1. Introduction and Purpose


Schuyler Business Park

The Herkimer County Industrial Development Agency, (HCIDA) is looking to expand the existing 99 acre Schuyler Business Park located on Route 5 in the Town of Schuyler. The current site is home to New England Wood Pellet, (manufacturer of premium wood pellets) and Wilcor International, (distributor of outdoor products). Located immediately east of the existing facility is a gently sloping ±188 acre property currently being utilized for agriculture. HCIDA is considering this property for the expansion. The property may be seen in the top portion of the photo above (large open field), with the existing facilities pictured in the foreground. With the purchase of the adjacent property the HCIDA plans to provide shovel ready sites for non-industrial businesses looking for a suburban environment.

Currently the existing businesses located within the park have access to municipal water, electric, natural gas and fiber-optic communication. These utilities will be made available at the proposed expansion site as well. Municipal sanitary facilities are not currently available at the site. The current businesses rely on on-site wastewater treatment systems (OWTS) to effectively treat and dispose of their sanitary waste. Similar systems will be necessary to meet the needs of future businesses as they occupy the expanded site.

The purpose of this investigation is to summarize the on-site testing conducted by GHD and to identify future potential treatment options. Additional information will need to be established and reviewed in order to develop the final on-site wastewater treatment systems during the design. The final system design will need to meet the requirements of NYS Department of Health (NYSDOH) and NYS Department of Environmental Conservation (NYSDEC) corresponding regulations.

2. Evaluation

As part of that comprehensive evaluation GHD has conducted a preliminary investigation including the following:

- On-site deep test pits
- On-site soil percolation tests
- Review of the NYSDEC Environmental Resource Mapper
- Review of FEMA Flood Insurance Rate Map FIRM
- Soils Resource Report from USDA NRCS

3. Site Investigation/Information Gathering

All on-site investigations were conducted in accordance with the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems. To obtain representative results of the proposed site GHD developed a map geospatially located using NAD83 New York State Planes, East Zone, US Foot coordinate system. On the map, the site was divided into four quadrants as shown on Figure No. 1. The proposed locations for the test pits and percolation test areas were then plotted on the map at each of the four quadrant centroids. Using the coordinates obtained from the map the locations were then staked at the site using a Trimble Geoexplorer 6000 series handheld GPS.

The investigations were conducted on December 10-11, 2018. Four deep test pits were dug and eight soil percolation tests were conducted, see Figure 1 for locations. At each test pit, the following factors were evaluated and recorded;

- Thickness of layers or horizons
- Texture (USDA), consistence, and structure of soil layers
- General color (using Munsell color charts in natural light) and colored mottling (i.e., an indication of a seasonally high groundwater table.
- Depth to water (if observed) and depth to estimated or observed seasonally high groundwater level
- Depth to bedrock if observed
- Other prominent features such as visible pores, stoniness, roots, or animal traces

A review of the soil survey for this site from United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) indicated two predominant soil types, refer to attached Soil Resource Report. The two soil types indicated in the report include H-hA-Herkimer gravely silt loam, 0 – 3 percent slopes and HhB-Herkimer gravely silt loam, 3 – 8 percent slopes. Both types are listed as well drained natural drainage class with hydraulic conductivity range of 0.57 to 1.98 in/hr. These values correspond with those observed in the site testing.

A. Deep Test Pits

Presented below are the findings for the deep test pits from the field investigation.

Test Pit No. 1 was excavate to a depth of ten feet with three distinct horizons observed.

- 0" to 18" down consisted of a Pale Brown Clayey Loam with little gravel and trace cobbles.
- 18" to 48" down consisted of Gray Rounded Gravel and silty loam with some Cobbles, major component gravel and sand silt mixture.

- 48” to 120” down consisted of Dark Gray Rounded Gravel and silty sand with some Cobbles, major component Silty Gravel, Gravel Sand-Silt mixture.
- No water observed.
- No bedrock observed.

Test Pit No. 2 was excavate to a depth of ten feet with three distinct horizons observed.

- 0” to 24” down consisted of a Pale Brown Clayey Loam with little gravel and trace cobbles.
- 24” to 72” down consisted of Gray Rounded Gravel and silty loam with some Cobbles, major component gravel and sand-silt mixture.
- 72” to 120” down consisted of Dark Gray Rounded Gravel and silty-sand with some Cobbles, major component Silty Gravel, Gravel Sand-Silt mixture.
- Water encountered at 80”.
- No bedrock observed.

