

COPY

USGS WEB SOIL SURVEY

for

88 ADAMS ROAD, THE RIDINGS

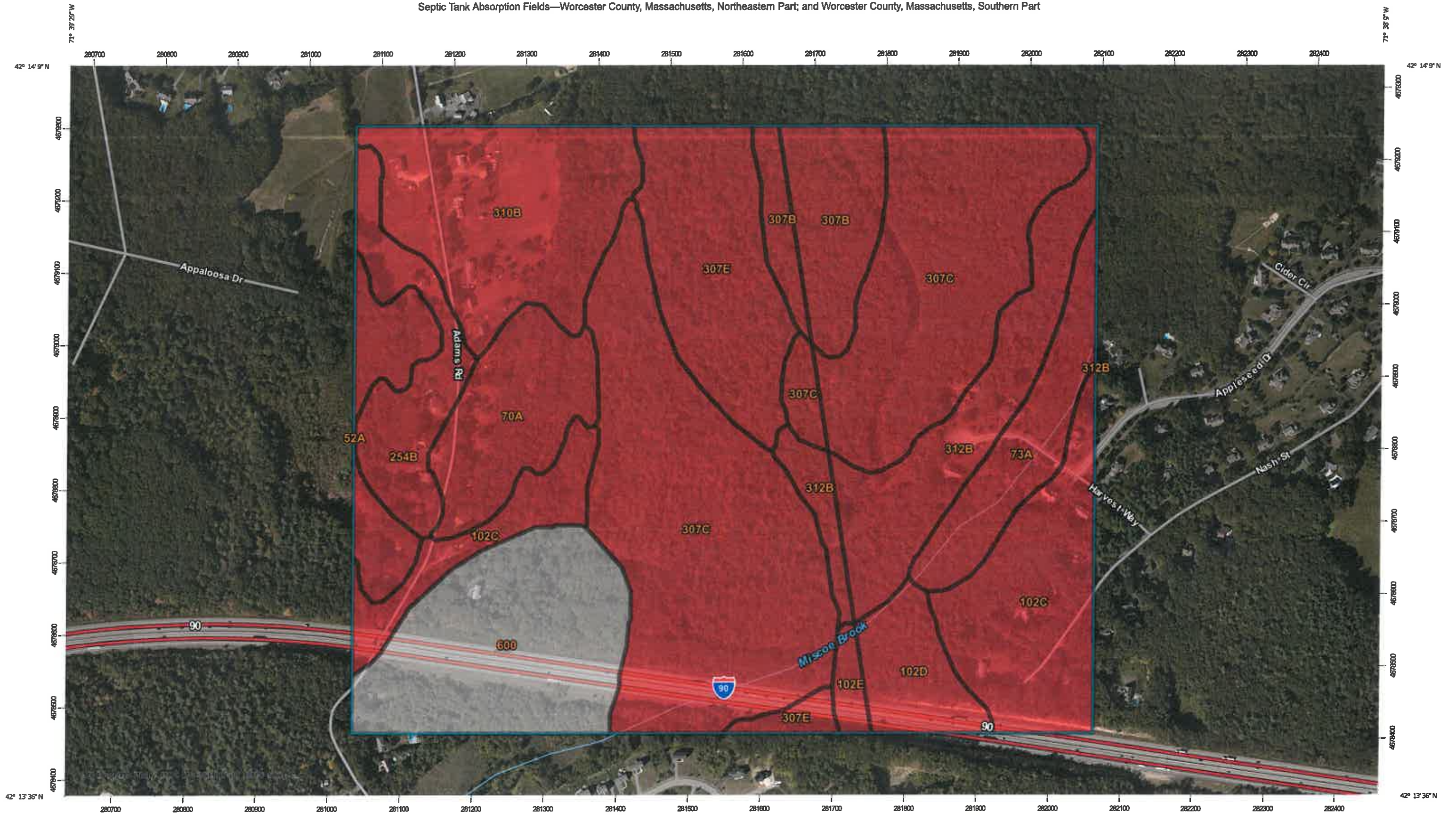
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**PLANNING BOARD
GRAFTON, MA**




















EXHIBIT 11.

