
4: SOILS

A. Soil Survey Maps

The *soil* is the unconsolidated mineral material on the immediate surface of the earth and which serves as the medium for growth of land plants. The characteristics of each soil type have developed over time (usually many thousands of years) under the influence of the parent material (the bedrock that has broken down into small fragments to form the soil), climate (including moisture and temperature regimes), macro- and microorganisms, and topography. Soil is a basic resource for food production, in addition to its essential role in collecting and purifying water before it enters the ground water (USDA NRCS, 2006). However, soil itself can be a pollutant as dust in the air or as sediment in water.

The US Department of Agriculture Natural Resources Conservation Service (USDA NRCS) is the science-based agency which provides technical assistance based on sound science in the conservation and management of soil, water, and other natural resources to private land owners and local, state, and federal agencies and policy-makers.

One of these technical services is the soil survey. A *soil survey* is an inventory of the country's soil resources to determine soil characteristics and capabilities and to help people understand soils and their uses. Soil surveys help identify the best way to protect soil and water quality through the use of conservation practices and to identify which sites are suitable (and the degree of suitability) for a various land uses (e.g. septic systems, roads, agriculture).

The NRCS prepared a soil survey of Hunterdon County in 1974 (Jablonski, 1974), which was updated in 1986 and digitized into GIS in 1999. The objective of soil mapping is to separate the landscape into segments that have similar use and management requirements. Therefore, this data set is not designed for use as a primary regulatory or management tool, but may be used as a broad scale reference source. According to the Soil Survey Geographic Database (SSURGO) information, field investigations and data collection were carried out in sufficient detail to name map units and to identify accurately and consistently areas of about 5 acres. As with other GIS data sets, enlargement of the maps to a scale greater than the accuracy of the data can cause misinterpretation of the data. Onsite sampling, testing, and detailed study of specific sites is essential for determining intensive uses, and managing farms and wetlands.

Beginning in 2005, the NRCS made its soil surveys available online (USDA NRCS, 2006; see **Internet Resources**). This provides the means for keeping the information current and available to the public. Users specify a geographic "area of interest" (must be less than 10,000 acres) and then may view a wide variety of tables of soil properties and soil interpretations. However, for this report, the entire SSURGO (Soil Survey Geographic Database) spatial data and tabular data for Hunterdon County were downloaded for use in the GIS (USDA NRCS, January 20, 2006).

B. Soil Series and Map Units

Soil characteristics vary from place to place in slope, depth, drainage, erodibility and other characteristics that affect management. A *soil series* is a basic unit of soil classification consisting of soils that are essentially alike, except that they may differ in surface texture, stoniness, slope or some other attribute. A *map unit* is the area delineated on a soil map, representing an area dominated by one major kind of soil, and is named according to the

classification of the dominant soil or soils. However, soils are natural systems, with natural variability, and the range of some observed properties may extend beyond the limits defined for the class. In addition, small areas of contrasting soils may not be visible on the maps. The databases included with the soils data describe the characteristics of each soil map unit. The NRCS has included both estimated and measured data on the physical and chemical soil properties and soil interpretations for engineering, water management, recreation, agronomic, woodland, range and wildlife uses of the soil.

There are 26 soil series' found in Holland, such as Parker, Klinsville and Readington. A total of 55 different map units are present in Holland. These map units are listed in **Table 4.2**, along with several important properties of these soils, and shown on **Figure 4a**. **Figures 4b – 4h** illustrate the distribution of some soil characteristics. A large portion of the soils in Holland have limitations due to shallow depth to bedrock. Some areas have poor drainage, high water table or steep slopes.

C. Characteristics of Holland Township Soils

Depth to Restrictive Layer (Bedrock and Fragipan)

The *depth to bedrock* is the distance from the land surface to bedrock. Each soil map unit is characterized by a range of depths to bedrock that is typical for the majority of that soil type. For the most part, Holland Township has shallow depths to bedrock, ranging from zero (bedrock is exposed at the surface, with no soil above it) to 116 inches. There are some soil units in Holland that have no restrictive layer, primarily the Gladstone, but also the Birdsboro and Parker units. **Figure 4b** shows the range of minimum depths to bedrock for the majority of each soil unit (see **Table 4.2** and **Figure 4b**).

A *fragipan* is a subsoil layer, typically high in clay, which is a higher density than the soil above it. A fragipan layer becomes cemented and very hard when dry and brittle when moist. The layer is low in organic matter and slowly permeable to water. When present in Holland, the fragipan layer varies in depth between 15 and 36 inches in depth (see **Figure 4b**).

Depth to Seasonal High Water Table

The *water table* is the top of the water surface in the saturated part of an aquifer. The majority of Holland Township does not have concern with a seasonal high water table (see **Figure 4c**). Flooding typically occurs in soils of the Fluvaquent, Rowland and Pope units (see **Figure 6b**).