Test Pit No. 3 was excavate to a depth of four feet with two distinct horizons observed. The high groundwater conditions encountered prevented any deeper excavation due to collapsing of the trench walls.

- 0” to 24” down consisted of a Pale Brown Clayey Loam with some gravel.
- 24” to 48” down consisted of Dark Brown silty gravels, gravel-sand-silt mixtures.
- Water encountered at 24”.
- No bedrock observed.

Test Pit No. 4 was excavate to a depth of ten feet with three distinct horizons observed.

- 0” to 24” down consisted of a Pale Brown Clayey Loam with little gravel and trace cobbles.
- 24” to 80” down consisted of Dark Grayish Brown Rounded silty gravels, gravel-sand-silt mixtures.
- 80” to 120” down consisted of Light Yellowish Brown gravel-sand-silt mixtures, major component silt.
- Water encountered at 42”.
- No bedrock observed.

B. Soil Percolation Tests

As shown on Figure No. 1 eight soil percolation tests were conducted adjacent to the four deep test pits. Each of the eight tests consisted of 12” diameter holes dug 30” deep. On December 10, 2018 the holes were dug and filled with water to meet the pre-soaking requirement. On December 11, 2018 the percolation tests were conducted as follows:

- The sides of the holes were scarified and the loose soil was removed from the bottom of the hole.
- A 1” square wooden stake was driven into the base of the hole with 2 finish nails driven perpendicular to the stake 5 and 6 inches above the base of the hole.
- Clean water was carefully placed into the hole using a siphon hose until the level reached the top nail on the stake (6” mark).
- The start time was then noted, refer to the table on Figure No. 1.
- The hole was observed until the water level reached the lower nail (5” mark) and the end time was noted, refer to the table on Figure No. 1.

- The test was repeated and the information recorded for each hole, final results are shown in the table on Figure No. 1.

4. Environmental Considerations

GHD reviewed two online resources, NYSDEC, Environmental Resource Mapper and the FIRM maps provided by FEMA. Both of these resources provide a general indication of the site as it relates to environmentally sensitive areas of concern and flood zones. As the project progresses it may be necessary to perform more conclusive investigations. However, our review of the above mentioned resources did not indicate that the site contains any environmentally sensitive areas and is not located in a flood zone. Refer to figures No. 2 and No. 3 respectively.

5. On-Site Wastewater Treatment

The percolation tests performed at the site showed varying results as indicated in the table shown on Figure No. 1. The guidelines state that conventional soil-based treatment systems should be avoided if the percolation rate is slower than 60 minutes per inch (mpi) of drop for trenches, or 30 minutes per inch of drop for beds. Additionally, conventional soil-based systems should be avoided in areas where high groundwater is present.

Favourable results were noted for percolation tests 1A, 2A, 4A and 4B each test resulted in percolation rates that fell within the acceptable range. The remaining percolation tests resulted in unfavourable conditions for a conventional absorption trench system. It is recommended that more tests be conducted in these areas to confirm these results.

In instances where the percolation rate or soil consistency is unacceptable for a conventional subsurface system, alternative systems must be considered. Alternative systems to be considered are listed below:

