STORMWATER MANAGEMENT PLAN

DRAINAGE ANALYSIS
&
EROSION & SEDIMENT CONTROL PLAN

Prepared for:

Paul Thibodeau
76 Young Road
Barrington, NH 03825

Land of:

Tax Map 240, Lot 8

Young Road, LLC.
76 Young Road
Barrington, NH 03825

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Berry Surveying & Engineering
335 Second Crown Point Road
Barrington, NH 03825

Project Number:
DB 2022-109

September 19, 2023
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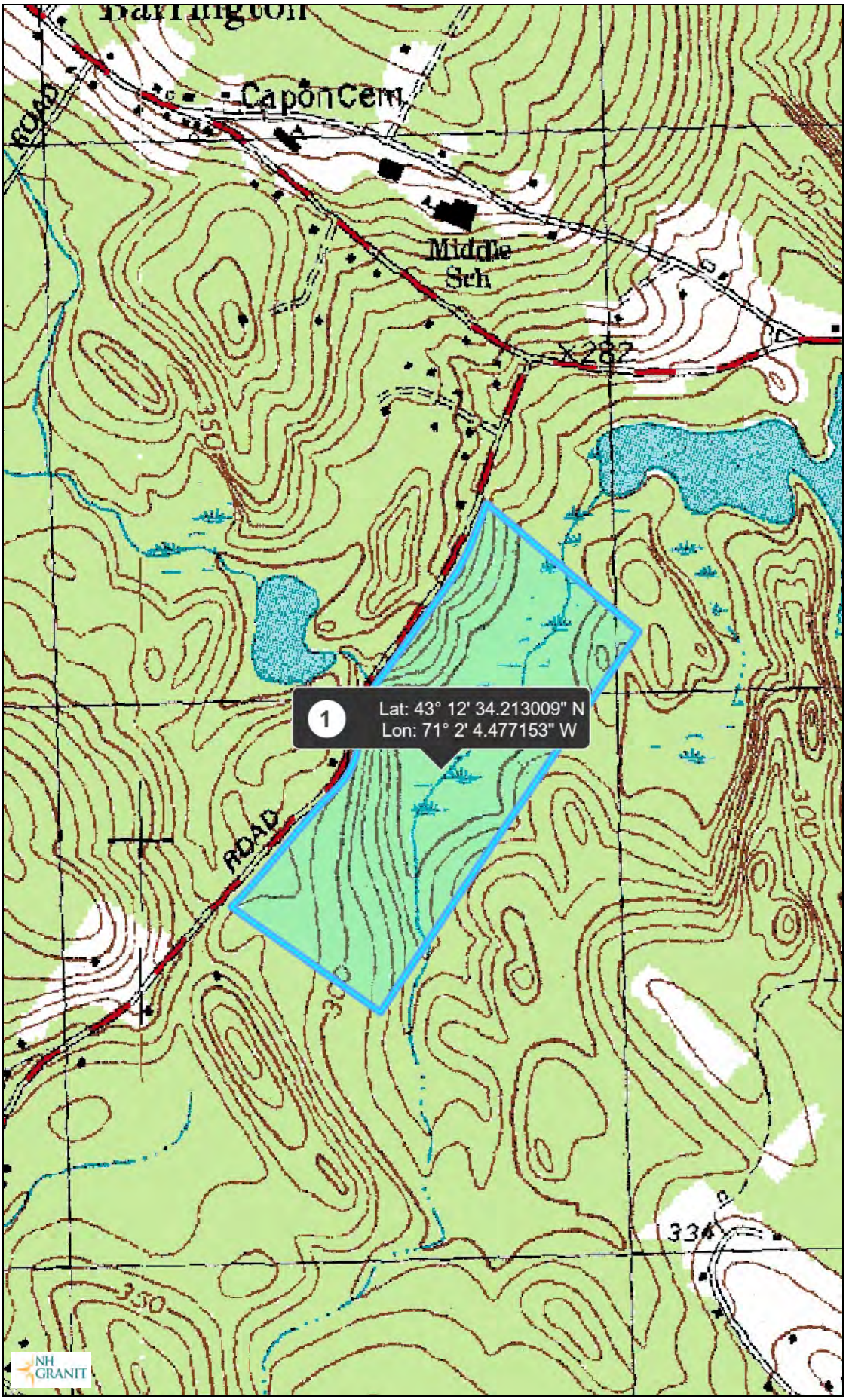
Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

1: 10,000

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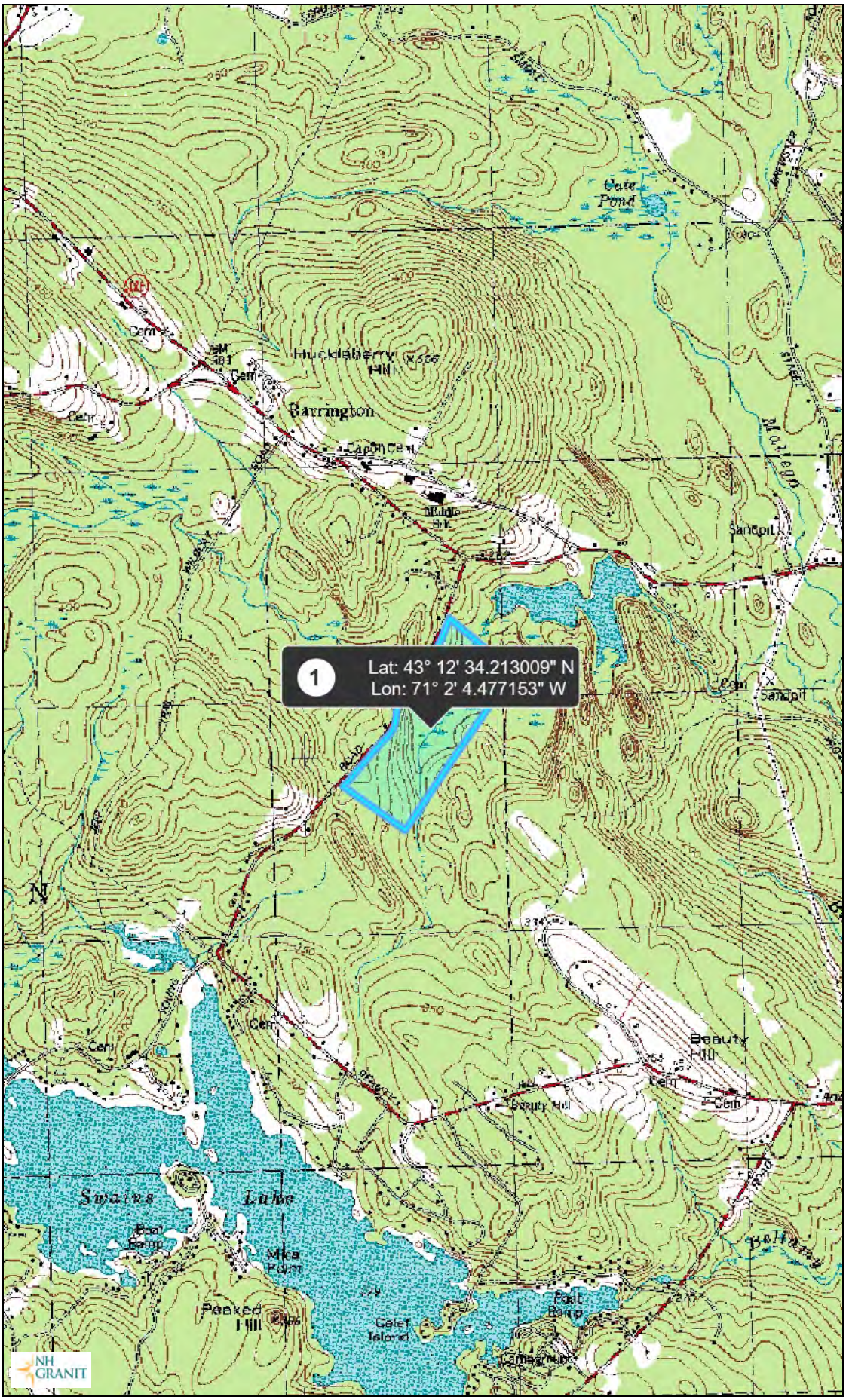

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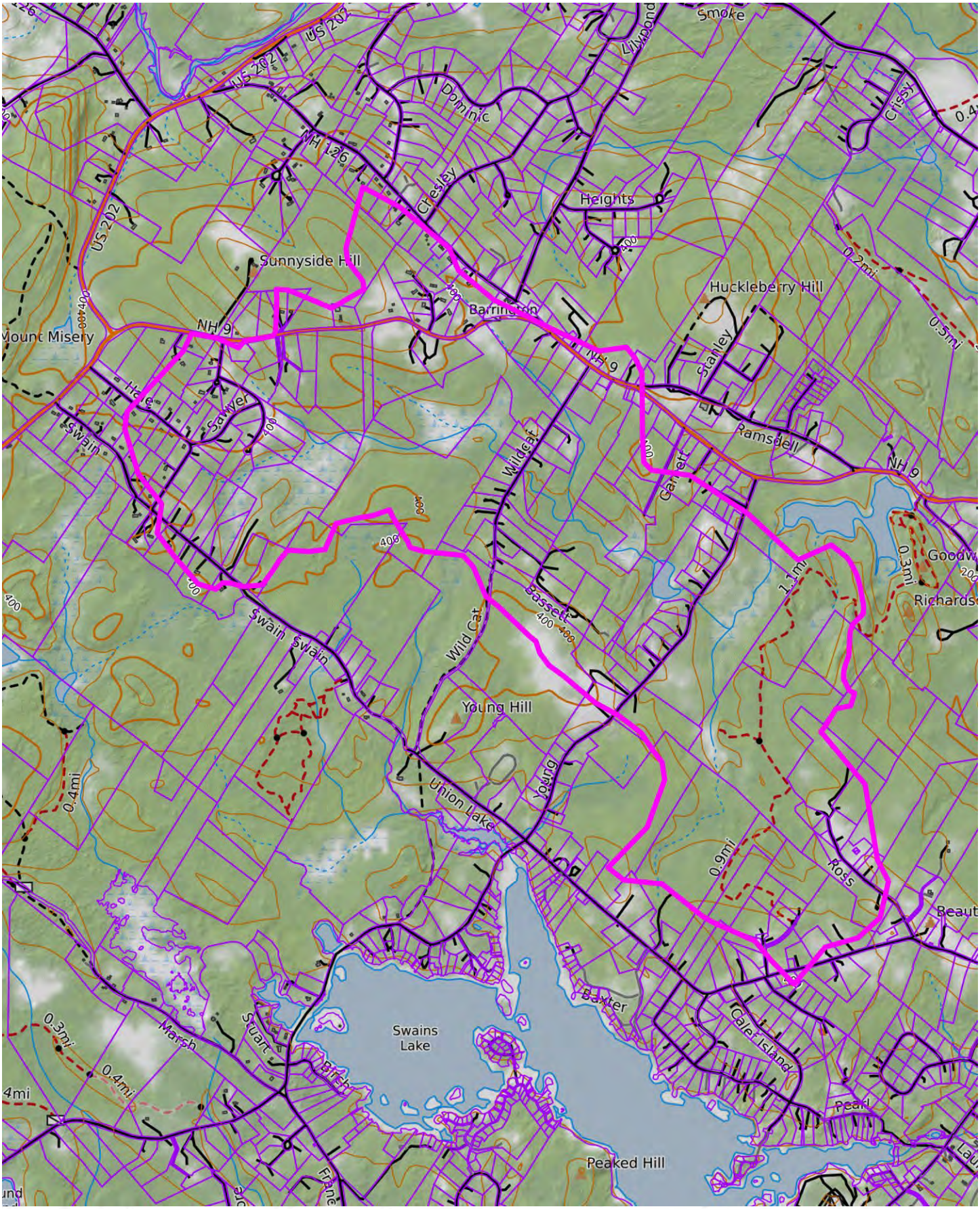


Mercator Projection
WGS84
UTM Zone 19T

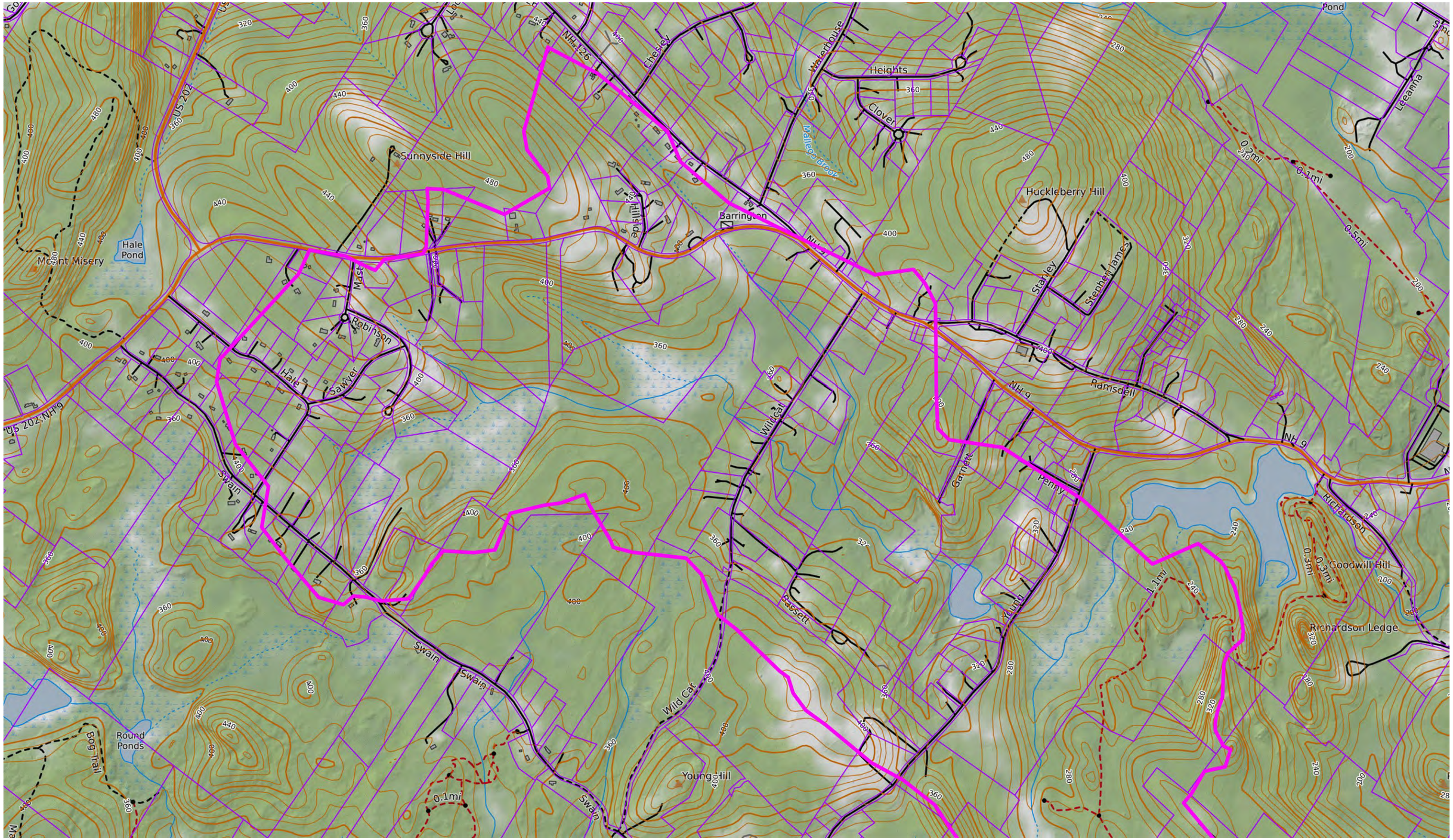
CALTOPO

0.5 1.0 1.5 2.0 2.5 km

0.5 1.0 1.5 mi

Parcels (c) LandGrid Scale **1:24000** 1 inch = 2000 feet

MN
-14.3º



Mercator Projection
WGS84
UTM Zone 19T

CALTOPO

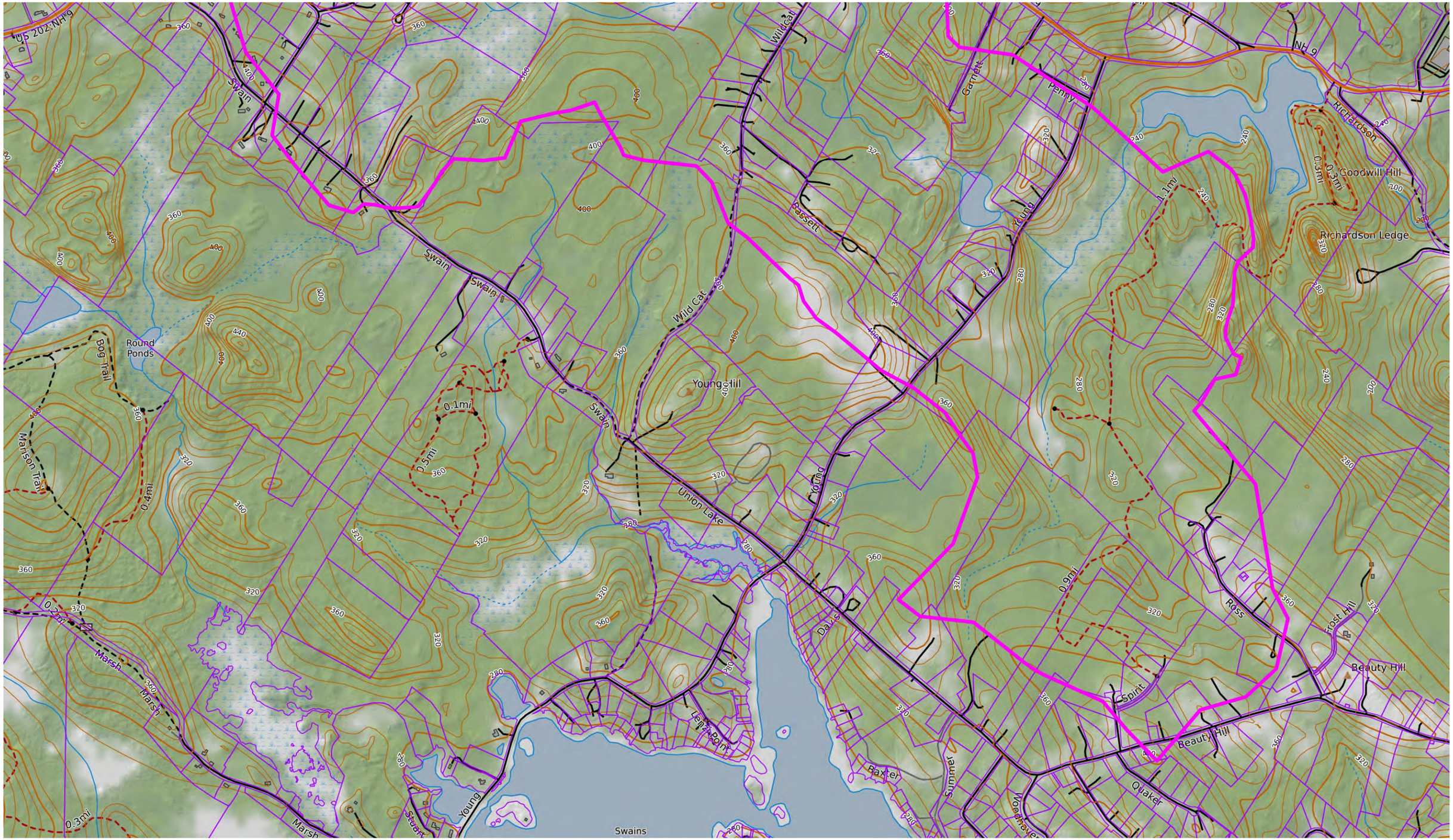
Parcels (c) LandGrid

1 2 3 km

0.5 1.0 1.5 mi

Scale **1:12000** 1 inch = 1000 feet

MN
-14.3°



Mercator Projection
WGS84
UTM Zone 19T

CALTOPO

Parcels (c) LandGrid

1 2 3 km

0.5 1.0 1.5 mi

Scale **1:12000** 1 inch = 1000 feet

MN
-14.3º

DESIGN METHOD OBJECTIVES

The owners of Tax Map 240, Lot 8, Young Road, LLC., and Paul Thibodeau, are proposing to develop the property on Young Road. Lot 8 is currently vacant land.