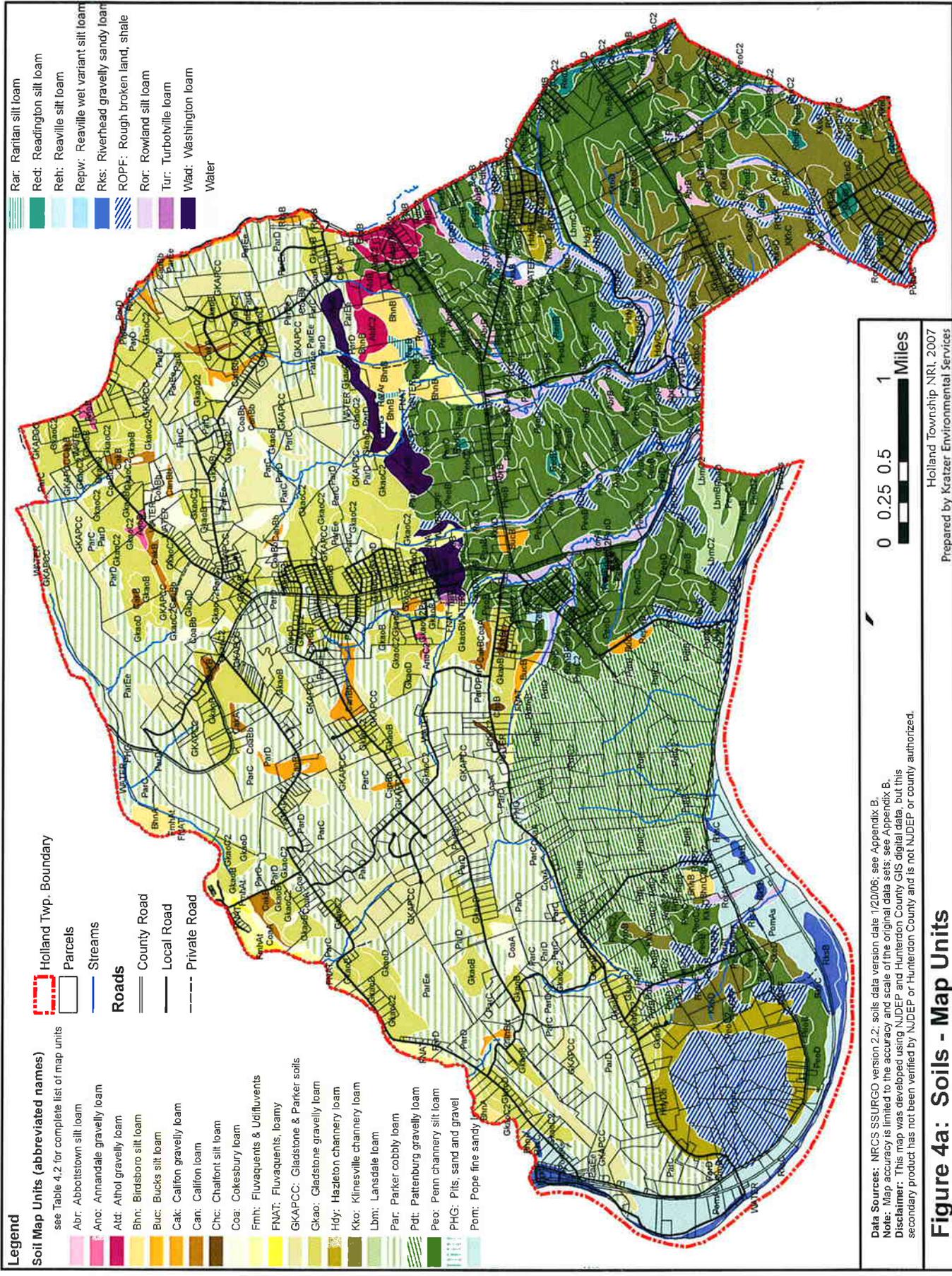
Hydrologic Soil Group

The *hydrologic soil grouping* describes the rate that water infiltrates into the ground. The majority of the township has moderate to slow infiltration rates (see **Figure 4b**). The definitions of the hydrologic soil groups are shown in **Table 4.1**.

Septic Limitations

The NRCS SSURGO database provides an interpretation of limitations of each soil for *septic suitability*. The interpretation¹ shown in **Figure 4e** is based on the N.J.A.C. 7:9A Standards for Individual Subsurface Sewage Disposal Systems, Subchapter 10. Disposal Fields (NJDEP, 1999). Using these technical specifications, most soils within Holland are very limited,

¹ The interpretation name used is "ENG – Disposal Field Suitability Class (NJ)."



- Legend**
- see Table 4.2 for complete list of map units
- Abr: Abbotstown silt loam
 - Anc: Annandale gravelly loam
 - Atd: Athol gravelly loam
 - Bhn: Birdsboro silt loam
 - Buc: Bucks silt loam
 - Cak: Callion gravelly loam
 - Can: Callion loam
 - Chc: Chalfont silt loam
 - Coa: Cokesbury loam
 - Fmh: Fluvaquents & Ueliftuents
 - FNAT: Fluvaquents, bamy
 - GKAPCC: Gladstone & Parker soils
 - GKao: Gladstone gravelly loam
 - Hoy: Hazleton channery loam
 - Kko: Klinesville channery loam
 - Lbm: Lansdale loam
 - Par: Parker cobbly loam
 - Pdt: Pattenburg gravelly loam
 - Peo: Penn channery silt loam
 - PHG: Pits, sand and gravel
 - Pom: Pope fine sandy
 - Rar: Raritan silt loam
 - Red: Readington silt loam
 - Reh: Reaville silt loam
 - Repw: Reaville wet variant silt loam
 - Rks: Riverhead gravelly sandy loam
 - ROPF: Rough broken land, shale
 - Ror: Rowland silt loam
 - Tur: Turbotville loam
 - Wad: Washington loam
 - Water

- Holland Twp. Boundary
- Parcels
- Streams
- Roads**
- County Road
- Local Road
- Private Road

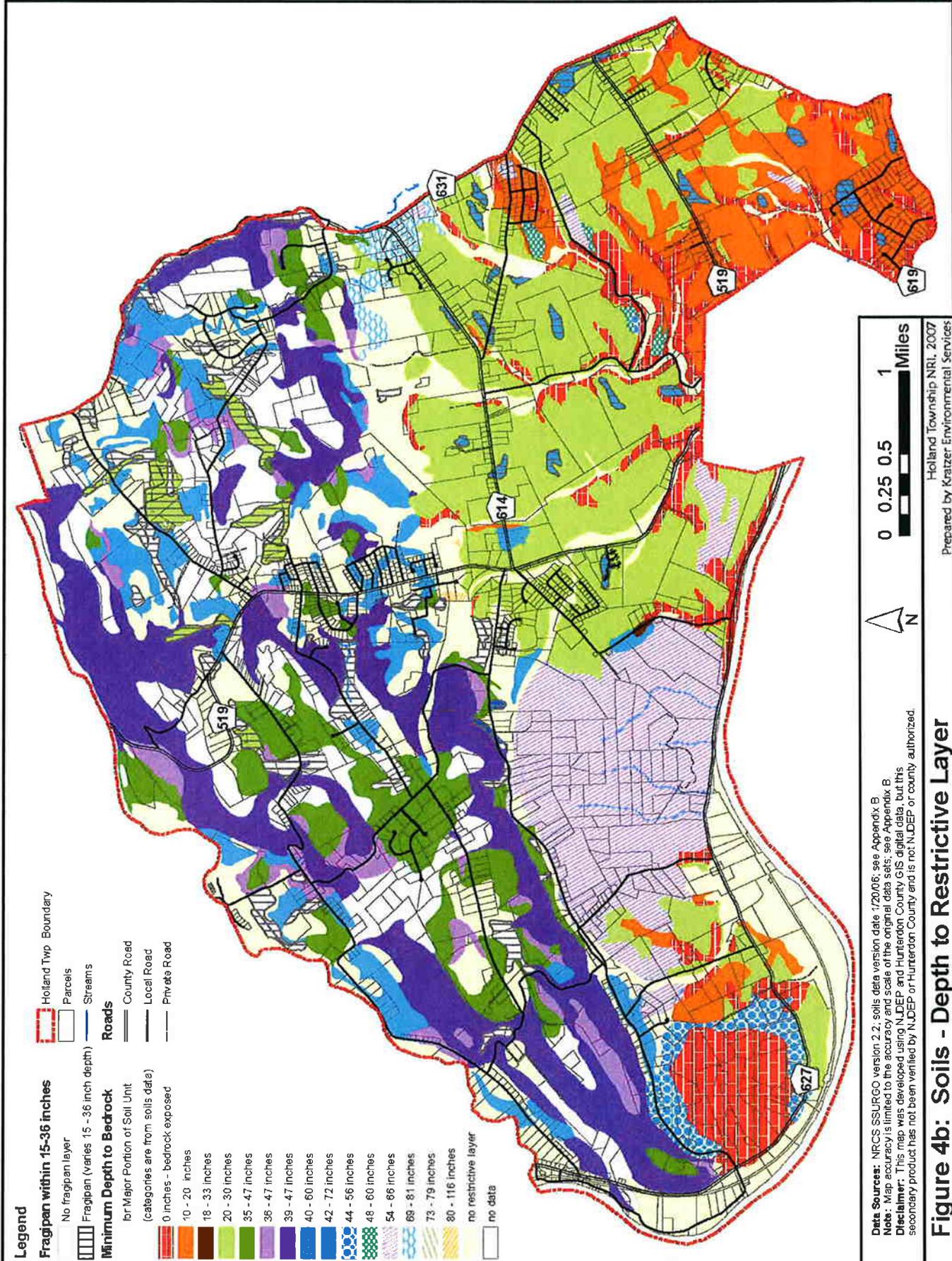
- Rar: Raritan silt loam
- Red: Readington silt loam
- Reh: Reaville silt loam
- Repw: Reaville wet variant silt loam
- Rks: Riverhead gravelly sandy loam
- ROPF: Rough broken land, shale
- Ror: Rowland silt loam
- Tur: Turbotville loam
- Wad: Washington loam
- Water

Data Sources: NRCSS SURGO version 2.2; soils data version date 1/20/06; see Appendix B.
Note: Map accuracy is limited to the accuracy and scale of the original data sets; see Appendix B.
Disclaimer: This map was developed using NJDEP and Hunterdon County GIS digital data, but this secondary product has not been verified by NJDEP or Hunterdon County and is not NJDEP or county authorized.