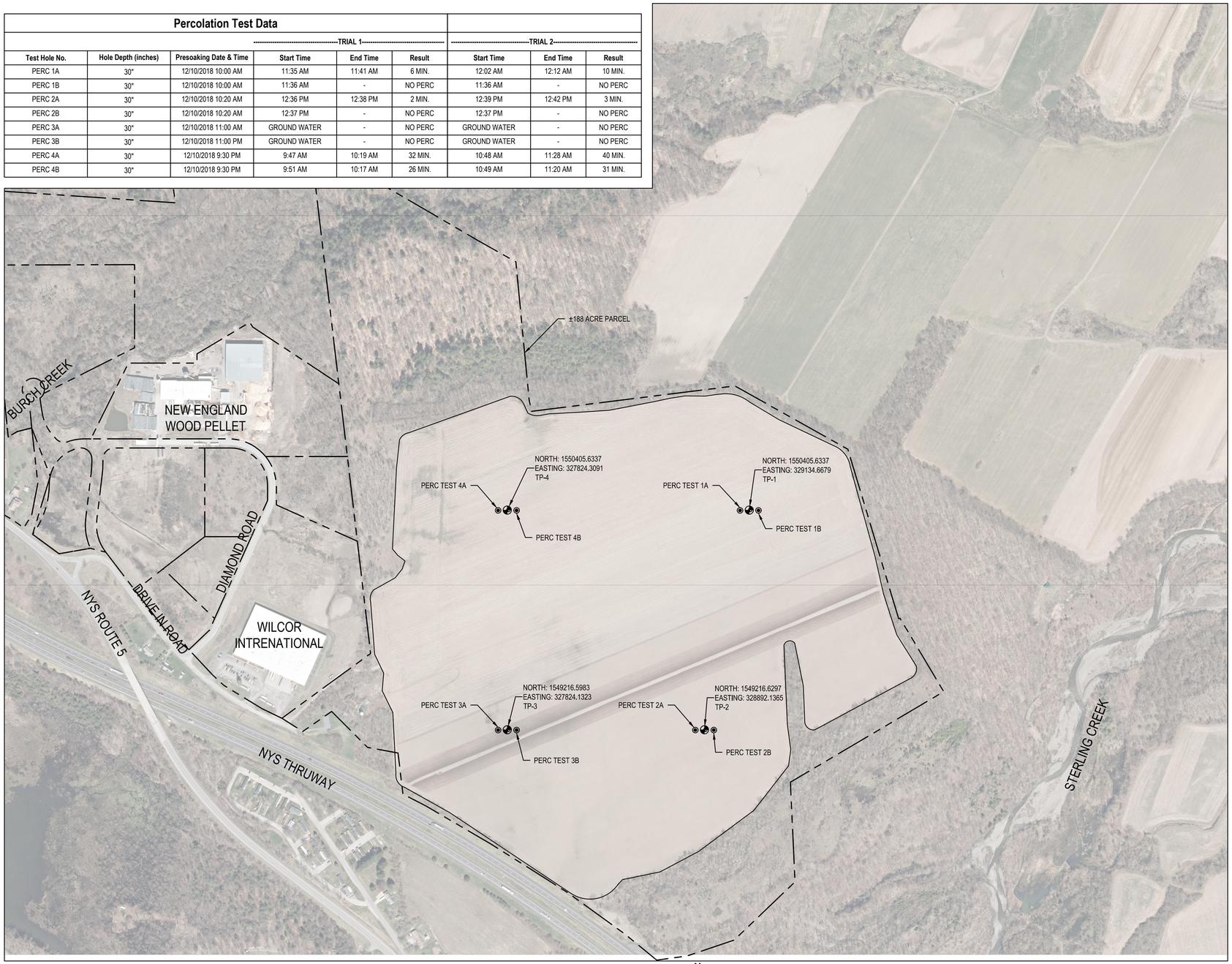
- soil amendment
- raised, mound
- sand filter system

6. Summary and Recommendations

Based upon the findings obtained from the site investigations the conditions appear to be suitable for a typical absorption trench layout depending on where the system is located on the site. Looking at the results of the testing three of the four quadrants (NW, NE and SE) showed favourable conditions. While the testing in the south west quadrant indicated high ground water which could be problematic for a conventional system. During final design of the on-site facilities, information specific to each one will need to be established and reviewed to develop the final on-site wastewater treatment system. It should be noted, based on the findings of this investigation, that specific areas of this site may require a more advanced treatment system to meet regulatory requirements.

Percolation Test Data

Test Hole No.	Hole Depth (inches)	Presoaking Date & Time	TRIAL 1 Start Time	TRIAL 1 End Time	TRIAL 1 Result	TRIAL 2 Start Time	TRIAL 2 End Time	TRIAL 2 Result
PERC 1A	30"	12/10/2018 10:00 AM	11:35 AM	11:41 AM	6 MIN.	12:02 AM	12:12 AM	10 MIN.
PERC 1B	30"	12/10/2018 10:00 AM	11:36 AM	-	NO PERC	11:36 AM	-	NO PERC
PERC 2A	30"	12/10/2018 10:20 AM	12:36 PM	12:38 PM	2 MIN.	12:39 PM	12:42 PM	3 MIN.
PERC 2B	30"	12/10/2018 10:20 AM	12:37 PM	-	NO PERC	12:37 PM	-	NO PERC
PERC 3A	30"	12/10/2018 11:00 AM	GROUND WATER	-	NO PERC	GROUND WATER	-	NO PERC
PERC 3B	30"	12/10/2018 11:00 PM	GROUND WATER	-	NO PERC	GROUND WATER	-	NO PERC
PERC 4A	30"	12/10/2018 9:30 PM	9:47 AM	10:19 AM	32 MIN.	10:48 AM	11:28 AM	40 MIN.
PERC 4B	30"	12/10/2018 9:30 PM	9:51 AM	10:17 AM	26 MIN.	10:49 AM	11:20 AM	31 MIN.