Septic Tank Absorption Fields—Worcester County, Massachusetts, Northeastern Part; and Worcester County, Massachusetts, Southern Part



Map Scale: 1:4,920 if printed on B landscape (17" x 11") sheet.
 0 50 100 200 300 Meters
 0 200 400 800 1200 Feet
 Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

- Area of Interest (AOI)**
 Area of Interest (AOI)
- Background**
 Aerial Photography
- Soils**
- Soil Rating Polygons**
-  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
- Soil Rating Lines**
-  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
- Soil Rating Points**
-  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:25,000.

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: Worcester County, Massachusetts,

Northeastern Part

Survey Area Data: Version 13, Sep 11, 2018

Soil Survey Area: Worcester County, Massachusetts, Southern Part

Survey Area Data: Version 11, Sep 11, 2018

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Sep 12, 2014—Sep 28, 2014

MAP LEGEND

MAP INFORMATION

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.

Septic Tank Absorption Fields

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	Very limited	Whitman, extremely stony (81%)	Ponding (1.00)	9.1	4.2%
				Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Ridgebury, extremely stony (10%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Scarboro (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
			Swansea (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Seepage, bottom layer (1.00)		
				Slow water movement (0.32)		
			Woodbridge, extremely stony (1%)	Depth to saturated zone (1.00)		
Slow water movement (1.00)						
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	Very limited	Chatfield, extremely stony (39%)	Depth to bedrock (1.00)	15.5	7.2%
				Slow water movement (0.32)		
				Slope (0.04)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Hollis, extremely stony (26%)	Depth to bedrock (1.00) Slope (0.04)		
			Sutton, extremely stony (3%)	Depth to saturated zone (1.00) Slow water movement (0.32)		
			Paxton, extremely stony (2%)	Depth to saturated zone (1.00) Slow water movement (1.00) Slope (0.63)		
			Leicester, extremely stony (1%)	Depth to saturated zone (1.00) Slow water movement (0.32)		
102D	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	Very limited	Chatfield, extremely stony (35%)	Slope (1.00) Depth to bedrock (1.00) Slow water movement (0.32)	6.1	2.9%
			Hollis, extremely stony (30%)	Depth to bedrock (1.00) Slope (1.00)		
			Charlton, extremely stony (7%)	Slope (1.00) Slow water movement (0.32)		
			Leicester, extremely stony (4%)	Depth to saturated zone (1.00) Slow water movement (0.32)		
			Paxton, extremely stony (2%)	Depth to saturated zone (1.00) Slow water movement (1.00) Slope (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI		
			Sutton, extremely stony (2%)	Depth to saturated zone (1.00) Slow water movement (0.32)				
307B	Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony	Very limited	Paxton, extremely stony (80%)	Depth to saturated zone (1.00) Slow water movement (1.00)	8.3	3.9%		
			Woodbridge, extremely stony (10%)	Depth to saturated zone (1.00) Slow water movement (1.00)				
			Charlton, extremely stony (5%)	Seepage, bottom layer (1.00)				
			Ridgebury, extremely stony (4%)	Depth to saturated zone (1.00) Slow water movement (1.00)				
			Whitman, extremely stony (1%)	Ponding (1.00) Depth to saturated zone (1.00) Slow water movement (1.00)				
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	Very limited	Paxton, extremely stony (85%)	Depth to saturated zone (1.00) Slow water movement (1.00) Slope (0.63)			24.8	11.6%
			Charlton, extremely stony (8%)	Seepage, bottom layer (1.00) Slope (0.63)				
			Woodbridge, extremely stony (6%)	Depth to saturated zone (1.00)				