Holland Township NRI, 2007
 Prepared by Kratzer Environmental Services

Figure 4a: Soils - Map Units



- Legend**
- Fragipan within 15-36 inches**
 - No fragipan layer
 - Fragipan (varies 15 - 36 inch depth)
 - Minimum Depth to Bedrock for Major Portion of Soil Unit (categories are from soils data)**
 - 0 inches - bedrock exposed
 - 10 - 20 inches
 - 18 - 33 inches
 - 20 - 30 inches
 - 35 - 47 inches
 - 36 - 47 inches
 - 39 - 47 inches
 - 40 - 60 inches
 - 42 - 72 inches
 - 44 - 56 inches
 - 48 - 60 inches
 - 54 - 66 inches
 - 68 - 81 inches
 - 73 - 79 inches
 - 80 - 116 inches
 - no restrictive layer
 - no data
 - Roads**
 - Holland Twp Boundary
 - Parcels
 - Streams
 - County Road
 - Local Road
 - Private Road

Data Sources: NRCS SSURGO version 2.2; soils data version date 1/2006; see Appendix B

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Figure 4b: Soils - Depth to Restrictive Layer

0 0.25 0.5 1 Miles

Holland Township NRI, 2007
Prepared by Kratzer Environmental Services

Table 4.1: Hydrologic Soil Grouping

Class	Definition
A	High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.
B	Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils that have moderately coarse textures.
B/D	Drained/undrained hydrology class of soils that can be drained and are classified. Moderate to very slow infiltration rates.
C	Slow infiltration rates. Soils with layers impeding downward movement of water, or soils that have moderately fine or fine textures.
C/D	Drained/undrained hydrology class of soils that can be drained and classified. Slow to very slow infiltration rates.
D	Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Source: USDA NRCS Soil Survey Geographic (SSURGO) Database, January 20, 2006.

with some areas rated as unsuitable, where septic system disposal fields would not be permitted due to steep slopes or flooding. A large portion of the township is "somewhat limited"; while

some areas have no technical limitations and some areas were not rated (such as rough broken land and sand and gravel pits). These general suitability guidelines would need to be used in combination with on-site testing, the SSURGO interpretation report "Sewage Disposal (NJ)," and N.J.A.C.7:9A subchapter 10 to determine what types of disposal field installations would be appropriate in any given situation.

Erodibility

Erosion is the wearing away of the land surface by running water, wind, ice, or other geological agents. Erosion is often accelerated as a result of human activities. The *erodibility* takes into account the affects of infiltration rate, permeability and total water capacity and factors that resist the forces of the rainfall and runoff. The majority of Holland Township is rated "potentially highly erodible", while the remainder is "highly erodible" (see **Figure 4f**).

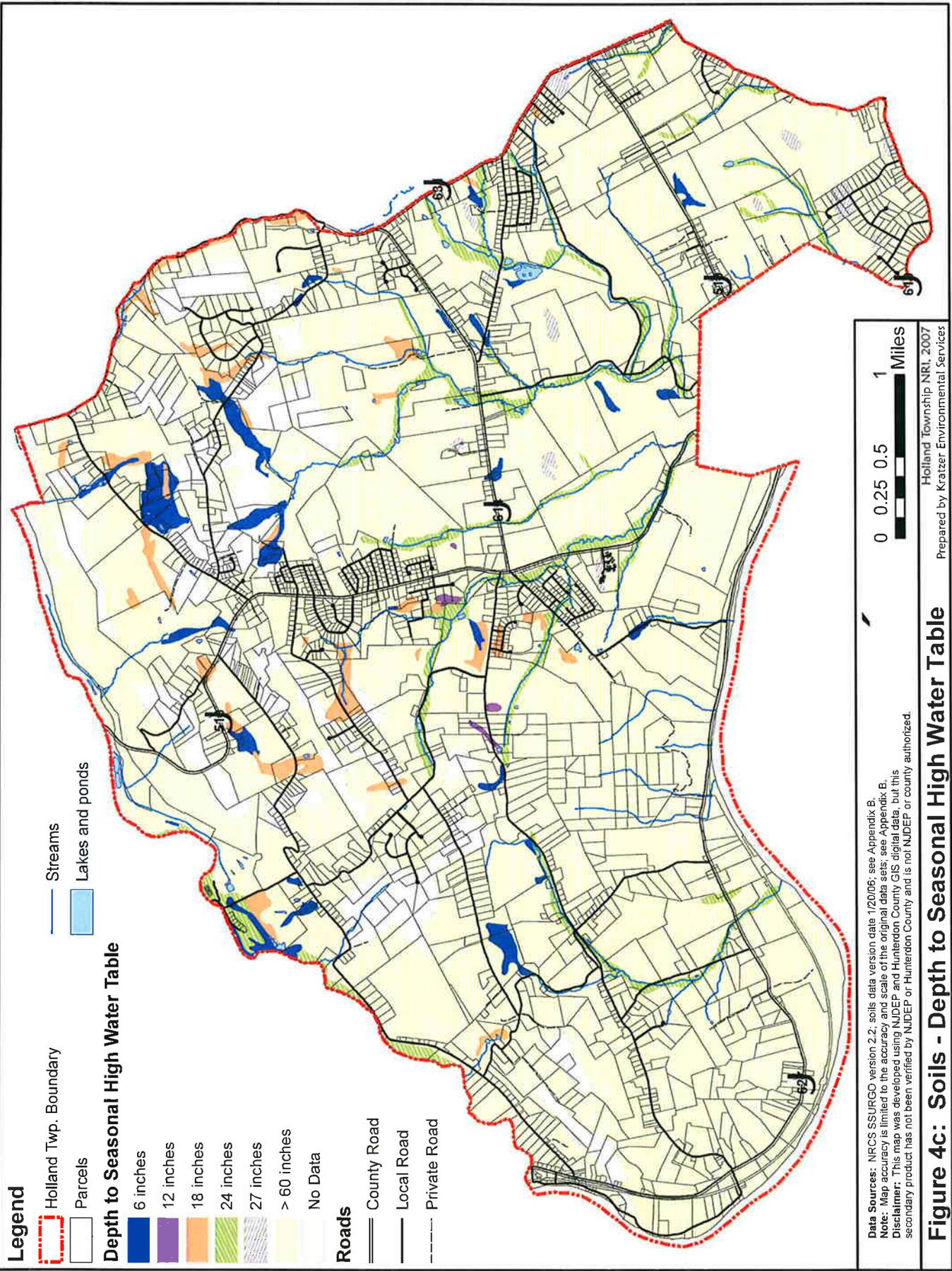
Soil Drainage Class

Soil Drainage Class is a code identifying the natural drainage condition of the soil and refers to the frequency and duration of periods when the soil is free of saturation or partial saturation during soil formation, and does not refer to saturation due to recently altered drainage (manmade or natural). The categories are as follows: well drained, moderately well drained, excessively drained, somewhat excessively drained, poorly drained, and somewhat poorly drained. For the most part, Holland Township has well drained soils. The steeper slopes and rocky soils tend to be somewhat excessively drained, while small patches are moderately well drained, somewhat poorly drained or poorly drained (see **Figure 4g**).

