

ENVIRONMENTAL IMPACT STATEMENT

For

SHI Builders Proposed Residential Subdivision

**2 & 10 Ridge Road
Block 80.03, Lots 10 & 21
Township of West Orange, Essex County, NJ**

Prepared by:



**1904 Main Street
Lake Como, NJ 07719
(732) 974-0198**

A handwritten signature in black ink, appearing to read 'Robert P. Freud', is written over a horizontal line.

**Robert P. Freud, PE, PP
NJ Professional Engineer License #41938**

**August 2022
DEC# 4266-99-001**

TABLE OF CONTENTS

	<u>Page No.</u>
1. PROJECT DESCRIPTION	1
2. SITE DESCRIPTION AND INVENTORY	2
B. TYPES OF SOIL	2
C. TOPOGRAPHY	2
D. GEOLOGY	2
E. VEGETATION	3
F. SURFACE WATER	3
G. SUBSURFACE WATER	3
H. SCENIC AND HISTORICAL FEATURES	3
I. EXISTING DEVELOPMENT FEATURES	4
3. AREA AND REGIONAL DESCRIPTION	4
4. IMPACT	4
A. SOIL EROSION AND SEDIMENTATION RESULTING FROM SURFACE RUNOFF	4
B. FLOODING AND FLOODPLAIN DISRUPTION	4
C. DEGRADATION OF SURFACE WATER QUALITY	4
D. GROUNDWATER POLLUTION	5
E. SEWAGE DISPOSAL	5
F. SOLID WASTE DISPOSAL	5
G. DESTRUCTION OF VEGETATION	5
H. DISRUPTION OF WILDLIFE HABITATS	5
I. DESTRUCTION OF SCENIC AND HISTORICAL FEATURES	6
J. AIR QUALITY DEGRADATION	6
K. NOISE LEVELS	6
L. ENERGY UTILIZATION	6
M. NEIGHBORHOOD DETERIORATION	6
N. EFFECT ON PUBLIC SERVICES	6
O. TRAFFIC CONGESTION	6
P. HEALTH, SAFETY AND WELFARE OF EXISTING RESIDENTS	7
Q. REGIONAL DEVELOPMENT POLICIES	7
5. RECOMMENDATION TO MITIGATE ADVERSE ENVIRONMENTAL IMPACT	7
A. DRAINAGE PLANS	7
B. SEWAGE DISPOSAL TECHNIQUES	7
C. WATER SUPPLY AND WATER CONSERVATION PROPOSALS	7
D. SITE DESIGN	7
E. ENERGY CONSERVATION MEASURES	8

F. NOISE REDUCTION TECHNIQUES.....	8
G. CONSTRUCTION SCHEDULE.....	8
H. MISCELLANEUOS	8
6. ALTERNATIVES	8
7. LICENSES, PERMITS AND OTHER APPROVALS REQUIRED BY LAW	8
8. DOCUMENTATION	9

APPENDIX

Aerial Photo Map

Township of West Orange Tax Map

NJDEP GeoWeb State Planning Area Map

NJDEP GeoWeb Historic Properties Map

Township of West Orange Zoning Map

Air Quality Monitoring Report

NRCS Web Soil Survey

NJDEP GeoWeb Streams and Water Bodies Map

NJDEP GeoWeb Bedrock Geology Map

Stormwater Management, Groundwater Recharge and Water Quality Analysis (Dynamic Engineering Consultants,
PC) (Included Separately)

ALTA/NSPS Land Title Survey (Dynamic Survey, LLC) (Included Separately)

Traffic Impact and Parking Assessment (Dynamic Traffic, LLC) (Included Separately)

Report of Preliminary Geotechnical and Stormwater Basin Area Investigation (Dynamic Earth, LLC) (Included
Separately)

(§ 25-13) Environmental Impact Analysis

1. PROJECT DESCRIPTION

This report has been prepared in association with a Preliminary and Final Subdivision Application for a proposed residential subdivision on Block 80.03, Lots 10 and 21. It is intended to provide general background information regarding potential adverse physical and environmental impacts, as associated with the proposed subdivision. This report addresses various items, as outlined in § 25-13 of the Township of West Orange Municipal Code.

The existing parcel is approximately 12.7 acres and is located on the east side of Ridge Road at the intersection of Mount Pleasant Avenue (County Route 577) which abuts the property to the north and east. The parcel is currently undeveloped and is predominately wooded. It is proposed to subdivide the property into four (4) lots with a single-family residential house to be constructed on each of the proposed lots. The site is located within the R-1 (Residential) Zone where the proposed use is permitted.

Associated with the development, are driveways, stormwater management facilities, along with other improvements as shown in the accompanying Subdivision Plan drawings.

2. SITE DESCRIPTION AND INVENTORY

A. TYPES OF SOIL

Based on the Essex County soils survey information, the soil types native to the site include:

CUMBERLAND COUNTY SOIL SURVEY INFORMATION		
SOIL TYPE (SYMBOL)	SOIL TYPE (NAME)	HYDROLOGIC SOIL GROUP
USBONB	Urban Land, Boonton Substratum-Boonton complex, 0 to 8 percent slopes	
BogCc	Boonton loam, 8 to 15 percent slopes, extremely stony	C
HanBc	Haledon silt loam, 0 to 8 percent slopes, extremely stony	C
YaobBc	Yalesville-Boonton-Holyoke complex, 0 to 8 percent slopes, extremely stony	C
BowrB	Boonton-Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes	C
YaohEh	Yalesville-Holyoke complex, 35 to 60 percent slopes, very rocky	C

B. TOPOGRAPHY

Existing site elevations range significantly between approximately 632.0 feet at the western-most portion of the site, sloping down to approximately 510.0 feet at the east corner of the site. The existing topography throughout the subject parcel contains significant topographic change and abuts a rock cliff face to the east. The area of development contains primarily slopes of 0 to 10 percent, however, there are isolated regions reaching over 25 percent slope. The undeveloped areas on the eastern portion of the site reach upwards of 50 percent slope.

C. GEOLOGY

According to the Report of Preliminary Geotechnical and Stormwater Basin Area Investigation, prepared by Dynamic Earth, LLC, the subject site is located in a region of the Piedmont Physiographic Province of New Jersey known as the Newark Basin. The Newark Basin contains rocks of the Newark Super Group and Brunswick Group which is a stratigraphic series of Triassic to Jurassic age igneous and sedimentary rocks containing intrusive sills and dikes as well as extrusive volcanics. The primary formation beneath the site is known as the Orange Mountain Basalt which

includes basalts, greenish-gray to greenish-black, massive, pillow, and columnar jointed structures separated by thick beds of red siltstone or volcanoclastic rocks. The formation beneath the eastern portion of the site is known as the Passaic Formation of the Brunswick Group which includes thin to thick bedded siltstone and sandstone. Mud cracks, ripple marks, crossbeds and burrows are common. The overburden materials include residual soils derived from the underlying bedrock. Surficial geology at the site consists of the Rahway Till (Qwtr). The reported lithology consists of exposed clayey silt and sandy silt deposits and include pebbles and cobbles and few boulders directly desisted from glacial ice. Overburden material also includes reworked on-site soils.

D. VEGETATION

The subject site is primarily covered with vegetation which including large trees and underbrush. The vegetation on site is typical of a northern New Jersey wooded area, with species native to this area.

E. SURFACE WATER

As shown in the NJDEP GeoWeb Streams and Water Bodies Map, located in the appendix of this report, there are currently no existing open waters or streams located within the existing parcel.

F. SUBSURFACE WATER

As outlined in the Geotechnical and Stormwater Basin Area Investigation Report, prepared by Dynamic Earth, LLC, located in the appendix of this report, the seasonal high groundwater was encountered 1.4 feet to 5 feet below the ground surface; corresponding to elevations ranging from 621.3 feet and 612.4 feet. Groundwater was encountered at depths ranging between approximately two feet and 9.6 feet below the ground surface; corresponding to elevations ranging between 621.3 feet and 562.1 feet.

G. UNIQUE, SCENIC AND/OR HISTORIC FEATURES

As shown in NJDEP GeoWeb Historical Properties Map, located in the appendix of this report, the subject parcel is not a designated historical property and it does not lie within a historical district. To the West of the property beyond Prospect Avenue lies the historical West Orange Sub Station. To the East of the property beyond Route 280 lies the Llewellyn Park Historic District. The property contains many steep slopes along the eastern most side of the property. These slopes will remain undisturbed as a result of this development.