This drainage analysis is somewhat atypical in the total area that is being analyzed and the level of detail in the analysis. In this case the watershed was looked at in two different formats. The first was by utilizing the USGS StreamStats analysis tool which resulted in the watershed being defined as 1.93 square mile, or 1,235 acres. The second form of analysis utilized the more traditional method outlined below utilizing the USDA SCS TR-20 method in the HydroCAD Stormwater Modeling System and utilizing USDA NRCS Websoil soil definitions. The HydroCAD model delineated a watershed area of 1,263 acres, more conservative by 4%. Although the StreamStats analysis takes into consideration ponding within a watershed and this was not modelled in the HydroCAD environment, neither method, in this case, take into consideration any impoundment upstream that might result from cross culverts and land development. The watershed area takes into consideration area on both sides of several roadways to include Franklin Pierce Highway, Hale, Sawyer, Robinson, and Mast Drive, and Wildcat Road. There are also no provisions within StreamStats to run a proposed drainage model.

Existing and Proposed Conditions analyses were conducted for the purpose of estimating the peak rate of stormwater run-off to evaluate the effect of the proposed subdivision. There is one existing drainage discharge point which was identified in the existing analysis and duplicated in the proposed conditions analysis. Evaluating two watershed models we have compared the differences in these rates of peak run-off and surface water volume. Sheet W-1, Existing Conditions Watershed Plan, outlines the characteristics of the site in its existing or pre-construction conditions. The second analysis displays the proposed (post-construction) conditions (See Sheet W-2). The analysis was conducted using data for; 2 Yr-24 Hr (3.05”), 10 Yr-24 Hr (4.60”), 25 Yr-24 Hr (5.81”), 50 Yr-24 Hr (6.94”), and 100 YR-24 Hr (8.29”) storm events. Storm event analysis was accomplished using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. Rainfall quantities are based on the Extreme Precipitation Table for this location from the Northeast Regional Climate Center / Cornell University (http://precip.eas.cornell.edu).

1.0 Existing Conditions Analysis:

Reference: Sheet W1 - Existing Conditions Watershed Plan (Enclosed)
Existing Conditions Plan

The existing watershed currently consist of mostly vacant land, roadways, and single family home and accessory structures, the soils within the development area are made up of multiple soil types, containing Hydrologic Soil Group (HSG) A, B, C & D including thirty-nine different soil and slope definitions. See the provided USDA NRCS Websoil Soils Report for more information. The land cover types involved are grass land, woods, roofs, and paved or gravel roads.

The land area analyzed consists of 1,263 acres, all evaluated as Subcatchment #1. The point of analysis, Final Reach #100, is just down stream of the Locus Parcel where the wetland and channel flow into the more open water of the Richardson Pond. This pond discharges into the Mallego Brook.

The Time of Concentration for the watershed was calculated as 286 minutes and consisted of twenty-three segments at a total length of 9,776 linear feet. The watershed area covers land area to the north as far as Church Street and Franklin Pierce Highway, crosses Wildcat Road and Young Road, and touches Beauty Hill Road in the southeast corner, to include a portion of Ross Road. There is one major culvert crossing under Young Road.

The watershed consists of 90.33% pervious area and 9.67% impervious area with the USDS NRCS Weighted Curve Number of 56.

2.0 Proposed Conditions Analysis:

Reference: Sheet W2 - Proposed Conditions Watershed Plan (Enclosed)
Proposed Grading & Drainage Plan
Erosion & Sediment Control Details

The proposed watershed and analysis are the same as the existing watershed and analysis with the addition of the twenty-three residential lots, including houses and driveways.

The watershed consists of 90.06% pervious area and 9.94% impervious area with the USDS NRCS Weighted Curve Number of 56.

3.0 FULL COMPARATIVE ANALYSIS

ANALYSIS COMPONENT: PEAK RATE DISCHARGE (Cubic Feet / Second)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing	33.75	141.11	264.31	401.33	583.92
	Proposed	33.75	141.11	264.31	401.33	583.92

ANALYSIS COMPONENT: VOLUME (Acre Feet)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #900	Existing	19.923	76.455	137.379	203.763	292.122
	Proposed	19.923	76.455	137.379	203.763	292.122

USGS StreamStats DISCHARGE (Cubic Feet / Second)

		2 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Final Reach #100	Existing		140	193	237	291

The StreamStats report gives results in percent storm probability. (10-percent AEP flood is equivalent to the 10 YR – 24 HR Storm Event and the 1-percent AEP flood is equivalent to the 100 YR – 24 HR Storm Event.

4.0 EROSION and SEDIMENT CONTROL PLAN & BEST MANAGEMENT PRACTICES (BMP's)

Reference: Proposed Grading Plan and E&SC Plan
Erosion & Sediment Control Details

The proposed site development is protected from erosion and the abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual, Volume 2, Post-Construction Best Management Practices Selection & Design (December 2008, NHDES & US EPA). Any area disturbed by construction will be re-stabilized within 30 days and abutting properties will not be adversely affected by this development. All swales will be constructed and stabilized prior to having run-off directed to them.

Perimeter Control (Silt Fence / SiltSoxx / Erosion Control Mix Berm)

The plan set demonstrates the location of perimeter sediment control. The Erosion and Sediment Control Details, Sheet E-101, has the specifications for installation and maintenance of the silt fence, Filtrexx mulch filled SiltSoxx (or approved equal), and Erosion Control Mix Berm. There are locations on the site, for example check dams, where SiltSoxx protection is specified. The contractor has the option of stone check dams or SiltSoxx check dams as specified in the construction details.

Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of breaking ground. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specification and on Sheet E-102 using seeding mixture C, as follows:

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Conservation Mix

Virginia Wild Rye	Native	FACW-
Little Bluestem	Native	FACU
Big Bluestem	Native	FAC
Red Fescue	Native	FACU
Switch Grass	Native	FAC
Partridge Pea	Native	FACU

Showy Tick Trefoil	Native	FAC
Butterfly Milkweed	Native	NI
Beggar Ticks	Native	FACW
Purple Joe Pye Weed	Native	FAC
Black Eyed Susan	Native	FACU-
Total	**25**	**0.57**

Conservation Mix to be provided by New England Wetland Plants, Inc., Amherst, MA as outline in their New England Conservation / Wildlife Mix or approved equal. Mix to be applied at a rate of 25 lbs. per acre or one-lb. per 1750 square feet. Ratio of seed is proprietary and substitutions are not allowed. Conservation Mix will be used to stabilize all 2:1 slopes.

Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be 3” coarse aggregate, and the pad itself constructed to a minimum length of 75’ for the full width of the access road. The minimum length can be reduced to 50’ with an entrance berm. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Sheet E-101- Erosion & Sediment Control Detail Plan. (If applicable).

Environmental Dust Control

Dust will be controlled on the site by the use of multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

Vegetated Filter Strips / Buffers

Filter strips are areas of land with natural or planted vegetation designed to receive sheet run-off from up gradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Filter strips should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet E-102 using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions (If applicable).

Construction Sequence

1.) Cut and remove trees in construction area only as required, relocate any project T.B.M.

2.) Construct and/or install temporary and permanent sediment erosion control measures as specified. Erosion and sediment control measures shall be installed prior to any soil land disturbance.

3.) Erosion, sediment and conveyance control measures shall be installed & stabilized prior to directing runoff to them. Temporary diversions may be required.

4.) Clear, cut and dispose of debris in approved facility.

5.) Construct temporary culverts as required, or directed.

6.) Construct driveways for access to desired construction areas. All driveways shall be stabilized immediately.

7.) Start building construction.

8.) Install pipe and construction associated appurtenances as required or directed. All disturbed areas shall stabilized immediately after grading.

9.) Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded or mulched as required, or directed. No area is allowed to be disturbed for a length of time that exceeds 30 days before being stabilized. Daily, or as required. All driveways shall be stabilized within 72 hours of

achieving finished grades. All cut and fill slopes shall be stabilized within 72 hours of achieving finished grades. Limit the length of exposure of unstabilized soil to 30 days or less.

10.) Construct temporary berms, drains ditches, silt fences, sediment traps, etc. Mulch and seed as required.

11.) Inspect and maintain all erosion and sediment control measures during construction. Erosion and sediment control practices are to be inspected weekly and after 0.5" of rainfall.

12.) Complete permanent seeding and landscaping.

13.) Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete.

14.) Smooth and revegetate all disturbed areas.

15.) Finish paving all driveways as desired.

Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.

2. Erosion, sediment control measures shall be installed as shown on the plans and at locations as required, or directed by the engineer.

3. All disturbed areas shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4” of loam and seeded with not less than 1.10 pound of seed per 1,000 square feet (48 pounds per acre) of area.

4. Silt fences and other barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired, sediment deposits shall periodically be removed and properly disposed of.

5. After all disturbed areas have been stabilized, the temporary erosion control measures are to be removed and the area disturbed by the removal smoothed and re-vegetated.

6. Areas must be seeded and mulched within 5 days of final grading, permanently stabilized within 15 days of final grading, or temporarily stabilized within 30 days of initial disturbance of soil.

Inspection and Maintenance Schedule

Perimeter control and Best Management Practices will be inspected during and after storm events to ensure that the practice still has integrity and is not allowing sediment to pass. See the Erosion and Sediment Control Detail Plans for specific inspection and maintenance criteria.

5.0 CONCLUSION

Peak rates of runoff and volume are modeled to be equal in the post-construction analysis / condition, as compared to the pre-construction peak rates of runoff and volume during all storm events.

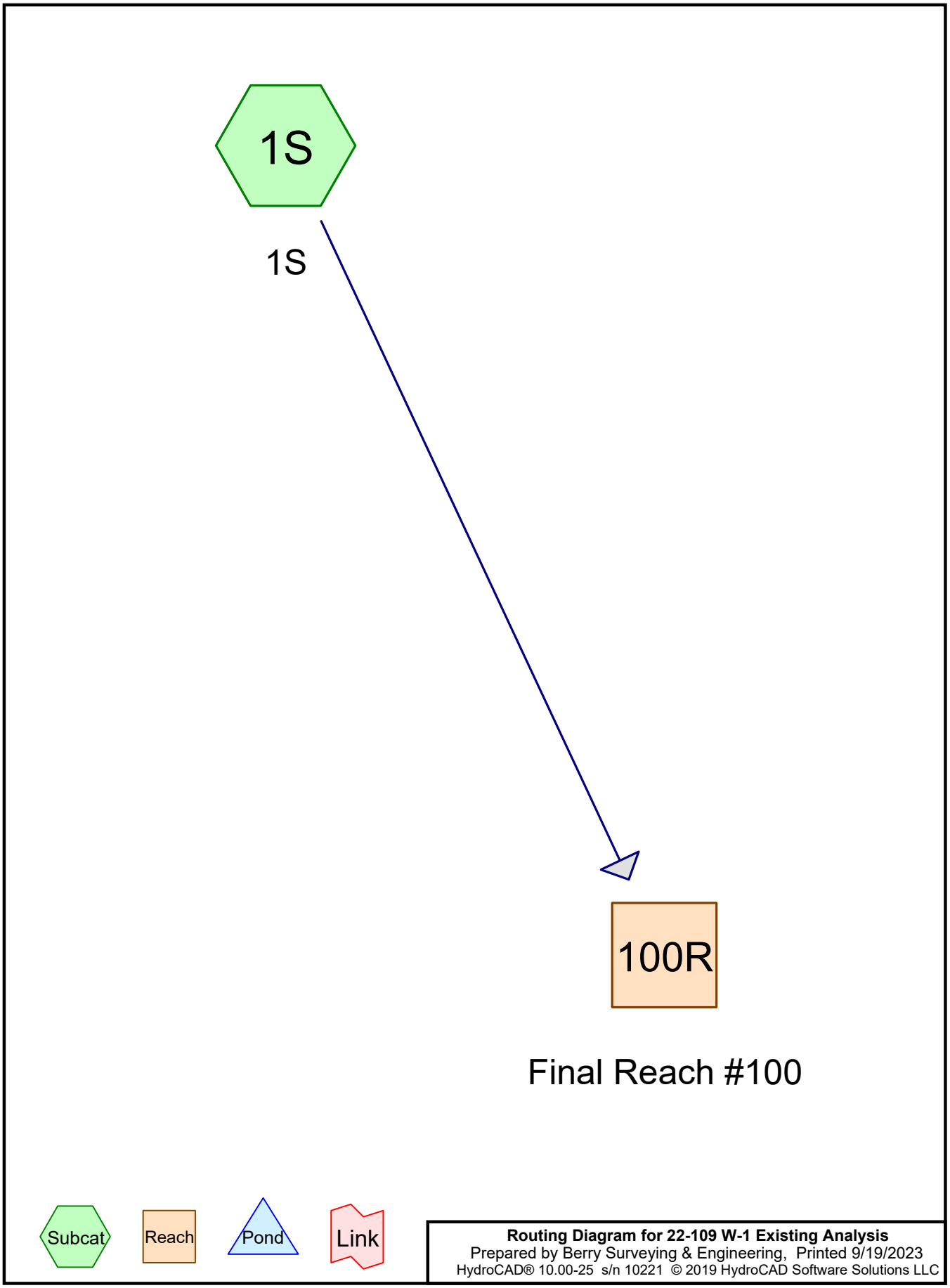
Respectfully Submitted,
BERRY SURVEYING & ENGINEERING

Christopher R. Berry, SIT 567
Principal, President

Kenneth A. Berry PE, LLS,
CPSWQ, CPESC, CESSWI
Principal, VP - Technical Operations

Appendix I - Existing Conditions Analysis

25 Yr - 24 Hr. Full Summary
2 Yr - 24 Hr. Node Listing
10 Yr -24 Hr. Node Listing
25 Yr -24 Hr. Node Listing
50 Yr -24 Hr. Node Listing
100 Yr - 24 Hr. Node Listing



Routing Diagram for 22-109 W-1 Existing Analysis
Prepared by Berry Surveying & Engineering, Printed 9/19/2023
HydroCAD® 10.00-25 s/n 10221 © 2019 HydroCAD Software Solutions LLC

Project Notes

CarlsonSurface||
RationalHydrographMethod|2|
ModifiedRational|5|1.00|1.00|1.00|
UnitHydrographMethod|1|

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
35.478	39	>75% Grass cover, Good HSG A (1S)
21.161	61	>75% Grass cover, Good HSG B (1S)
44.540	74	>75% Grass cover, Good HSG C (1S)
6.322	80	>75% Grass cover, Good HSG D (1S)
5.027	96	Gravel surface, HSG A (1S)
3.384	96	Gravel surface, HSG B (1S)
1.789	96	Gravel surface, HSG C (1S)
0.867	96	Gravel surface, HSG D (1S)
8.794	98	Paved parking HSG A (1S)
2.334	98	Paved parking HSG B (1S)
10.326	98	Paved parking HSG C (1S)
2.495	98	Paved parking HSG D (1S)
3.530	98	Roofs HSG A (1S)
0.981	98	Roofs HSG B (1S)
3.333	98	Roofs HSG C (1S)
0.544	98	Roofs HSG D (1S)
4.356	98	Water Surface HSG A (1S)
12.498	98	Water Surface HSG B (1S)
1.070	98	Water Surface HSG C (1S)
71.867	98	Water Surface HSG D (1S)
442.553	30	Woods, Good HSG A (1S)
259.014	55	Woods, Good HSG B (1S)
170.097	70	Woods, Good HSG C (1S)
150.682	77	Woods, Good HSG D (1S)
1,263.040	**56**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
499.737	HSG A	1S
299.372	HSG B	1S
231.154	HSG C	1S
232.776	HSG D	1S
0.000	Other	
1,263.040		**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
35.478	21.161	44.540	6.322	0.000	107.500	>75% Grass cover, Good	1S
5.027	3.384	1.789	0.867	0.000	11.066	Gravel surface	1S
8.794	2.334	10.326	2.495	0.000	23.949	Paved parking	1S
3.530	0.981	3.333	0.544	0.000	8.387	Roofs	1S
4.356	12.498	1.070	71.867	0.000	89.791	Water Surface	1S
442.553	259.014	170.097	150.682	0.000	1,022.346	Woods, Good	1S
499.737	**299.372**	**231.154**	**232.776**	**0.000**	**1,263.040**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: 1S Runoff Area=55,018,008 sf 9.67% Impervious Runoff Depth>1.31"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=264.31 cfs 137.379 af

Reach100R: Final Reach#100 Inflow=264.31 cfs 137.379 af
Outflow=264.31 cfs 137.379 af

Total Runoff Area = 1,263.040 ac Runoff Volume = 137.379 af Average Runoff Depth = 1.31"
90.33% Pervious = 1,140.913 ac 9.67% Impervious = 122.127 ac

Summary for Subcatchment 1S: 1S

CarlsonPlanXYPos|1151812.3297|261093.3900|

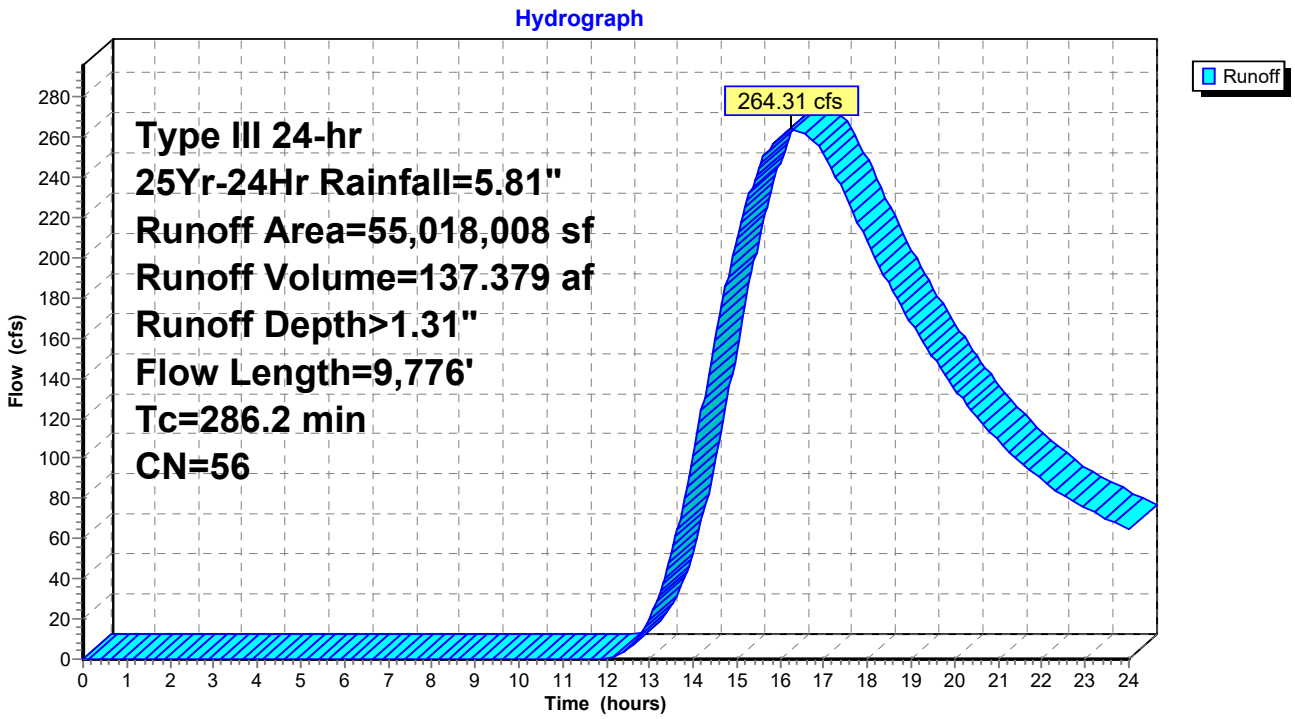
Runoff = 264.31 cfs @ 16.24 hrs, Volume= 137.379 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25Yr-24Hr Rainfall=5.81"