Prime Agricultural Soils

Prime Farmland Soils include soils that have the best combination of physical and chemical characteristics for economically producing sustained high yields of crops when treated and managed according to acceptable farming methods and is also available for these uses. These soils have the soil quality, growing season, and moisture supply needed; they are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding (USDA NRCS NJ, 2006).

Farmlands of statewide importance include those soils with characteristics that are nearly Prime Farmland. They economically produce high yields of crops when treated and managed



Legend

- Holland Twp. Boundary
- Parcels
- Streams
- Lakes and ponds

Depth to Seasonal High Water Table

- 6 inches
- 12 inches
- 18 inches
- 24 inches
- 27 inches
- > 60 inches
- No Data

Roads

- County Road
- Local Road
- Private Road

Data Sources: NRCS SSURGO version 2.2; soils data version date 1/20/06; see Appendix B.
Note: Map accuracy is limited to the accuracy and scale of the original data sets; see Appendix B.
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Holland Township NRI, 2007
 Prepared by Kratzer Environmental Services

Figure 4c: Soils - Depth to Seasonal High Water Table

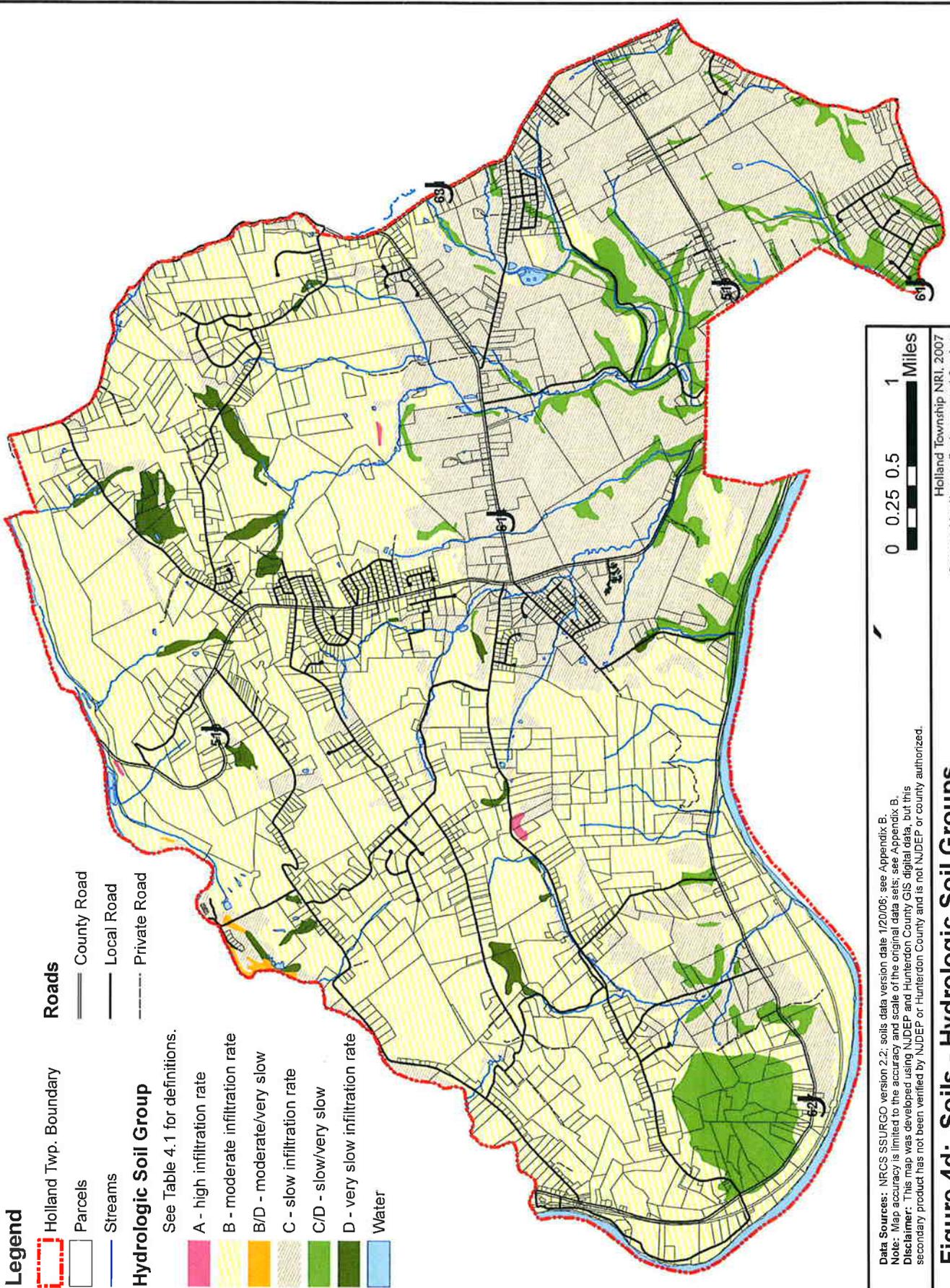
Legend

-  Holland Twp. Boundary
-  Parcels
-  Streams
-  County Road
-  Local Road
-  Private Road

Hydrologic Soil Group

See Table 4.1 for definitions.

-  A - high infiltration rate
-  B - moderate infiltration rate
-  B/D - moderate/very slow
-  C - slow infiltration rate
-  C/D - slow/very slow
-  D - very slow infiltration rate
-  Water



Data Sources: NRCS SSURGO version 2.2; soils data version date 1/2006; see Appendix B.
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Figure 4d: Soils - Hydrologic Soil Groups

Holland Township NRI, 2007
 Prepared by Kratzer Environmental Services

Legend

Holland Twp. Boundary

Parcels

Septic Limitations (N.J.A.C. 7:9A.10)

No Limitations

Somewhat Limited

Very Limited

Very to Not Permitted (flooding)

Very to Not Permitted (steep slopes)

