STEVENS & ASSOCIATES, P.C.
SMART DESIGN FOR LIVABLE COMMUNITIES

June 17, 2020

RE: Ben's Sugar Shack - Stormwater Design
Ben's Maple Products LLC
Webster Highway, Temple NH

On behalf of Ben's Maple Products, LLC, please find attached stormwater discharge study which evaluates the proposed improvements during the 25-yr storm event. The project approach is to limit the peak flow of the discharge during the design storm to reduce erosive damage caused by high-velocity runoff and to delay the peak flows in effort to protect stream banks of downstream receiving waters.

Existing conditions and proposed conditions were evaluated on a single watershed extending east from the western hill, including road runoff from adjacent streets, and on-site soils and improvements. Stormwater peak discharge rates are mitigated to below existing conditions via a new pond with detaining structure which allows for the peak storm flows to occur in a controlled manner over longer period of time. Stormwater runoff was modeled using HydroCAD 10 stormwater modeling software. The 25-yr, 24-hr storm was chosen for modeling in lieu of the zoning specified 20-yr storm since NOAA Atlas 14 provides regional data for Temple NH for the 25 yr storm.

Stormwater modeling indicates a post-development peak discharge rate of 5.21 Cubic Feet Per Second during the 25-year storm after the building, pavements, and pond have been constructed. Stormwater modeling indicates a pre-development peak discharge rate of 9.98 Cubic Feet Per Second during the 25-year storm.

Please find the following attachments:

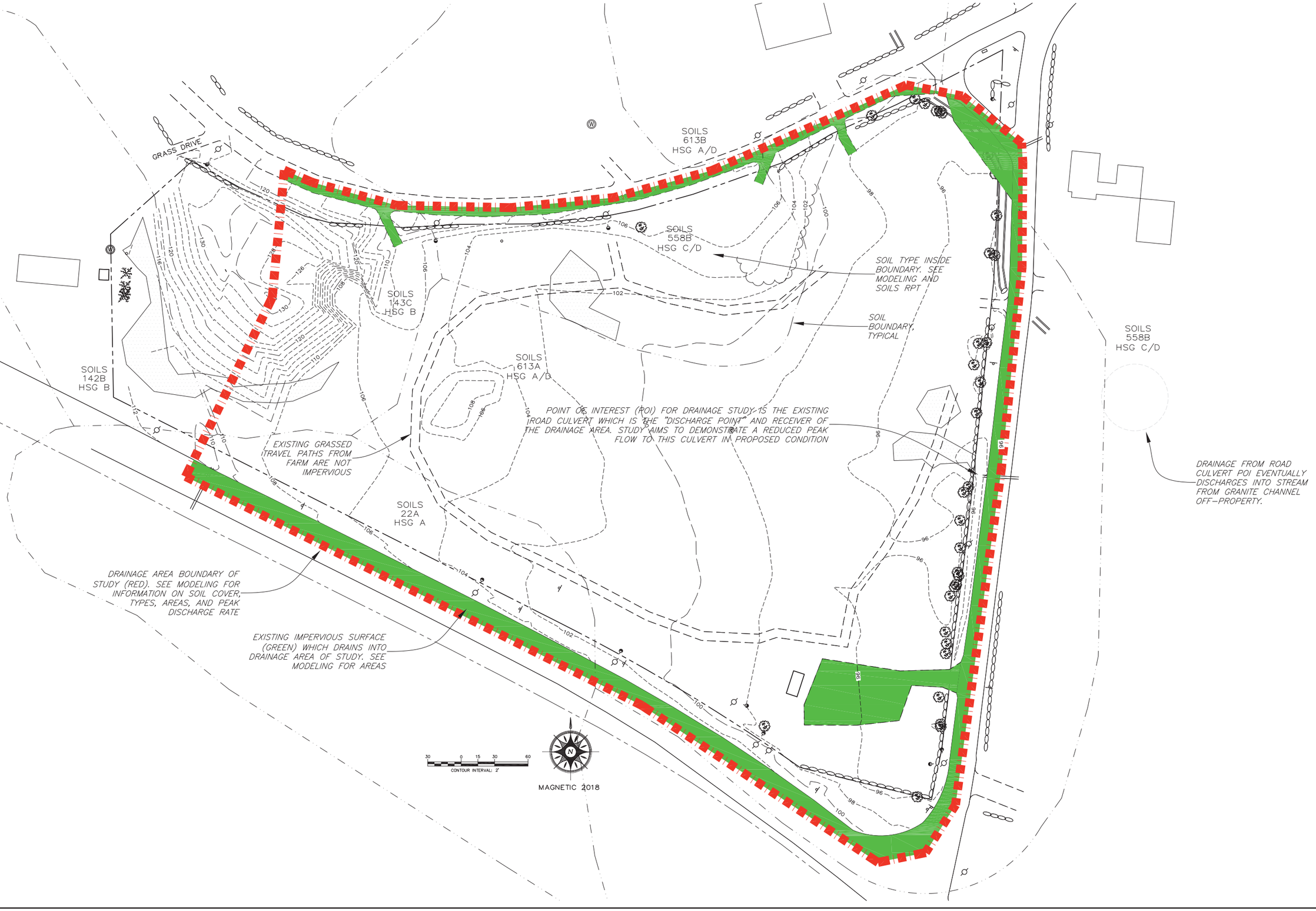
- Existing Stormwater Plan (Pre-Development Impervious)
- Proposed Stormwater Plan (Post-Development Impervious)
- EX-1: Existing conditions watershed modeling
- PN-1: Proposed conditions watershed modeling
- NOAA Atlas 14 – Rainfall data report, Temple NH (with maps)
- USDA NRCS – Soil Survey for project site

Please contact us if you have any questions or require additional information. Thank you.

Sincerely,

Hamilton Hodgman
S&A Stormwater Design Team

95 MAIN ST. | P.O. BOX 1586 | BRATTLEBORO, VT 05302
802-257-9329 | FAX: 802-258-3892



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BEN'S SUGAR SHACK

WEBSTER HIGHWAY
TEMPLE, NH

PREPARED FOR:

BEN'S MAPLE PRODUCTS LLC

83 WEBSTER HIGHWAY
TEMPLE, NH

DATE: REVISION:

EXISTING STORM WATER PLAN

DES. BY	HRH
DWN. BY	HRH
CHKD. BY	HRH
SCALE	NTS
DATE	06/09/20
PROJECT NUM:	20-024

DWG. NO.

D-1

SHEET 1 OF 2

SOIL TYPE INSIDE BOUNDARY. SEE MODELING AND SOILS RPT

GRASS DRIVE

SOILS 613B HSG A/D

SOILS 558B HSG C/D

SOIL BOUNDARY, TYPICAL

SOILS 143C HSG B

SOILS 142B HSG B

SOILS 613A HSG A/D

SOILS 22A HSG A

SOILS 558B HSG C/D

6-INCH FOUNDATION DRAIN. DAYLIGHT AT 96'. PROVIDE STAINLESS STEEL SCREEN

BUILDING FOUNDATION DRAINAGE

BUILDING SLAB FFE = 105

DETEN. STRUCT RIM=96.3
15" INV IN =93.9
4" OPENING INV = 94.0
5 FT WEIR INV = 95.0
15" INV OUT =93.9
SEE DETAIL

15" HDPE

INV=93.5

INV=93.1

DRAINAGE FROM ROAD CULVERT POI EVENTUALLY DISCHARGES INTO STREAM FROM GRANITE CHANNEL OFF-PROPERTY.