Area (sf)	CN	Description
153,751	98	Roofs HSG A
42,725	98	Roofs HSG B
145,176	98	Roofs HSG C
23,694	98	Roofs HSG D
1,545,405	39	>75% Grass cover, Good HSG A
921,767	61	>75% Grass cover, Good HSG B
1,940,170	74	>75% Grass cover, Good HSG C
275,367	80	>75% Grass cover, Good HSG D
383,064	98	Paved parking HSG A
101,685	98	Paved parking HSG B
449,781	98	Paved parking HSG C
108,672	98	Paved parking HSG D
19,277,593	30	Woods, Good HSG A
11,282,651	55	Woods, Good HSG B
7,409,442	70	Woods, Good HSG C
6,563,714	77	Woods, Good HSG D
189,750	98	Water Surface HSG A
544,416	98	Water Surface HSG B
46,599	98	Water Surface HSG C
3,130,536	98	Water Surface HSG D
218,969	96	Gravel surface, HSG A
147,414	96	Gravel surface, HSG B
77,919	96	Gravel surface, HSG C
37,748	96	Gravel surface, HSG D
55,018,008	56	Weighted Average
49,698,159		90.33% Pervious Area
5,319,849		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0600	0.12		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.05"
0.8	59	0.0639	1.26		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.5	59	0.0679	1.82		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
1.7	128	0.0644	1.27		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
0.0	13	0.0583	4.90		**Shallow Concentrated Flow, Segment #5** Paved Kv= 20.3 fps
1.5	118	0.0657	1.28		**Shallow Concentrated Flow, Segment #6** Woodland Kv= 5.0 fps
0.1	40	0.0620	5.05		**Shallow Concentrated Flow, Segment #7** Paved Kv= 20.3 fps
4.8	370	0.0655	1.28		**Shallow Concentrated Flow, Segment #8** Woodland Kv= 5.0 fps
0.6	84	0.1165	2.39		**Shallow Concentrated Flow, Segment #9** Short Grass Pasture Kv= 7.0 fps
1.6	165	0.1150	1.70		**Shallow Concentrated Flow, Segment #10** Woodland Kv= 5.0 fps
8.4	622	0.0611	1.24		**Shallow Concentrated Flow, Segment #11** Woodland Kv= 5.0 fps
3.3	171	0.0293	0.86		**Shallow Concentrated Flow, Segment #12** Woodland Kv= 5.0 fps
71.7	1,862	0.0075	0.43		**Shallow Concentrated Flow, Segment #13** Woodland Kv= 5.0 fps
104.1	1,249	0.0016	0.20		**Shallow Concentrated Flow, Segment #14** Woodland Kv= 5.0 fps
16.4	519	0.0111	0.53		**Shallow Concentrated Flow, Segment #15** Woodland Kv= 5.0 fps
0.3	30	0.0083	1.85		**Shallow Concentrated Flow, Segment #16** Paved Kv= 20.3 fps
4.1	182	0.0110	0.73		**Shallow Concentrated Flow, Segment 317** Short Grass Pasture Kv= 7.0 fps
1.4	91	0.0247	1.10		**Shallow Concentrated Flow, Segment #18** Short Grass Pasture Kv= 7.0 fps
12.1	604	0.0277	0.83		**Shallow Concentrated Flow, Segment #19** Woodland Kv= 5.0 fps
13.2	888	0.0056	1.12		**Shallow Concentrated Flow, Segment #20** Grassed Waterway Kv= 15.0 fps
13.9	978	0.0061	1.17		**Shallow Concentrated Flow, Segment #21** Grassed Waterway Kv= 15.0 fps
8.6	740	0.0091	1.43		**Shallow Concentrated Flow, Segment #22** Grassed Waterway Kv= 15.0 fps
2.9	704	0.0739	4.08		**Shallow Concentrated Flow, Segment #23** Grassed Waterway Kv= 15.0 fps
286.2	9,776	Total			

Subcatchment 1S: 1S



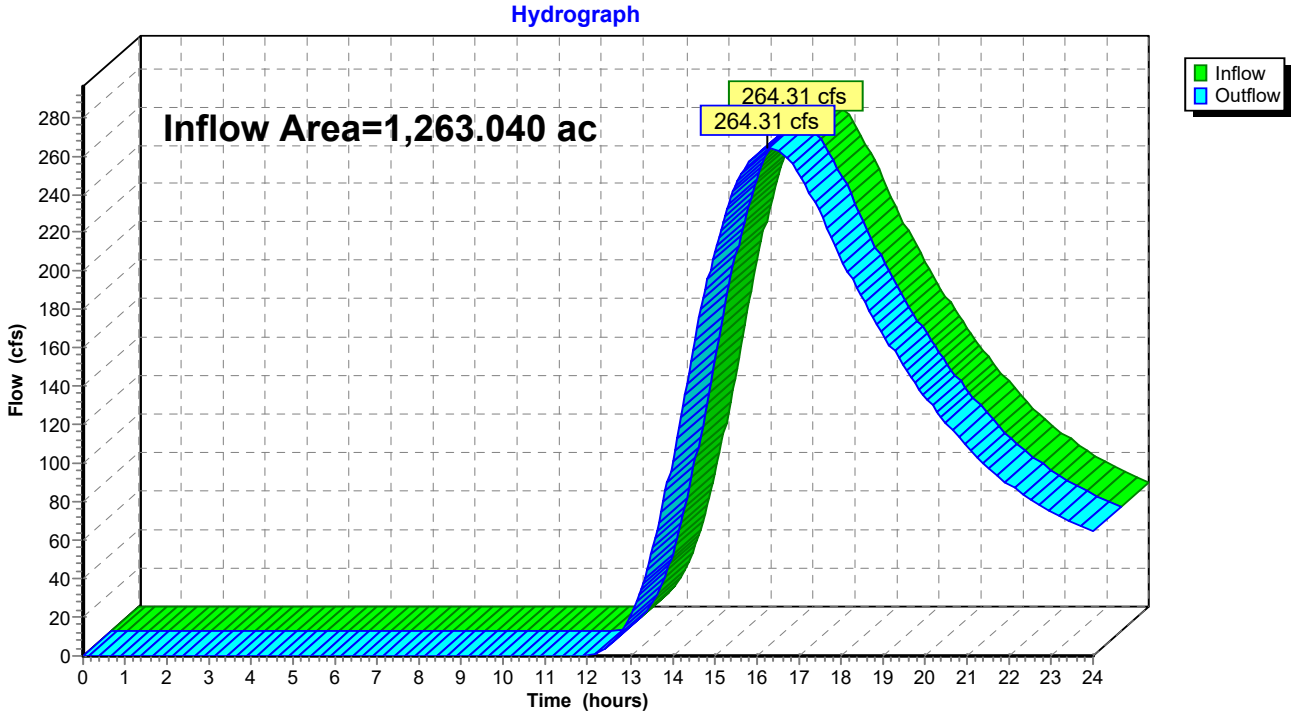
Summary for Reach 100R: Final Reach #100

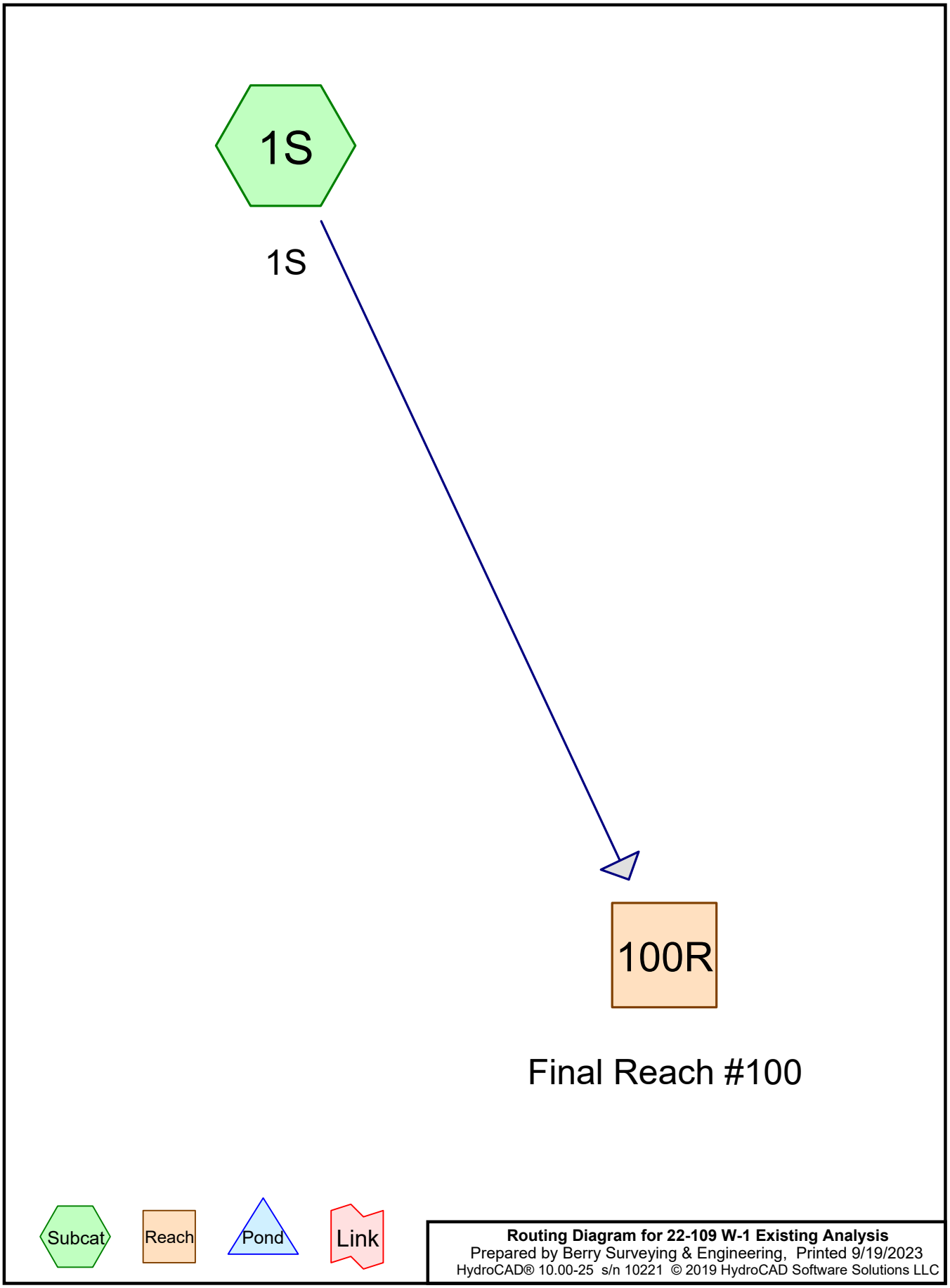
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,263.040 ac, 9.67% Impervious, Inflow Depth > 1.31" for 25Yr-24Hr event
Inflow = 264.31 cfs @ 16.24 hrs, Volume= 137.379 af
Outflow = 264.31 cfs @ 16.24 hrs, Volume= 137.379 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 100R: Final Reach #100





Routing Diagram for 22-109 W-1 Existing Analysis
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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: 1S Runoff Area=55,018,008 sf 9.67% Impervious Runoff Depth>0.19"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=33.75 cfs 19.923 af

Reach100R: Final Reach#100 Inflow=33.75 cfs 19.923 af
Outflow=33.75 cfs 19.923 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: 1S Runoff Area=55,018,008 sf 9.67% Impervious Runoff Depth>0.73"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=141.11 cfs 76.455 af

Reach100R: Final Reach#100 Inflow=141.11 cfs 76.455 af
Outflow=141.11 cfs 76.455 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: 1S Runoff Area=55,018,008 sf 9.67% Impervious Runoff Depth>1.31"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=264.31 cfs 137.379 af

Reach100R: Final Reach#100 Inflow=264.31 cfs 137.379 af
Outflow=264.31 cfs 137.379 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: 1S Runoff Area=55,018,008 sf 9.67% Impervious Runoff Depth>1.94"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=401.33 cfs 203.763 af

Reach100R: Final Reach#100 Inflow=401.33 cfs 203.763 af
Outflow=401.33 cfs 203.763 af

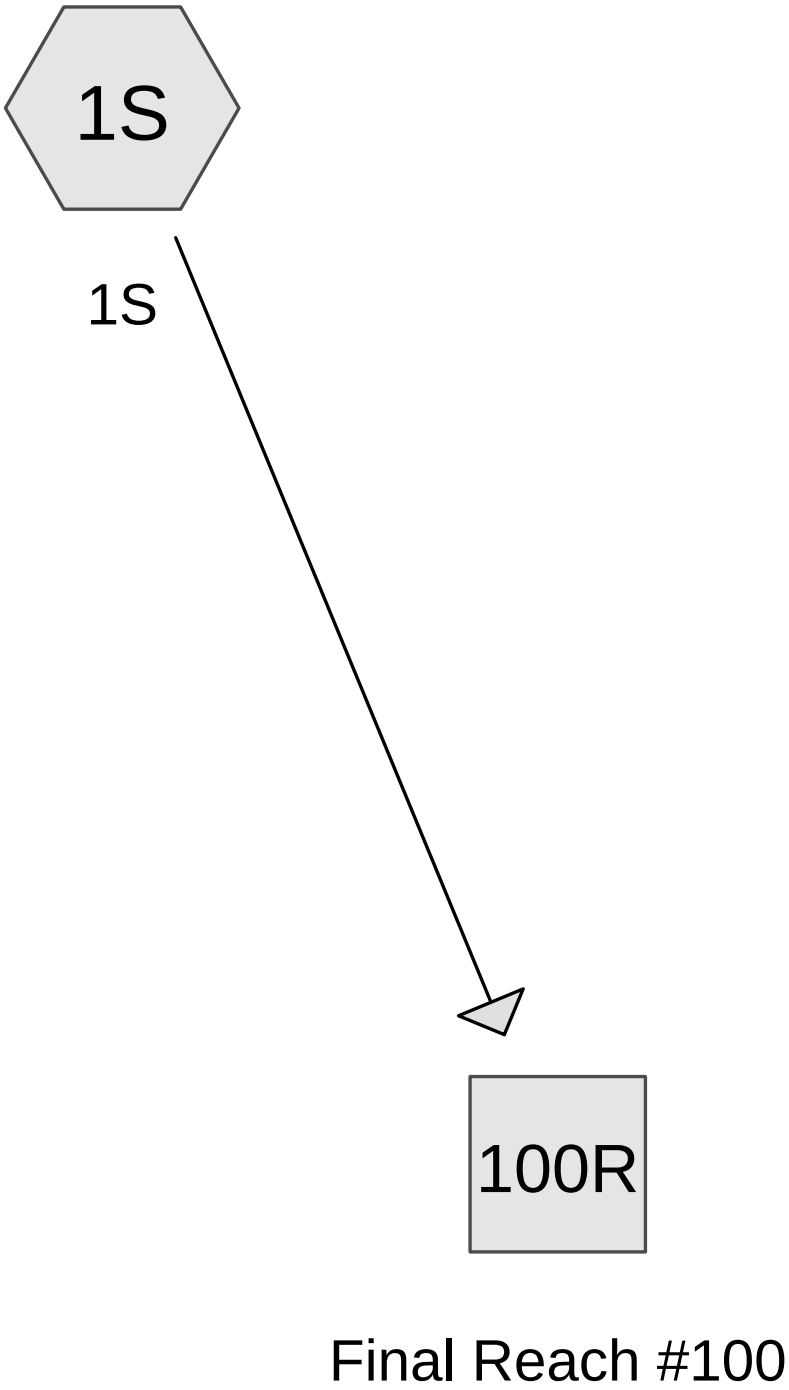
Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

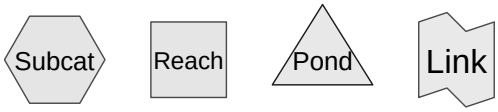
Subcatchment1S: 1S Runoff Area=55,018,008 sf 9.67% Impervious Runoff Depth>2.78"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=583.92 cfs 292.122 af

Reach100R: Final Reach#100 Inflow=583.92 cfs 292.122 af
Outflow=583.92 cfs 292.122 af

Appendix II - Proposed Conditions Analysis

25 Yr - 24 Hr. Full Summary
2 Yr - 24 Hr. Node Listing
10 Yr -24 Hr. Node Listing
25 Yr -24 Hr. Node Listing
50 Yr -24 Hr. Node Listing
100 Yr - 24 Hr. Node Listing





Routing Diagram for 22-109 W-2 Proposed Analysis
Prepared by Berry Surveying & Engineering, Printed 12/21/2023
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Project Notes

CarlsonSurface||
RationalHydrographMethod|2|
ModifiedRational|5|1.00|1.00|1.00|
UnitHydrographMethod|1|
Rainfall events imported from "22-109 W-1 Existing Analysis.hcp"

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
45.510	39	>75% Grass cover, Good HSG A (1S)
21.530	61	>75% Grass cover, Good HSG B (1S)
44.540	74	>75% Grass cover, Good HSG C (1S)
8.196	80	>75% Grass cover, Good HSG D (1S)
5.027	76	Gravel roads HSG A (1S)
3.384	85	Gravel roads HSG B (1S)
1.789	89	Gravel roads HSG C (1S)
0.867	91	Gravel roads, HSG D (1S)
10.272	98	Paved parking HSG A (1S)
2.640	98	Paved parking HSG B (1S)
10.326	98	Paved parking HSG C (1S)
2.852	98	Paved parking HSG D (1S)
4.571	98	Roofs HSG A (1S)
1.003	98	Roofs HSG B (1S)
3.333	98	Roofs HSG C (1S)
0.758	98	Roofs HSG D (1S)
4.356	98	Water Surface HSG A (1S)
12.498	98	Water Surface HSG B (1S)
1.070	98	Water Surface HSG C (1S)
71.867	98	Water Surface HSG D (1S)
430.001	30	Woods, Good HSG A (1S)
258.317	55	Woods, Good HSG B (1S)
170.097	70	Woods, Good HSG C (1S)
148.236	77	Woods, Good HSG D (1S)
1,263.040	**56**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
499.737	HSG A	1S
299.372	HSG B	1S
231.154	HSG C	1S
232.776	HSG D	1S
0.000	Other	
1,263.040		**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
45.510	21.530	44.540	8.196	0.000	119.777	>75% Grass cover, Good	1S
5.027	3.384	1.789	0.867	0.000	11.066	Gravel roads	1S
10.272	2.640	10.326	2.852	0.000	26.090	Paved parking	1S
4.571	1.003	3.333	0.758	0.000	9.664	Roofs	1S
4.356	12.498	1.070	71.867	0.000	89.791	Water Surface	1S
430.001	258.317	170.097	148.236	0.000	1,006.652	Woods, Good	1S
499.737	**299.372**	**231.154**	**232.776**	**0.000**	**1,263.040**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=55,018,008 sf 9.94% Impervious Runoff Depth>1.31"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=264.31 cfs 137.379 af

Reach 100R: Final Reach #100 Inflow=264.31 cfs 137.379 af
Outflow=264.31 cfs 137.379 af