H. EXISTING DEVELOPMENT FEATURES

As shown in the ALTA/NSPS Land Title Survey, prepared by Dynamic Survey, LLC, located in the appendix of this report. The subject property contains an existing brick walkway on the northeastern portion. The subject also contains an existing channel and headwall within the same area. Other than the minor aforementioned features, the site is currently undeveloped and forested.

3. AREA AND REGIONAL DESCRIPTION

The subject property is bordered to the north by commercial uses, which include the Italian Tribune newspaper publisher as well as the Emmis Communications Corporation, with residential uses beyond. To the east of the subject property lies residential uses with Route 280 Essex Freeway beyond. The subject property is bordered to the West by the Arden Courts and Brookdale West Orange assisted living facilities with a golf course beyond. To the south of the subject property lies residential uses.

4. IMPACT

A. SOIL EROSION AND SEDIMENTATION RESULTING FROM SURFACE RUNOFF

The impervious area resulting from the proposed development is less than a quarter acre, however will increase surface runoff on the subject property nonetheless. Surface runoff flow rates are controlled via four (4) proposed aboveground bio-retention basins with underdrains and meet the stormwater quantity reduction requirements set forth by the Township of West Orange Land Use Ordinance and NJAC 7:8. Therefore, we do not anticipate soil erosion and/or sedimentation to occur as a result from surface runoff. Additionally, soil erosion and sediment control measures will be in place through the duration of construction as shown in the Subdivision Plan Drawings.

B. FLOODING AND FLOODPLAIN DISRUPTION

As per FEMA Flood Hazard Area Mapping, the subject property is not located within a flood hazard area. Therefore, no flooding and floodplain disruption is anticipated.

C. DEGRADATION OF SURFACE WATER QUALITY

The proposed development does not result in an increase of a quarter acre or more of vehicular traveled surface, and therefore as per NJAC 7:8, the proposed development is not subject to the Stormwater Quality requirements. However, the proposed new impervious areas are designed to flow into four (4) new bioretention basins designed with underdrains. These systems are designed in

accordance with the New Jersey Stormwater Best Management Practices Manual in order to achieve a Total Suspended Solids (TSS) removal rate of 80% which meets standards set forth by NJAC 7:8.

D. GROUNDWATER POLLUTION

As stated above the subdivision will be constructed with four (4) new bioretention basins with underdrains. This system has an impermeable liner along the bottom which prohibits water from infiltrating through the bottom. Therefore, the impervious runoff generated by the subdivision will be treated through the proposed bioretention basins in accordance with NJAC 7:8. Therefore the subdivision will have no negative impact on groundwater pollution.

E. SEWAGE DISPOSAL

It is proposed to construct an 8-inch sanitary sewer main within Ridge Road extending north to the intersection of Mount Pleasant Avenue and continuing east to connect to the existing sanitary sewer system located within Mount Pleasant Avenue. The proposed residential units will connect to the proposed sewer main with a 4" sanitary lateral.

F. SOLID WASTE DISPOSAL

It is anticipated that the solid waste generated from the residential dwellings will be handled by the Township of West Orange Public Works and disposed of properly.

G. DESTRUCTION OF VEGETATION

The proposed development on the subject property has an area of disturbance around 155,000 square feet (3.6 acres). Existing vegetation will be removed within this area of disturbance. However, the proposed new impervious area is minor in comparison to the 3.6 acres in total disturbance. The remaining area will be restored with open space and/ or new landscaping.

H. DISRUPTION OF WILDLIFE HABITATS

Of the 12.7-acre property, the proposed development on the subject property has an area of disturbance of only approximately 160,894 square feet (3.7 acres). Therefore, the majority of the property will remain undisturbed and wooded. According to the NJDEP GeoWeb Mapping System, there are no threatened or endangered species located on the subject property. Therefore, no wildlife habitats of threatened or endangered species will be impacted.

I. DESTRUCTION OF SCENIC AND HISTORIC FEATURES

As previously stated, the proposed development is not located within a historical property, and the limit of disturbance is primarily within a vegetative area that is located outside of the most extreme slopes within the existing parcel. Therefore, the proposed subdivision will not impact of scenic or historical features.

J. AIR QUALITY DEGRADATION

Due to the low density of proposed residences associated with the proposed subdivision, there is no anticipated negative impact on air quality for the surrounding area.

K. NOISE LEVELS

Due to the low density of proposed residences associated with the proposed subdivision, there is no anticipated negative impact on noise levels for the surrounding area.

L. ENERGY UTILIZATION

The proposed development on the subject property includes four (4) single family residential homes. Typically, newer construction uses energy efficient building materials and appliances, therefore, the energy utilization of the proposed dwellings may be less than typically expected from older homes of the same size.

M. NEIGHBORHOOD DETERIORATION

Due to the low density of proposed residences associated with the proposed subdivision, it is not anticipated that the subdivision will result in any neighborhood deterioration.

N. EFFECT ON PUBLIC SERVICES

The surrounding infrastructure is expected to have sufficient capacity to handle the proposed development. Due to the low density of proposed residences associated with the subdivision, there is minimal anticipated impact on public services.

O. TRAFFIC CONGESTION

Due to the low density of the development, the proposed development on the subject parcel is not expected to result in any traffic impacts for the surrounding area. More information pertaining to traffic impact is detailed within the Traffic Impact and Parking Assessment prepared by Dynamic Traffic, LLC provided within the appendix of this report.

P. HEALTH, SAFETY AND WELFARE OF EXISTING RESIDENTS

The purpose of the proposed subdivision is to create four (4) residential lots with single-family residential homes consistent with those in the area. As such, no negative impact on the health, safety and welfare of the existing residents is expected.

Q. REGIONAL DEVELOPMENT POLICIES

The proposed residential subdivision is consistent with the West Orange Zoning and Master Plan as well as county and applicable regional development policies.

5. RECOMMENDATION TO MITIGATE ADVERSE ENVIRONMENTAL IMPACT

A. DRAINAGE PLAN

The proposed grading and drainage plan for the subject property includes four (4) aboveground bioretention basins with underdrains, located on each proposed lot to collect stormwater runoff in order to meet the stormwater requirements set forth by the Township of West Orange Land Use Ordinance and NJAC 7:8. The grading surrounding each proposed building is designed to allow water to drain directly into each basin via overland flow. Underdrains are proposed for each basin to allow stormwater to drain to the most optimal location at a controllable rate.

B. SEWAGE DISPOSAL

As previously detailed, the proposed sewer main extension for the subject property will extend west in Mount Pleasant Avenue and route south within Ridge Road. Each single-family residential building will connect to the 8" proposed sewer main via a 4" proposed sewer lateral. Sewer service will be provided by the Joint Meeting of Essex & Union Sewer Authority, however will be coordinated through the Township of West Orange.

C. WATER SUPPLY AND CONSERVATION PROPOSALS

The subject property is located within the purveyor service area of New Jersey American Water. Each proposed residential building will connect to the existing water main located within Ridge Road via a lateral. The exact size and other details are to be coordinated with the water company.

D. SITE DESIGN TECHNIQUES

The subject property is totals approximately 522,878 square feet (12.7 acres) in size with an anticipated area of disturbance of approximately 160,894 square feet (3.7 acres) as shown in the Subdivision Plan Drawings. Disturbance was limited to the greatest extent practically possible while meeting stormwater management requirements and achieving development goals. Approximately 70% of the overall tract remains undisturbed and wooded.

E. ENERGY CONSERVATION

The proposed development on the subject property includes four (4) single family residential homes. Typically, newer construction uses energy efficient building materials and appliances, therefore, the energy utilization of the proposed dwellings may be less than typically expected from older homes of the same size.

F. NOISE REDUCTION TECHNIQUES

As previously stated, the proposed development is not anticipated to result in an increase in noise levels. Therefore, no noise reduction techniques are proposed.

G. CONSTRUCTION SCHEDULE

This environmental impact statement has been prepared for a proposed subdivision application (creating lots), and as such, details regarding a construction schedule are not known or available at this time. Each Development lot will provide a plot plan and architectural plans for review by the Township Engineer and Building Department. A more detailed construction schedule will accompany the Plot Plans.

