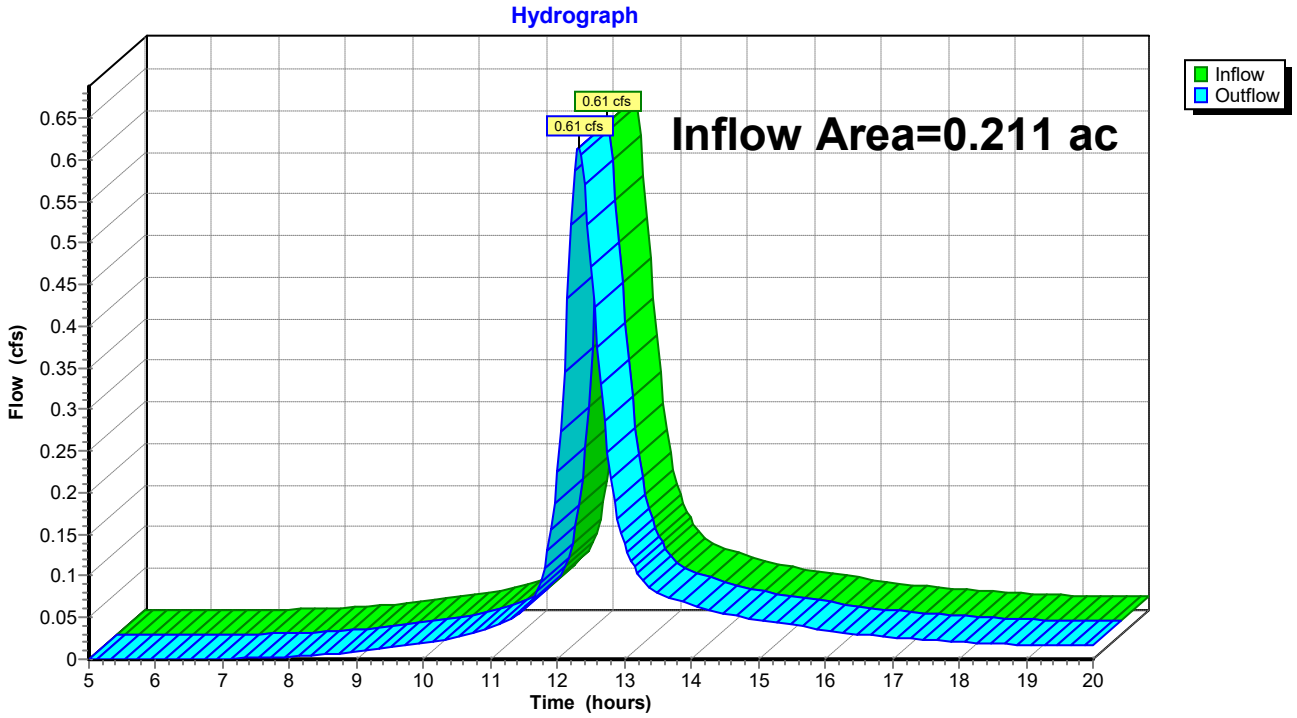
## Summary for Reach Pre: Pre Analysis Point

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.211 ac, 7.72% Impervious, Inflow Depth > 3.65" for 25-yr event
Inflow = 0.61 cfs @ 12.31 hrs, Volume= 0.064 af
Outflow = 0.61 cfs @ 12.31 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach Pre: Pre Analysis Point