not rated

Streams

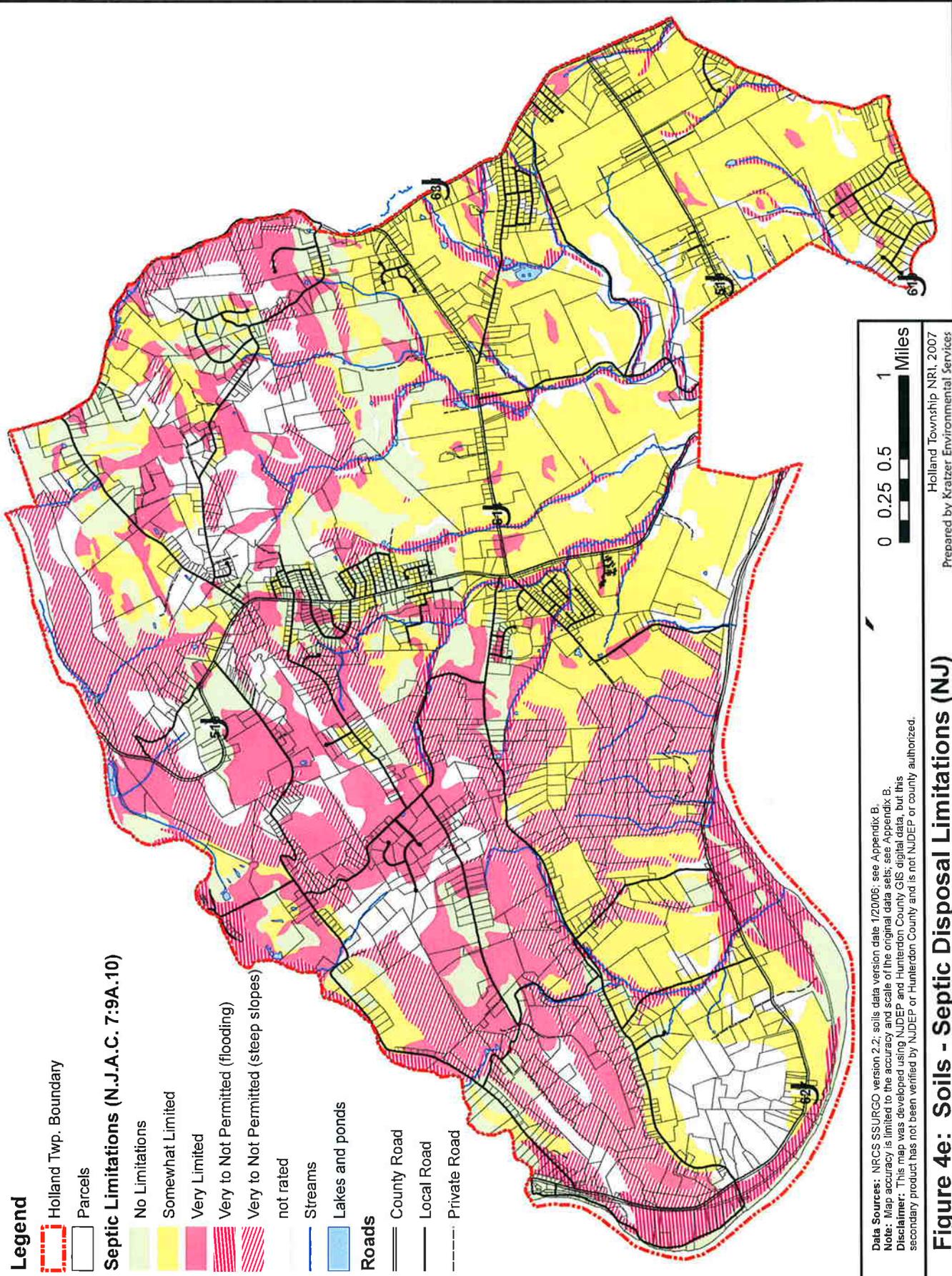
Lakes and ponds

Roads

County Road

Local Road

Private Road



Data Sources: NRCS SSURGO version 2.2; soils data version date 1/20/06; see Appendix B.
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Figure 4e: Soils - Septic Disposal Limitations (NJ)

Legend

Holland Twp. Boundary

Parcels

Streams

Erodibility

Highly erodible land

Potentially highly erodible

Not highly erodible land

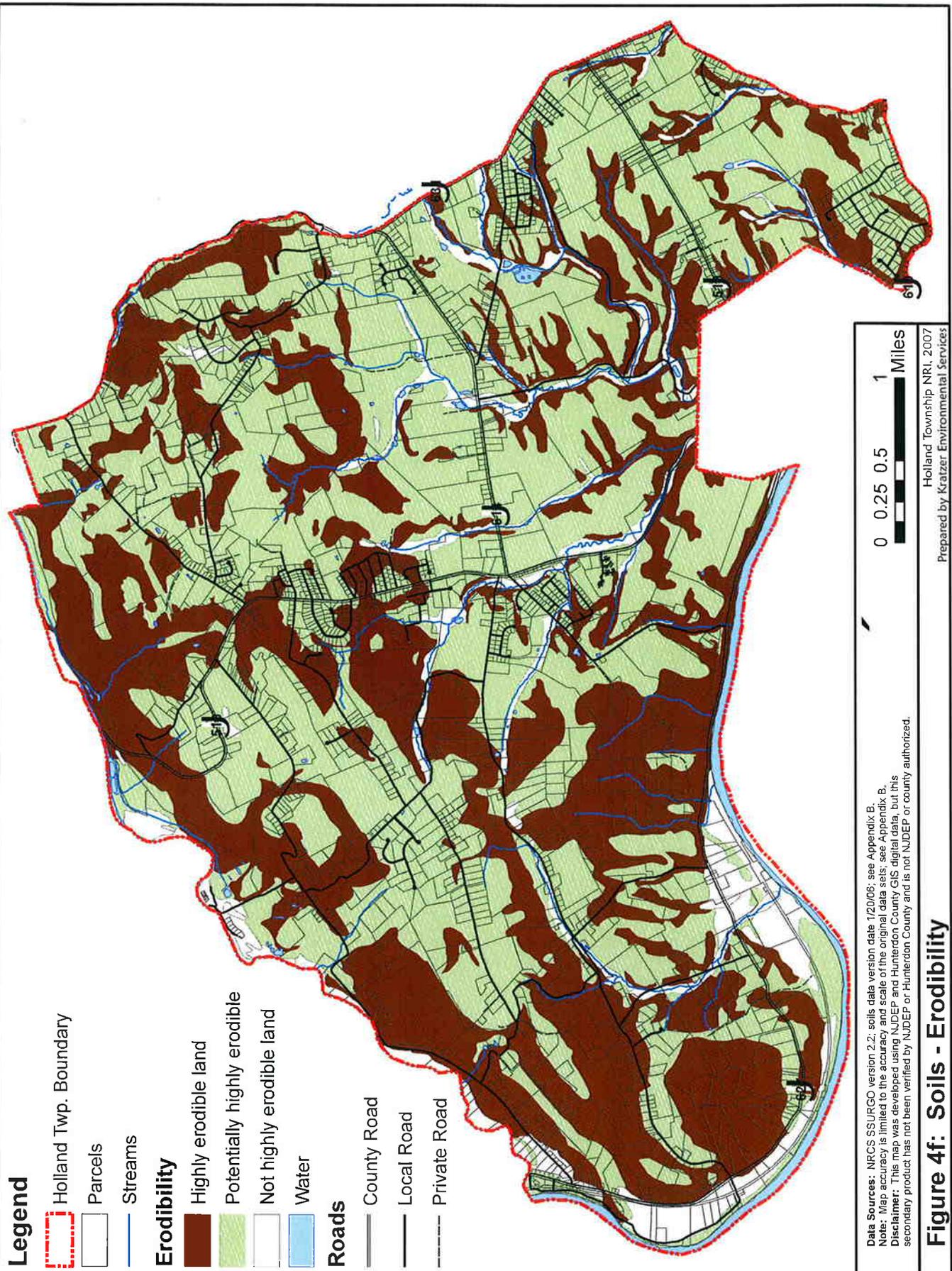
Water

Roads

County Road

Local Road

Private Road



Data Sources: NRCS SSURGO version 2.2; soils data version date 1/20/06; see Appendix B.
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Figure 4f: Soils - Erodibility

according to acceptable farming methods. Some may produce yields as high as Prime Farmland if conditions are favorable (USDA NRCS NJ, 2006). Holland Township has a high proportion of prime farmland soils and farmland of statewide importance, excluding all the steep slopes which are not ideal for farming (see **Figure 4h**).