H. MISCELLANEOUS PUBLIC IMPROVEMENTS

As part of the subdivision application, it is proposed to extend the public sanitary sewer system from Mount Pleasant Avenue through Ridge Road along the parcel frontage to provide sanitary sewer service to the development. Belgian block curbing is also proposed along the frontage of each proposed lot to convey stormwater and match the existing adjacent residential frontages along Ridge Road to the south.

6. ALTERNATIVES

The proposed layout provides the most practical development allowed by the current zoning while maintaining and protecting the unique features that are currently in the parcel and meeting the required stormwater management standards set forth by NJAC 7:8.

7. LICENSES, PERMITS AND OTHER APPROVALS

- A. Essex County Planning Board
- B. Hudson Essex Passaic Soil Conservation District
- C. New Jersey Department of Environmental Protection (NJDEP) – Treatment Works Approval (TWA)
- D. New Jersey American Water (NJAW) – Water Service
- E. Joint Meeting of Essex & Union Sewerage Authority – Sewer Service
- F. Public Service Electric & Gas Company (PSE&G) – Electric & Gas Service

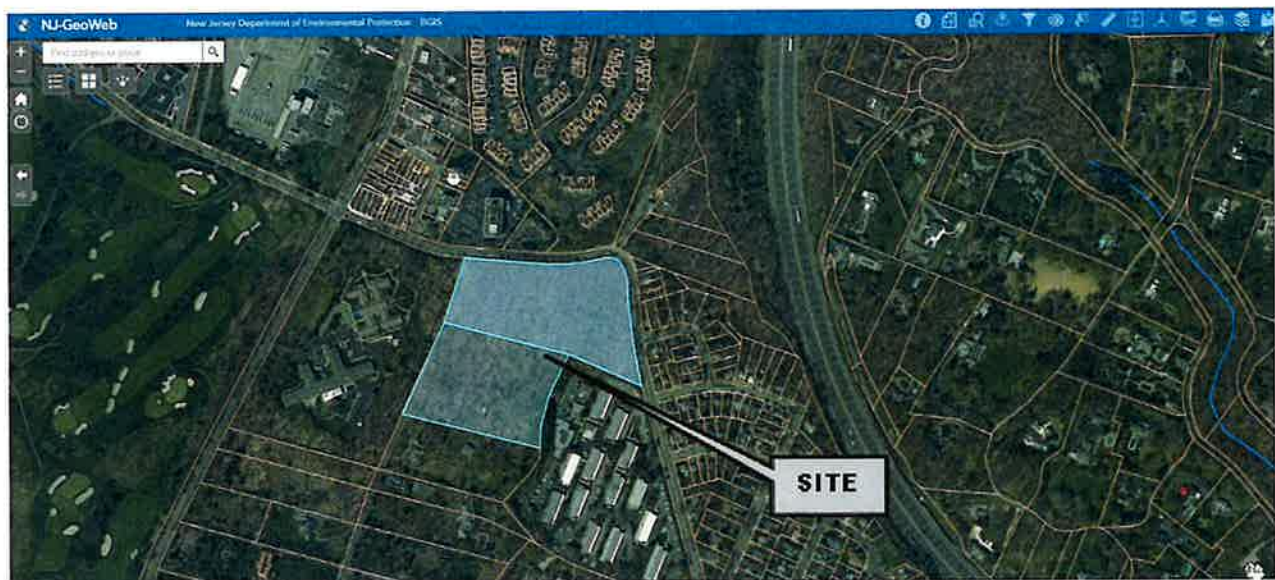
8. DOCUMENTATION

Documentation is provided within the Appendix of this report.

APPENDIX

AERIAL PHOTO MAP

Aerial Photo Map



1904 Main Street, Lake Como, NJ 07719 T. 732-974-0198

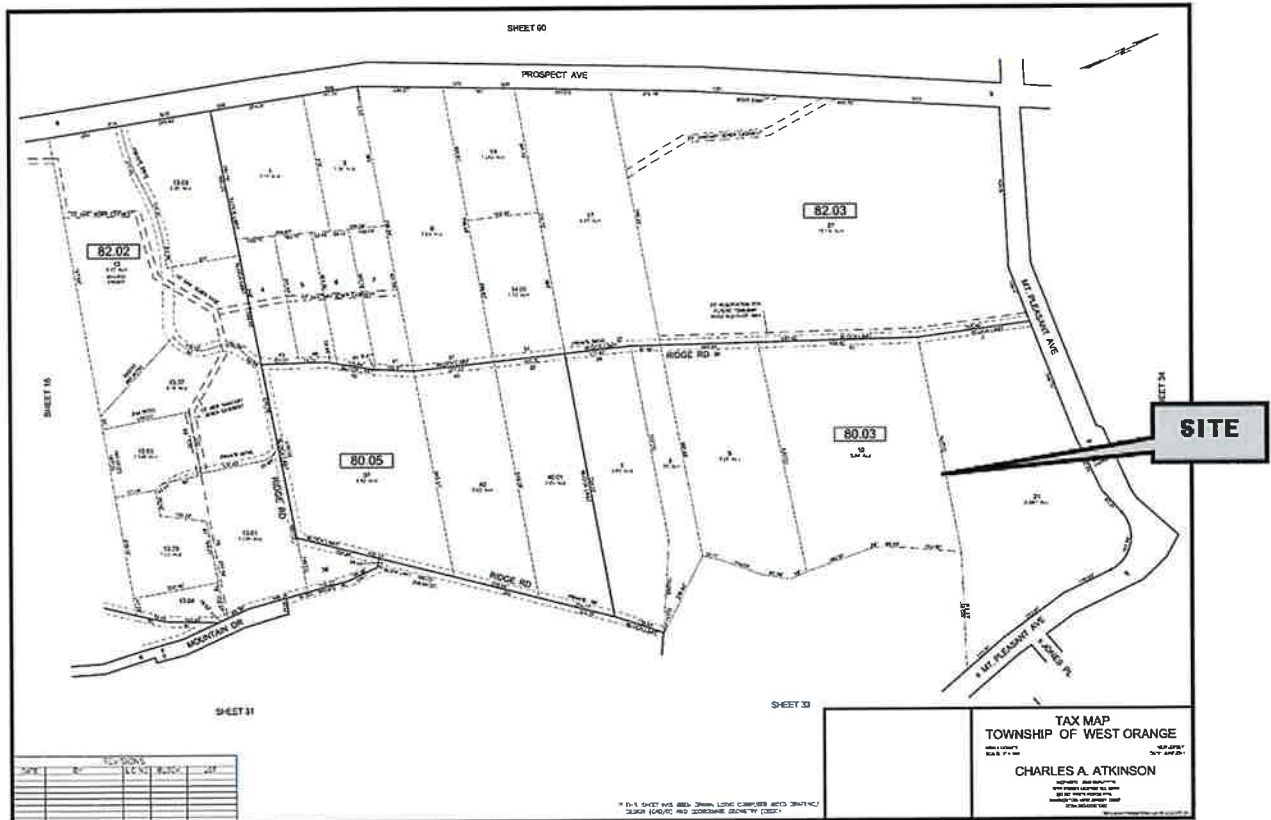
245 Main Street, Suite 110, Chester, NJ 07930 T. 908-879-9229
8 Robbins Street, Suite 102, Toms River, NJ 08753 T. 732-974-0198
826 Newtown Yardley Rd., Suite 201, Newtown, PA 18940 T. 267-685-0276

100 NE 5th Avenue, Suite B2, Delray Beach, FL 33483 T. 561-291-8570
14521 Old Katy Road, Suite 270, Houston, TX 77079 T. 281-789-6400
714 S. Greenville Avenue, Suite 100, Allen, TX 75002 T. 972-534-2100

TOWNSHIP OF WEST ORANGE TAX MAP

Township of West Orange Tax Map

32



32

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NJDEP GEOWEB STATE PLANNING AREA MAP

NJDEP GeoWeb State Planning Area Map



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NJDEP GEOWEB HISTORIC PROPERTIES MAP