Total Runoff Area = 1,263.040 ac Runoff Volume = 137.379 af Average Runoff Depth = 1.31"
90.06% Pervious = 1,137.495 ac 9.94% Impervious = 125.545 ac

Summary for Subcatchment 1S: 1S

CarlsonPlanXYPos|1153158.4476|260306.7175|

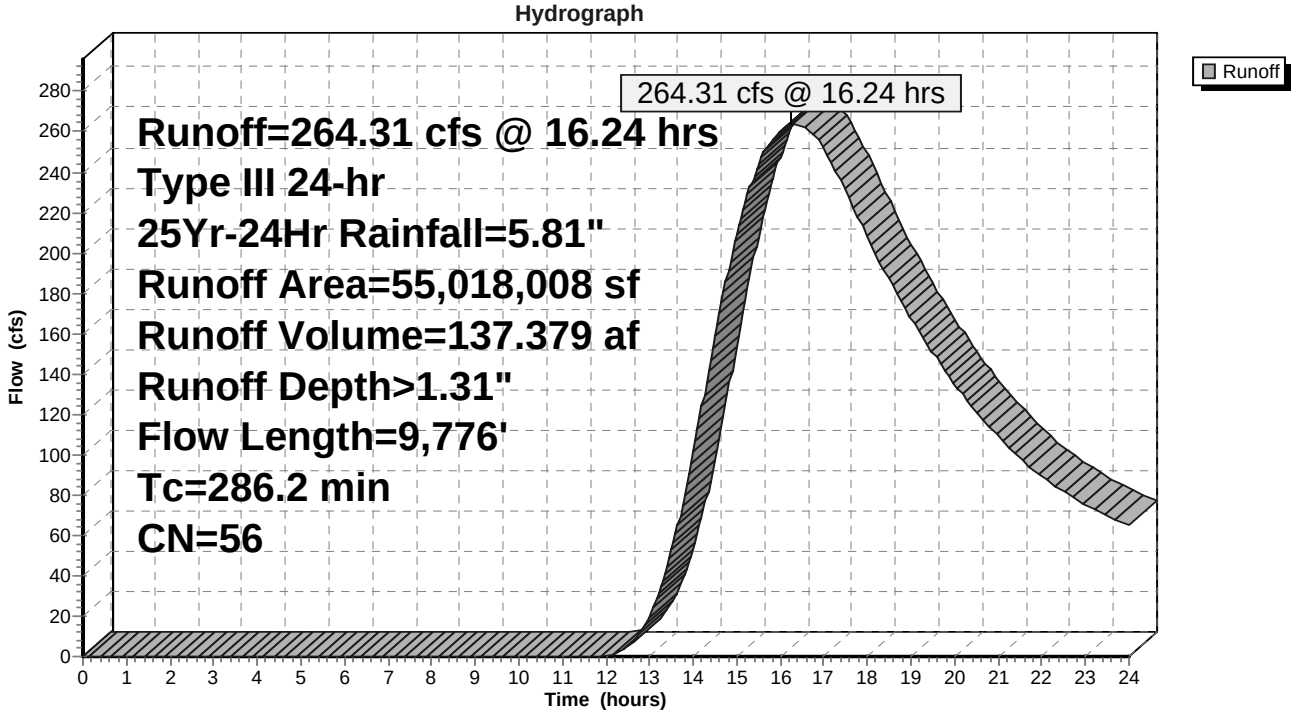
Runoff = 264.31 cfs @ 16.24 hrs, Volume= 137.379 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25Yr-24Hr Rainfall=5.81"

Area (sf)	CN	Description
199,092	98	Roofs HSG A
43,688	98	Roofs HSG B
145,176	98	Roofs HSG C
33,004	98	Roofs HSG D
1,982,435	39	>75% Grass cover, Good HSG A
937,833	61	>75% Grass cover, Good HSG B
1,940,170	74	>75% Grass cover, Good HSG C
357,028	80	>75% Grass cover, Good HSG D
447,434	98	Paved parking HSG A
115,020	98	Paved parking HSG B
449,781	98	Paved parking HSG C
124,234	98	Paved parking HSG D
18,730,852	30	Woods, Good HSG A
11,252,287	55	Woods, Good HSG B
7,409,442	70	Woods, Good HSG C
6,457,181	77	Woods, Good HSG D
189,750	98	Water Surface HSG A
544,416	98	Water Surface HSG B
46,599	98	Water Surface HSG C
3,130,536	98	Water Surface HSG D
218,969	76	Gravel roads HSG A
147,414	85	Gravel roads HSG B
77,919	89	Gravel roads HSG C
37,748	91	Gravel roads, HSG D
55,018,008	56	Weighted Average
49,549,278		90.06% Pervious Area
5,468,730		9.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	100	0.0600	0.12		**Sheet Flow, Segment #1** Woods: Light underbrush n= 0.400 P2= 3.05"
0.8	59	0.0639	1.26		**Shallow Concentrated Flow, Segment #2** Woodland Kv= 5.0 fps
0.5	59	0.0679	1.82		**Shallow Concentrated Flow, Segment #3** Short Grass Pasture Kv= 7.0 fps
1.7	128	0.0644	1.27		**Shallow Concentrated Flow, Segment #4** Woodland Kv= 5.0 fps
0.0	13	0.0583	4.90		**Shallow Concentrated Flow, Segment #5** Paved Kv= 20.3 fps
1.5	118	0.0657	1.28		**Shallow Concentrated Flow, Segment #6** Woodland Kv= 5.0 fps
0.1	40	0.0620	5.05		**Shallow Concentrated Flow, Segment #7** Paved Kv= 20.3 fps
4.8	370	0.0655	1.28		**Shallow Concentrated Flow, Segment #8** Woodland Kv= 5.0 fps
0.6	84	0.1165	2.39		**Shallow Concentrated Flow, segment #9** Short Grass Pasture Kv= 7.0 fps
1.6	165	0.1150	1.70		**Shallow Concentrated Flow, Segment #10** Woodland Kv= 5.0 fps
8.4	622	0.0611	1.24		**Shallow Concentrated Flow, Segment #11** Woodland Kv= 5.0 fps
3.3	171	0.0293	0.86		**Shallow Concentrated Flow, Segment #12** Woodland Kv= 5.0 fps
71.7	1,862	0.0075	0.43		**Shallow Concentrated Flow, Segment #13** Woodland Kv= 5.0 fps
104.1	1,249	0.0016	0.20		**Shallow Concentrated Flow, Segment #14** Woodland Kv= 5.0 fps
16.4	519	0.0111	0.53		**Shallow Concentrated Flow, Segment #15** Woodland Kv= 5.0 fps
0.3	30	0.0083	1.85		**Shallow Concentrated Flow, Segment #16** Paved Kv= 20.3 fps
4.1	182	0.0110	0.73		**Shallow Concentrated Flow, Segment #17** Short Grass Pasture Kv= 7.0 fps
1.4	91	0.0247	1.10		**Shallow Concentrated Flow, Segment #18** Short Grass Pasture Kv= 7.0 fps
12.1	604	0.0277	0.83		**Shallow Concentrated Flow, Segment #19** Woodland Kv= 5.0 fps
13.2	888	0.0056	1.12		**Shallow Concentrated Flow, Segment #20** Grassed Waterway Kv= 15.0 fps
13.9	978	0.0061	1.17		**Shallow Concentrated Flow, Segment #21** Grassed Waterway Kv= 15.0 fps
8.6	740	0.0091	1.43		**Shallow Concentrated Flow, Segment #22** Grassed Waterway Kv= 15.0 fps
2.9	704	0.0739	4.08		**Shallow Concentrated Flow, Segment #23** Grassed Waterway Kv= 15.0 fps
286.2	9,776	Total			

Subcatchment 1S: 1S



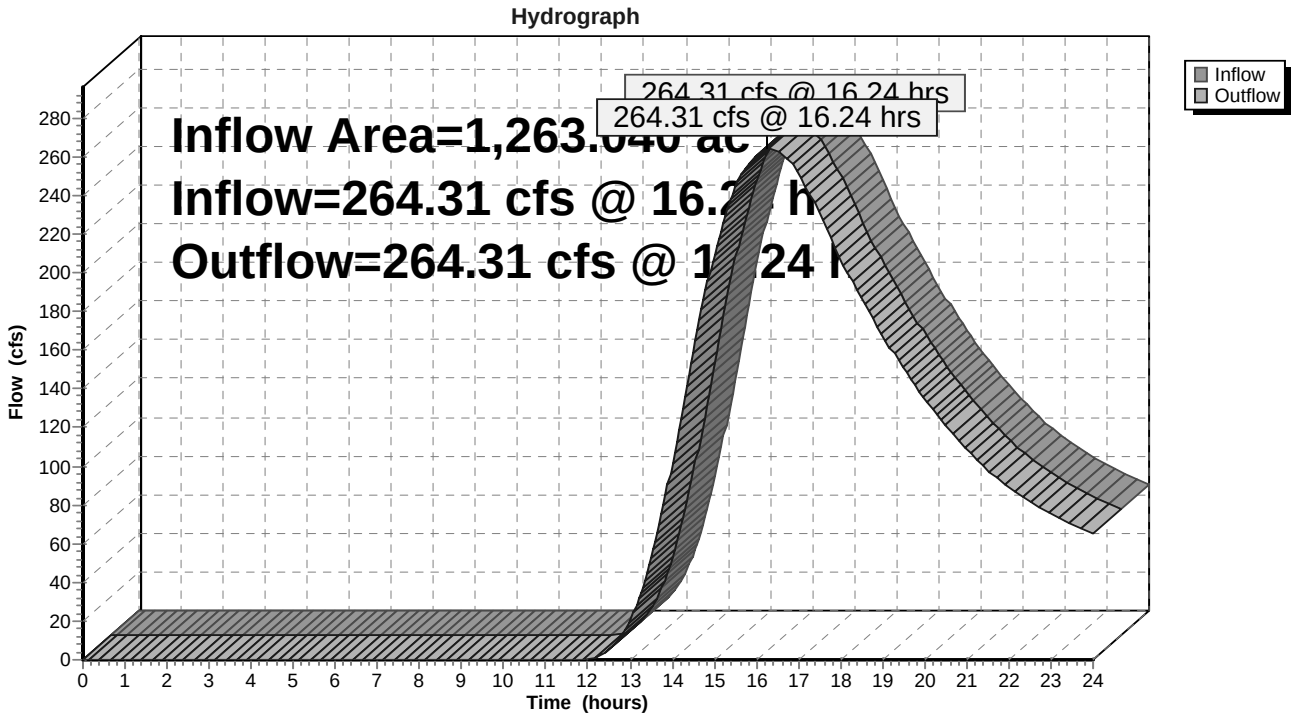
Summary for Reach 100R: Final Reach #100

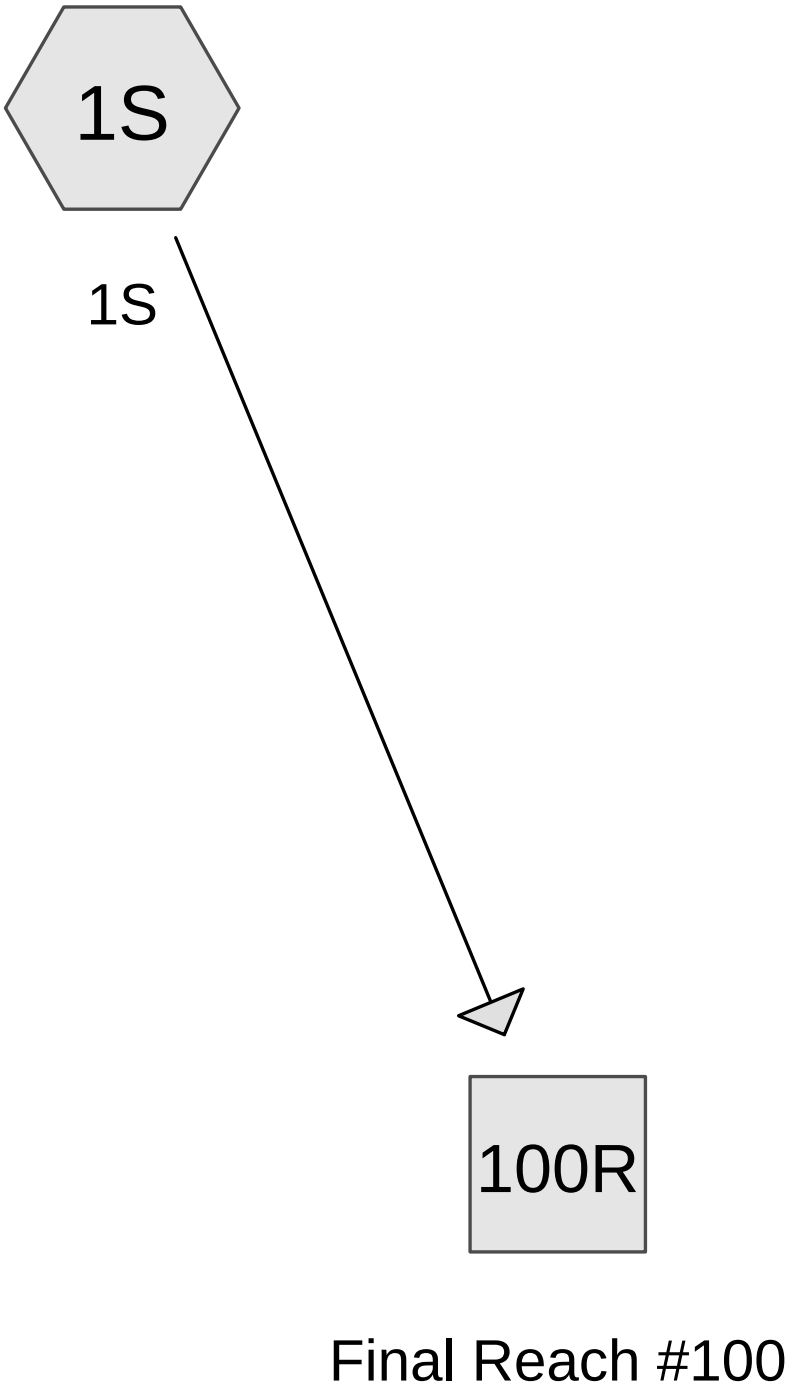
[40] Hint: Not Described (Outflow=Inflow)

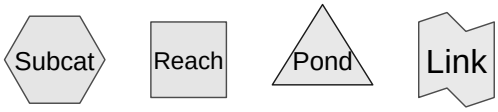
Inflow Area = 1,263.040 ac, 9.94% Impervious, Inflow Depth > 1.31" for 25Yr-24Hr event
Inflow = 264.31 cfs @ 16.24 hrs, Volume= 137.379 af
Outflow = 264.31 cfs @ 16.24 hrs, Volume= 137.379 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 100R: Final Reach #100







Routing Diagram for 22-109 W-2 Proposed Analysis
Prepared by Berry Surveying & Engineering, Printed 12/21/2023
HydroCAD® 10.00-25 s/n 10221 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=55,018,008 sf 9.94% Impervious Runoff Depth>0.19"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=33.75 cfs 19.923 af

Reach 100R: Final Reach #100 Inflow=33.75 cfs 19.923 af
Outflow=33.75 cfs 19.923 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
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Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=55,018,008 sf 9.94% Impervious Runoff Depth>0.73"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=141.11 cfs 76.455 af

Reach 100R: Final Reach #100 Inflow=141.11 cfs 76.455 af
Outflow=141.11 cfs 76.455 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=55,018,008 sf 9.94% Impervious Runoff Depth>1.31"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=264.31 cfs 137.379 af

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Outflow=264.31 cfs 137.379 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=55,018,008 sf 9.94% Impervious Runoff Depth>1.94"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=401.33 cfs 203.763 af

Reach 100R: Final Reach #100 Inflow=401.33 cfs 203.763 af
Outflow=401.33 cfs 203.763 af

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 1S Runoff Area=55,018,008 sf 9.94% Impervious Runoff Depth>2.78"
Flow Length=9,776' Tc=286.2 min CN=56 Runoff=583.92 cfs 292.122 af

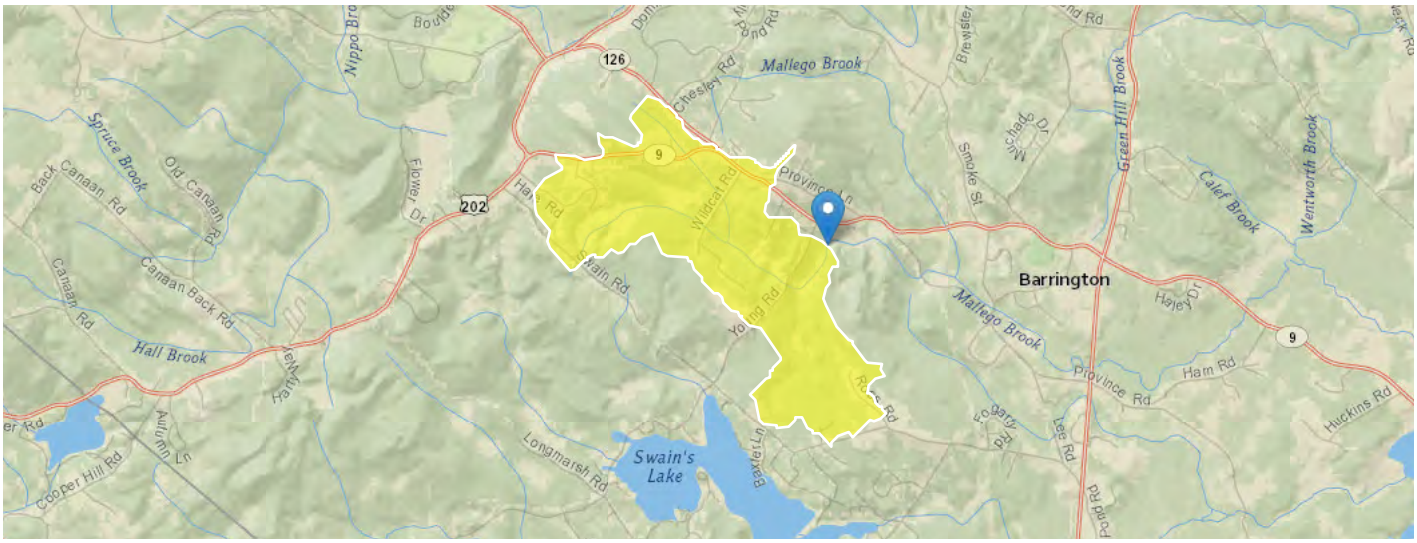
Reach 100R: Final Reach #100 Inflow=583.92 cfs 292.122 af
Outflow=583.92 cfs 292.122 af

Appendix III - Calculations, Charts, & Graphs

USGS StreamStats
Extreme Precipitation Tables
NCRS USDA Web-soil Map

StreamStats Report

Region ID: NH
Workspace ID: NH20230207204759981000
Clicked Point (Latitude, Longitude): 43.21378, -71.03120
Time: 2023-02-07 15:48:25 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
APRAVPRE	Mean April Precipitation	4.319	inches
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	63.7	feet per mi
DRNAREA	Area that drains to a point on a stream	1.93	square miles
WETLAND	Percentage of Wetlands	9.9214	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Statewide SIR2008 5206]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.93	square miles	0.7	1290
APRAVPRE	Mean April Precipitation	4.319	inches	2.79	6.23
WETLAND	Percent Wetlands	9.9214	percent	0	21.8
CSL10_85	Stream Slope 10 and 85 Method	63.7	feet per mi	5.43	543

Peak-Flow Statistics Flow Report [Peak Flow Statewide SIR2008 5206]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu	ASEp	Equiv. Yrs.
50-percent AEP flood	58.7	ft^3/s	36	95.8	30.1	3.2
20-percent AEP flood	103	ft^3/s	62.3	170	31.1	4.7