Other

Annual flood frequency is a descriptive term used to describe the frequency of flooding that is likely to occur in a year. **Frequent** is > 50% chance of flooding in a given year; **occasional** is 5 to 50%; **rare** is 0 to 5% chance of flooding. For those soils which experience frequent or occasional flooding, duration of annual flooding in a normal year and the months during which flooding occurs in a normal year are also noted (shown in **Figure 6b** with floodplains).

Potential Frost Action is an interpretation rating of the susceptibility of the soil to frost heaving. Most soils within Holland are moderately susceptible to frost action, while the rest are highly susceptible (except gravel pits and rough broken land, which is rated “none”).

Hydric soils are those soils that are wet long enough to periodically produce anaerobic conditions, thereby influencing the growth of plants. For delineation of hydric soils the ponding event must last greater than seven days. Hydric Soils are noted in **Table 4.2**, and are shown with wetlands in **Figure 6c**.

Legend

Holland Twp. Boundary

Parcels
Streams

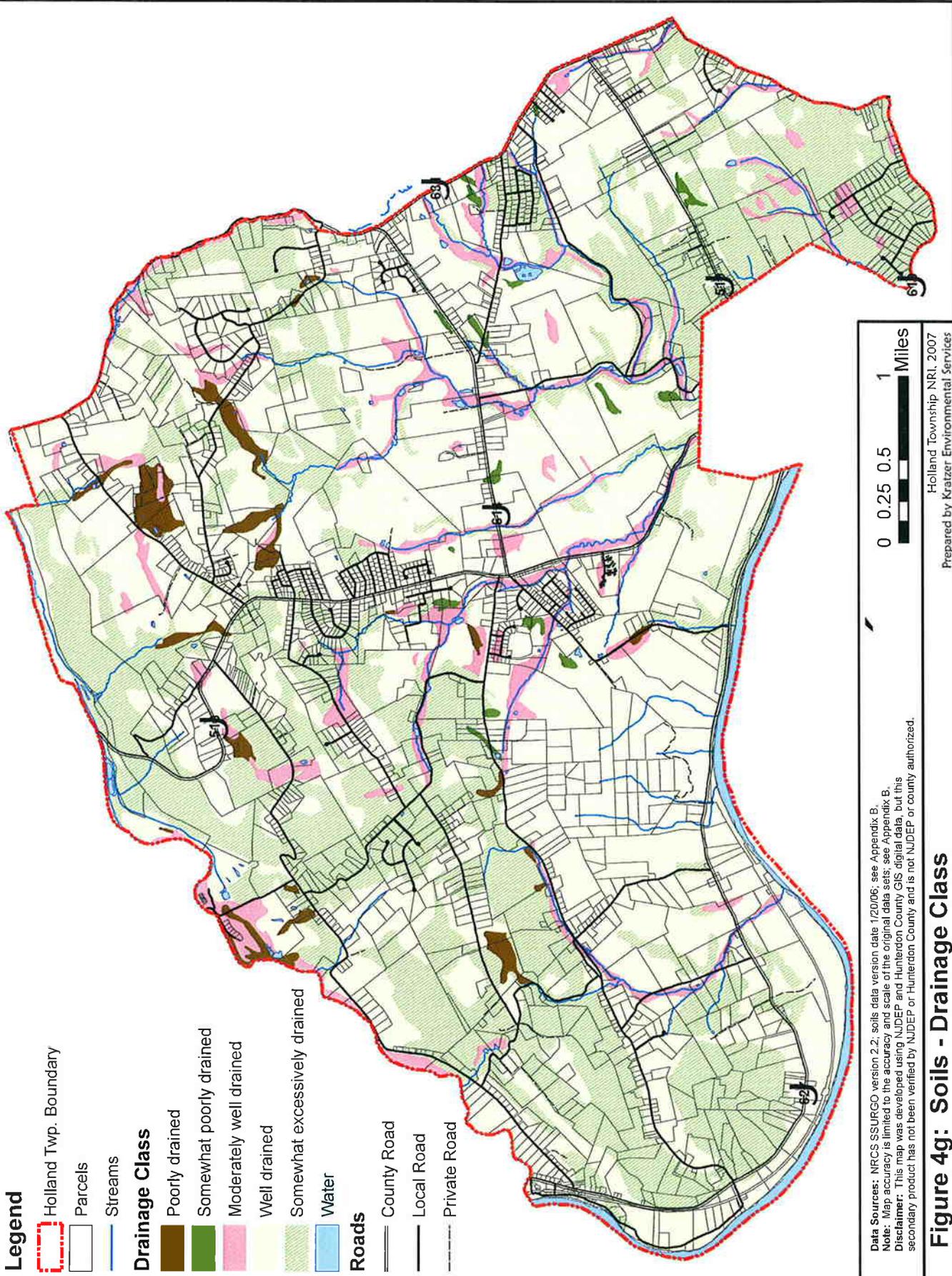
Drainage Class

Poorly drained
Somewhat poorly drained
Moderately well drained
Well drained
Somewhat excessively drained

Water

Roads

County Road
Local Road
Private Road



Data Sources: NRCS SSURGO version 2.2; soils data version date 1/20/06; see Appendix B.
 Note: Map accuracy is limited to the accuracy and scale of the original data sets; see Appendix B.
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Figure 4g: Soils - Drainage Class