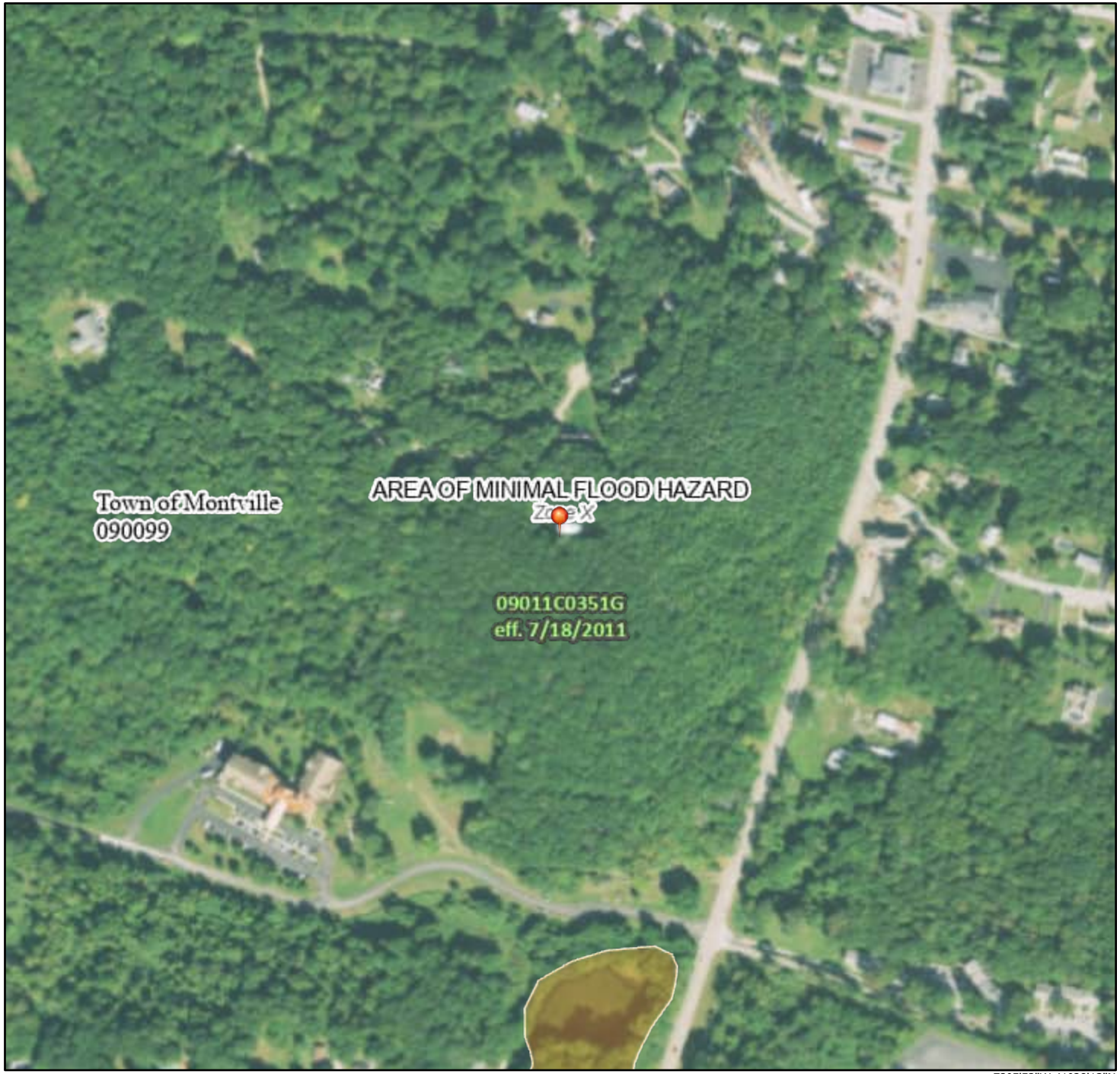


# FIRMette Map

# National Flood Hazard Layer FIRMette

FEMA

72°6'30"W 41°28'40"N




72°5'53"W 41°28'13"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

*Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/29/2022 at 12:21 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

NRCS Web Soil Survey

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

## Cook Hill Tank - Montville, CT


May 3, 2022

# Custom Soil Resource Report
## Soil Map


Map Scale: 1:748 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 21, Sep 7, 2021

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

Date(s) aerial images were photographed: Data not available.

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 |
|---|---|---|---|
| 44B | Rainbow silt loam, 2 to 8 percent slopes, very stony | 1.9 | 66.3% |
| 73E | Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky | 1.0 | 33.7% |
| **Totals for Area of Interest** | | **2.9** | **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

## 44B—Rainbow silt loam, 2 to 8 percent slopes, very stony

### Map Unit Setting

*National map unit symbol:* 9lnp
*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

*Rainbow and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Rainbow

#### Setting

*Landform:* Hills, drumlins
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Parent material:* Eolian deposits over coarse-loamy lodgment till derived from gneiss and/or schist and/or sandstone and/or basalt

#### Typical profile

*Ap - 0 to 6 inches:* silt loam
*Bw1 - 6 to 18 inches:* silt loam
*Bw2 - 18 to 26 inches:* silt loam
*2Cd - 26 to 65 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 3 to 8 percent
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* 20 to 40 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 18 to 30 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Low (about 4.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* C
*Ecological site:* F144AY037MA - Moist Dense Till Uplands
*Hydric soil rating:* No

### Minor Components

#### Sutton

*Percent of map unit:* 5 percent

*Landform:* Drainageways, depressions
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Broadbrook**

*Percent of map unit:* 5 percent
*Landform:* Till plains, hills, drumlins
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Hydric soil rating:* No

**Unnamed, nonstony surface**

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

**Woodbridge**

*Percent of map unit:* 2 percent
*Landform:* Hills, drumlins
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Ridgebury**

*Percent of map unit:* 2 percent
*Landform:* Drainageways, depressions
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Wilbraham**

*Percent of map unit:* 2 percent
*Landform:* Drainageways, depressions
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* Yes

**Narragansett**

*Percent of map unit:* 2 percent
*Landform:* Till plains, hills
*Down-slope shape:* Linear
*Across-slope shape:* Convex
*Hydric soil rating:* No

## 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
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* More than 80 inches
*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 supply, 0 to 60 inches:* Low (about 5.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* B
*Ecological site:* F144AY034CT - Well Drained Till Uplands
*Hydric soil rating:* No

**Description of Chatfield**

**Setting**

*Landform:* Ridges, hills
*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
*Surface area covered with cobbles, stones or boulders:* 1.6 percent
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock
*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 supply, 0 to 60 inches:* Low (about 3.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* B
*Ecological site:* F144AY034CT - Well Drained Till Uplands
*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:* Drainageways, depressions
*Down-slope shape:* Concave
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Leicester**

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

**Hollis**

*Percent of map unit:* 3 percent
*Landform:* Ridges, hills
*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