POINT OF INTEREST (POI) FOR DRAINAGE STUDY IS THE INLET SIDE (WEST) OF EXISTING ROAD CULVERT

DETENTION POND. WATER SURFACE 7000 SF. SEE DETENTION STRUCTURE NOTES AND MODEL FOR STORMWATER CONTROLS. WATER SURFACE CONSIDERED IMPERVIOUS FOR DRAINAGE STUDY

CBT RIM=100 18" INV=96.0

PROPOSED NEW IMPERVIOUS SURFACES (BLUE) INCLUDING BUILDING, WALKS, AND PAVEMENTS

DRAINAGE AREA BOUNDARY OF STUDY (RED). SEE MODELING FOR INFORMATION ON SOIL COVER, TYPES, AREAS, AND PEAK DISCHARGE RATE

EXISTING IMPERVIOUS SURFACE (GREEN) WHICH DRAINS INTO DRAINAGE AREA OF STUDY. SEE MODELING FOR AREAS

30 0 15 30 60
CONTOUR INTERVAL: 2'

MAGNETIC 2018

STEVENS & ASSOCIATES, P.C.
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BEN'S SUGAR SHACK

WEBSTER HIGHWAY
TEMPLE, NH

PREPARED FOR:
BEN'S MAPLE PRODUCTS LLC
83 WEBSTER HIGHWAY
TEMPLE, NH

DATE:	
REVISION:	

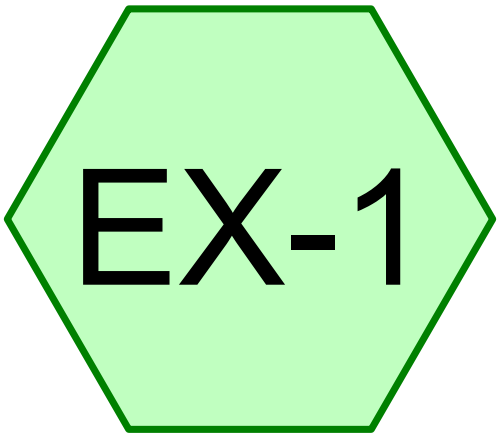
PROPOSED STORM WATER PLAN

DES. BY	HRH
DWN. BY	HRH
CHKD. BY	HRH
SCALE	NTS
DATE	06/09/20
PROJECT NUM:	20-024

DWG. NO.

D-2

SHEET 2 OF 2



EXISTING

Subcat Reach Pond Link

Routing Diagram for Bens Sugarshack - Temple NH
Prepared by {enter your company name here}, Printed 6/17/2020

Summary for Subcatchment EX-1: EXISTING

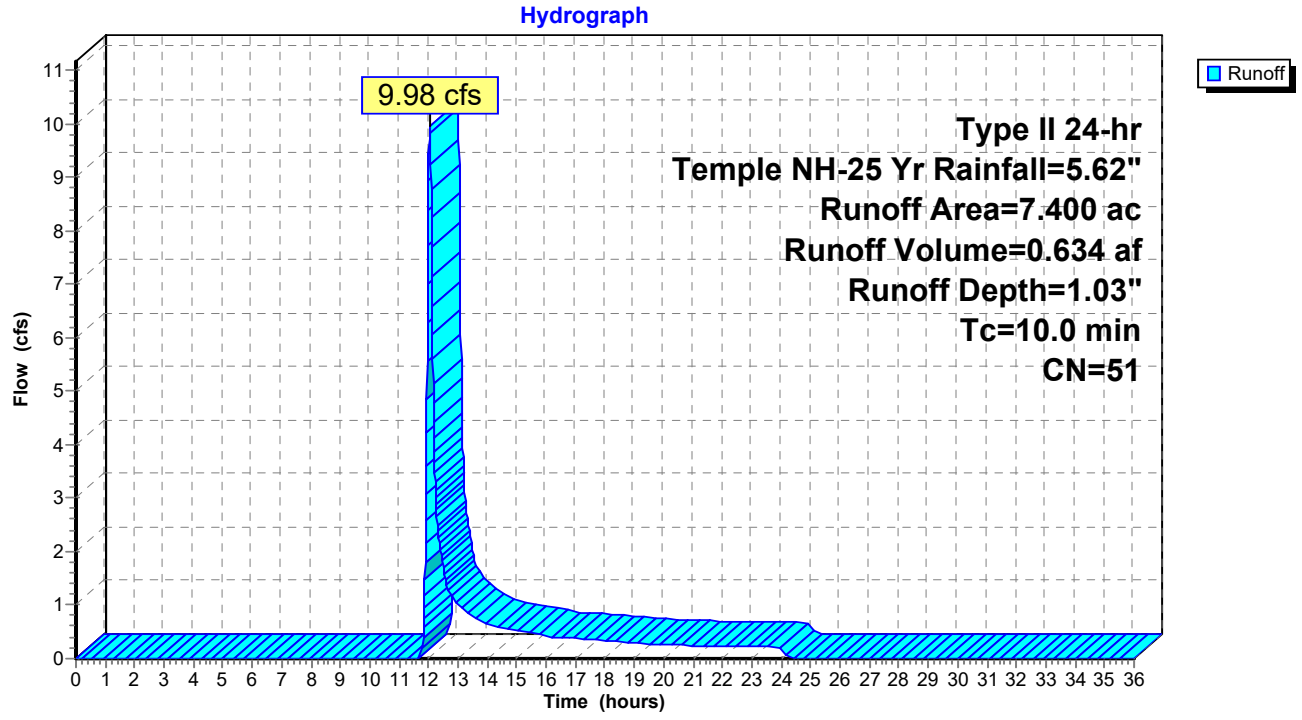
Runoff = 9.98 cfs @ 12.04 hrs, Volume= 0.634 af, Depth= 1.03"

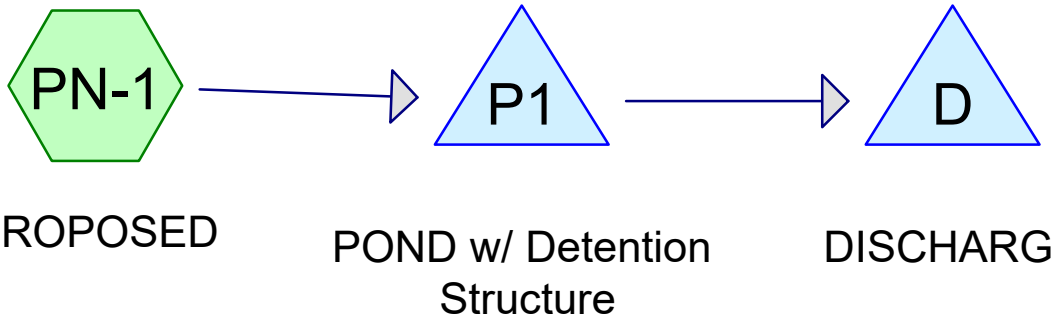
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr Temple NH-25 Yr Rainfall=5.62"