Statistic	Value	Unit	PIl	PIu	ASEp	Equiv. Yrs.
10-percent AEP flood	140	ft^3/s	83	236	32.3	6.2
4-percent AEP flood	193	ft^3/s	111	337	34.3	8
2-percent AEP flood	237	ft^3/s	132	426	36.4	9
1-percent AEP flood	291	ft^3/s	156	542	38.6	9.8
0.2-percent AEP flood	425	ft^3/s	211	858	44.1	11

Peak-Flow Statistics Citations

Olson, S.A.,2009, Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206, 57 p. (http://pubs.usgs.gov/sir/2008/5206/)

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Application Version: 4.12.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.036 degrees West
Latitude	43.211 degrees North
Elevation	0 feet
Date/Time	Tue, 04 Oct 2022 09:07:02 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.49	0.65	0.81	1.02	**1yr**	0.70	0.98	1.19	1.53	1.96	2.54	2.79	**1yr**	2.25	2.69	3.10	3.82	4.39	**1yr**
2yr	0.32	0.49	0.61	0.80	1.01	1.28	**2yr**	0.87	1.16	1.48	1.88	2.39	3.05	3.40	**2yr**	2.70	3.27	3.77	4.49	5.12	**2yr**
5yr	0.37	0.57	0.72	0.96	1.23	1.57	**5yr**	1.06	1.44	1.84	2.35	3.01	3.85	4.35	**5yr**	3.41	4.18	4.80	5.66	6.40	**5yr**
10yr	0.40	0.64	0.80	1.09	1.42	1.85	**10yr**	1.23	1.69	2.17	2.79	3.58	4.60	5.23	**10yr**	4.07	5.03	5.76	6.74	7.58	**10yr**
25yr	0.47	0.74	0.95	1.30	1.73	2.28	**25yr**	1.50	2.09	2.69	3.49	4.51	5.81	6.70	**25yr**	5.14	6.44	7.34	8.50	9.50	**25yr**
50yr	0.52	0.84	1.07	1.50	2.02	2.68	**50yr**	1.74	2.46	3.19	4.15	5.38	6.94	8.07	**50yr**	6.14	7.76	8.82	10.14	11.26	**50yr**
100yr	0.59	0.95	1.22	1.73	2.35	3.15	**100yr**	2.03	2.89	3.76	4.92	6.40	8.29	9.74	**100yr**	7.34	9.36	10.60	12.09	13.36	**100yr**
200yr	0.65	1.07	1.38	1.99	2.74	3.71	**200yr**	2.37	3.41	4.45	5.86	7.64	9.91	11.75	**200yr**	8.77	11.30	12.74	14.43	15.86	**200yr**
500yr	0.77	1.27	1.66	2.41	3.37	4.60	**500yr**	2.91	4.23	5.54	7.34	9.63	12.55	15.06	**500yr**	11.11	14.48	16.26	18.25	19.91	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.90	**1yr**	0.63	0.88	0.93	1.25	1.52	1.96	2.47	**1yr**	1.74	2.38	2.88	3.30	3.88	**1yr**
2yr	0.31	0.48	0.59	0.80	0.99	1.17	**2yr**	0.86	1.15	1.35	1.81	2.33	2.95	3.29	**2yr**	2.62	3.16	3.65	4.38	5.00	**2yr**
5yr	0.35	0.54	0.67	0.92	1.16	1.40	**5yr**	1.01	1.37	1.60	2.13	2.76	3.53	3.96	**5yr**	3.13	3.81	4.41	5.31	5.93	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.42	3.11	4.02	4.55	**10yr**	3.56	4.38	5.08	6.13	6.72	**10yr**
25yr	0.44	0.67	0.83	1.19	1.57	1.91	**25yr**	1.35	1.86	2.12	2.82	3.62	4.76	5.45	**25yr**	4.21	5.24	6.14	7.44	8.20	**25yr**
50yr	0.49	0.74	0.93	1.33	1.79	2.19	**50yr**	1.55	2.14	2.38	3.18	4.05	5.39	6.23	**50yr**	4.77	5.99	7.08	8.60	9.48	**50yr**
100yr	0.55	0.83	1.04	1.50	2.05	2.51	**100yr**	1.77	2.45	2.68	3.58	4.52	6.09	7.11	**100yr**	5.39	6.84	8.17	9.94	10.83	**100yr**
200yr	0.61	0.92	1.16	1.69	2.35	2.88	**200yr**	2.03	2.81	3.01	4.02	5.05	6.87	8.75	**200yr**	6.08	8.41	9.45	11.48	12.40	**200yr**
500yr	0.72	1.07	1.37	1.99	2.83	3.47	**500yr**	2.44	3.40	3.53	4.70	5.87	8.02	10.60	**500yr**	7.09	10.19	11.45	13.92	14.77	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.07	**1yr**	0.75	1.05	1.23	1.71	2.16	2.76	3.05	**1yr**	2.44	2.94	3.37	4.11	4.76	**1yr**
2yr	0.33	0.50	0.62	0.84	1.03	1.24	**2yr**	0.89	1.21	1.45	1.93	2.49	3.19	3.54	**2yr**	2.82	3.40	3.92	4.62	5.27	**2yr**
5yr	0.39	0.60	0.75	1.03	1.31	1.57	**5yr**	1.13	1.53	1.83	2.46	3.14	4.19	4.73	**5yr**	3.70	4.55	5.20	6.01	6.86	**5yr**
10yr	0.46	0.70	0.87	1.22	1.57	1.90	**10yr**	1.36	1.86	2.20	2.98	3.78	5.18	5.91	**10yr**	4.59	5.68	6.46	7.34	8.38	**10yr**
25yr	0.56	0.85	1.06	1.51	1.98	2.44	**25yr**	1.71	2.39	2.83	3.87	4.84	6.89	7.95	**25yr**	6.10	7.64	8.60	9.64	10.65	**25yr**
50yr	0.65	0.98	1.22	1.76	2.37	2.94	**50yr**	2.05	2.88	3.43	4.69	5.85	8.55	9.97	**50yr**	7.57	9.59	10.70	11.81	12.98	**50yr**
100yr	0.76	1.14	1.43	2.07	2.83	3.55	**100yr**	2.44	3.47	4.16	5.72	7.09	10.63	12.51	**100yr**	9.40	12.03	13.30	14.49	15.82	**100yr**
200yr	0.88	1.32	1.68	2.43	3.38	4.29	**200yr**	2.92	4.19	5.05	6.97	8.58	13.25	14.90	**200yr**	11.73	14.33	16.53	17.77	19.32	**200yr**
500yr	1.08	1.60	2.06	3.00	4.26	5.50	**500yr**	3.68	5.37	6.50	9.08	11.07	17.77	19.94	**500yr**	15.73	19.18	22.04	23.31	25.19	**500yr**

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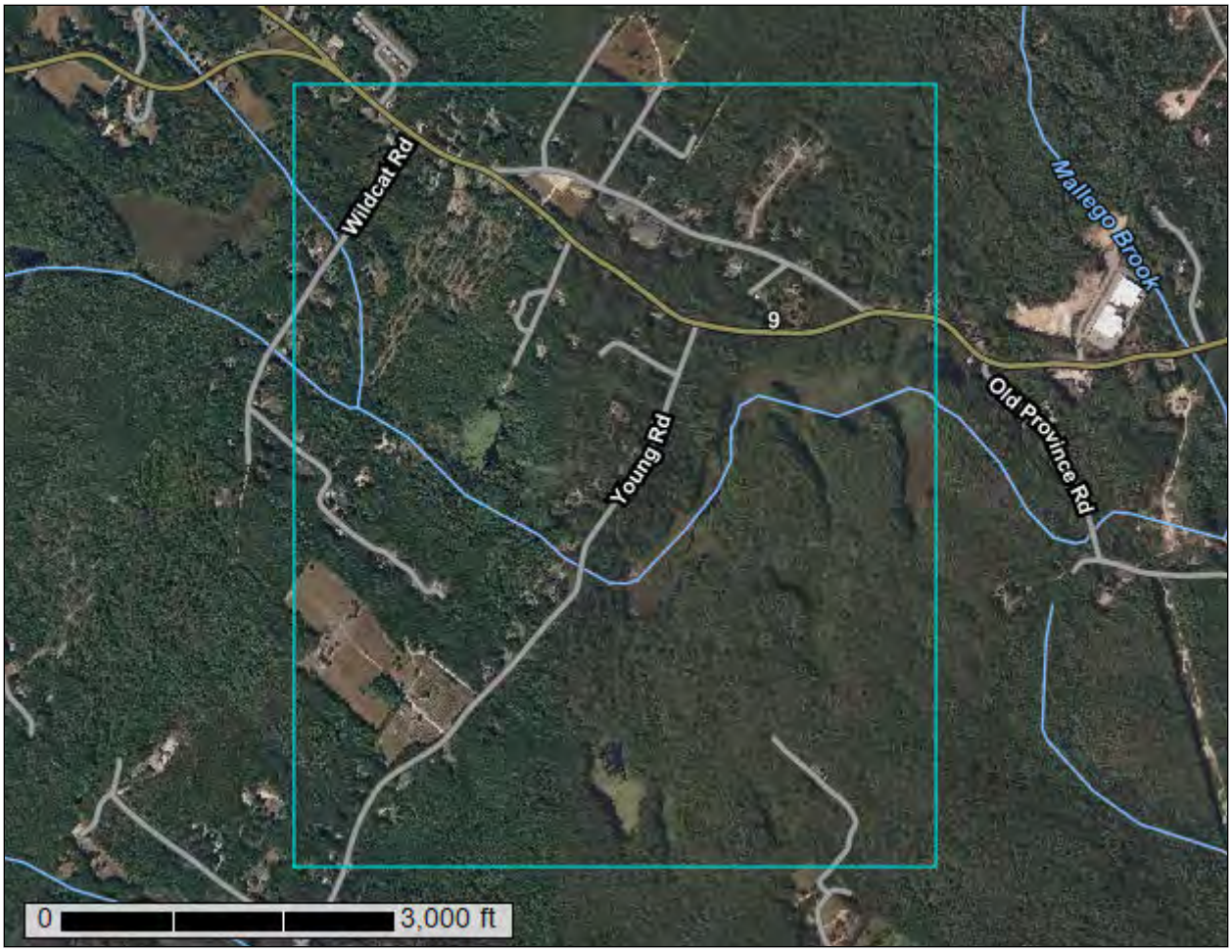
United States Department of Agriculture

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 Strafford County, New Hampshire



October 3, 2022

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

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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: 1:13,600 if printed on A portrait (8.5" x 11") sheet.

N

0 200 400 800 1200 Meters

0 500 1000 2000 3000 Feet

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 1:20,000.

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: Strafford County, New Hampshire
Survey Area Data: Version 23, Sep 9, 2022

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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
AcB	Acton fine sandy loam, 0 to 8 percent slopes	4.1	0.4%
AdB	Acton very stony fine sandy loam, 0 to 8 percent slopes	0.7	0.1%
AdC	Acton very stony fine sandy loam, 8 to 15 percent slopes	12.8	1.4%
CfB	Charlton fine sandy loam, 3 to 8 percent slopes	2.6	0.3%
CfC	Charlton fine sandy loam, 8 to 15 percent slopes	6.1	0.7%
CsB	Charlton fine sandy loam, 3 to 8 percent slopes, very stony	8.9	1.0%
CsC	Charlton fine sandy loam, 8 to 15 percent slopes, very stony	127.2	13.6%
CsD	Charlton very stony fine sandy loam, 15 to 25 percent slopes	25.7	2.7%
CvD	Charlton extremely stony fine sandy loam, 8 to 25 percent slopes	20.2	2.2%
Fa	Fresh water marsh	17.3	1.8%
GlB	Gloucester fine sandy loam, 3 to 8 percent slopes	11.6	1.2%
GlC	Gloucester fine sandy loam, 8 to 15 percent slopes	28.2	3.0%
GsB	Gloucester very stony fine sandy loam, 3 to 8 percent slopes	140.1	15.0%
GsC	Gloucester very stony fine sandy loam, 8 to 15 percent slopes	21.4	2.3%
HaB	Hinckley loamy sand, 3 to 8 percent slopes	5.5	0.6%
HaC	Hinckley loamy sand, 8 to 15 percent slopes	0.2	0.0%
HbE	Hinckley loamy sand, 15 to 60 percent slopes	3.9	0.4%
HcC	Hollis-Charlton fine sandy loams, 8 to 15 percent slopes	2.7	0.3%
HdB	Hollis-Charlton very rocky fine sandy loams, 3 to 8 percent slopes	48.9	5.2%
HdC	Hollis-Charlton very rocky fine sandy loams, 8 to 15 percent slopes	14.1	1.5%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HfC	Hollis-Gloucester fine sandy loams, 8 to 15 percent slopes	6.2	0.7%
HgB	Hollis-Gloucester very rocky fine sandy loams, 3 to 8 percent slopes	23.4	2.5%
HgC	Hollis-Gloucester very rocky fine sandy loams, 8 to 15 percent slopes	131.6	14.1%
HgD	Hollis-Gloucester very rocky fine sandy loams, 15 to 25 percent slopes	35.1	3.8%
HlD	Hollis-Gloucester extremely rocky fine sandy loams, 8 to 25 percent slopes	12.2	1.3%
LeA	Leicester very stony fine sandy loam, 0 to 3 percent slopes	5.5	0.6%
LrA	Leicester-Ridgebury fine sandy loams, 0 to 3 percent slopes, very stony	33.9	3.6%
LrB	Leicester-Ridgebury fine sandy loams, 3 to 8 percent slopes, very stony	5.6	0.6%
Mp	Freetown and Swansea mucky peats, 0 to 2 percent slopes	11.7	1.2%
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	29.2	3.1%
PdC	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	40.0	4.3%
RgB	Ridgebury fine sandy loam, 3 to 8 percent slopes	2.7	0.3%
RlB	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	2.4	0.3%
Sb	Saugatuck loamy sand	13.2	1.4%
SuB	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	2.3	0.2%
W	Water	19.4	2.1%
Wa	Whitman fine sandy loam, 0 to 3 percent slopes, very stony	38.8	4.2%
WgB	Woodbridge fine sandy loam, 3 to 8 percent slopes	9.9	1.1%
WsB	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	9.5	1.0%
Totals for Area of Interest		**934.8**	**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.

Strafford County, New Hampshire

AcB—Acton fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d6j
Elevation: 80 to 920 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: Farmland of statewide importance

Map Unit Composition

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

Description of Acton

Setting

Parent material: Till

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 23 inches: very gravelly loamy sand
H3 - 23 to 42 inches: very cobbly loamy coarse sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F144AY008CT - Moist Till Uplands
Hydric soil rating: No

Minor Components

Not named pan

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

Leicester

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

AdB—Acton very stony fine sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d6k
Elevation: 100 to 970 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

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

Description of Acton

Setting

Parent material: Till

Typical profile

H1 - 0 to 6 inches: very stony fine sandy loam
H2 - 6 to 23 inches: very gravelly loamy sand
H3 - 23 to 42 inches: very cobbly loamy coarse sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A/D
Ecological site: F144BY602ME - Sandy Toeslope
Hydric soil rating: No

Minor Components

Not named pan

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

Leicester

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

AdC—Acton very stony fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d6l
Elevation: 130 to 970 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

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

Description of Acton

Setting

Parent material: Till

Typical profile

H1 - 0 to 6 inches: very stony fine sandy loam
H2 - 6 to 23 inches: very gravelly loamy sand
H3 - 23 to 42 inches: very cobbly loamy coarse sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A/D
Ecological site: F144BY602ME - Sandy Toeslope
Hydric soil rating: No

Minor Components

Not named pan

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

Gloucester

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

CfB—Charlton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wh0n
Elevation: 0 to 1,440 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: All areas are prime farmland

Map Unit Composition

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

Description of Charlton

Setting

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

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Sutton

Percent of map unit: 8 percent
Landform: Ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Paxton

Percent of map unit: 5 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield

Percent of map unit: 1 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

CfC—Charlton fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wh0q

Elevation: 0 to 1,440 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: Farmland of statewide importance

Map Unit Composition

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

Description of Charlton

Setting

Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Sutton, fine sandy loam

Percent of map unit: 5 percent
Landform: Ridges, 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

Paxton

Percent of map unit: 5 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield

Percent of map unit: 3 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Canton

Percent of map unit: 2 percent
Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

CsB—Charlton fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2wh0r
Elevation: 0 to 1,570 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: Farmland of local importance

Map Unit Composition

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

Description of Charlton, Very Stony

Setting

Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
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 8 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: 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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F142XB009VT - Acidic Till Upland
Hydric soil rating: No

Minor Components

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

Paxton, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield, very stony

Percent of map unit: 3 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex

Hydric soil rating: No

Leicester, very stony

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

CsC—Charlton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2wh0p
Elevation: 0 to 1,570 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: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Very Stony

Setting

Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
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: 8 to 15 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: 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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

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

Paxton, very stony
Percent of map unit: 5 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Chatfield, very stony
Percent of map unit: 3 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, very stony
Percent of map unit: 2 percent
Landform: Hills, ground moraines, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

CsD—Charlton very stony fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9d6w
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: very stony fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 25 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: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Not named

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

Hollis

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

CvD—Charlton extremely stony fine sandy loam, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9d6x
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: extremely stony fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 5.2 inches)

Interpretive groups

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

Minor Components

Not named
Percent of map unit: 5 percent
Hydric soil rating: No

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

Sutton
Percent of map unit: 3 percent
Hydric soil rating: No

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

Fa—Fresh water marsh

Map Unit Setting
National map unit symbol: 9d72
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
Fresh water marsh: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fresh Water Marsh

Setting
Landform: Marshes

Typical profile
H1 - 0 to 6 inches: mucky peat
H2 - 6 to 16 inches: mucky peat
H3 - 16 to 65 inches: variable

Properties and qualities
Slope: 0 to 1 percent
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8w
Ecological site: F144BY210ME - Marsh Wetland Complex
Hydric soil rating: Yes

GlB—Gloucester fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d73
Elevation: 70 to 1,100 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: Farmland of statewide importance

Map Unit Composition

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

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Not named pan

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

Hollis

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

Acton

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

GlC—Gloucester fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d74
Elevation: 20 to 970 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

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

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Acton

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

Not named pan

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

Hollis

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

GsB—Gloucester very stony fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d75
Elevation: 30 to 1,260 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

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

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

Minor Components

Acton

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

Not named

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

Hollis

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

GsC—Gloucester very stony fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d76
Elevation: 0 to 1,440 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

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

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained

Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

Minor Components

Not named

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

Hollis

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

Acton

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

HaB—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope

Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 8 percent
Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope, base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

HaC—Hinckley loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm9
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

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, moraines, kames, outwash plains, eskers
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces, eskers, kames
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

HbE—Hinckley loamy sand, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: 2svmh
Elevation: 0 to 890 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, kames, outwash plains, kame terraces, eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Outwash deltas, outwash terraces, kames, outwash plains, kame terraces, eskers, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, moraines, kames, outwash plains, eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

HcC—Hollis-Charlton fine sandy loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d7k
Elevation: 0 to 1,080 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Hollis and similar soils: 55 percent
Charlton and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Not named

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

Buxton

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

HdB—Hollis-Charlton very rocky fine sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d7m
Elevation: 0 to 1,000 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hollis and similar soils: 40 percent
Charlton and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: very stony fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 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: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
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

Leicester

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Sutton

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

Buxton

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

Not named

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

HdC—Hollis-Charlton very rocky fine sandy loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d7n
Elevation: 0 to 1,200 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 120 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hollis and similar soils: 40 percent
Charlton and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Charlton

Setting

Parent material: Till

Typical profile

H1 - 0 to 13 inches: very stony fine sandy loam
H2 - 13 to 36 inches: fine sandy loam
H3 - 36 to 40 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 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: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 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 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
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