NJDEP GeoWeb Historical Properties Map



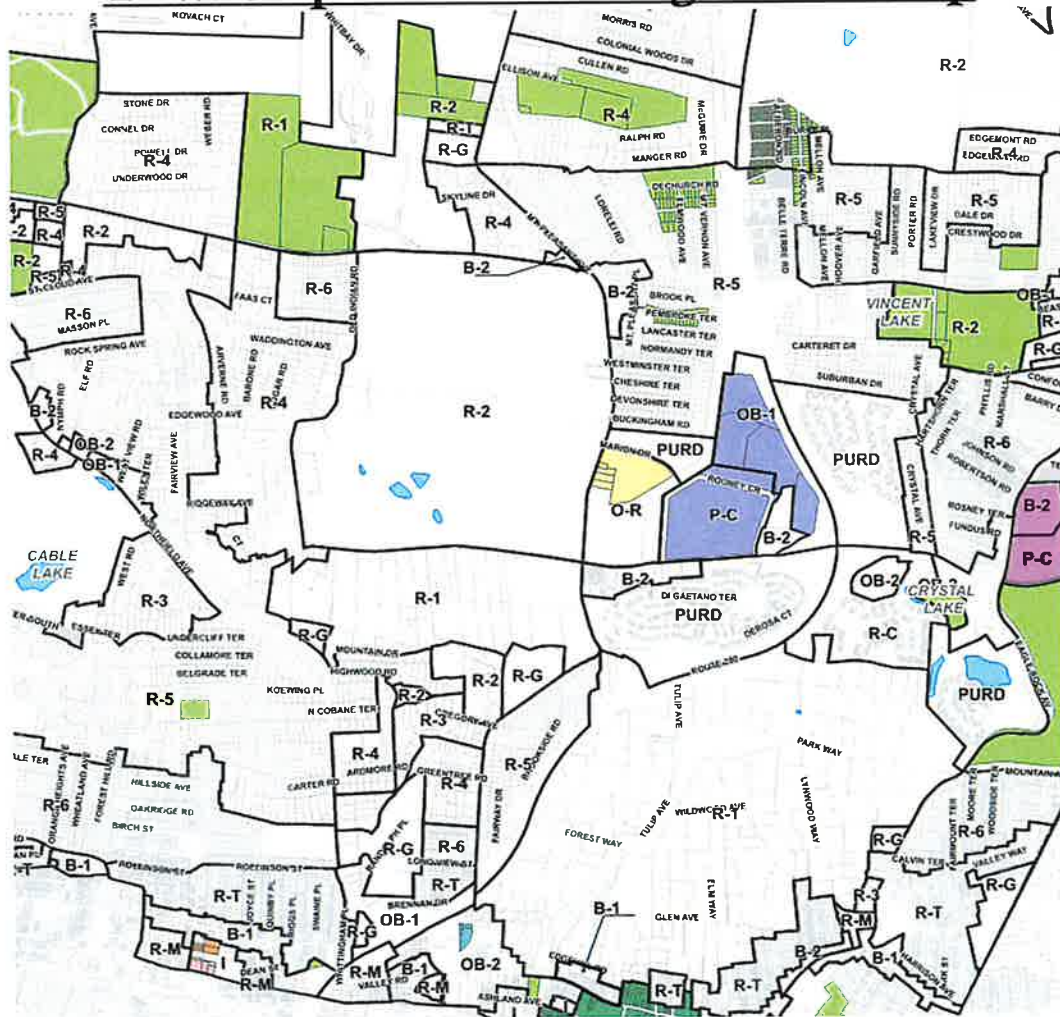
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TOWNSHIP OF WEST ORANGE ZONING MAP

Township of West Orange Zone Map



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AIR QUALITY MONITORING REPORT

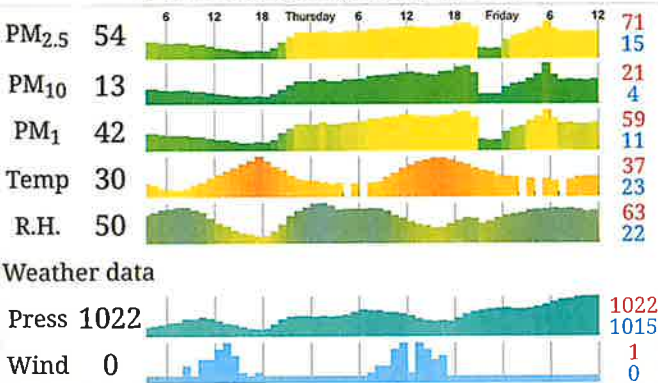
Crown View Villas, West Orange, United States of America, West Orange, United States of America Air PollutionUS

Real-time Air Quality Index (AQI)

54 😊 Moderate

trend ↗

updated 4 minutes ago (Friday 12:10 PM)



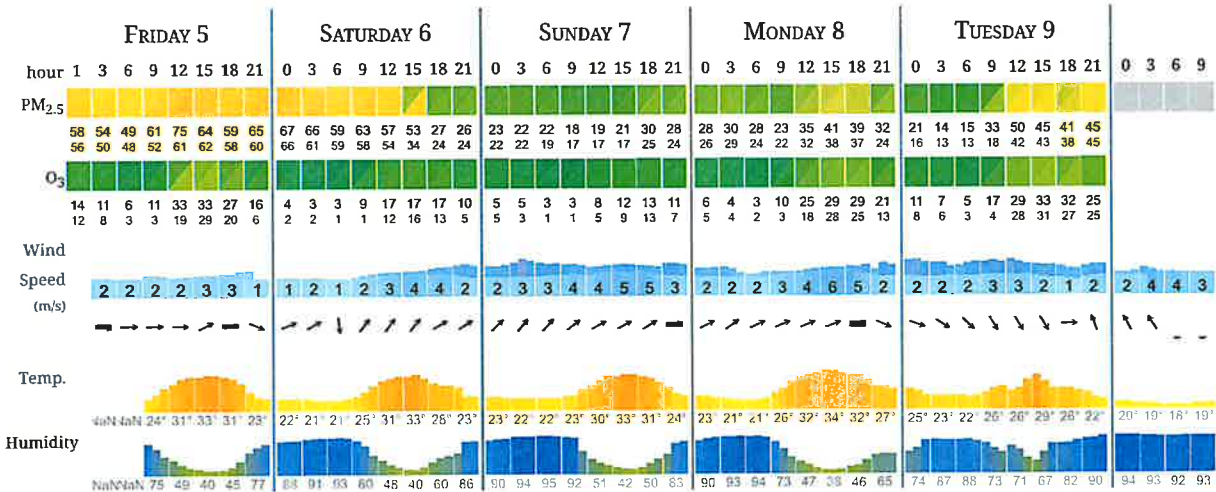
Located 1022, Smith Manor Boulevard, West Orange, Essex County, New Jersey, 07052, USA.

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Share: "How polluted is the air today? Check out the real-time air pollution map, for more than 100 countries." - <https://aqicn.org/here/>