Area (ac)	CN	Description
0.690	61	>75% Grass cover, Good, HSG B
0.030	98	Paved parking, HSG B
0.880	74	>75% Grass cover, Good, HSG C
0.090	98	Paved parking, HSG C
5.130	39	>75% Grass cover, Good, HSG A
0.580	98	Paved parking, HSG A
7.400	51	Weighted Average
6.700		90.54% Pervious Area
0.700		9.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment EX-1: EXISTING





Subcat Reach Pond Link

Routing Diagram for Bens Sugarshack - Temple NH
Prepared by {enter your company name here}, Printed 6/17/2020

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PN-1: PROPOSED Runoff Area=7.400 ac 30.30% Impervious Runoff Depth=1.83"
Tc=5.0 min CN=62 Runoff=25.09 cfs 1.132 af

Pond D: DISCHARGE Inflow=5.21 cfs 1.098 af
Primary=5.21 cfs 1.098 af

Pond P1: POND w/ Detention Structure Peak Elev=95.78' Storage=17,088 cf Inflow=25.09 cfs 1.132 af
Outflow=5.21 cfs 1.098 af

Total Runoff Area = 7.400 ac Runoff Volume = 1.132 af Average Runoff Depth = 1.83"
69.70% Pervious = 5.158 ac 30.30% Impervious = 2.242 ac

Summary for Subcatchment PN-1: PROPOSED

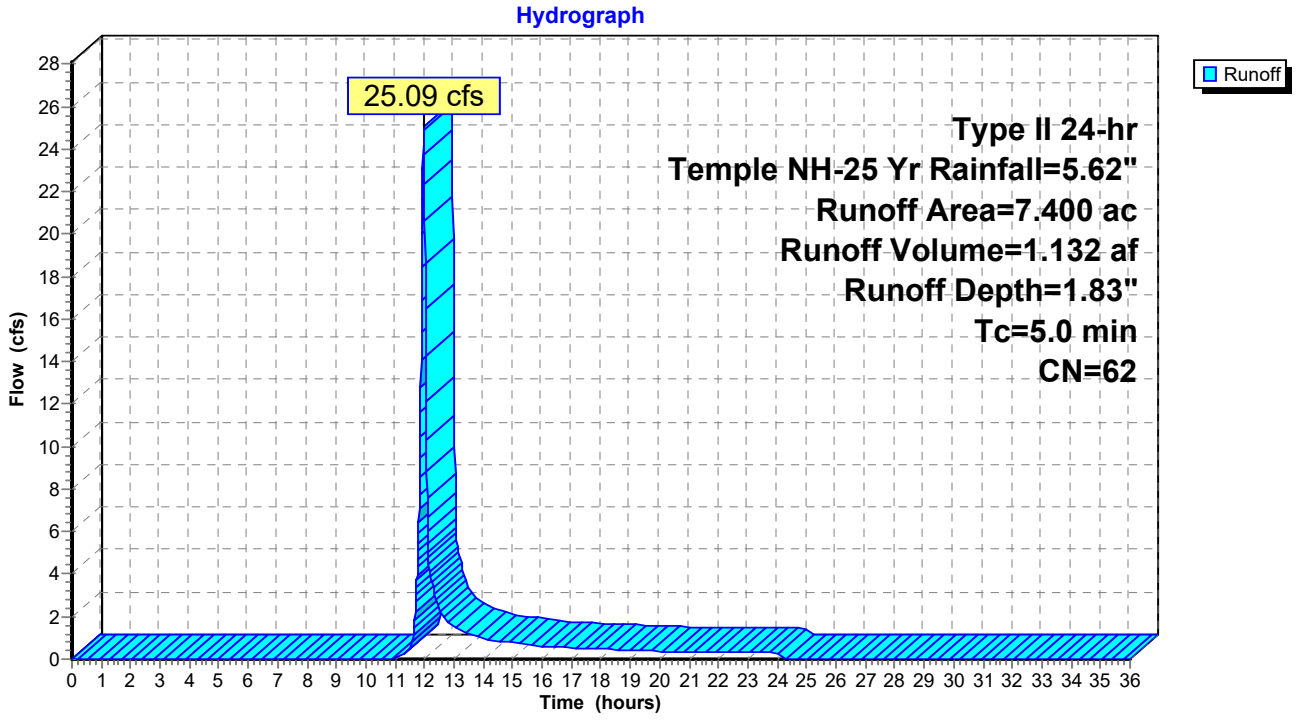
Runoff = 25.09 cfs @ 11.97 hrs, Volume= 1.132 af, Depth= 1.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type II 24-hr Temple NH-25 Yr Rainfall=5.62"

Area (ac)	CN	Description
0.690	61	>75% Grass cover, Good, HSG B
0.030	98	Paved parking, HSG B
0.624	74	>75% Grass cover, Good, HSG C
0.346	98	Paved parking, HSG C
3.844	39	>75% Grass cover, Good, HSG A
1.705	98	Paved parking, HSG A
0.161	98	Water Surface, HSG A
7.400	62	Weighted Average
5.158		69.70% Pervious Area
2.242		30.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 1/2 EX Tc**