Not named

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

Woodbridge

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

Sutton

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

HfC—Hollis-Gloucester fine sandy loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9d7t
Elevation: 30 to 1,120 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

Hollis and similar soils: 55 percent
Gloucester and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 7 percent
Hydric soil rating: No

Acton

Percent of map unit: 3 percent
Hydric soil rating: No

HgB—Hollis-Gloucester very rocky fine sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9d7v
Elevation: 30 to 1,120 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

Hollis and similar soils: 50 percent
Gloucester and similar soils: 30 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

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

Not named
Percent of map unit: 5 percent
Hydric soil rating: No

Acton
Percent of map unit: 3 percent
Hydric soil rating: No

Leicester
Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

HgC—Hollis-Gloucester very rocky fine sandy loams, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9d7w
Elevation: 30 to 1,120 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
Hollis and similar soils: 50 percent
Gloucester and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting
Parent material: Till

Typical profile
H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities
Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

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

Not named

Percent of map unit: 7 percent
Hydric soil rating: No

Acton

Percent of map unit: 3 percent
Hydric soil rating: No

HgD—Hollis-Gloucester very rocky fine sandy loams, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9d7x
Elevation: 0 to 1,230 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

Hollis and similar soils: 50 percent
Gloucester and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: very stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY032NH - Dry Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

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

Not named

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

HID—Hollis-Gloucester extremely rocky fine sandy loams, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9d7y
Elevation: 100 to 1,610 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

Hollis and similar soils: 40 percent
Gloucester and similar soils: 25 percent
Minor components: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: extremely stony fine sandy loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 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: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144BY702ME - Shallow and Moderately-deep Till
Hydric soil rating: No

Description of Gloucester

Setting

Parent material: Till

Typical profile

H1 - 0 to 14 inches: extremely stony fine sandy loam
H2 - 14 to 28 inches: very gravelly loamy sand
H3 - 28 to 40 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 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 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 20 percent
Hydric soil rating: No

Not named

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

Acton

Percent of map unit: 3 percent
Hydric soil rating: No

Leicester

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

LeA—Leicester very stony fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9d81
Elevation: 0 to 2,100 feet
Mean annual precipitation: 28 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 100 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Leicester

Setting

Landform: Depressions
Parent material: Till

Typical profile

H1 - 0 to 5 inches: very stony fine sandy loam

H2 - 5 to 44 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A/D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Ridgebury

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Not named wet

Percent of map unit: 5 percent
Landform: Outwash terraces
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

LrA—Leicester-Ridgebury fine sandy loams, 0 to 3 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xffr
Elevation: 20 to 960 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Leicester, very stony, and similar soils: 60 percent
Ridgebury, very stony, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leicester, Very Stony

Setting

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

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 7 inches: fine sandy loam
Bg - 7 to 18 inches: fine sandy loam
BC - 18 to 24 inches: fine sandy loam
C1 - 24 to 39 inches: gravelly fine sandy loam
C2 - 39 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly 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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5s
Hydrologic Soil Group: B/D
Ecological site: F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Description of Ridgebury, Very Stony

Setting

Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5s
Hydrologic Soil Group: D
Ecological site: F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Minor Components

Walpole

Percent of map unit: 5 percent
Landform: Outwash terraces, drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman, very stony

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

Swansea, mucky peat

Percent of map unit: 2 percent
Landform: Swamps, marshes, kettles, depressions, bogs
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

LrB—Leicester-Ridgebury fine sandy loams, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xffs
Elevation: 100 to 1,160 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Leicester, very stony, and similar soils: 60 percent
Ridgebury, very stony, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leicester, Very Stony

Setting

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

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 7 inches: fine sandy loam
Bg - 7 to 18 inches: fine sandy loam
BC - 18 to 24 inches: fine sandy loam
C1 - 24 to 39 inches: gravelly fine sandy loam
C2 - 39 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: More than 80 inches
Drainage class: Poorly 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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B/D
Ecological site: F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Description of Ridgebury, Very Stony

Setting

Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly 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: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144BY305ME - Wet Loamy Flat
Hydric soil rating: Yes

Minor Components

Woodbridge, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

Walpole

Percent of map unit: 3 percent
Landform: Outwash terraces, drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman, very stony

Percent of map unit: 2 percent
Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Mp—Freetown and Swansea mucky peats, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w68w
Elevation: 10 to 940 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 50 percent
Swansea and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Marshes, kettles, depressions, swamps, bogs
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Moderately decomposed organic material

Typical profile

Oe1 - 0 to 2 inches: mucky peat
Oe2 - 2 to 79 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 20.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Description of Swansea

Setting

Landform: Swamps, marshes, depressions, bogs, kettles
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Moderately decomposed organic material over sandy and gravelly glaciofluvial deposits

Typical profile

Oe1 - 0 to 12 inches: mucky peat
Oe2 - 12 to 25 inches: mucky peat
Cg - 25 to 79 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: High (about 11.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Natchaug

Percent of map unit: 10 percent
Landform: Depressions, depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Scarboro

Percent of map unit: 4 percent
Landform: Outwash deltas, outwash terraces, drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 4 percent
Landform: Hills, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Maybid

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

PbB—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2qp
Elevation: 0 to 1,570 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: All areas are prime farmland

Map Unit Composition

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

Description of Paxton

Setting

Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Hills, ground moraines, drainageways, depressions
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

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

PdC—Paxton fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w677
Elevation: 0 to 1,330 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

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

Description of Paxton, Very Stony

Setting

Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge, very stony
Percent of map unit: 8 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton, very stony
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, very stony
Percent of map unit: 2 percent
Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

RgB—Ridgebury fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2xffw
Elevation: 0 to 1,030 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: Farmland of local importance

Map Unit Composition
Ridgebury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury

Setting

Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Woodbridge

Percent of map unit: 8 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Scituate

Percent of map unit: 4 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex

Hydric soil rating: No

Whitman

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

RIB—Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2xffx
Elevation: 40 to 1,320 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

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

Description of Ridgebury, Very Stony

Setting

Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly 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: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Woodbridge, very stony

Percent of map unit: 7 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Whitman, very stony

Percent of map unit: 4 percent
Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Walpole

Percent of map unit: 2 percent
Landform: Outwash terraces, drainageways, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scituate, very stony

Percent of map unit: 2 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Sb—Saugatuck loamy sand

Map Unit Setting

National map unit symbol: 9d8r
Elevation: 300 to 1,000 feet
Mean annual precipitation: 27 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 125 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Saugatuck

Setting

Landform: Outwash terraces
Parent material: Outwash

Typical profile

H1 - 0 to 4 inches: loamy sand
H2 - 4 to 7 inches: sand
H3 - 7 to 26 inches: loamy sand
H4 - 26 to 42 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 10 to 16 inches to undefined
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Not named wet

Percent of map unit: 15 percent

Landform: Outwash terraces
Hydric soil rating: Yes

SuB—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
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: More than 80 inches
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
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B/D
Ecological site: F144AY008CT - Moist Till Uplands
Hydric soil rating: No

Minor Components

Charlton, very stony

Percent of map unit: 7 percent
Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Canton, very stony

Percent of map unit: 4 percent
Landform: Ridges, moraines, hills
Landform position (two-dimensional): Summit, shoulder, backslope
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, ground moraines, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
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: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

W—Water

Map Unit Composition

Water (less than 40 acres): 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wa—Whitman fine sandy loam, 0 to 3 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2zggn
Elevation: 130 to 970 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

Whitman, very stony, and similar soils: 81 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitman, Very Stony

Setting

Landform: Ground moraines, drumlins, drainageways, depressions, hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from granite and gneiss and/or schist

Typical profile

Oi - 0 to 1 inches: peat
A - 1 to 10 inches: fine sandy loam
Bg - 10 to 17 inches: gravelly fine sandy loam
Cdg - 17 to 61 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 7 to 38 inches to densic material
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5s
Hydrologic Soil Group: D
Ecological site: F144AY041MA - Very Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Ridgebury, very stony

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, depressions, drainageways
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Swansea

Percent of map unit: 3 percent
Landform: Swamps, marshes, bogs
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Woodbridge, very stony

Percent of map unit: 1 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

WgB—Woodbridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2ql
Elevation: 0 to 1,470 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: All areas are prime farmland

Map Unit Composition

Woodbridge, fine sandy loam, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Fine Sandy Loam

Setting

Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw1 - 7 to 18 inches: fine sandy loam
Bw2 - 18 to 30 inches: fine sandy loam
Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 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 low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Paxton

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury

Percent of map unit: 8 percent
Landform: Hills, ground moraines, drainageways, depressions

Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

WsB—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2t2qr
Elevation: 0 to 1,440 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

Woodbridge, very stony, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Very Stony

Setting

Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 9 inches: fine sandy loam
Bw1 - 9 to 20 inches: fine sandy loam
Bw2 - 20 to 32 inches: fine sandy loam
Cd - 32 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 43 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 low (0.00 to 0.14 in/hr)
Depth to water table: About 19 to 27 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

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

Minor Components

Paxton, very stony

Percent of map unit: 10 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 8 percent
Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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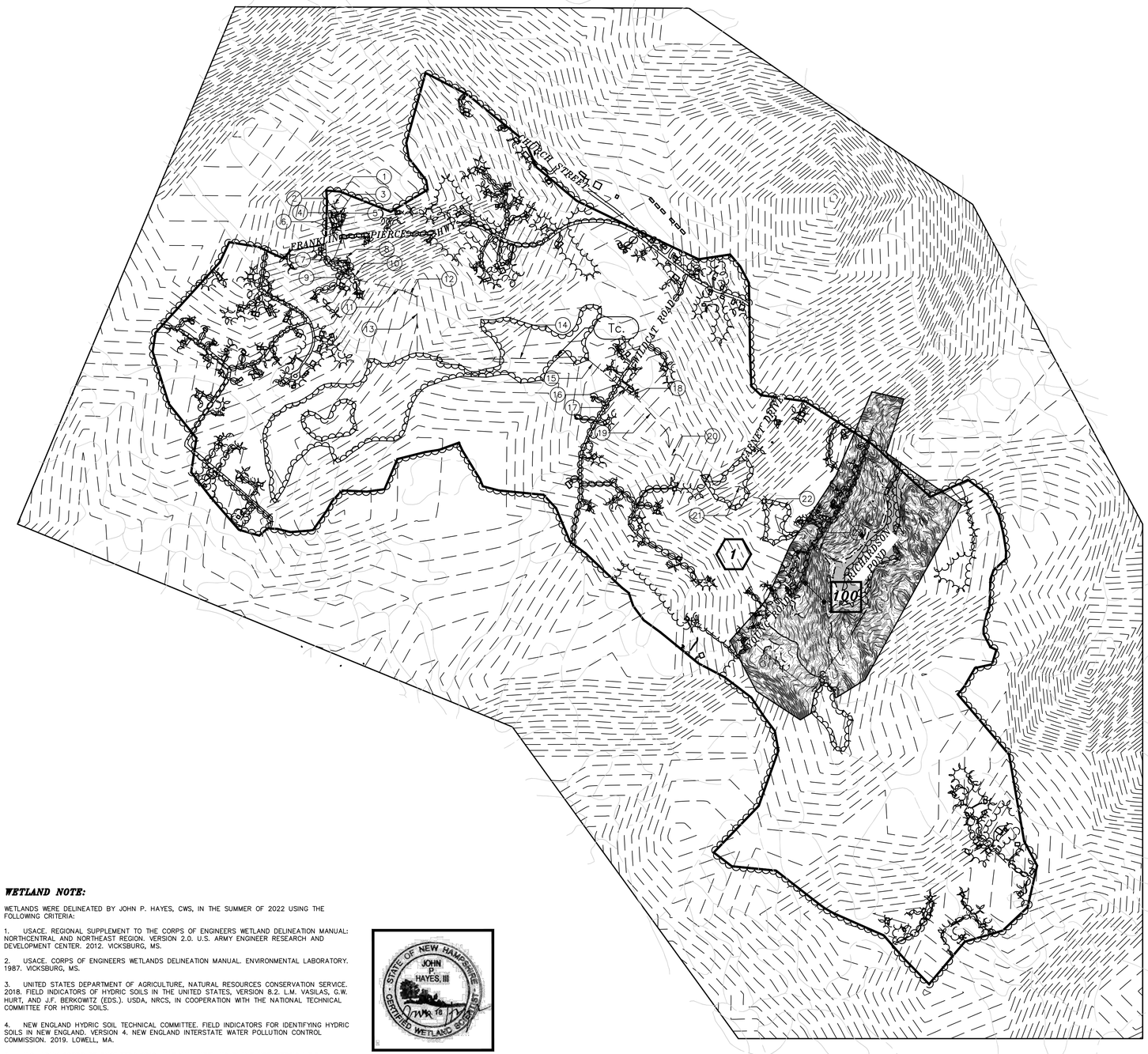
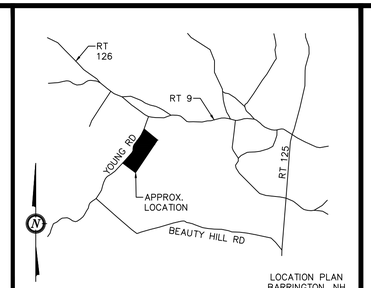




LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD, LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE EXISTING DRAINAGE OVERVIEW OF THE LOCUS PARCEL.

5.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

SOILS:

AdC – ACTON VERY STONY FINE SANDY LOAM, 8 TO 15% SLOPES

CsC – CHARLTON FINE SANDY LOAM, 8 TO 15% SLOPES, VERY STONY

Fa – FRESH WATER MARSH

GlC – GLOUCESTER FINE SANDY LOAM, 8 TO 15% SLOPES

GsB – GLOUCESTER VERY STONY FINE SANDY LOAM, 8 TO 15% SLOPES

HgC – HOLLIS–GLOUCESTER VERY ROCKY FINE SANDY LOAMS, 8 TO 15% SLOPES

LrA – LEICESTER–RIDGEBURY FINE SANDY LOAMS, 0 TO 3% SLOPES, VERY STONY

SEE WEBSOIL USDA–NRCS

LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HfB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc.	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

800 0 400 800 1600 3200

(IN FEET)
1 inch = 800 ft.

WETLAND NOTE:

WETLANDS WERE DELINEATED BY JOHN P. HAYES, CWS, IN THE SUMMER OF 2022 USING THE FOLLOWING CRITERIA:

1. USACE. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. VERSION 2.0. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER. 2012. VICKSBURG, MS.

2. USACE. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. ENVIRONMENTAL LABORATORY. 1987. VICKSBURG, MS.

3. UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. 2018. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2. L.M. VASILAS, G.W. HURT, AND J.F. BERKOWITZ (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.

4. NEW ENGLAND HYDRIC SOIL TECHNICAL COMMITTEE. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 4. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 2019. LOWELL, MA.

5. U.S. ARMY CORPS OF ENGINEERS 2019. NATIONAL WETLAND PLANT LIST, VERSION 3.3. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/

STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST
MAR 16

JOHN P. HAYES, CWS #18

REVISION	DATE	DESCRIPTION
#2	8–21–23	SIGHT DISTANCE PLAN REVISIONS
#1	3–20–23	MINOR REVISIONS TO LAYOUT

W–1 EXISTING CONDITION WATERSHED OVERVIEW PLAN

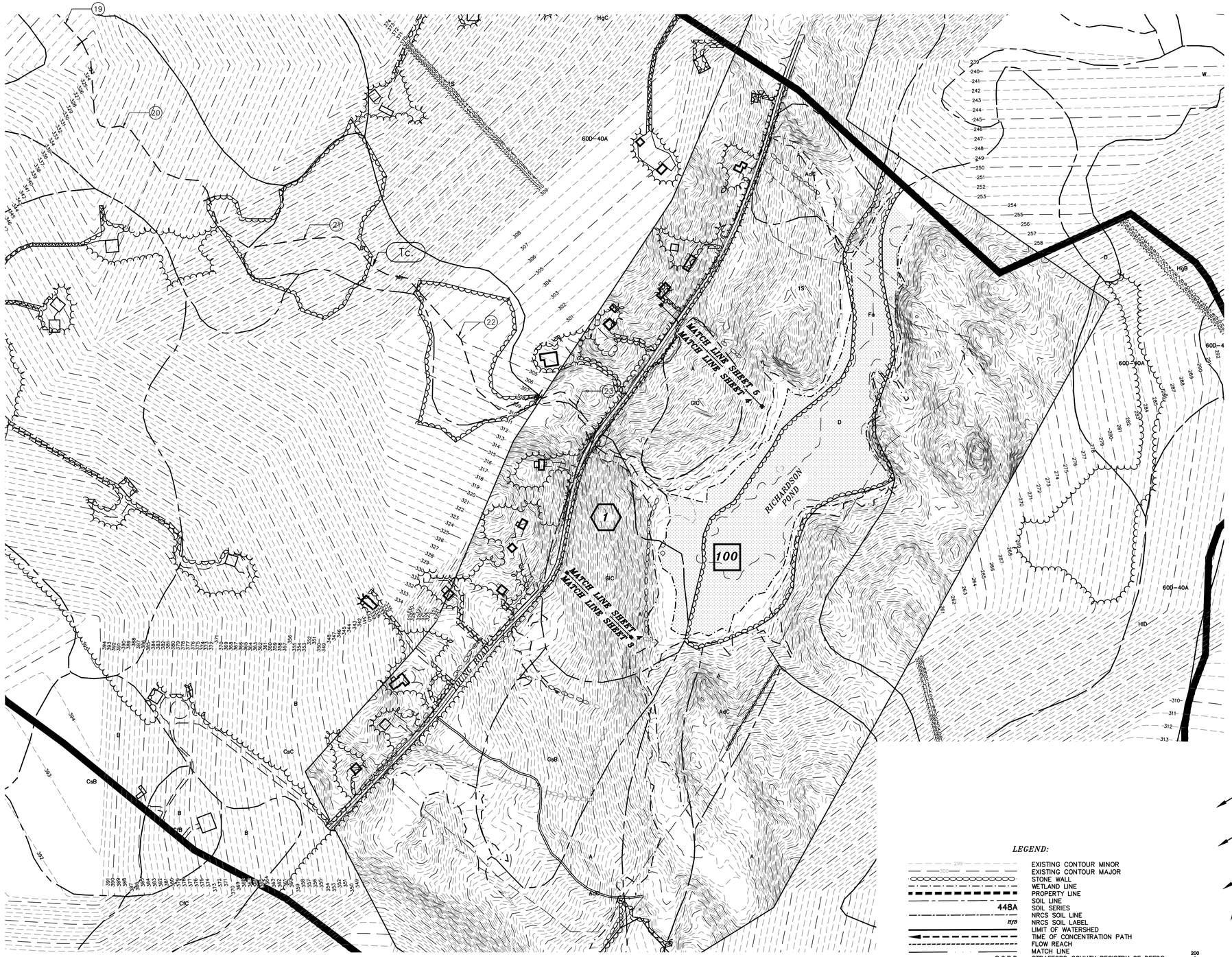
FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD, LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

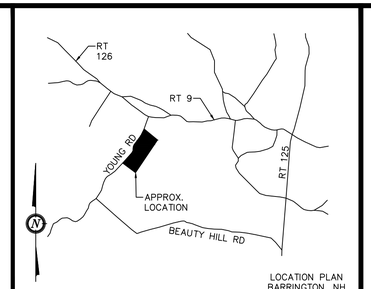
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 800 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 – 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED
PROFESSIONAL ENGINEER

SHEET 1 OF 10





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE EXISTING DRAINAGE OVERVIEW OF THE LOCUS PARCEL.

5.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

WETLAND NOTE:

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2. USACE. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. ENVIRONMENTAL LABORATORY. 1987. VICKSBURG, MS.