Like 7.5KShareTweetShare 11.7K

Air Quality Forecast



Forecast timezone: America/New_York

NRCS WEB SOIL SURVEY



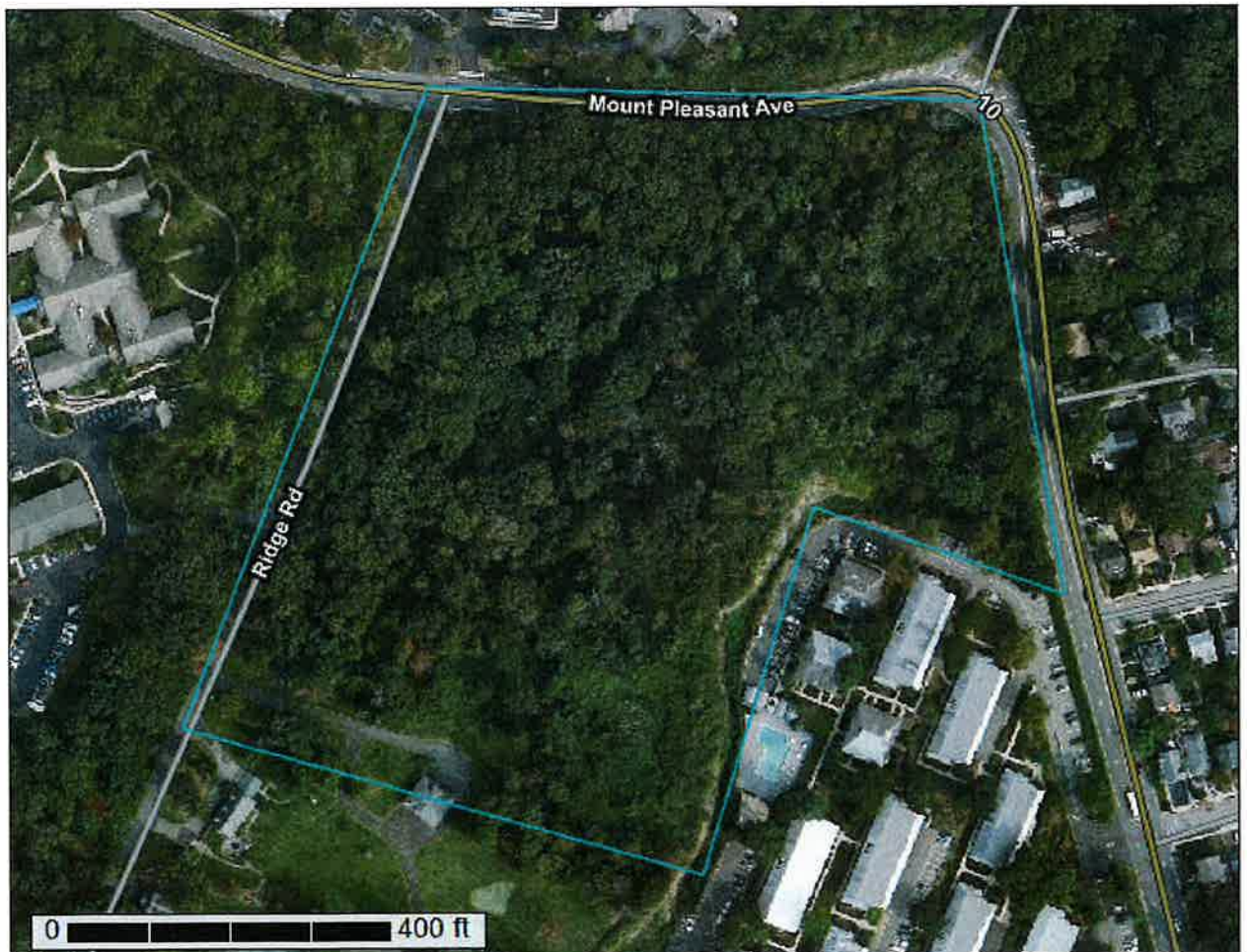
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

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

Custom Soil Resource Report for **Essex County, New Jersey**



March 29, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Essex County, New Jersey.....	13
BogCc—Boonton loam, 8 to 15 percent slopes, extremely stony.....	13
BowrB—Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes.....	14
HanBc—Haledon silt loam, 0 to 8 percent slopes, extremely stony.....	16
USBONB—Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes.....	17
YaobBc—Yalesville - Boonton - Holyoke complex, 0 to 8 percent slopes, extremely stony.....	19
YaohEh—Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky.....	21
Soil Information for All Uses	24
Soil Properties and Qualities.....	24
Soil Qualities and Features.....	24
Hydrologic Soil Group.....	24
References	29

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

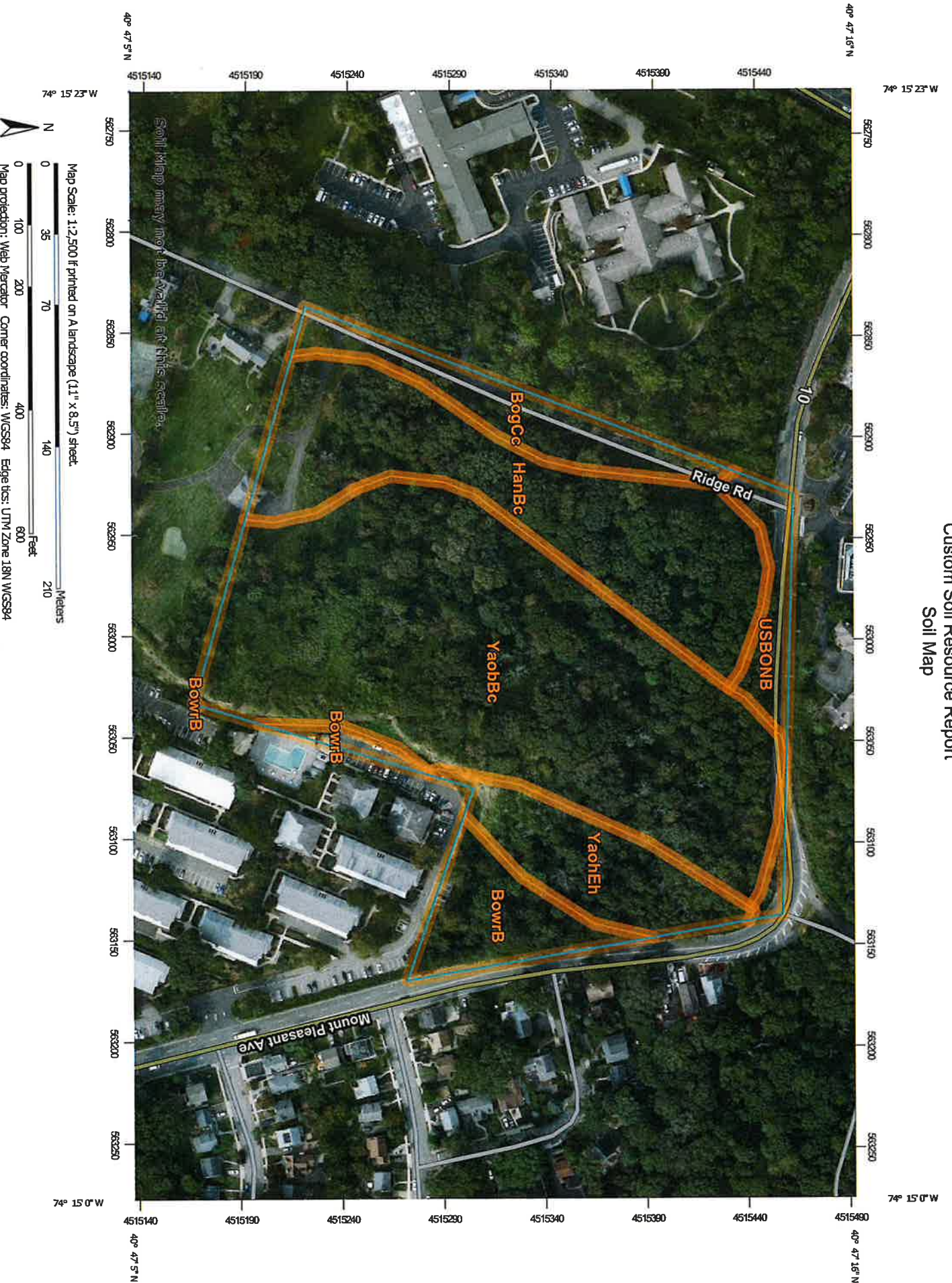
Custom Soil Resource Report

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 LEGEND

	Area of Interest (AOI)		Spoil Area
	Area of Interest (AOI)		Stony Spot
Soils			Very Stony Spot
	Soil Map Unit Polygons		Wet Spot
	Soil Map Unit Lines		Other
	Soil Map Unit Points		Special Line Features
Special Point Features		Water Features	
	Blowout		Streams and Canals
	Borrow Pit	Transportation	
	Clay Spot		Rails
	Closed Depression		Interstate Highways
	Gravel Pit		US Routes
	Gravelly Spot		Major Roads
	Landfill		Local Roads
	Lava Flow		Aerial Photography
	Marsh or swamp	Background	
	Mine or Quarry		
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: Essex County, New Jersey
Survey Area Data: Version 17, Aug 30, 2021

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

Date(s) aerial images were photographed: May 9, 2020—Oct 15, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BogCc	Boonton loam, 8 to 15 percent slopes, extremely stony	1.1	6.9%
BowrB	Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes	1.1	7.0%
HanBc	Haledon silt loam, 0 to 8 percent slopes, extremely stony	3.7	23.8%
USBONB	Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes	0.7	4.3%
YaobBc	Yalesville - Boonton - Holyoke complex, 0 to 8 percent slopes, extremely stony	7.8	49.6%
YaohEh	Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky	1.3	8.4%
Totals for Area of Interest		15.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the

scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Essex County, New Jersey

BogCc—Boonton loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: b120
Elevation: 50 to 500 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Boonton, Extremely Stony