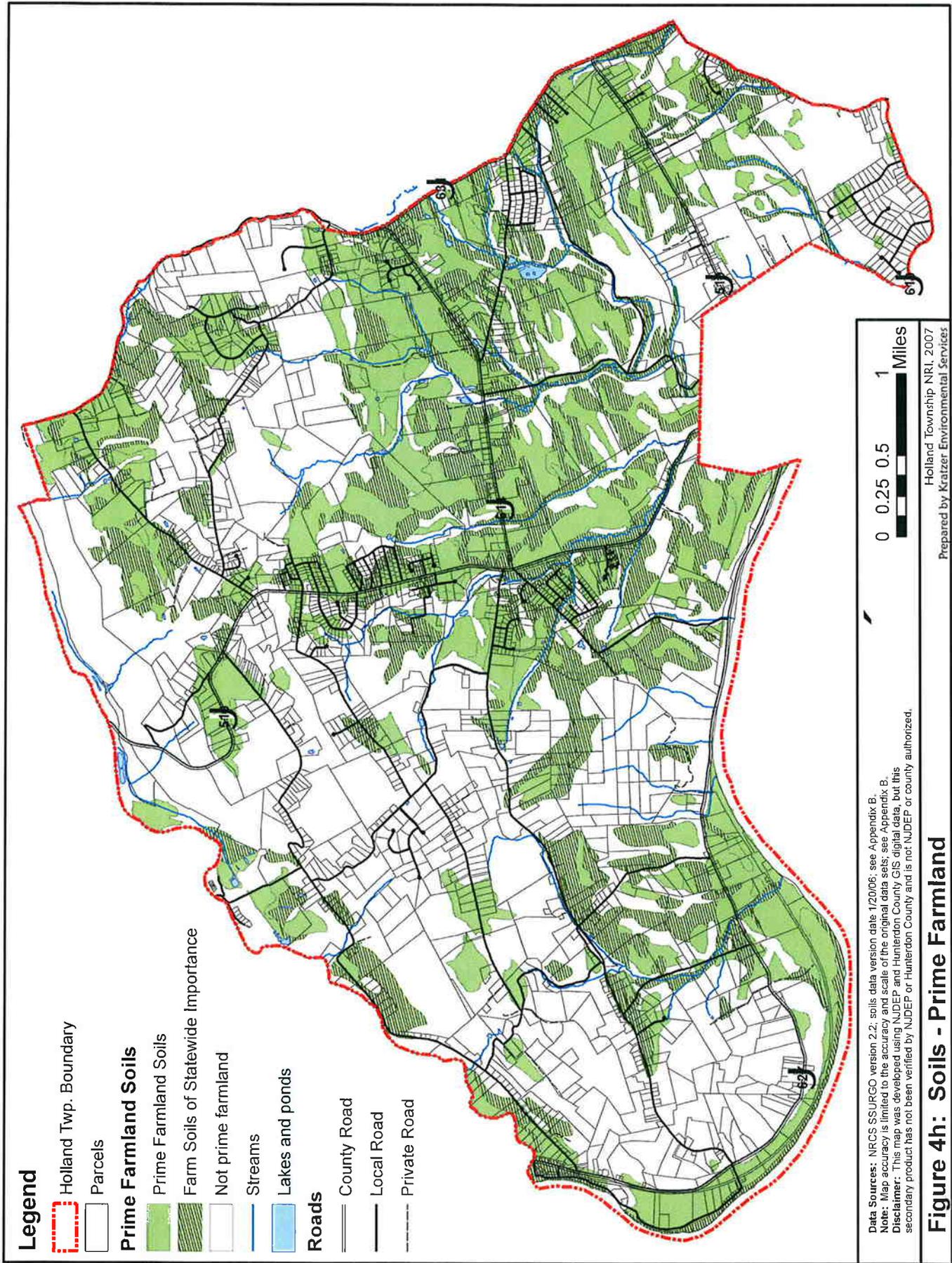


Figure 4h: Soils - Prime Farmland

Table 4.2: Characteristics of Soil Types Found in Holland Township²

Map Unit Symbol	Map Unit Name	Depth to Restrictive Features (inches)	Seasonal High Water Table Depth (inches)	A annual Flood Frequency	Hydrologic Group	Potential Frost Action	Drainage Class	Hydric Soil?	Prime Farmland?	Septic Limitations
AbrB	Abbotstown silt loam, 2 to 6 percent slopes	F: 15-30 B: 40-60	6	none	C	HIGH	somewhat poorly		SI	VERY
AnoB	Annandale gravelly loam, 3 to 8 percent slopes	F: 24-36 B: 73-79	>60	none	C	MODERATE	WELL		P	VERY
AnoC2	Annandale gravelly loam, 8 to 15 percent slopes, eroded	F: 18-30	>60	none	C	MODERATE	WELL		SI	VERY
AtotB	Athol gravelly loam, 2 to 6 percent slopes	B: 69-81	>60	none	B	MODERATE	WELL		P	somewhat
AtotC2	Athol gravelly loam, 6 to 12 percent slopes, eroded	B: 69-81	>60	none	B	MODERATE	WELL		SI	somewhat
BhnA	Birdsboro silt loam, 0 to 2 percent slopes	none	>60	none	B	MODERATE	WELL		P	NONE
BhnB	Birdsboro silt loam, 2 to 6 percent slopes	none	>60	none	B	MODERATE	WELL		P	NONE
BhnC2	Birdsboro silt loam, 6 to 12 percent slopes, eroded	none	>60	none	B	MODERATE	WELL		SI	NONE
BucB	Bucks silt loam, 2 to 6 percent slopes	B: 40-53	>60	none	B	MODERATE	WELL		P	VERY
CakA	Califon loam, 0 to 3 percent slopes	F: 20-30	18	none	C	HIGH	moderately well		P	VERY
CakB	Califon loam, 3 to 8 percent slopes	F: 20-30	18	none	C	HIGH	moderately well		P	VERY
CanBb	Califon gravelly loam, 0 to 8 percent slopes, very stony	F: 20-30	18	none	C	HIGH	moderately well			VERY
ChcB	Chalfont silt loam, 2 to 6 percent slopes	F: 15-30 B: 42-72	12	none	C	HIGH	somewhat poorly		SI	VERY

² The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.

Map Unit Symbol	Map Unit Name	Depth to Restrictive Features (inches)	Seasonal High Water Table Depth (inches)	Annual Flood Frequency	Hydrologic Group	Potential Frost Action	Drainage Class	Hydric Soil?	Prime Farmland?	Septic Limitations
ChcC2	Chalfont silt loam, 6 to 12 percent slopes, eroded	F: 15-30 B: 42-72	12	none	C	HIGH	somewhat poorly		SI	VERY
CoaA	Cokesbury loam, 0 to 3 percent slopes	F: 20-30	6	none	D	HIGH	POORLY	YES		VERY
CoaBb	Cokesbury loam, 0 to 8 percent slopes, very stony	F: 20-26	6	none	D	HIGH	POORLY	YES		VERY
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	none	6	FREQUENT Brief Sept-May	B/D	HIGH	POORLY	YES		VERY - NP(f)
FNAT	Fluvaquents and Udifluvents, 0 to 3 percent slopes, frequently flooded	none	24	FREQUENT very brief-brief Dec-May	C	LOW	moderately well			VERY - NP(f)
GkaoB	Gladstone gravelly loam, 3 to 8 percent slopes	none	>60	none	B	MODERATE	WELL		P	NONE
GkaoC2	Gladstone gravelly loam, 8 to 15 percent slopes, eroded	B: 40-60	>60	none	B	MODERATE	WELL		SI	somewhat
GkaoD	Gladstone gravelly loam, 15 to 25 percent slopes	none	>60	none	B	MODERATE	WELL			NONE
GKAPC	Gladstone and Parker soils, 8 to 15 percent slopes, extremely stony	B: 40-60	>60	none	B	MODERATE	WELL			somewhat - VERY
HdyB	Hazleton channery loam, 2 to 6 percent slopes	B: 48-60	>60	none	B	MODERATE	WELL		SI	somewhat
HdyC2	Hazleton channery loam, 6 to 12 percent slopes, eroded	B: 48-60	>60	none	B	MODERATE	WELL		SI	somewhat
HdyD	Hazleton channery loam, 12 to 18 percent slopes	B: 44-56	>60	none	B	MODERATE	WELL			somewhat
HdyDb	Hazleton channery loam, 6 to 18 percent slopes, very stony	B: 44-56	>60	none	B	MODERATE	WELL			somewhat