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4. NEW ENGLAND HYDRIC SOIL TECHNICAL COMMITTEE. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 4. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 2019. LOWELL, MA.

5. U.S. ARMY CORPS OF ENGINEERS 2019. NATIONAL WETLAND PLANT LIST, VERSION 3.3. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/

JOHN P. HAYES, CWS #18

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

FLOW REACH SYMBOL

POND DEVICE SYMBOL

TIME OF CONCENTRATION SEGMENT

LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HfB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

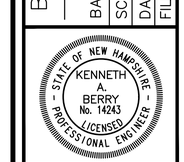
REVISION	DATE	DESCRIPTION
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

W-1 EXISTING CONDITION SITE OVERVIEW PLAN

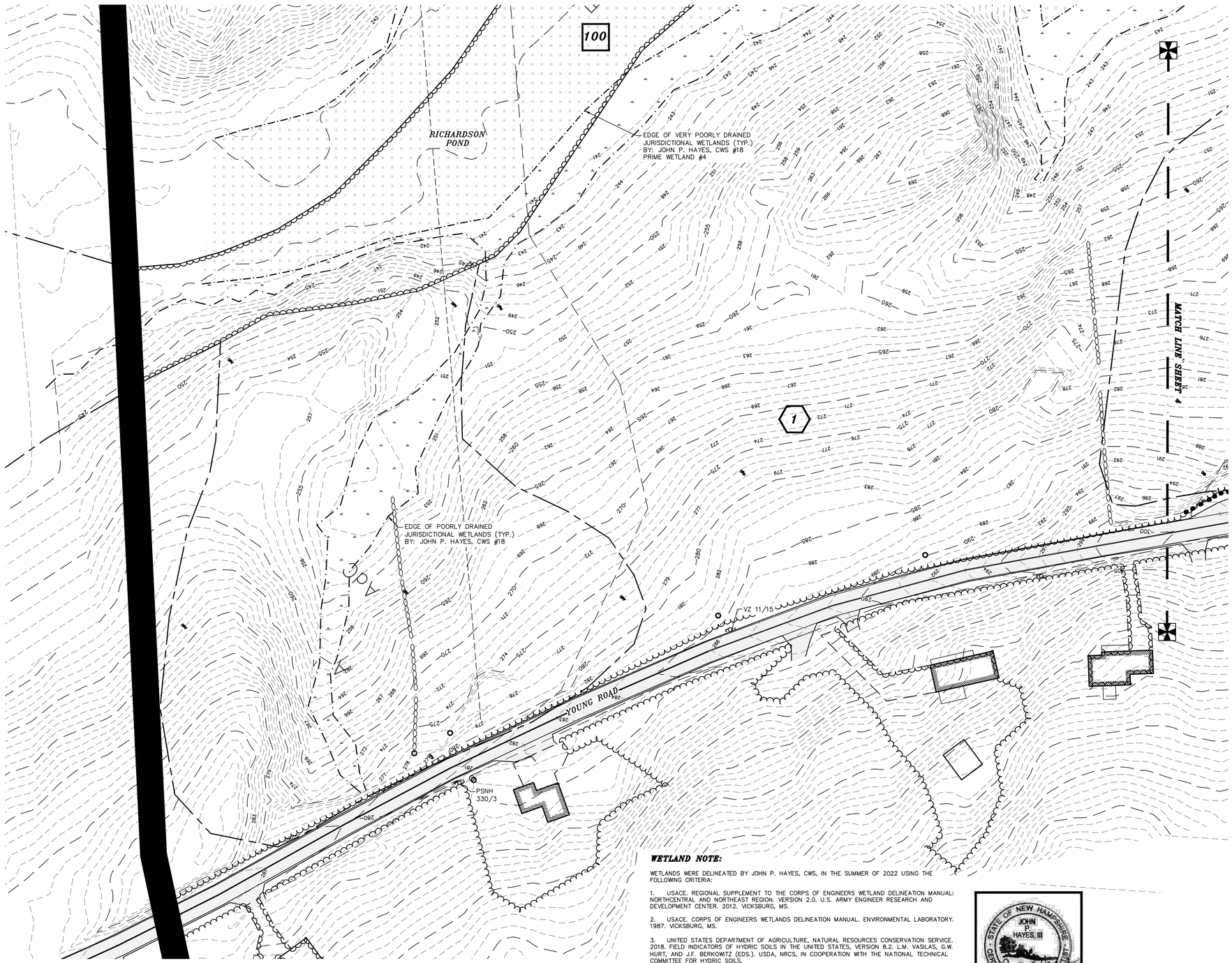
FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD,
BARRINGTON, NH
TAX MAP 240, LOT 8

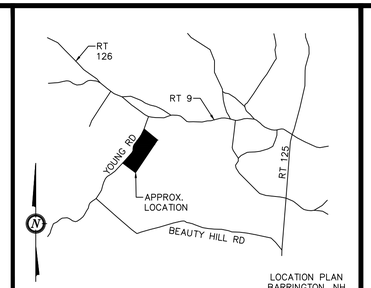
BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 200 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 – 109



SHEET 2 OF 10





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE EXISTING DRAINAGE DETAILS OF THE LOCUS PARCEL.

5.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
Bfb	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc. #	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

WETLAND NOTE:

WETLANDS WERE DELINEATED BY JOHN P. HAYES, CWS, IN THE SUMMER OF 2022 USING THE FOLLOWING CRITERIA:

1. USACE. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. VERSION 2.0. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER. 2012. VICKSBURG, MS.

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4. NEW ENGLAND HYDRIC SOIL TECHNICAL COMMITTEE. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 4. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 2019. LOWELL, MA.

5. U.S. ARMY CORPS OF ENGINEERS 2019. NATIONAL WETLAND PLANT LIST, VERSION 3.3. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/

STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST
No. 18

JOHN P. HAYES, CWS #18

REVISION	DATE	DESCRIPTION
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

W-1 EXISTING CONDITION DETAIL PLAN 1

FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 - 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED
PROFESSIONAL ENGINEER

WETLAND NOTE:

WETLANDS WERE DELINEATED BY JOHN P. HAYES, CWS, IN THE SUMMER OF 2022 USING THE FOLLOWING CRITERIA:

1. USACE. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. VERSION 2.0. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER. 2012. VICKSBURG, MS.

2. USACE. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. ENVIRONMENTAL LABORATORY. 1987. VICKSBURG, MS.

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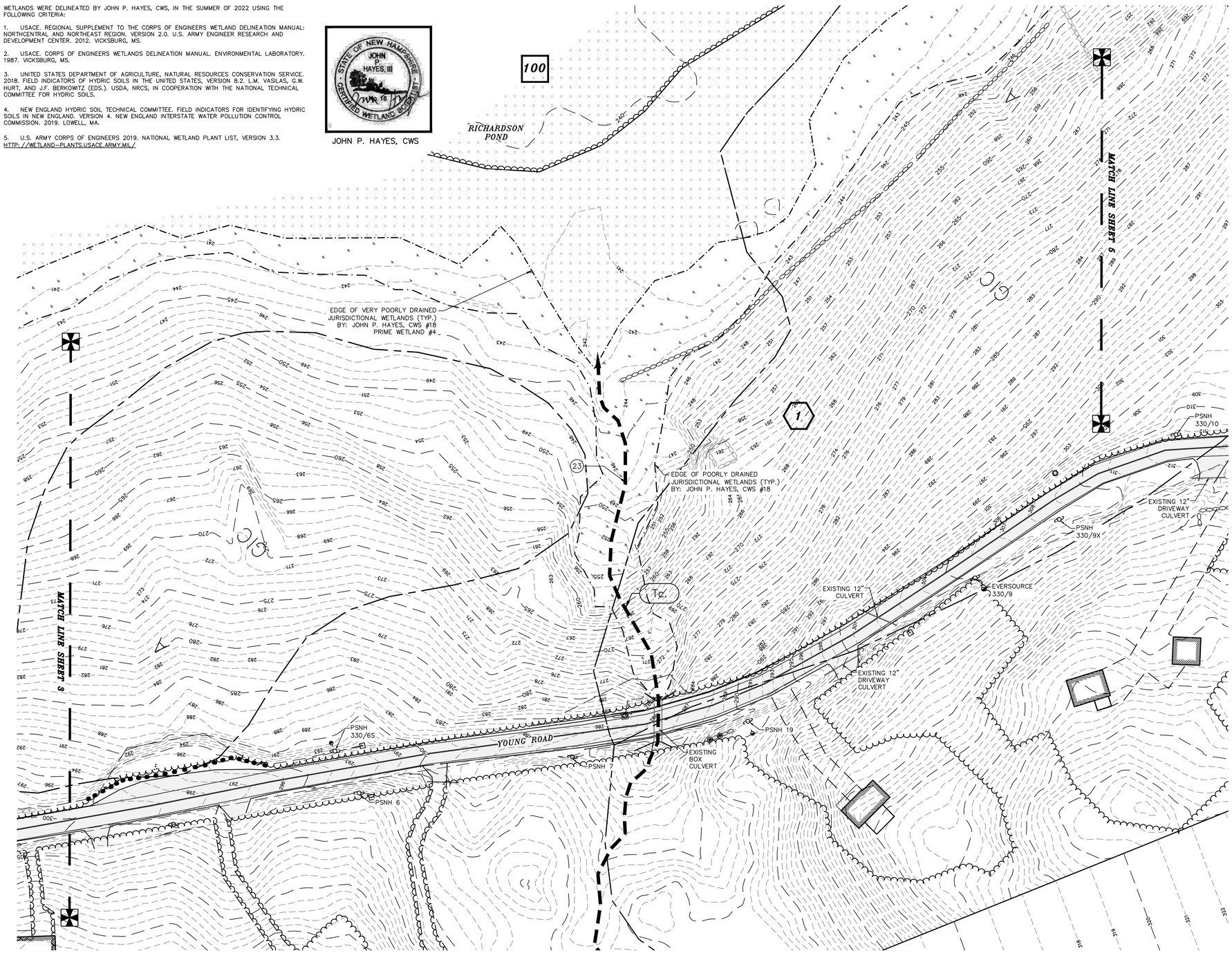
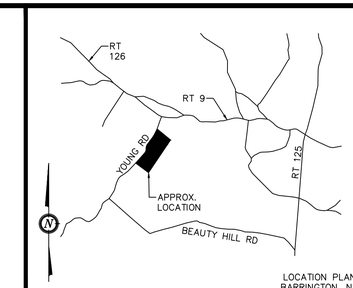
4. NEW ENGLAND HYDRIC SOIL TECHNICAL COMMITTEE. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 4. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 2019. LOWELL, MA.

5. U.S. ARMY CORPS OF ENGINEERS 2019. NATIONAL WETLAND PLANT LIST, VERSION 3.3. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/

STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST
NH 18

JOHN P. HAYES, CWS





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE EXISTING DRAINAGE DETAILS OF THE LOCUS PARCEL.

5.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HfB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

FLOW REACH SYMBOL

POND DEVICE SYMBOL

TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISION	DATE	DESCRIPTION
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

W-1 EXISTING CONDITION DETAIL PLAN 2

FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 - 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED
PROFESSIONAL ENGINEER

SHEET 4 OF 10

WETLAND NOTE:

WETLANDS WERE DELINEATED BY JOHN P. HAYES, CWS, IN THE SUMMER OF 2022 USING THE FOLLOWING CRITERIA:

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2. USACE. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. ENVIRONMENTAL LABORATORY. 1987. VICKSBURG, MS.

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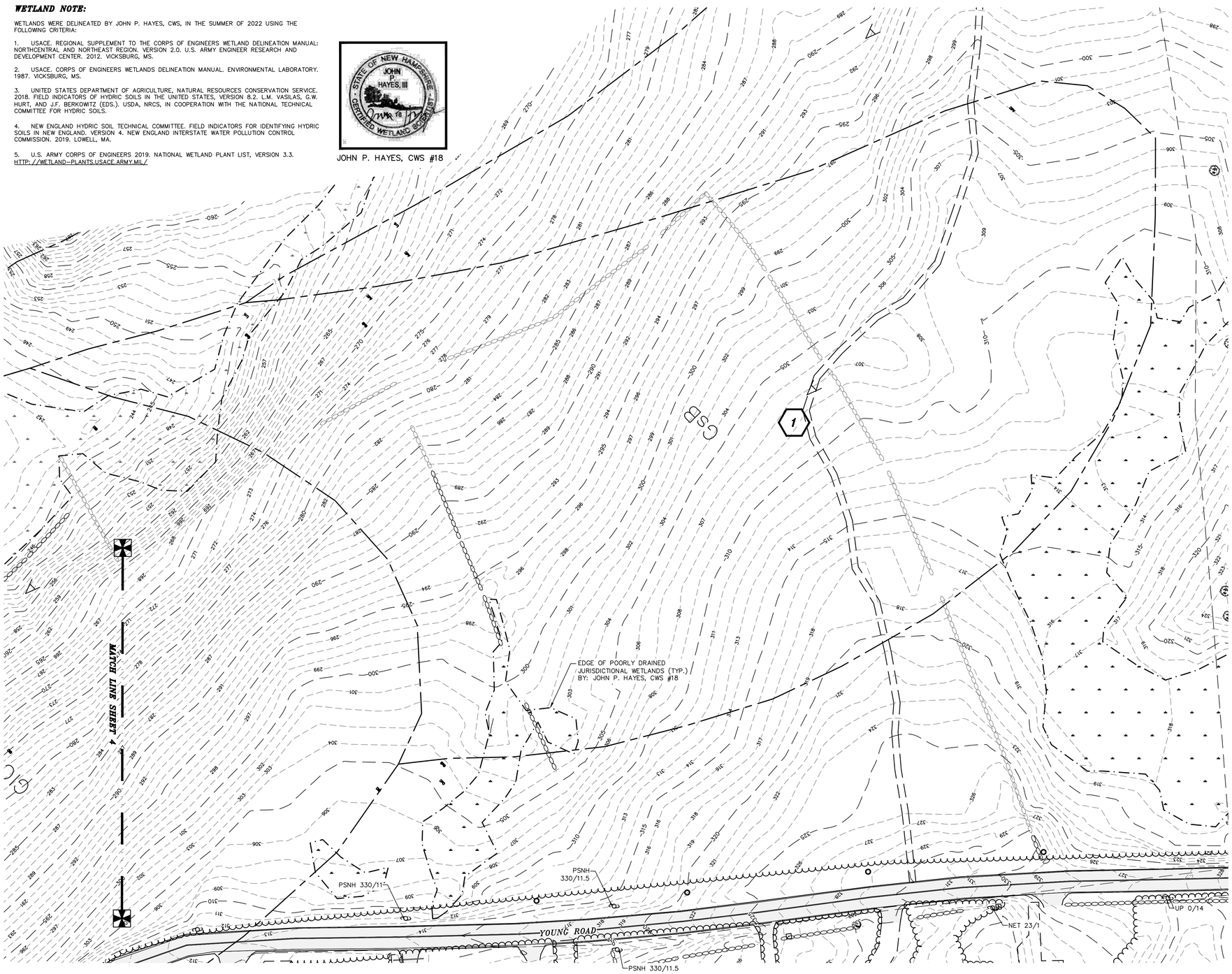
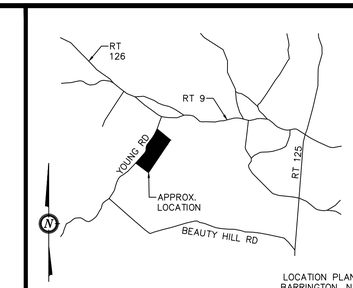
STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST
NH 18

JOHN P. HAYES, CWS #18





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE EXISTING DRAINAGE DETAILS OF THE LOCUS PARCEL.

5.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HYB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc.	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISION	DATE	DESCRIPTION
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

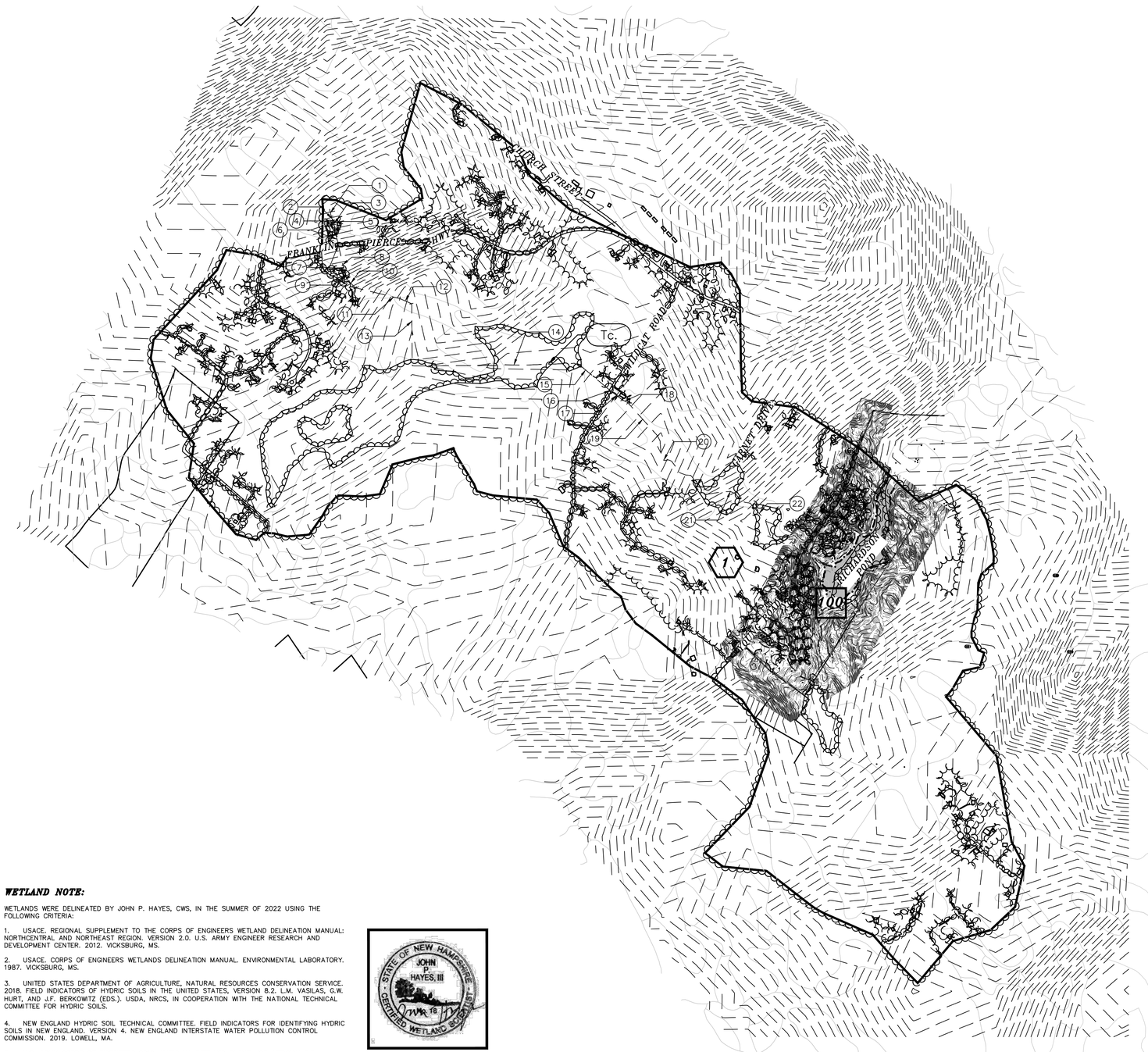
W-1 EXISTING CONDITION DETAIL PLAN 3

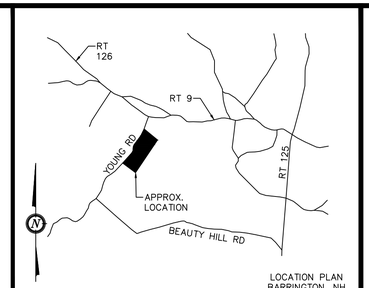
FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 - 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 14243
LICENSED
PROFESSIONAL ENGINEER





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE PROPOSED DRAINAGE OVERVIEW OF THE LOCUS PARCEL.