Setting

Landform: Ground moraines
Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oa - 1 to 3 inches: highly decomposed plant material
A - 3 to 5 inches: loam
BA - 5 to 8 inches: silt loam
BE - 8 to 17 inches: silt loam
Bt - 17 to 30 inches: silt loam
Btx1 - 30 to 40 inches: gravelly fine sandy loam
Btx2 - 40 to 47 inches: fine sandy loam
CBt1 - 47 to 58 inches: loamy sand
CBt2 - 58 to 72 inches: loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

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Hydrologic Soil Group: C

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Boonton, moderately well drained, extremely stony

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Head slope, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Haledon, extremely stony

Percent of map unit: 5 percent

Landform: Ground moraines

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Head slope, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

BowrB—Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w8p8

Elevation: 20 to 560 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 178 days

Farmland classification: Not prime farmland

Map Unit Composition

Boonton, red sandstone lowland, and similar soils: 50 percent

Urban land, boonton red sandstone lowland substratum: 40 percent

Minor components: 10 percent

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

Description of Boonton, Red Sandstone Lowland

Setting

Landform: Ground moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy till derived from sandstone and shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

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A - 1 to 3 inches: silt loam
BE - 3 to 10 inches: loam
Bw - 10 to 27 inches: gravelly loam
Bx1 - 27 to 40 inches: gravelly fine sandy loam
Bx2 - 40 to 67 inches: gravelly fine sandy loam
BCx - 67 to 83 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

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

Description of Urban Land, Boonton Red Sandstone Lowland Substratum

Setting

Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material
H2 - 12 to 67 inches: gravelly loam
2CB - 67 to 83 inches: gravelly sandy loam

Interpretive groups

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

Minor Components

Udorthents, boonton red sandstone lowland substratum

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

HanBc—Haledon silt loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: b12k
Elevation: 50 to 500 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Haledon, Extremely Stony

Setting

Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy basal till derived from basalt

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
Ap - 2 to 8 inches: silt loam
Bt - 8 to 15 inches: silt loam
Btg - 15 to 22 inches: silt loam
2Bt1 - 22 to 27 inches: loam
2Bt2 - 27 to 30 inches: loam
BCtx - 30 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 24 to 36 inches to fragipan
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 7 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C

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Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Boonton, moderately well drained, extremely stony

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Linear

Hydric soil rating: No

Hasbrouck, extremely stony

Percent of map unit: 5 percent

Landform: Depressions

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

USBONB—Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w9c1

Elevation: 0 to 520 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 213 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land, boonton substratum: 60 percent

Boonton and similar soils: 30 percent

Minor components: 10 percent

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

Description of Urban Land, Boonton Substratum

Setting

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Asphalt over supraglacial meltout till

Typical profile

M - 0 to 12 inches: material

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2^AC - 12 to 47 inches: gravelly sandy loam
3CBt1 - 47 to 58 inches: loamy sand
3CBt2 - 58 to 72 inches: loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

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

Description of Boonton

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Red coarse-loamy till derived from sedimentary rock

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: loam
Bt - 4 to 28 inches: sandy loam
Btx - 28 to 51 inches: sandy loam
BC - 51 to 72 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to fragipan
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: About 28 to 59 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

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

Minor Components

Udorthents, boonton substratum

Percent of map unit: 10 percent

Landform: Ground moraines

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Lower third of mountainflank, upper third of mountainflank, center third of mountainflank

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

YaobBc—Yalesville - Boonton - Holyoke complex, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: w9dx

Elevation: 50 to 690 feet

Mean annual precipitation: 30 to 64 inches

Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 178 days

Farmland classification: Not prime farmland

Map Unit Composition

Yalesville, extremely stony, and similar soils: 40 percent

Boonton, extremely stony, and similar soils: 35 percent

Holyoke, extremely stony, and similar soils: 25 percent

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

Description of Yalesville, Extremely Stony

Setting

Landform: Ground moraines

Landform position (three-dimensional): Mountaintop

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy till derived from basalt

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material

A - 1 to 5 inches: loam

Bw1 - 5 to 19 inches: fine sandy loam

Bw2 - 19 to 31 inches: fine sandy loam

BC - 31 to 32 inches: fine sandy loam

R - 32 to 80 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

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Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 20 to 39 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
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
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Boonton, Extremely Stony

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oa - 1 to 3 inches: highly decomposed plant material
A - 3 to 5 inches: loam
BA - 5 to 8 inches: gravelly loam
BE - 8 to 17 inches: silt loam
Bt - 17 to 30 inches: silt loam
Btx1 - 30 to 40 inches: gravelly fine sandy loam
Btx2 - 40 to 47 inches: fine sandy loam
CBt1 - 47 to 58 inches: loamy sand
CBt2 - 58 to 72 inches: loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Custom Soil Resource Report

Hydrologic Soil Group: C

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Description of Holyoke, Extremely Stony

Setting

Landform: Ground moraines, hills, ridges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Mountaintop

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Loamy till derived from basalt

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

Oa - 1 to 3 inches: highly decomposed plant material

A - 3 to 5 inches: loam

Bw1 - 5 to 14 inches: loam

Bw2 - 14 to 18 inches: loam

R - 18 to 80 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 10.0 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

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

Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: F145XY011CT - Well Drained Shallow Till Uplands

Hydric soil rating: No

YaohEh—Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky

Map Unit Setting

National map unit symbol: w9g0

Elevation: 50 to 660 feet

Mean annual precipitation: 30 to 64 inches

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Mean annual air temperature: 46 to 79 degrees F

Frost-free period: 131 to 178 days

Farmland classification: Not prime farmland

Map Unit Composition

Yalesville, very rocky, and similar soils: 50 percent

Holyoke, very rocky, and similar soils: 30 percent

Minor components: 20 percent

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

Description of Yalesville, Very Rocky

Setting

Landform: Ground moraines

Landform position (three-dimensional): Mountaintop

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy till derived from basalt

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material

A - 1 to 5 inches: loam

Bw1 - 5 to 19 inches: fine sandy loam

Bw2 - 19 to 31 inches: fine sandy loam

BC - 31 to 32 inches: fine sandy loam

R - 32 to 80 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent

Surface area covered with cobbles, stones or boulders: 10.0 percent

Depth to restrictive feature: 20 to 39 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

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

Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Ecological site: F145XY013CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Holyoke, Very Rocky

Setting

Landform: Ground moraines, hills, ridges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Mountaintop

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Loamy till derived from basalt

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Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oa - 1 to 3 inches: highly decomposed plant material
A - 3 to 5 inches: loam
Bw1 - 5 to 14 inches: loam
Bw2 - 14 to 18 inches: loam
R - 18 to 80 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
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
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: Unranked

Boonton, very rocky

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Upper third of mountainflank, center third of mountainflank
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