Subcatchment PN-1: PROPOSED



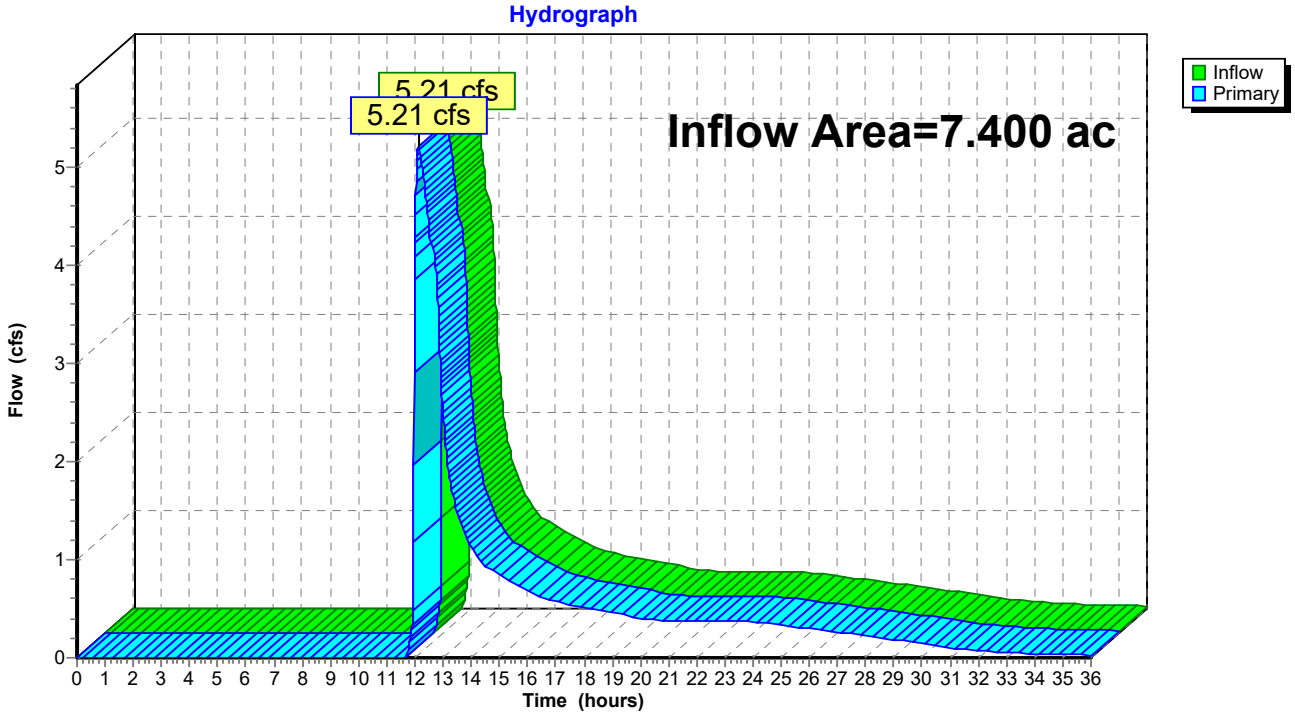
Summary for Pond D: DISCHARGE

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

Inflow Area = 7.400 ac, 30.30% Impervious, Inflow Depth > 1.78" for Temple NH-25 Yr event
Inflow = 5.21 cfs @ 12.12 hrs, Volume= 1.098 af
Primary = 5.21 cfs @ 12.12 hrs, Volume= 1.098 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond D: DISCHARGE



Summary for Pond P1: POND w/ Detention Structure

Inflow Area = 7.400 ac, 30.30% Impervious, Inflow Depth = 1.83" for Temple NH-25 Yr event
Inflow = 25.09 cfs @ 11.97 hrs, Volume= 1.132 af
Outflow = 5.21 cfs @ 12.12 hrs, Volume= 1.098 af, Atten= 79%, Lag= 8.9 min
Primary = 5.21 cfs @ 12.12 hrs, Volume= 1.098 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 95.78' @ 12.12 hrs Surf.Area= 11,417 sf Storage= 17,088 cf

Plug-Flow detention time= 180.7 min calculated for 1.098 af (97% of inflow)
Center-of-Mass det. time= 164.0 min (1,021.4 - 857.4)

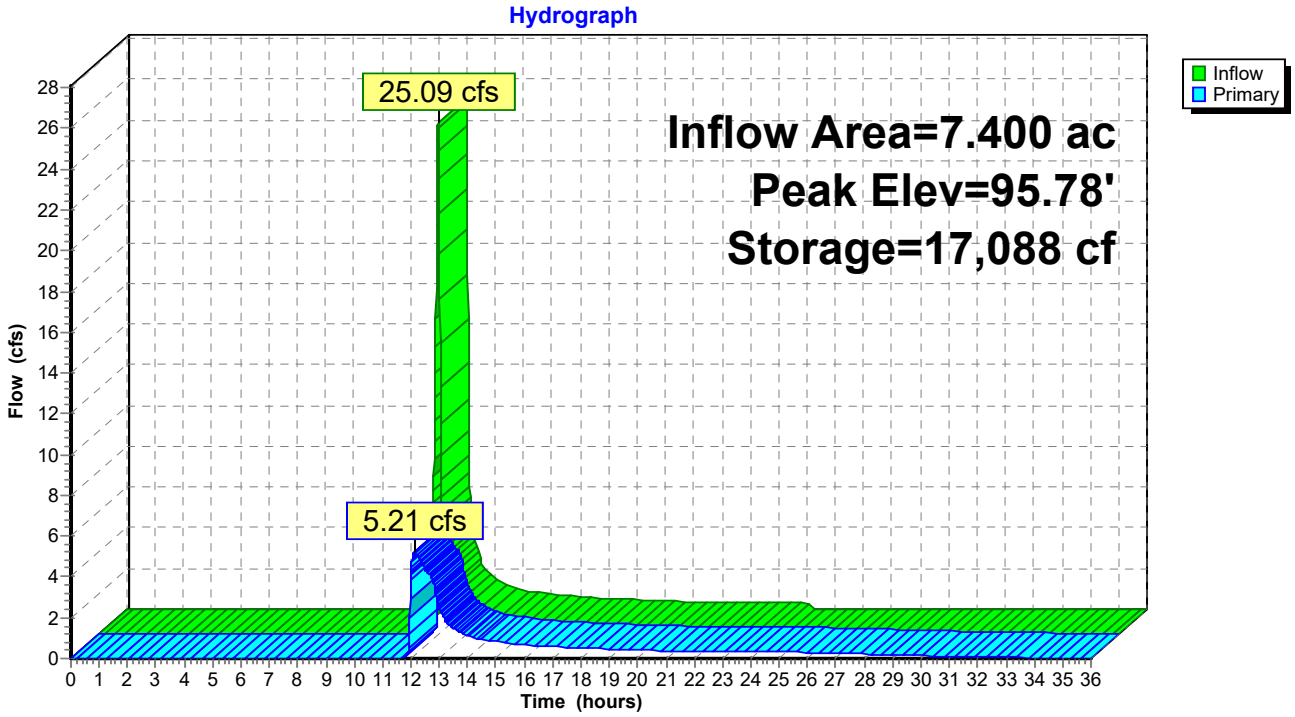
Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	19,615 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.90	7,000	0	0
95.00	9,300	8,965	8,965
96.00	12,000	10,650	19,615

Device	Routing	Invert	Outlet Devices
#1	Primary	93.90'	**15.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 93.90' / 93.90' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	95.00'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	94.00'	**4.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.21 cfs @ 12.12 hrs HW=95.78' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.21 cfs @ 4.24 fps)
└**2=Broad-Crested Rectangular Weir** (Passes < 11.39 cfs potential flow)
└**3=Orifice/Grate** (Passes < 0.53 cfs potential flow)