N

TEST PIT PLAN

SCALE 1" = 300'

LOCATION PLAN

AREA MAP

HERKIMER COUNTY INDUSTRIAL DEVELOPMENT AGENCY
HERKIMER COUNTY, NEW YORK
TOWN OF SCHUYLER
SCHUYLER BUSINESS PARK

SITE MAP

Project No. 11184709
Report No. 1
Date 01/2019

FIGURE No. 1

Filename: G:\111\11184709 HCIDA Schuyler Business Park\CADD\Drawings\11184709-XV-AERIAL.dwg
Plot Date: 11 January 2019 - 5:36 PM

Source:

Environmental Resource Mapper

Base Map: Satellite with Labels ▼ Using this map

Search

Tools

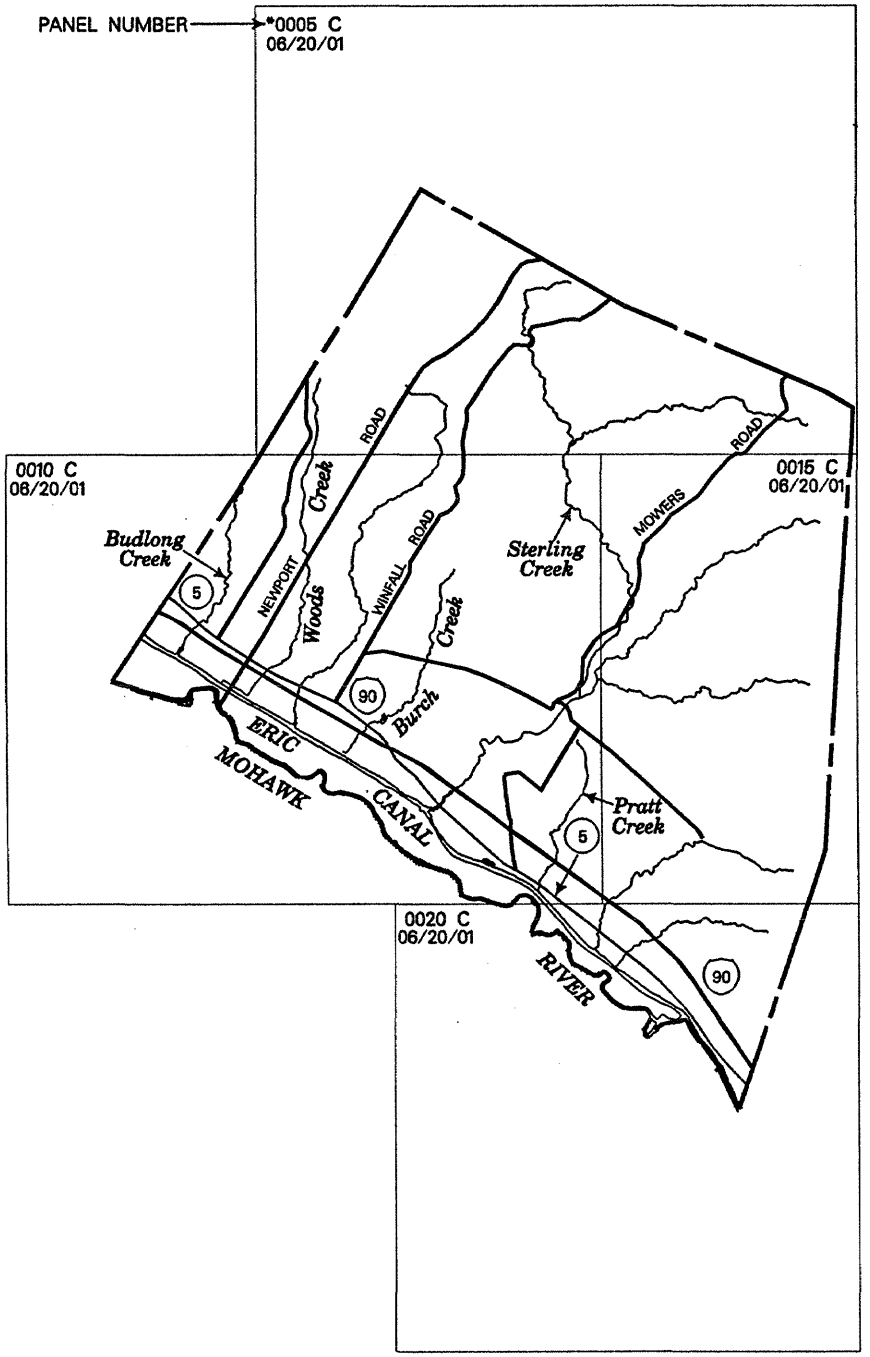
Layers and Legend

- [x] **All Layers**
- [x] Unique Geological Features
- [x] Waterbody Classifications for Rivers/Streams
- [x] Waterbody Classifications for Lakes
- [x] State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone
- [x] Significant Natural Communities
- Natural Communities Near This Location
- [x] Rare Plants or Animals