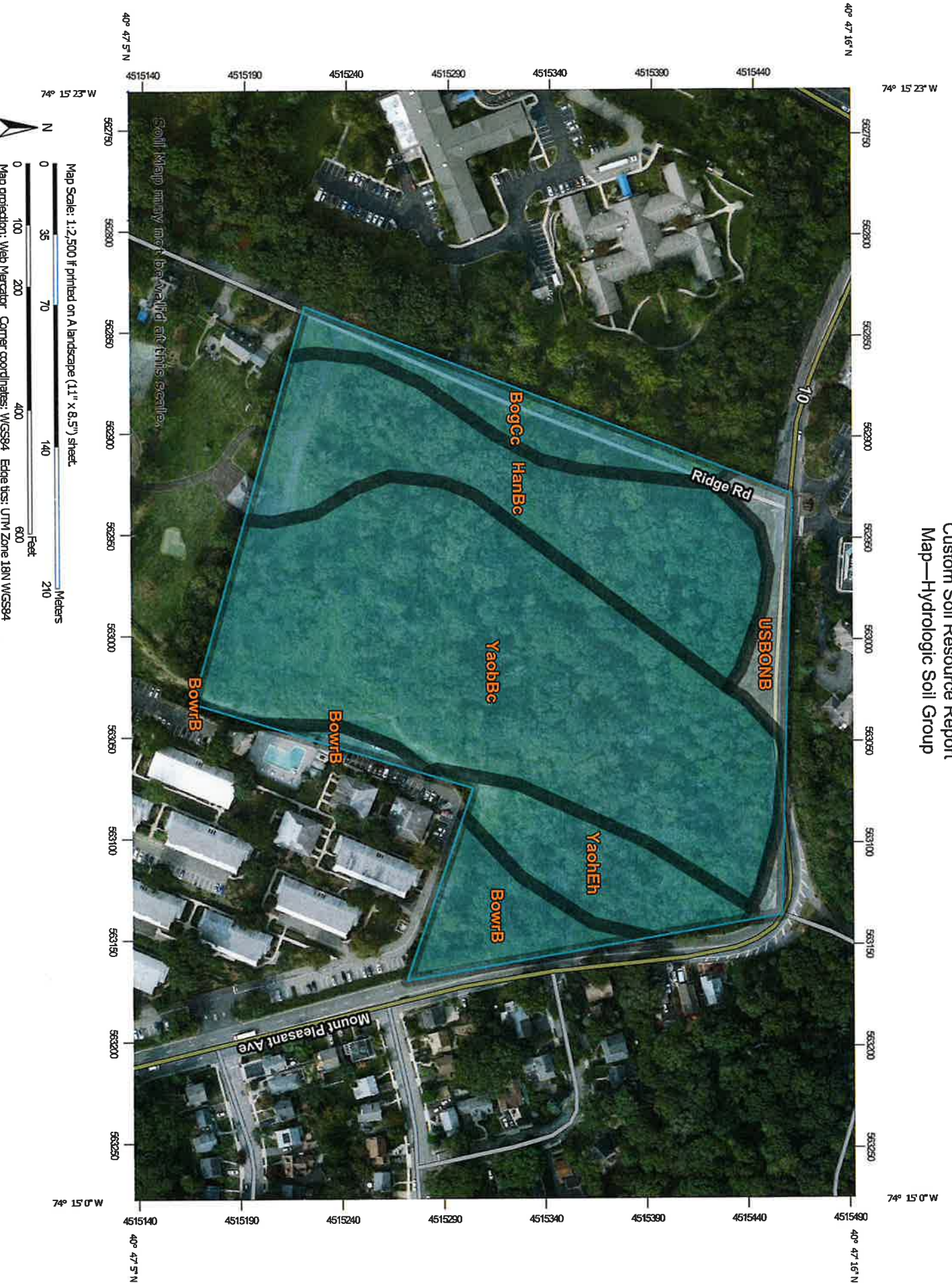
Custom Soil Resource Report

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

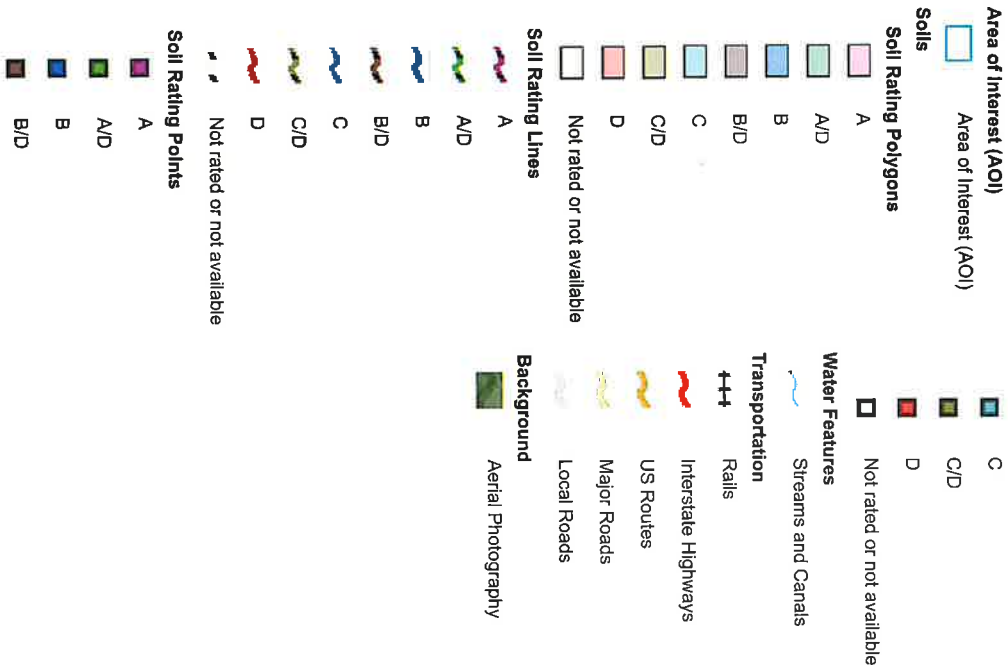
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report Map—Hydrologic Soil Group



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: Essex County, New Jersey
Survey Area Data: Version 17, Aug 30, 2021

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

Date(s) aerial images were photographed: May 9, 2020—Oct 15, 2020

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BogCc	Boonton loam, 8 to 15 percent slopes, extremely stony	C	1.1	6.9%
BowrB	Boonton - Urban land, Boonton substratum complex, red sandstone lowland, 0 to 8 percent slopes	C	1.1	7.0%
HanBc	Haledon silt loam, 0 to 8 percent slopes, extremely stony	C	3.7	23.8%
USBONB	Urban land, Boonton substratum - Boonton complex, 0 to 8 percent slopes		0.7	4.3%
YaobBc	Yalesville - Boonton - Holyoke complex, 0 to 8 percent slopes, extremely stony	C	7.8	49.6%
YaohEh	Yalesville - Holyoke complex, 35 to 60 percent slopes, very rocky	C	1.3	8.4%
Totals for Area of Interest			15.8	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method: Dominant Condition**Component Percent Cutoff: None Specified**Tie-break Rule: Higher*

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NJDEP GEOWEB STREAMS AND WATER BODIES MAP

NJDEP GeoWeb Streams and Water Bodies Map



1904 Main Street, Lake Como, NJ 07719 T. 732-974-0198

245 Main Street, Suite 110, Chester, NJ 07930 T. 908-879-9229
8 Robbins Street, Suite 102, Toms River, NJ 08753 T. 732-974-0198
826 Newtown Yardley Rd., Suite 201, Newtown, PA 18940 T. 267-685-0276

100 NE 5th Avenue, Suite B2, Delray Beach, FL 33483 T. 561-291-8570
14521 Old Katy Road, Suite 270, Houston, TX 77079 T. 281-789-6400
714 S. Greenville Avenue, Suite 100, Allen, TX 75002 T. 972-534-2100

NJDEP GEOWEB BEDROCK GEOLOGY MAP

[illegible]

100 NE 5th Avenue, Suite B2, Delray Beach, FL 33483 T. 561-291-8570
14521 Old Katy Road, Suite 270, Houston, TX 77079 T. 281-789-6400
714 S. Greenville Avenue, Suite 100, Allen, TX 75002 T. 972-534-2100

**STORMWATER MANAGEMENT, GROUNDWATER
RECHARGE AND WATER QUALITY ANALYSIS (DYNAMIC
ENGINEERING CONSULTANTS, PC) (INCLUDED
SEPARATELY)**

**ALTA/NSPS LAND TITLE SURVEY (DYNAMIC SURVEY, LLC)
(INCLUDED SEPARATELY)**

**TRAFFIC IMPACT STUDY (DYNAMIC TRAFFIC, LLC)
(INCLUDED SEPARATELY)**

**REPORT OF PRELIMINARY GEOTECHNICAL AND
STORMWATER BASIN AREA INVESTIGATION (DYNAMIC
EARTH, LLC) (INCLUDED SEPARATELY)**

(§25-13) ENVIRONMENTAL IMPACT ANALYSIS

General Provisions.

[Ord. No. 2357-12 § 25-13.1]

The environmental impact generated by a land development project necessitates a comprehensive analysis of the variety of problems that may result and the actions that can be taken to minimize those problems. This constitutes an environmental impact statement. In evaluating the environmental impact, the Planning Board and the Zoning Board shall not approve any submission until it determines and finds that the proposed development:

- a. Will not result in appreciable harmful effects to the environment.
- b. Has been designed and conceived with a view toward the protection of the regional resources.
- c. Will not place a disproportionate or excessive demand upon the total resources available for such proposal and for any future proposals.