Pond P1: POND w/ Detention Structure



NOAA Atlas 14, Volume 10, Version 3
Location name: Temple, New Hampshire, USA*
Latitude: 42.8434°, Longitude: -71.8535°
Elevation: 1024.68 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.319** (0.245-0.410)	**0.378** (0.290-0.487)	**0.475** (0.364-0.612)	**0.555** (0.423-0.720)	**0.665** (0.492-0.894)	**0.748** (0.543-1.02)	**0.835** (0.589-1.18)	**0.930** (0.624-1.34)	**1.06** (0.688-1.58)	**1.17** (0.742-1.77)
10-min	**0.452** (0.347-0.581)	**0.535** (0.411-0.689)	**0.672** (0.515-0.867)	**0.785** (0.598-1.02)	**0.942** (0.697-1.27)	**1.06** (0.769-1.45)	**1.18** (0.834-1.67)	**1.32** (0.885-1.90)	**1.51** (0.976-2.23)	**1.66** (1.05-2.50)
15-min	**0.531** (0.409-0.683)	**0.630** (0.484-0.811)	**0.791** (0.606-1.02)	**0.925** (0.705-1.20)	**1.11** (0.819-1.49)	**1.25** (0.904-1.71)	**1.39** (0.981-1.96)	**1.55** (1.04-2.23)	**1.77** (1.15-2.63)	**1.95** (1.24-2.94)
30-min	**0.737** (0.567-0.948)	**0.874** (0.672-1.13)	**1.10** (0.842-1.42)	**1.29** (0.979-1.67)	**1.54** (1.14-2.07)	**1.74** (1.26-2.37)	**1.94** (1.36-2.73)	**2.16** (1.45-3.10)	**2.47** (1.60-3.65)	**2.71** (1.72-4.09)
60-min	**0.943** (0.726-1.21)	**1.12** (0.860-1.44)	**1.41** (1.08-1.82)	**1.65** (1.25-2.13)	**1.97** (1.46-2.65)	**2.22** (1.61-3.04)	**2.48** (1.75-3.49)	**2.76** (1.85-3.97)	**3.16** (2.04-4.67)	**3.47** (2.20-5.23)
2-hr	**1.18** (0.910-1.50)	**1.41** (1.09-1.80)	**1.79** (1.38-2.30)	**2.11** (1.62-2.72)	**2.55** (1.90-3.42)	**2.88** (2.11-3.94)	**3.23** (2.31-4.57)	**3.65** (2.45-5.21)	**4.26** (2.77-6.27)	**4.78** (3.04-7.16)
3-hr	**1.33** (1.04-1.70)	**1.61** (1.25-2.05)	**2.06** (1.59-2.63)	**2.43** (1.87-3.12)	**2.95** (2.21-3.95)	**3.33** (2.45-4.55)	**3.74** (2.69-5.30)	**4.24** (2.86-6.05)	**5.01** (3.26-7.35)	**5.67** (3.61-8.45)
6-hr	**1.66** (1.30-2.10)	**2.02** (1.58-2.55)	**2.59** (2.02-3.29)	**3.07** (2.38-3.92)	**3.73** (2.81-4.97)	**4.22** (3.13-5.74)	**4.75** (3.44-6.71)	**5.41** (3.66-7.66)	**6.44** (4.20-9.38)	**7.33** (4.68-10.9)
12-hr	**2.07** (1.63-2.60)	**2.51** (1.98-3.16)	**3.23** (2.53-4.07)	**3.83** (2.98-4.85)	**4.65** (3.52-6.15)	**5.25** (3.91-7.09)	**5.91** (4.30-8.29)	**6.73** (4.57-9.46)	**8.00** (5.23-11.6)	**9.09** (5.82-13.4)
24-hr	**2.52** (1.99-3.14)	**3.05** (2.41-3.80)	**3.91** (3.09-4.90)	**4.63** (3.63-5.83)	**5.62** (4.28-7.37)	**6.35** (4.75-8.50)	**7.14** (5.21-9.92)	**8.11** (5.53-11.3)	**9.57** (6.29-13.8)	**10.8** (6.95-15.8)
2-day	**2.97** (2.37-3.67)	**3.58** (2.86-4.44)	**4.59** (3.65-5.71)	**5.43** (4.29-6.79)	**6.59** (5.04-8.57)	**7.44** (5.59-9.87)	**8.36** (6.11-11.5)	**9.45** (6.48-13.1)	**11.1** (7.31-15.8)	**12.5** (8.02-18.1)
3-day	**3.28** (2.63-4.05)	**3.94** (3.16-4.87)	**5.03** (4.01-6.24)	**5.94** (4.71-7.39)	**7.18** (5.51-9.30)	**8.11** (6.10-10.7)	**9.10** (6.66-12.4)	**10.3** (7.06-14.2)	**12.0** (7.92-17.0)	**13.4** (8.66-19.4)
4-day	**3.55** (2.85-4.37)	**4.25** (3.41-5.23)	**5.39** (4.31-6.66)	**6.34** (5.04-7.87)	**7.65** (5.88-9.87)	**8.63** (6.50-11.3)	**9.66** (7.07-13.1)	**10.9** (7.49-15.0)	**12.6** (8.37-17.9)	**14.1** (9.12-20.4)
7-day	**4.27** (3.45-5.23)	**5.03** (4.06-6.17)	**6.27** (5.04-7.71)	**7.30** (5.83-9.02)	**8.72** (6.74-11.2)	**9.79** (7.39-12.8)	**10.9** (7.99-14.7)	**12.2** (8.42-16.7)	**14.0** (9.31-19.8)	**15.5** (10.1-22.3)
10-day	**4.98** (4.04-6.07)	**5.77** (4.67-7.04)	**7.06** (5.69-8.64)	**8.13** (6.51-10.00)	**9.60** (7.43-12.2)	**10.7** (8.11-13.9)	**11.9** (8.69-15.9)	**13.2** (9.12-17.9)	**15.0** (9.96-21.0)	**16.4** (10.7-23.5)
20-day	**7.13** (5.82-8.64)	**7.96** (6.49-9.65)	**9.32** (7.56-11.3)	**10.4** (8.42-12.8)	**12.0** (9.32-15.1)	**13.2** (9.99-16.8)	**14.4** (10.5-18.9)	**15.6** (10.9-21.0)	**17.1** (11.5-23.9)	**18.3** (11.9-26.0)
30-day	**8.91** (7.30-10.8)	**9.77** (7.99-11.8)	**11.2** (9.11-13.5)	**12.3** (10.0-15.0)	**14.0** (10.9-17.4)	**15.2** (11.6-19.3)	**16.4** (12.0-21.3)	**17.6** (12.3-23.6)	**19.0** (12.7-26.3)	**19.9** (13.0-28.2)
45-day	**11.1** (9.13-13.3)	**12.0** (9.87-14.4)	**13.5** (11.1-16.3)	**14.8** (12.0-17.9)	**16.5** (12.9-20.4)	**17.8** (13.6-22.5)	**19.1** (13.9-24.6)	**20.2** (14.2-27.0)	**21.5** (14.5-29.6)	**22.3** (14.6-31.4)
60-day	**12.9** (10.6-15.5)	**13.9** (11.4-16.6)	**15.5** (12.7-18.6)	**16.8** (13.7-20.3)	**18.6** (14.6-23.0)	**20.1** (15.3-25.2)	**21.4** (15.6-27.4)	**22.5** (15.9-30.1)	**23.8** (16.1-32.8)	**24.6** (16.2-34.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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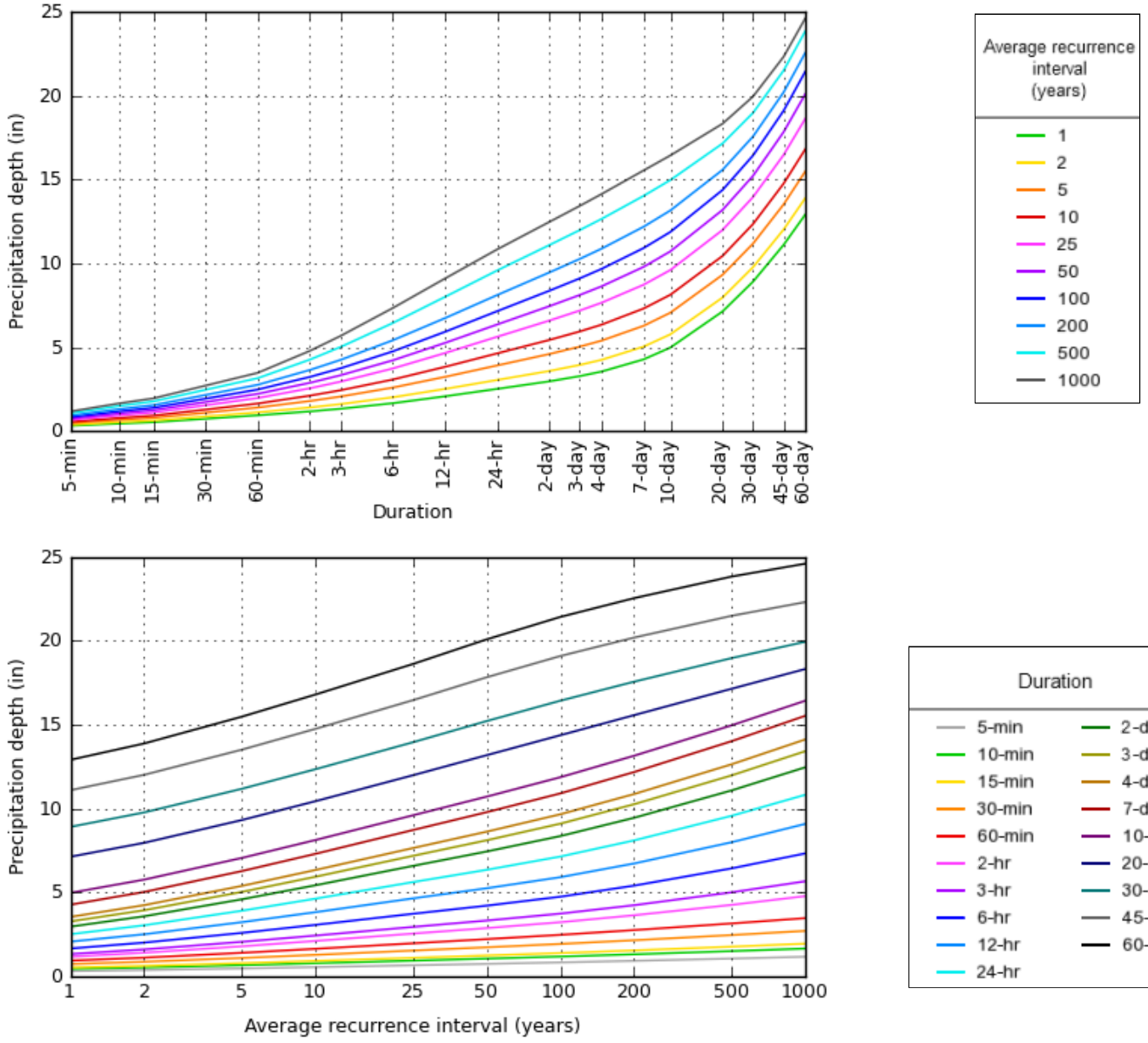
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 42.8434°, Longitude: -71.8535°