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Slow water movement (1.00)		
			Ridgebury, extremely stony (1%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
312B	Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony	Very limited	Woodbridge, extremely stony (82%)	Depth to saturated zone (1.00)	14.3	6.7%
				Slow water movement (1.00)		
			Paxton, extremely stony (10%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Ridgebury, extremely stony (8%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
Subtotals for Soil Survey Area					78.2	36.5%
Totals for Area of Interest					214.2	100.0%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
52A	Freetown muck, 0 to 1 percent slopes	Very limited	Freetown (85%)	Ponding (1.00)	6.2	2.9%
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Flooding (0.40)		
				Slow water movement (0.32)		
			Scarboro (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres In AOI	Percent of AOI
				Seepage, bottom layer (1.00)		
				Filtering capacity (1.00)		
			Whitman (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Swansea (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Seepage, bottom layer (1.00)		
				Flooding (0.40)		
70A	Ridgebury fine sandy loam, 0 to 3 percent slopes	Very limited	Ridgebury (85%)	Depth to saturated zone (1.00)	10.9	5.1%
				Slow water movement (1.00)		
			Woodbridge (9%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Whitman (5%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Leicester (1%)	Depth to saturated zone (1.00)		
				Slow water movement (0.32)		
102C	Chatfield-Hollis-Rock outcrop complex, 0 to	Very limited	Chatfield, extremely stony (39%)	Depth to bedrock (1.00)	6.1	2.9%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres In AOI	Percent of AOI
	15 percent slopes			Slow water movement (0.32)		
				Slope (0.04)		
			Hollis, extremely stony (26%)	Depth to bedrock (1.00)		
				Slope (0.04)		
			Sutton, extremely stony (3%)	Depth to saturated zone (1.00)		
				Slow water movement (0.32)		
			Paxton, extremely stony (2%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Slope (0.63)		
			Leicester, extremely stony (1%)	Depth to saturated zone (1.00)		
				Slow water movement (0.32)		
102E	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	Very limited	Chatfield, extremely stony (35%)	Slope (1.00)	1.4	0.7%
				Depth to bedrock (1.00)		
				Slow water movement (0.32)		
			Hollis, extremely stony (30%)	Depth to bedrock (1.00)		
				Slope (1.00)		
			Charlton, extremely stony (7%)	Slope (1.00)		
				Slow water movement (0.32)		
			Leicester, extremely stony (4%)	Depth to saturated zone (1.00)		
				Slow water movement (0.32)		
			Sutton, extremely stony (2%)	Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Slow water movement (0.32)		
			Paxton, extremely stony (2%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
				Slope (1.00)		
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	Very limited	Merrimac (85%)	Filtering capacity (1.00)	9.4	4.4%
				Seepage, bottom layer (1.00)		
			Hinckley (5%)	Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
			Sudbury (5%)	Depth to saturated zone (1.00)		
				Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
			Windsor (3%)	Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
			Agawam (2%)	Filtering capacity (1.00)		
				Seepage, bottom layer (1.00)		
307B	Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony	Very limited	Paxton, extremely stony (80%)	Depth to saturated zone (1.00)	2.6	1.2%
				Slow water movement (1.00)		
			Woodbridge, extremely stony (10%)	Depth to saturated zone (1.00)		
				Slow water movement (1.00)		
			Charlton, extremely stony (5%)	Seepage, bottom layer (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Ridgebury, extremely stony (4%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
			Whitman, extremely stony (1%)	Ponding (1.00) Depth to saturated zone (1.00) Slow water movement (1.00)		
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	Very limited	Paxton, extremely stony (85%)	Depth to saturated zone (1.00) Slow water movement (1.00) Slope (0.63)	38.1	17.8%
			Charlton, extremely stony (8%)	Seepage, bottom layer (1.00) Slope (0.63)		
			Woodbridge, extremely stony (6%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
			Ridgebury, extremely stony (1%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
307E	Paxton fine sandy loam, 15 to 35 percent slopes, extremely stony	Very limited	Paxton, extremely stony (75%)	Depth to saturated zone (1.00) Slow water movement (1.00) Slope (1.00)	17.6	8.2%
			Charlton, extremely stony (20%)	Slope (1.00) Seepage, bottom layer (1.00)		
			Woodbridge, extremely stony (4%)	Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres In AOI	Percent of AOI
				Slow water movement (1.00) Slope (1.00)		
			Ridgebury, extremely stony (1%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	Very limited	Woodbridge, fine sandy loam (82%)	Depth to saturated zone (1.00) Slow water movement (1.00)	20.3	9.5%
			Paxton (10%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
			Ridgebury (8%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
312B	Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony	Very limited	Woodbridge, extremely stony (82%)	Depth to saturated zone (1.00) Slow water movement (1.00)	2.5	1.1%
			Paxton, extremely stony (10%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
			Ridgebury, extremely stony (8%)	Depth to saturated zone (1.00) Slow water movement (1.00)		
600	Pits, gravel	Not rated	Pits, gravel (100%)		20.9	9.8%
Subtotals for Soil Survey Area					136.0	63.5%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Totals for Area of Interest					214.2	100.0%

Rating	Acres in AOI	Percent of AOI
Very limited	193.3	90.2%
Null or Not Rated	20.9	9.8%
Totals for Area of Interest	214.2	100.0%

Description

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

 Dominant Condition



 Higher