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SOILS:

AdC – ACTON VERY STONY FINE SANDY LOAM, 8 TO 15% SLOPES

CsC – CHARLTON FINE SANDY LOAM, 8 TO 15% SLOPES, VERY STONY

Fa – FRESH WATER MARSH

GlC – GLOUCESTER FINE SANDY LOAM, 8 TO 15% SLOPES

GsB – GLOUCESTER VERY STONY FINE SANDY LOAM, 8 TO 15% SLOPES

HgC – HOLLIS–GLOUCESTER VERY ROCKY FINE SANDY LOAMS, 8 TO 15% SLOPES

LrA – LEICESTER–RIDGEBURY FINE SANDY LOAMS, 0 TO 3% SLOPES, VERY STONY

SEE WEBSOIL USDA–NRCS

LEGEND:

299	EXISTING CONTOUR MINOR
295	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HfB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc.	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

800 0 400 800 1600 3200

(IN FEET)
1 inch = 800 ft.

WETLAND NOTE:

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JOHN P. HAYES, CWS #18

REVISION	DATE	DESCRIPTION
#3	12-21-23	REVISED PER CMA ENGINEERS REVIEW
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

W-2 PROPOSED CONDITION WATERSHED OVERVIEW PLAN

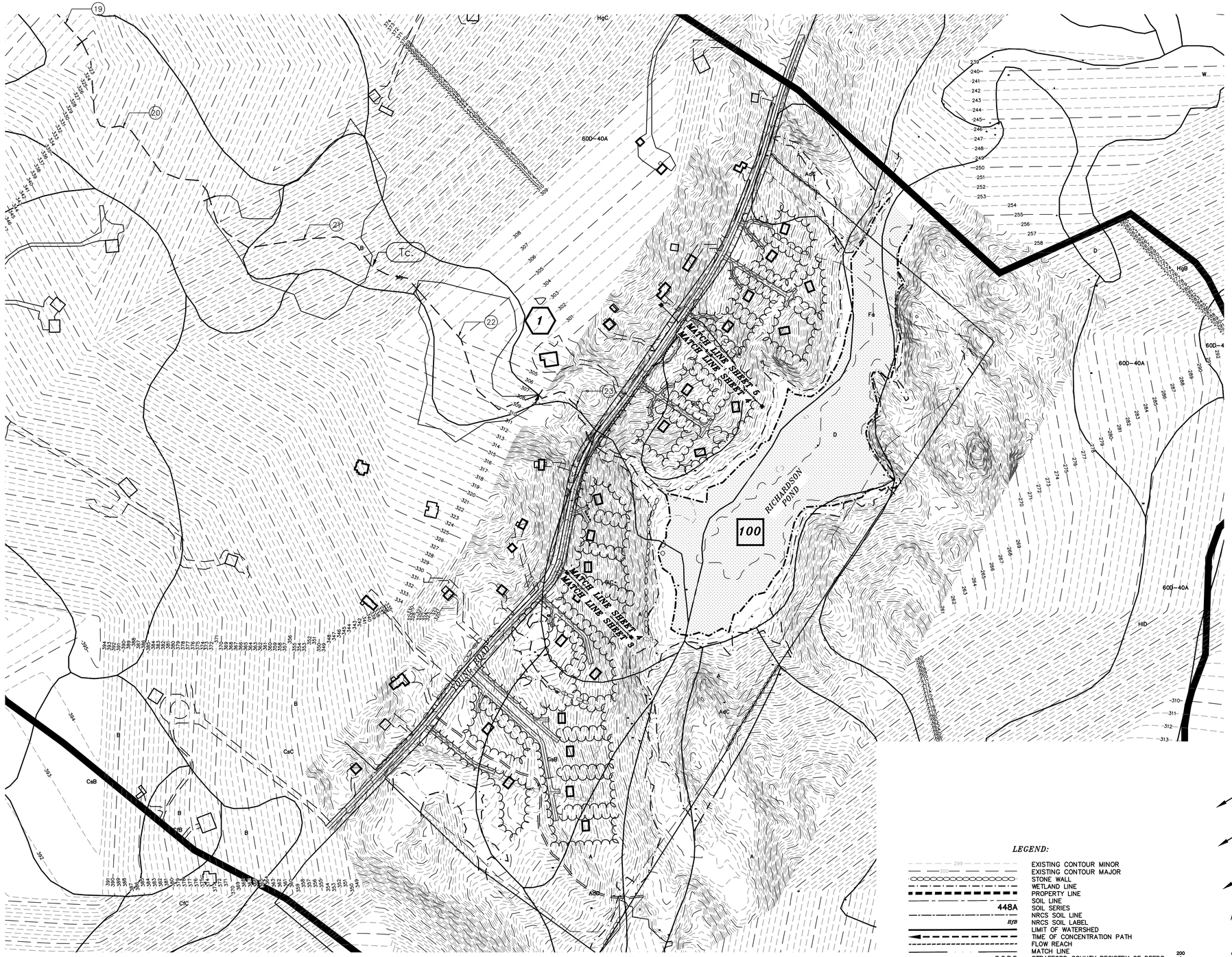
FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

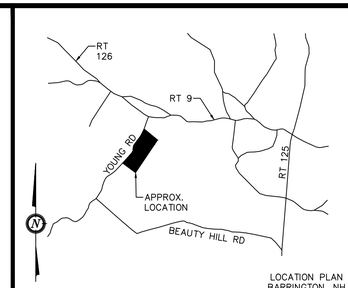
BERRY & SURVEYING ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 800 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 – 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 7174
LICENSED
PROFESSIONAL ENGINEER

SHEET 6 OF 10





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

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JOHN P. HAYES, CWS #18

SYMBOLS LEGEND:

SUBCATCHMENT AREA SYMBOL

FLOW REACH SYMBOL

POND DEVICE SYMBOL

TIME OF CONCENTRATION SEGMENT

LEGEND:

299	EXISTING CONTOUR MINOR
100	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HfB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

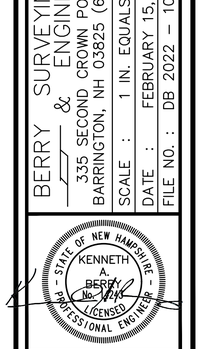
REVISION	DATE	DESCRIPTION
#3	12-21-23	REVISED PER CMA ENGINEERS REVIEW
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

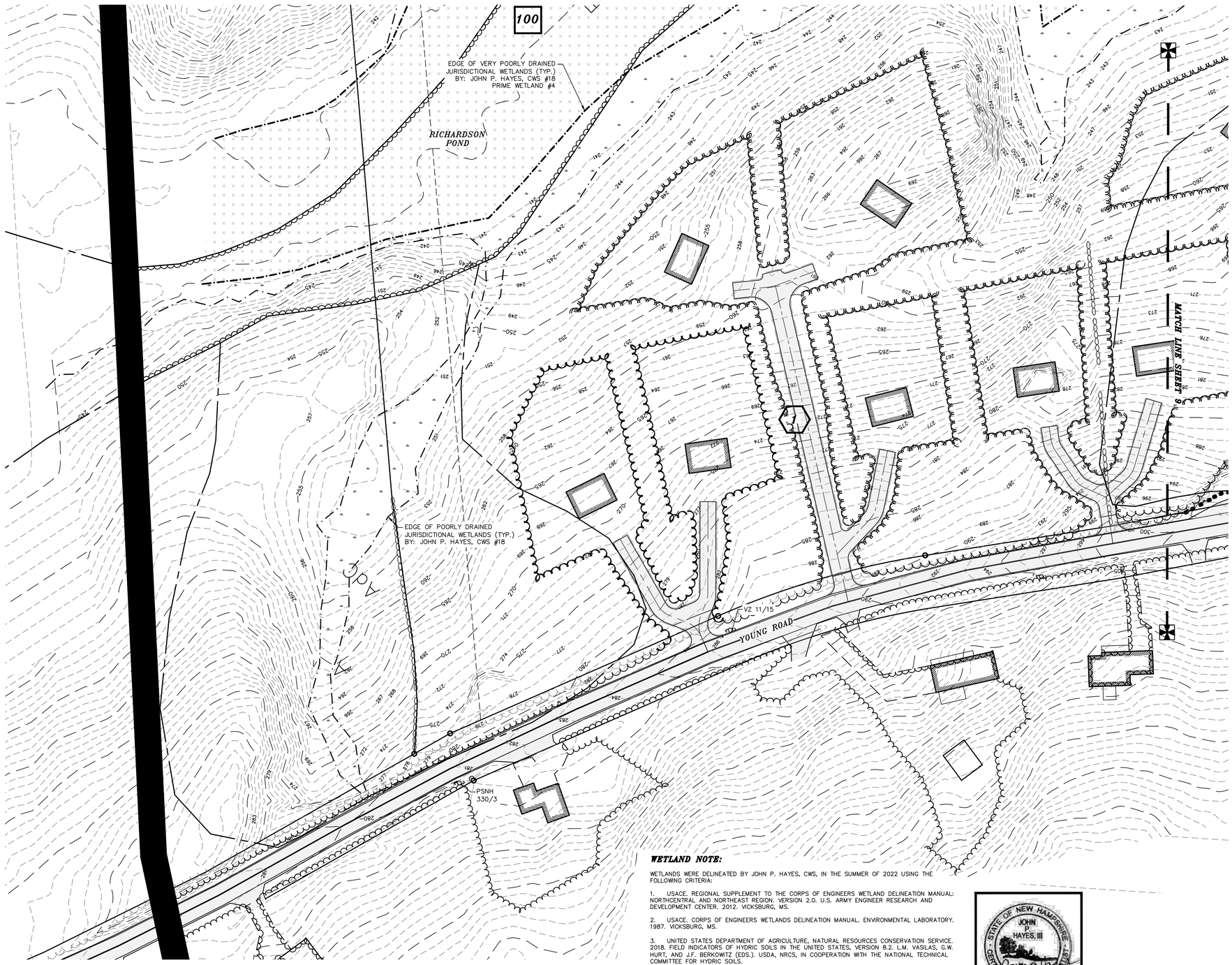
W-2 PROPOSED CONDITION SITE OVERVIEW PLAN

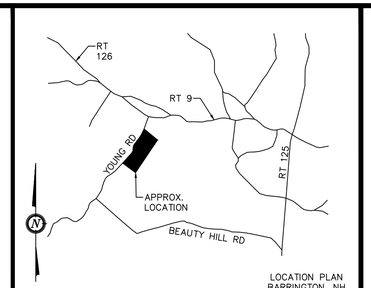
FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD, LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 200 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 - 109







LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

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LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
H/M	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc. #	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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STATE OF NEW HAMPSHIRE
JOHN P. HAYES, III
CERTIFIED WETLAND SCIENTIST

JOHN P. HAYES, CWS #18

REVISION	DATE	DESCRIPTION
#3	12-21-23	REVISED PER CMA ENGINEERS REVIEW
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

W-2 PROPOSED CONDITION DETAIL PLAN 1

FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 - 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 10243
LICENSED
PROFESSIONAL ENGINEER

SHEET 8 OF 10

WETLAND NOTE:

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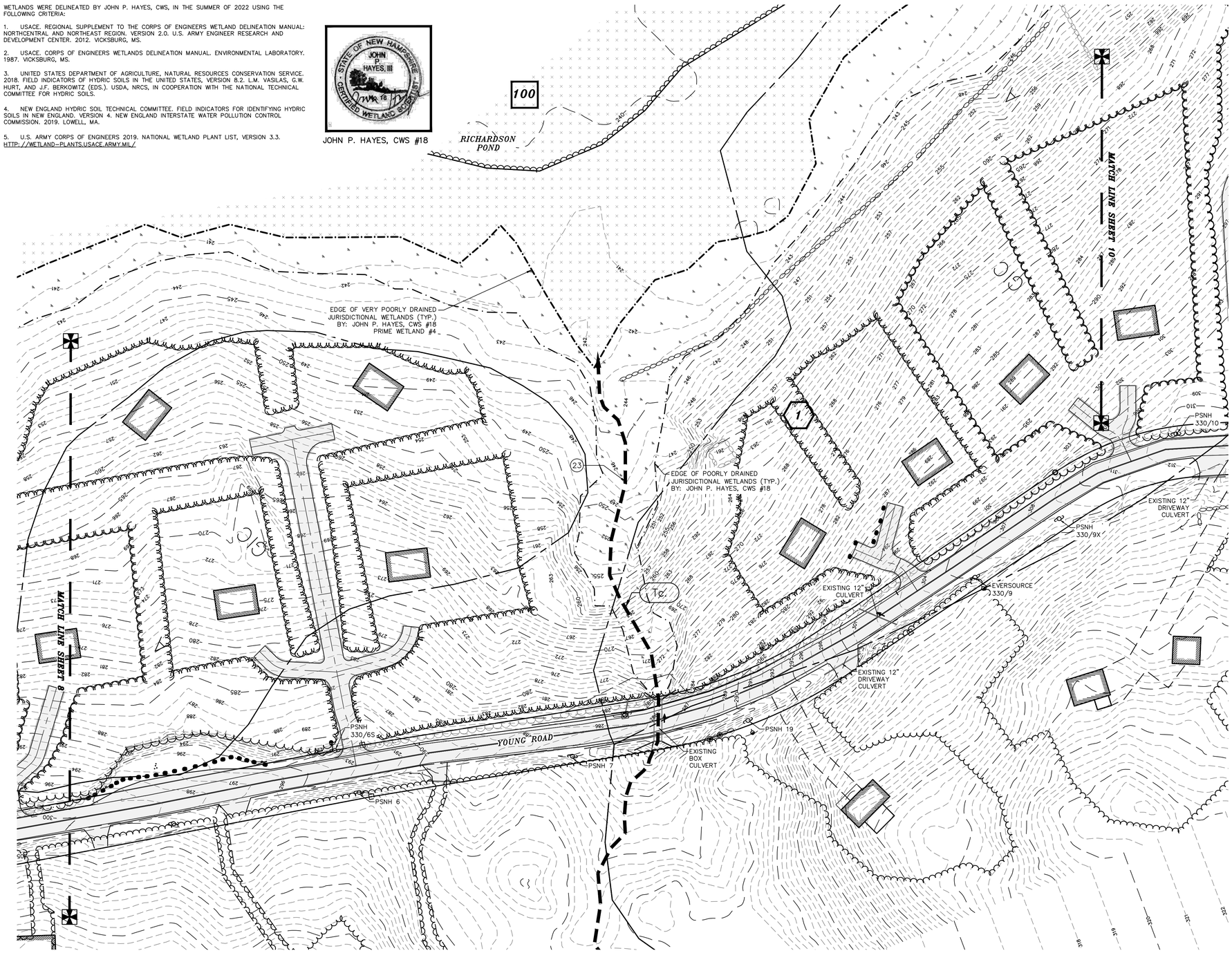
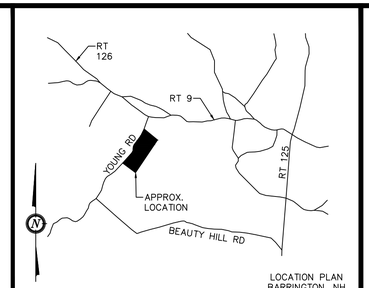
JOHN P. HAYES, CWS #18





LOCATION PLAN
BARRINGTON, NH
NOT TO SCALE

NOTES:

1.) OWNER: YOUNG ROAD LLC
76 YOUNG ROAD
BARRINGTON, NH 03825

1A.) APPLICANT: PAUL THIBODEAU
76 YOUNG ROAD
BARRINGTON, NH 03825

2.) TAX MAP 240, LOT 8

3.) LOT AREA: 2,855,458 Sq.Ft., 65.55 Ac.

4.) THE INTENT OF THIS PLAN IS TO DEMONSTRATE THE PROPOSED DRAINAGE DETAILS OF THE LOCUS PARCEL.

5.) HYDROCAD USES A SERIES OF NODE SUFFIXES FOR NUMBERING PURPOSES (S=SUBCATCHMENT, P=POND DEVICE, R=REACH), TO SIMPLIFY ANNOTATION THESE SUFFIXES ARE LEFT OFF THE WATERSHED PLANS AND NODE TYPE IS DENOTED BY THE SYMBOL SHAPE ACCORDING TO THE DISPLAYED LEGEND WHICH COINCIDES WITH HYDROCAD GRAPHICS.

LEGEND:

299	EXISTING CONTOUR MINOR
300	EXISTING CONTOUR MAJOR
	STONE WALL
	WETLAND LINE
	PROPERTY LINE
	SOIL LINE
448A	SOIL SERIES
	NRCS SOIL LINE
HYB	NRCS SOIL LABEL
	LIMIT OF WATERSHED
	TIME OF CONCENTRATION PATH
	FLOW REACH
	MATCH LINE
S.C.R.D.	STRAFFORD COUNTY REGISTRY OF DEEDS
TYP.	TYPICAL
FND	FOUND
TBR	TO BE REMOVED

SYMBOLS LEGEND:

#	SUBCATCHMENT AREA SYMBOL
#	FLOW REACH SYMBOL
#	POND DEVICE SYMBOL
Tc.	TIME OF CONCENTRATION SEGMENT

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REVISION	DATE	DESCRIPTION
#3	12-21-23	REVISED PER CMA ENGINEERS REVIEW
#2	8-21-23	SIGHT DISTANCE PLAN REVISIONS
#1	3-20-23	MINOR REVISIONS TO LAYOUT

W-2 PROPOSED CONDITION DETAIL PLAN 2

FOR
PAUL THIBODEAU
LAND OF
YOUNG ROAD LLC
YOUNG ROAD
BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 50 FT.
DATE : FEBRUARY 15, 2023
FILE NO. : DB 2022 - 109

STATE OF NEW HAMPSHIRE
KENNETH A. BERRY
No. 9247
LICENSED
PROFESSIONAL ENGINEER

SHEET 9 OF 10

WETLAND NOTE:

WETLANDS WERE DELINEATED BY JOHN P. HAYES, CWS, IN THE SUMMER OF 2022 USING THE FOLLOWING CRITERIA:

1. USACE. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. VERSION 2.0. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER. 2012. VICKSBURG, MS.

2. USACE. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL. ENVIRONMENTAL LABORATORY. 1987. VICKSBURG, MS.

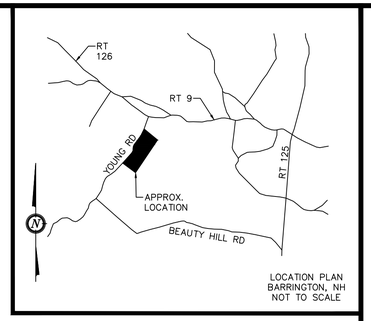
3. UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. 2018. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2. L.M. VASILAS, G.W. HURT, AND J.F. BERKOWITZ (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.

4. NEW ENGLAND HYDRIC SOIL TECHNICAL COMMITTEE. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND. VERSION 4. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 2019. LOWELL, MA.

5. U.S. ARMY CORPS OF ENGINEERS 2019. NATIONAL WETLAND PLANT LIST, VERSION 3.3. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/

STATE OF NEW HAMPSHIRE · JOHN P. HAYES, III · CERTIFIED WETLAND SCIENTIST · 18

JOHN P. HAYES, CWS #18



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LAND OF
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BARRINGTON, NH
TAX MAP 240, LOT 8

BERRY SURVEYING & ENGINEERING
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STATE OF NEW HAMPSHIRE · KENNETH A. BERRY · No. 7243 · LICENSED · PROFESSIONAL ENGINEER

SHEET 10 OF 10