Other Wetland Layers

Reference Layers

FIGURE No. 2



* PANEL NOT PRINTED – NO SPECIAL FLOOD HAZARD AREAS

MAP REPOSITORY

Schuyler Town Office, 2090 State Route 5, Utica, New York 13502 (Maps available for reference only, not for distribution.)

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
SCHUYLER,
NEW YORK
HERKIMER COUNTY

MAP INDEX

PANELS PRINTED: 10, 15, 20

COMMUNITY – PANEL NUMBERS
360318 0005 – 0020

MAP REVISED:
JUNE 20, 2001

Federal Emergency Management Agency

FIGURE No. 3

United States Department of Agriculture

Natural Resources Conservation Service

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

Custom Soil Resource Report for Herkimer County, New York, Southern Part

December 14, 2018

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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: 1:9,030 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Herkimer County, New York, Southern Part
Survey Area Data: Version 15, Sep 3, 2018

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

Date(s) aerial images were photographed: Apr 23, 2014—Sep 23, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ad	Alluvial land	15.4	3.7%
Cm	Carlisle muck	3.4	0.8%
Co	Cohoctah mucky very fine sandy loam	6.4	1.6%
Cu	Cut and fill land	76.6	18.6%
Fr	Fredon fine sandy loam	13.5	3.3%
HhA	Herkimer gravelly silt loam, 0 to 3 percent slopes	250.8	60.8%
HhB	Herkimer gravelly silt loam, 3 to 8 percent slopes	0.0	0.0%
HkB	Herkimer gravelly silt loam, moderately well drained, 0 to 4 percent slopes	12.1	2.9%
HvA	Howard gravelly silt loam, 0 to 3 percent slopes	0.2	0.0%
HvC	Howard gravelly silt loam, 8 to 15 percent slopes	0.4	0.1%
HwD	Howard and Palmyra soils, 15 to 25 percent slopes	13.5	3.3%
PmF	Palmyra and Howard soils, 25 to 70 percent slopes	2.8	0.7%
Ts	Teel silt loam	17.3	4.2%
Totals for Area of Interest		**412.4**	**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.

Herkimer County, New York, Southern Part

Ad—Alluvial land

Map Unit Setting

National map unit symbol: 9svp
Elevation: 100 to 3,000 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Fluvaquents

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium with highly variable texture

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 72 inches: gravelly silt loam

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 very high (0.06 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Udifluvents

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf

Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium with a wide range of texture

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 70 inches: very gravelly sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)
Depth to water table: About 24 to 72 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Hamlin

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

Teel

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

Wayland

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

Cohoctah

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

Fresh water marsh

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

Cm—Carlisle muck

Map Unit Setting

National map unit symbol: 9sw6
Elevation: 250 to 1,000 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Carlisle and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Carlisle

Setting

Landform: Swamps, marshes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Deep organic material

Typical profile

H1 - 0 to 60 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Palms

Percent of map unit: 5 percent

Landform: Swamps, marshes
Hydric soil rating: Yes

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

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

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

Cohoctah
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Co—Cohoctah mucky very fine sandy loam

Map Unit Setting
National map unit symbol: 9sw7
Elevation: 600 to 1,000 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition
Cohoctah and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cohoctah

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical profile
H1 - 0 to 12 inches: mucky very fine sandy loam
H2 - 12 to 21 inches: fine sandy loam
2C1 - 21 to 27 inches: loamy fine sand

2C2 - 27 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Minor Components

Wayland

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

Fresh water marsh

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

Sun

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

Teel

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

Hamlin

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

Cu—Cut and fill land

Map Unit Setting

National map unit symbol: 9sw9
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Typical profile

H1 - 0 to 4 inches: channery loam
H2 - 4 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

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

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Lansing

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

Mohawk

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

Hornell

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

Sun

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

Lamson

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

Fr—Fredon fine sandy loam

Map Unit Setting

National map unit symbol: 9swg
Elevation: 250 to 1,200 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fredon, poorly drained, and similar soils: 50 percent
Fredon, somewhat poorly drained, and similar soils: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fredon, Poorly Drained