In order to accomplish these goals, the Board shall condition any approval upon the implementation of those performance controls deemed necessary to assure the protection of the environment. Any approval shall also be conditioned upon the receipt of licenses, permits or other approvals required by law. Those factors outlined in Subsection 25-13.4e along with supplemental requirements adopted by the Board shall be used to determine the environmental performance controls that are necessary.

§ 25-13.2 General Requirements.

[Ord. No. 2357-12 § 25-13.2]

It is further recognized that the level of detail required for various types of applications will vary depending on the size of the proposal, the nature of the site and the location of the project. Therefore, having determined that some flexibility is needed in preparing the environmental impact statement, the requirements for such a document are listed as follows:

- a. Any application for a single one-family or two-family home, whether a new dwelling or a modification to an existing dwelling, is specifically exempt from the environmental impact statement requirements. In addition, all minor subdivisions and site plans that will not result in potential new construction or alteration to the site shall be exempt.
- b. A preapplication conference shall be held with the Planning Director to determine the content of the environmental impact statement as outlined in Subsection 25-13.4 along with any supplemental guidelines adopted by the Board. Waivers of specific environmental impact statement requirements or of preparation of an environmental impact statement shall be appealed to the Board.
- c. When the environmental impact statement is prepared by an individual other than the applicant, the credentials and expertise of that individual shall be submitted with the environmental impact statement. All applicable material on file in the office of the West Orange Department of Planning and Development pertinent to local conditions shall be consulted. Any additional material pertinent to the evaluation of potential regional impacts shall also be considered.
- d. Twenty copies of each environmental impact statement shall be submitted with the appropriate development application. One copy of the environmental impact statement shall be forwarded to the Environmental Commission for review and comment. The Environmental Commission shall submit its comments expeditiously to the Board. Four copies of the environmental impact statement shall be circulated among the municipal departments that participate in the application review process. The remaining copies shall be retained by the Department of Planning and Development and the Planning Board members or Zoning Board members, and shall be made available for review and comment.
- e. The environmental impact statement shall consist of written and graphic materials which will clearly present the information that is required. The scale of all maps shall be one inch equals 50 feet, unless the Planning Director and/or Board agree to another scale. Contours, when required, shall be provided at two-foot intervals for slopes of less than 10% and at five-foot intervals for slopes 10% or greater.

Applicability. § 25-13.3

[Ord. No. 2357-12 § 25-13.3]

- a. All proposals for development shall obtain all required approvals and permits pertaining to environmental protection from the Township of West Orange, County of Essex, State of New Jersey and other entities, including, but not limited to, regulations for air quality, floodplains, natural features and habitats, soil conservation and protection, steep slopes, stormwater, stream corridors, sewage, and wetlands, and address all applicable environmental requirements of the development application procedures in § 24-51 and the application checklists.
- b. All preliminary and final major subdivision applications and preliminary and final site plan applications, consisting of five acres or more, shall be accompanied by an environmental impact statement. The information required shall be determined by the Planning Board or Zoning Board in consultation with the Planning Director.
- c. Any application requiring a variance pursuant to N.J.S.A. 40:55D-70d may be required, at the discretion of the Zoning Board, to be accompanied by an environmental impact statement. The information required shall be determined by the Zoning Board in consultation with the Planning Director.

§ 25-13.4 Format.

[Ord. No. 2357-12 § 25-13.4]

When an environmental impact statement is required, the following format shall be utilized and the information requested shall be provided.

- a. Project Description. Indicate the purpose and scope of the proposed project. Enumerate the benefits to the public which will result from the proposed project and describe the suitability of the site for the intended use.

A description of the proposed project shall be presented to indicate the extent to which the site must be altered, the kinds of facilities to be constructed, how they are to be considered and the uses intended. The resident population, working population and visitor population shall be estimated. The compatibility or incompatibility of the proposed project shall be described in relation to the following:

1. Township Master Plan
2. Master Plan of any adjacent municipality located within 500 feet of the proposed project.
3. Essex County Master Plan.
- b. Site Description and Inventory. Provide a description of environmental conditions on the site which shall include, but not be limited to the following items:
 1. Types of Soils. List and description of each soil type located on the site. Relative to the type of project proposed, a complete mapping of all soil types on the site shall be required indicating where those moderate and severe limitations exist.
 2. Topography. Description of the topographic conditions within the site and extending 200 feet beyond the property lines. When 15% or more of the proposed area of land disturbance encompasses slopes in excess of 10%, the following slope ranges shall be mapped for the entire site: 10% to 15%; 15% to 20%; 20% and up.
 3. Geology. Description of the geologic formations and features associated with the site as well as depth to bedrock conditions. Delineation of those areas where bedrock is in close proximity to the surface, within two feet of the surface as well as major bedrock outcroppings.
 4. Vegetation. Description of the existing vegetation on the site. When required, sketch the location of major vegetation grouping such as woodland, open field and wetland.
 5. Surface Water. Description of existing watercourses and water bodies that are partially or totally on the site and their relationship to the area of land disturbance. Existing surface runoff from the site shall be calculated using methods approved by the Township Engineer. When the natural drainage pattern will be significantly altered, an analysis shall be conducted which will investigate flow, depth, capacity and water quality of receiving

waters. When required, floodplain areas shall be mapped in consultation with the New Jersey Department of Environmental Protection. Existing drainage structures shall be mapped and the capacity of the drainage network shall be determined.

6. Subsurface Water. Description of the subsurface water conditions on the site, in terms of depth to ground water shall be provided.

7. Unique, Scenic and/or Historic Features. Description and a map of those portions of the site that can be considered to have unique, scenic and/or historic qualities.

8. Existing Development Features. Description of any existing features on the site that are not considered to be part of the natural environment. This may include, but not necessarily be limited to, roads, housing units, accessory structures, and utility lines.

9. Miscellaneous. When warranted, an analysis shall be conducted of existing air quality and noise levels as prescribed by the New Jersey Department of Environmental Protection or the West Orange Health Department.

c. Area and Regional Description. A description of the surrounding environs shall be provided as well as the existing land use pattern. When required, the existing infrastructure, with respect to the drainage and transportation network, as well as any central sewerage and water supply facilities shall be described in detail. An appropriate regional analysis relative to the proposed subject shall be included.

d. Impact. Discuss the negative and the positive on- and off-site impacts as they affect the items listed in Subsections b and c above. Indicate those negative impacts that are unavoidable. Indicate those resources affected by the proposal which will be irretrievably lost and those resources which are renewable. The specific concerns that shall be considered include, but are not limited to the following:

1. Soil erosion and sedimentation resulting from surface runoff.
2. Flooding and floodplain disruption.
3. Degradation of surface water quality.
4. Groundwater pollution.
5. Sewage disposal.
6. Solid waste disposal.
7. Destruction of vegetation.
8. Disruption of wildlife habitats.
9. Destruction of scenic and historic features.
10. Air quality degradation.
11. Noise levels.
12. Energy utilization.
13. Neighborhood deterioration.
14. Effect on public services, such as schools, fire police.
15. Traffic congestion.
16. Health, safety and welfare of existing residents.
17. Regional development policies.

e. Recommendation to Mitigate Adverse Environmental Impact. Describe in detail what measures will be employed during the planning, construction and operation phases which will minimize or eliminate negative impacts on and off-site that could result from the proposed project. Of specific interest are:

1. Drainage plans which shall include, but not be limited to, soil erosion and sedimentation controls. Every effort should be made to limit off-site runoff to predevelopment levels.
2. Sewage disposal techniques.
3. Water supply and water conservation proposals.
4. Site design techniques sensitive to the natural environment which should include innovative landscape, building and circulation design.
5. Energy conservation measures.
6. Noise reduction techniques.

7. Construction schedule.

8. Miscellaneous on-site and off-site public improvements.

f. Alternatives. Discuss what alternatives were considered both in terms of site design and project location. Indicate why an alternative was rejected if it would have resulted in less of a negative impact than the subject proposal.

g. Licenses, Permits and Other Approvals Required by Law. The applicant shall list all known licenses, permits and other forms of approval required by law for the construction and operation of the proposed project. This list shall include, but will not be limited to approval required by the Township, as well as agencies of the County, State and Federal governments. Where approvals have been granted, copies of such approvals shall be attached. Where approvals are pending, a note shall be made to that effect.

h. Documentation. All publications, file reports, manuscripts or other written sources of information related to the project, the project site and the Township which were consulted and employed in compilation of the environmental impact statement shall be listed.