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed Mar 11 20:10:01 2020

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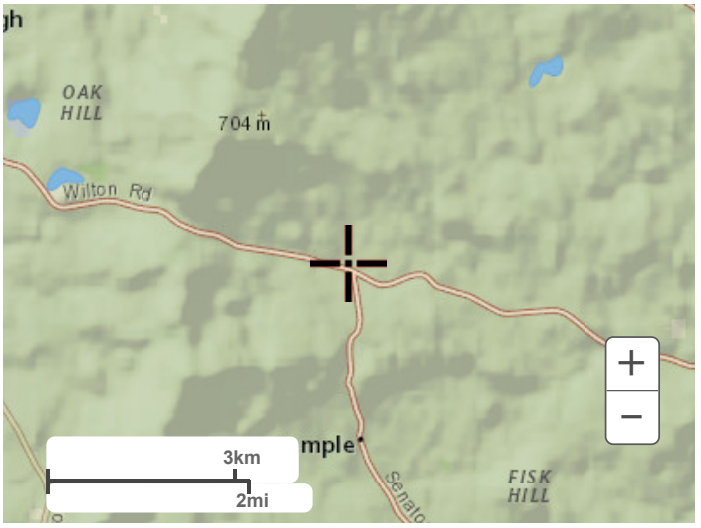
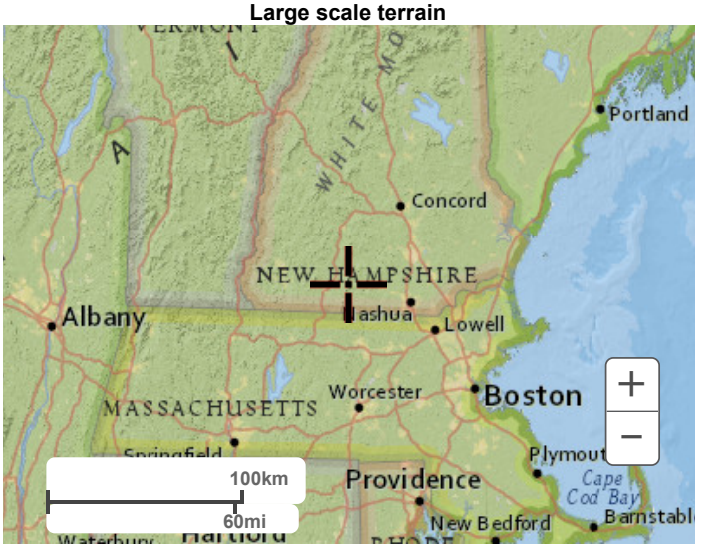
Maps & aerials

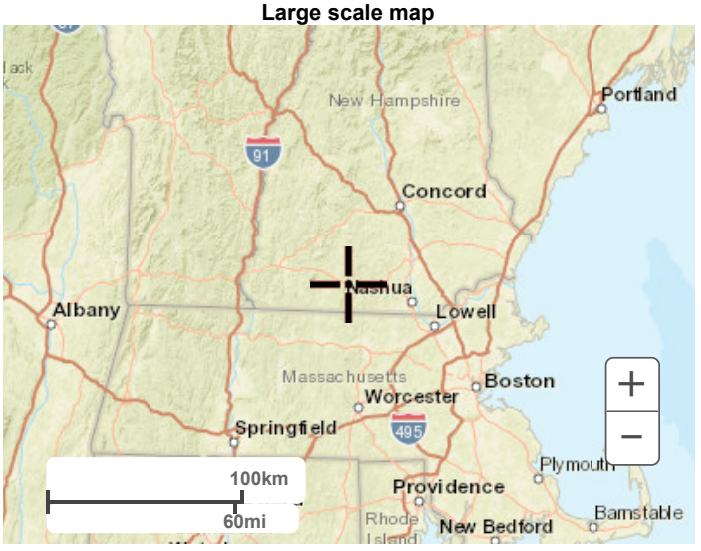
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Hillsborough County, New Hampshire, Western Part

March 11, 2020

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.