Map Unit Symbol	Map Unit Name	Depth to Restrictive Features (inches)	Seasonal High Water Table Depth (inches)	Annual Flood Frequency	Hydrologic Group	Potential Frost Action	Drainage Class	Hydric Soil?	Prime Farmland?	Septic Limitations
HdyEb	Hazleton channery loam, 18 to 40 percent slopes, very stony	B: 48-60	>60	none	B	MODERATE	WELL			somewhat
KkoC	Klinesville channery loam, 6 to 12 percent slopes	B: 10-20	>60	none	C	MODERATE	somewhat excessively			somewhat
KkoD	Klinesville channery loam, 12 to 18 percent slopes	B: 10-20	>60	none	C	MODERATE	somewhat excessively			somewhat
LbmB	Lansdale loam, 2 to 6 percent slopes	B: 54-66	>60	none	B	MODERATE	WELL		P	somewhat
LbmC2	Lansdale loam, 6 to 12 percent slopes, eroded	B: 54-66	>60	none	B	MODERATE	WELL		SI	somewhat
ParC	Parker cobbly loam, 3 to 15 percent slopes	B: 35-47	>60	none	B	MODERATE	somewhat excessively			VERY
ParD	Parker cobbly loam, 15 to 25 percent slopes	B: 36-47	>60	none	B	MODERATE	somewhat excessively			VERY
ParEe	Parker cobbly loam, 18 to 40 percent slopes, extremely stony	B: 39-47	>60	none	B	MODERATE	somewhat excessively			VERY – NP(s)
PdtB	Pattenburg gravelly loam, 2 to 6 percent slopes	B: 54-66	>60	none	B	MODERATE	WELL		P	somewhat
PdtC2	Pattenburg gravelly loam, 6 to 12 percent slopes, eroded	B: 54-66	>60	none	B	MODERATE	WELL		SI	somewhat
PdtD	Pattenburg gravelly loam, 12 to 18 percent slopes	B: 54-66	>60	none	B	MODERATE	WELL			somewhat
PdtE	Pattenburg gravelly loam, 18 to 40 percent slopes	B: 54-66	>60	none	B	MODERATE	WELL			VERY – NP(s)
PdtmB	Pattenburg gravelly loam, moderately wet, 2 to 6 percent slopes	B: 54-66	>60	none	C	HIGH	moderately well		P	somewhat
PeoB	Penn channery silt loam, 2 to 6 percent slopes	B: 20-40	>60	none	C	MODERATE	WELL		P	somewhat

Map Unit Symbol	Map Unit Name	Depth to Restrictive Features (inches)	Seasonal High Water Table Depth (inches)	A annual Flood Frequency	Hydrologic Group	Potential Frost Action	Drainage Class	Hydric Soil?	Prime Farmland?	Septic Limitations
PeoC2	Penn channery silt loam, 6 to 12 percent slopes, eroded	B: 20-40	>60	none	C	MODERATE	WELL		SI	somewhat
PeoD	Penn channery silt loam, 12 to 18 percent slopes	B: 20-40	>60	none	C	MODERATE	WELL			somewhat
PHG	Pits, sand and gravel	none	>60	none	A	-	WELL			-
PomAs	Pope fine sandy loam, high bottom, 0 to 2 percent slopes, occasionally flooded	none	>60	OCCASIONAL Brief Jan-May	B	MODERATE	WELL		P	VERY - NP(f)
RarAr	Raritan silt loam, 0 to 3 percent slopes, rarely flooded	F: 22-33	18	RARE Brief Nov-Mar	C	HIGH	moderately well		P	VERY - NP(f)
RarB	Raritan silt loam, 3 to 8 percent slopes	none	18	none	C	HIGH	moderately well		P	VERY
RedB	Readington silt loam, 2 to 6 percent slopes	F: 24-36 B: 40-60	27	none	C	MODERATE	moderately		P	VERY
RehB	Reaville silt loam, 2 to 6 percent slopes	B: 20-33	18	none	C	HIGH	somewhat poorly		SI	VERY
RepwB	Reaville wet variant silt loam, 2 to 6 percent slopes	B: 18-33	6	none	D	HIGH	poorly	YES		VERY
RksB	Riverhead gravelly sandy loam, 3 to 8 percent slopes	none	>60	none	B	MODERATE	WELL		P	NONE
RksC	Riverhead gravelly sandy loam, 8 to 15 percent slopes	none	>60	none	B	MODERATE	WELL		SI	NONE
ROPF	Rough broken land, shale	B: 0	>60	none	D	NONE	WELL			-
RorAt	Rowland silt loam, 0 to 2 percent slopes, frequently flooded	none	24	FREQUENT Brief Nov-Mar	C	HIGH	moderately well		SI	VERY - NP(f)

Map Unit Symbol	Map Unit Name	Depth to Restrictive Features (inches)	Seasonal High Water Table Depth (inches)	Annual Flood Frequency	Hydrologic Group	Potential Frost Action	Drainage Class	Hydric Soil?	Prime Farmland?	Septic Limitations
Turb	Turbotville loam, 2 to 6 percent slopes	B: 80-116	12	none	C	HIGH	somewhat poorly		P	VERY
WadB	Washington loam, 3 to 8 percent slopes	none	>60	none	B	MODERATE	WELL		P	NONE
Water	Water	0	0							-

Notes: See preceding text for descriptions of these various characteristics.

Restrictive Features: F=depth to fragipan; B=depth to bedrock

Hydrologic Group explanations see **Table 4.1.**

Drainage Class: W=well drained; MW=moderately well drained; E=excessive; SE=somewhat excessively; P=poorly; SP=somewhat poorly.

Hydric Soil?: YES=Hydric; blank=not Hydric

Prime Farmland?: P=Prime Farmland Soil; SI=Farmland of Statewide Importance; blank=not prime farmland

Septic Limitations: VERY=very limited; somewhat=somewhat limited; NONE=Not Limited; NP(f)=not permitted due to flooding; NP(s)=not permitted due to steep slope

Source: Soil Survey Geographic (SSURGO) Database Version 2.2 for Hunterdon County, New Jersey . Tabular Data Version Date 1/20/06

References: Soils

Jablonski, C.F. 1974. Soil Survey: Hunterdon County, New Jersey. US Department of Agriculture, Soil Conservation Service in cooperation with the New Jersey Agricultural Experiment Station at Rutgers. 131 pages.

US Department of Agriculture, Natural Resources Conservation Service (NRCS). January 1995. Soil Survey Geographic (SSURGO) Database: Data Use Information. 110 pages.

US Department of Agriculture, Soil Conservation Service. 1987. New Jersey County Soil Survey.

US Department of Agriculture, Natural Resources Conservation Service (NRCS). 2006. The Web Soil Survey Site. <http://websoilsurvey.nrcs.usda.gov/app/>

US Department of Agriculture, Natural Resources Conservation Service. January 20, 2006. Soil Data Mart (Hunterdon County data SSURGO version 2.2): <http://soildatamart.nrcs.usda.gov/>

US Department of Agriculture, Natural Resources Conservation Service, NJ. 2006. Soils Online Study Guide: Geology of New Jersey: <http://www.nj.nrcs.usda.gov/partnerships/envirothon/soils/geology.html>

NJDEP Division of Water Quality, Bureau of Nonpoint Source Pollution Control. August 15, 1999. N.J.A.C. 7:9A Standards for Individual Subsurface Sewage Disposal Systems, Subchapter 10. Disposal Fields. 130 pages. <http://www.state.nj.us/dep/dwq/pdf/njac79a.pdf>

Internet Resources: Soils

NRCS New Jersey Office: <http://www.nj.nrcs.usda.gov/>

NRCS Soils Website: **Helping People Understand Soils:** <http://soils.usda.gov/>

NRCS Soil Data Mart (download soils data for GIS): <http://soildatamart.nrcs.usda.gov/>

NRCS Soils Online Study Guide: <http://www.nj.nrcs.usda.gov/partnerships/envirothon/soils/>

Web Soil Survey Site (soils online): <http://websoilsurvey.nrcs.usda.gov/app/>

Web Soil Survey: How to Use it: http://websoilsurvey.nrcs.usda.gov/app/Help/WSS_HomePage_HowTo.pdf