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 15 inches: gravelly fine sandy loam
H3 - 15 to 23 inches: very gravelly fine sandy loam
H4 - 23 to 60 inches: stratified extremely gravelly loamy sand to 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 high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Fredon, Somewhat Poorly Drained

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 15 inches: gravelly fine sandy loam
H3 - 15 to 23 inches: very gravelly fine sandy loam
H4 - 23 to 60 inches: stratified extremely gravelly loamy sand to sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

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

Minor Components

Palmyra

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

Howard

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

Phelps

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

Herkimer

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

Halsey

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

HhA—Herkimer gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9swr
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Herkimer

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy old alluvium derived from dark, calcareous shale and varying amounts of sandstone and limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 31 inches: gravelly silt loam
H3 - 31 to 46 inches: gravelly silt loam
H4 - 46 to 75 inches: channery loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

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

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

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

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

HhB—Herkimer gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9sws
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

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

Description of Herkimer

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy old alluvium derived from dark, calcareous shale and varying amounts of sandstone and limestone

Typical profile
H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 31 inches: gravelly silt loam
H3 - 31 to 46 inches: gravelly silt loam
H4 - 46 to 75 inches: channery loam

Properties and qualities
Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Available water storage in profile: Moderate (about 8.8 inches)

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

Minor Components

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

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

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

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

HkB—Herkimer gravelly silt loam, moderately well drained, 0 to 4 percent slopes

Map Unit Setting
National map unit symbol: 9swt
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

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

Description of Herkimer

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy old alluvium derived from dark, calcareous shale and varying amounts of sandstone and limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 31 inches: gravelly silt loam
H3 - 31 to 46 inches: gravelly silt loam
H4 - 46 to 75 inches: channery loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

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

Minor Components

Phelps

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

Fredon

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

Howard

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

Palmyra

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

HvA—Howard gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9sxf
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Howard and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: gravelly sandy loam
H3 - 13 to 29 inches: very gravelly sandy loam
H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

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

Minor Components

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

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

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

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

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

HvC—Howard gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9sxh
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Howard and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting
Landform: Valley trains, terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile
H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: gravelly sandy loam
H3 - 13 to 29 inches: very gravelly sandy loam

H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

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

Minor Components

Herkimer

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

Agawam

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

Hartland

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

Phelps

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

Fredon

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

HwD—Howard and Palmyra soils, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9sxj
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Howard and similar soils: 40 percent
Palmyra and similar soils: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Howard

Setting

Landform: Valley trains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: gravelly sandy loam
H3 - 13 to 29 inches: very gravelly sandy loam
H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

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

Description of Palmyra

Setting

Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits, derived mainly from limestone and other sedimentary rocks

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 17 inches: gravelly very fine sandy loam
H3 - 17 to 36 inches: gravelly silt loam

H4 - 36 to 60 inches: Error

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

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

Minor Components

Phelps

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

Fredon

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

Hinckley

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

Herkimer

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

PmF—Palmyra and Howard soils, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9syw
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Palmyra and similar soils: 40 percent
Howard and similar soils: 40 percent
Minor components: 20 percent

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

Description of Palmyra

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy over sandy and gravelly glaciofluvial deposits, derived mainly from limestone and other sedimentary rocks

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 17 inches: gravelly very fine sandy loam
H3 - 17 to 36 inches: gravelly silt loam
H4 - 36 to 60 inches: Error

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

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

Description of Howard

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, containing significant amounts of limestone

Typical profile

H1 - 0 to 8 inches: gravelly silt loam
H2 - 8 to 13 inches: gravelly sandy loam
H3 - 13 to 29 inches: very gravelly sandy loam
H4 - 29 to 60 inches: extremely gravelly loamy fine sand

Properties and qualities

Slope: 25 to 70 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

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

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

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

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

Ts—Teel silt loam

Map Unit Setting
National map unit symbol: 9sz7
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 125 to 165 days
Farmland classification: All areas are prime farmland

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

Description of Teel

Setting
Landform: Flood plains

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Silty alluvium

Typical profile

H1 - 0 to 11 inches: silt loam
H2 - 11 to 30 inches: silt loam
H3 - 30 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Available water storage in profile: High (about 10.1 inches)

Interpretive groups

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

Minor Components

Hamlin

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

Phelps

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

Wayland

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

Cohoctah

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

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