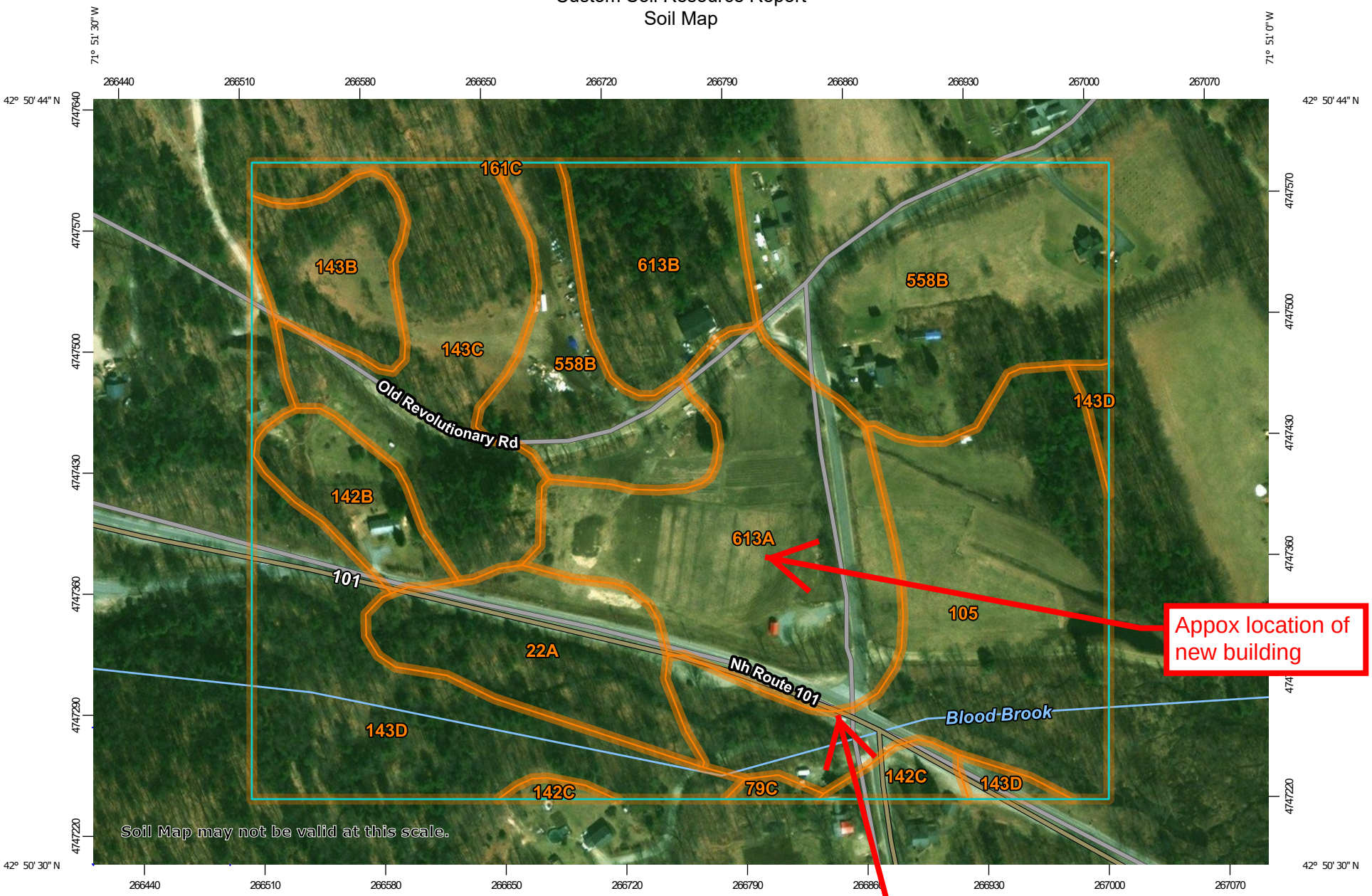
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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: 1:3,120 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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.

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

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

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

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

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

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

Soil Survey Area: Hillsborough County, New Hampshire, Western Part
Survey Area Data: Version 20, Sep 16, 2019

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

Date(s) aerial images were photographed: Jul 11, 2014—Apr 19, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
22A	Colton gravelly sandy loam, 0 to 3 percent slopes	3.1	6.8%
79C	Peru fine sandy loam, 8 to 15 percent slopes, very stony	0.1	0.3%
105	Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded	8.0	17.6%
142B	Monadnock fine sandy loam, 3 to 8 percent slopes	1.5	3.3%
142C	Monadnock fine sandy loam, 8 to 15 percent slopes	0.6	1.3%
143B	Monadnock fine sandy loam, 0 to 8 percent slopes, very stony	1.8	4.0%
143C	Monadnock fine sandy loam, 8 to 15 percent slopes, very stony	5.1	11.1%
143D	Monadnock fine sandy loam, 15 to 35 percent slopes, very stony	6.0	13.2%
161C	Lyman-Tunbridge-Rock outcrop complex, 3 to 15 percent slopes	0.0	0.0%
558B	Skerry fine sandy loam, 3 to 8 percent slopes	9.8	21.5%
613A	Croghan loamy fine sand, 0 to 3 percent slopes	6.6	14.6%
613B	Croghan loamy fine sand, 3 to 8 percent slopes	2.8	6.3%
Totals for Area of Interest		**45.4**	**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.

Hillsborough County, New Hampshire, Western Part

22A—Colton gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2ym4j
Elevation: 10 to 2,000 feet
Mean annual precipitation: 31 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Colton

Setting

Landform: Outwash terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Base slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy-skeletal glaciofluvial deposits

Typical profile

Ap - 0 to 7 inches: gravelly sandy loam
Bs - 7 to 14 inches: gravelly loamy sand
BC - 14 to 24 inches: very gravelly coarse sand
C - 24 to 65 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Adams

Percent of map unit: 10 percent
Landform: Outwash terraces

Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sheepscot

Percent of map unit: 3 percent
Landform: Outwash terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Croghan

Percent of map unit: 2 percent
Landform: Outwash terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

79C—Peru fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty65
Elevation: 360 to 2,160 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Peru, very stony, and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: fine sandy loam
E - 5 to 6 inches: fine sandy loam
Bs1 - 6 to 7 inches: fine sandy loam
Bs2 - 7 to 13 inches: fine sandy loam
Bs3 - 13 to 18 inches: fine sandy loam
BC - 18 to 21 inches: fine sandy loam
Cd1 - 21 to 37 inches: fine sandy loam
Cd2 - 37 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.1 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 17 to 34 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

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

Minor Components

Marlow, very stony

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Cabot, very stony

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Colonel, very stony

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: No

Lyman, very stony

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, side slope, nose slope
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

105—Rumney fine sandy loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2qgvs
Elevation: 0 to 2,440 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 54 degrees F
Frost-free period: 80 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Rumney and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumney

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium derived from schist and/or coarse-loamy alluvium derived from quartzite and/or coarse-loamy alluvium derived from granite and gneiss

Typical profile

Ap - 0 to 9 inches: fine sandy loam
Bg1 - 9 to 20 inches: fine sandy loam
Bg2 - 20 to 30 inches: sandy loam
Cg - 30 to 65 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
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 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Medomak

Percent of map unit: 6 percent
Landform: Flood plains
Microfeatures of landform position: Closed depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Podunk

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Microfeatures of landform position: Rises
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Charles

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Ondawa

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Microfeatures of landform position: Rises
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Hydric soil rating: No

142B—Monadnock fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wlm3
Elevation: 390 to 1,570 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 55 degrees F
Frost-free period: 90 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Monadnock

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bs1 - 7 to 9 inches: fine sandy loam
Bs2 - 9 to 19 inches: gravelly fine sandy loam
BC - 19 to 22 inches: gravelly fine sandy loam
2C1 - 22 to 42 inches: gravelly loamy sand
2C2 - 42 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 30 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Berkshire

Percent of map unit: 11 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, base slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Skerry

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Cabot

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tunbridge

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

142C—Monadnock fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wlm4

Elevation: 390 to 1,640 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 55 degrees F
Frost-free period: 90 to 150 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Monadnock

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bs1 - 7 to 9 inches: fine sandy loam
Bs2 - 9 to 19 inches: gravelly fine sandy loam
BC - 19 to 22 inches: gravelly fine sandy loam
2C1 - 22 to 42 inches: gravelly loamy sand
2C2 - 42 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 30 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

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

Minor Components

Berkshire

Percent of map unit: 10 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Skerry

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, side slope, nose slope
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Hydric soil rating: No

Cabot

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, nose slope, side slope
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Tunbridge

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

143B—Monadnock fine sandy loam, 0 to 8 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2wlm6
Elevation: 430 to 1,540 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 55 degrees F
Frost-free period: 90 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Monadnock, very stony, and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monadnock, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
E - 3 to 8 inches: fine sandy loam
Bs1 - 8 to 10 inches: fine sandy loam
Bs2 - 10 to 12 inches: fine sandy loam
Bs3 - 12 to 22 inches: gravelly fine sandy loam
BC - 22 to 25 inches: gravelly fine sandy loam
2C1 - 25 to 45 inches: gravelly loamy sand
2C2 - 45 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.1 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

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

Minor Components

Becket, very stony

Percent of map unit: 7 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, base slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex

Hydric soil rating: No

Skerry, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Tunbridge, very stony

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lyme, very stony

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

143C—Monadnock fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2wlm7
Elevation: 360 to 1,670 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 55 degrees F
Frost-free period: 90 to 150 days
Farmland classification: Farmland of local importance

Map Unit Composition

Monadnock, very stony, and similar soils: 79 percent
Minor components: 21 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monadnock, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank, mountainbase, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
E - 3 to 8 inches: fine sandy loam
Bs1 - 8 to 10 inches: fine sandy loam
Bs2 - 10 to 12 inches: fine sandy loam
Bs3 - 12 to 22 inches: gravelly fine sandy loam
BC - 22 to 25 inches: gravelly fine sandy loam
2C1 - 25 to 45 inches: gravelly loamy sand
2C2 - 45 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.1 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

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

Minor Components

Becket, very stony

Percent of map unit: 11 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, mountainflank, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Skerry, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, side slope, nose slope

Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Hydric soil rating: No

Tunbridge, very stony

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainbase, mountainflank, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Lyme, very stony

Percent of map unit: 1 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Mountainflank, mountainbase, nose slope, interfluve, side slope
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

143D—Monadnock fine sandy loam, 15 to 35 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2wlm9
Elevation: 390 to 1,770 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 55 degrees F
Frost-free period: 90 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Monadnock, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Convex

Across-slope shape: Convex
Parent material: Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
E - 3 to 8 inches: fine sandy loam
Bs1 - 8 to 10 inches: fine sandy loam
Bs2 - 10 to 12 inches: fine sandy loam
Bs3 - 12 to 22 inches: gravelly fine sandy loam
BC - 22 to 25 inches: gravelly fine sandy loam
2C1 - 25 to 45 inches: gravelly loamy sand
2C2 - 45 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 1.1 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

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

Minor Components

Berkshire, very stony

Percent of map unit: 10 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Tunbridge, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Sunapee, very stony

Percent of map unit: 3 percent

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Microfeatures of landform position: Open depressions, open depressions
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Cabot, very stony

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Microfeatures of landform position: Open depressions, open depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

161C—Lyman-Tunbridge-Rock outcrop complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2trpt
Elevation: 390 to 1,440 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 36 to 55 degrees F
Frost-free period: 60 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Lyman, very stony, and similar soils: 38 percent
Tunbridge, very stony, and similar soils: 28 percent
Rock outcrop: 18 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase, crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loam
E - 3 to 5 inches: fine sandy loam
Bhs - 5 to 7 inches: loam
Bs1 - 7 to 11 inches: loam
Bs2 - 11 to 18 inches: channery loam
R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 11 to 24 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

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

Description of Tunbridge, Very Stony

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
Oa - 3 to 5 inches: highly decomposed plant material
E - 5 to 8 inches: fine sandy loam
Bhs - 8 to 11 inches: fine sandy loam
Bs - 11 to 26 inches: fine sandy loam
BC - 26 to 28 inches: fine sandy loam
R - 28 to 38 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

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

Description of Rock Outcrop

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase, crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 14.17 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Marlow, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Monadnock, very stony

Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase, side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Brayton, very stony

Percent of map unit: 4 percent
Landform: Hills, mountains

Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountaintop, mountainflank, mountainbase, side slope, crest
Microfeatures of landform position: Open depressions, open depressions, closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Abram, very stony

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountainflank, mountaintop, mountainbase, side slope, crest
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

558B—Skerry fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w9p8
Elevation: 260 to 1,210 feet
Mean annual precipitation: 31 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Skerry

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and gneiss and/or schist over sandy lodgment till derived from granite and gneiss and/or schist

Typical profile

Ap - 0 to 6 inches: fine sandy loam

Bs1 - 6 to 20 inches: gravelly fine sandy loam
Bs2 - 20 to 25 inches: gravelly fine sandy loam
Cd1 - 25 to 34 inches: gravelly loamy sand
Cd2 - 34 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 21 to 43 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Colonel

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: No

Becket

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Brayton

Percent of map unit: 3 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Hermon

Percent of map unit: 2 percent

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

613A—Croghan loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cjh
Elevation: 150 to 1,800 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Croghan and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Croghan

Setting

Parent material: Sandy outwash derived mainly from granite, gneiss and schist

Typical profile

H1 - 0 to 4 inches: loamy fine sand
H2 - 4 to 28 inches: sand
H3 - 28 to 60 inches: coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
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: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Naumburg

Percent of map unit: 10 percent
Landform: Outwash terraces
Hydric soil rating: Yes

613B—Croghan loamy fine sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cjj
Elevation: 150 to 1,800 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of local importance

Map Unit Composition

Croghan and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Croghan

Setting

Parent material: Sandy outwash derived mainly from granite, gneiss and schist

Typical profile

H1 - 0 to 4 inches: loamy fine sand
H2 - 4 to 28 inches: sand
H3 - 28 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well 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: About 18 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Naumburg

Percent of map unit: 10 percent
Landform: Outwash terraces
Hydric soil rating: Yes

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