PRELIMINARY INVESTIGATION

Block 32, Lot 4

Block 33, Lots 2, 2.03, 2.01, 14, 3, and 3.01

Harrison Township, NJ

June 5, 2019 **DRAFT**

report prepared by,

Pennoni

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1.0 INTRODUCTION

1.1 Introduction

Harrison Township, through Resolution No. 113 - 2019 (Appendix A), adopted May 20, 2019, requested that Pennoni perform a Preliminary Investigation into the following parcels to ascertain whether the specified area qualifies under N.J.S.A. 40A:12A-5 as a non-condemnation "Area in Need of Redevelopment":

- Block 32, Lot 4
- Block 33, Lots 2, 2.03, 2.01, 3, 3.01, and 14.

Figure 1 identifies the location and surrounding environs of the Investigation Parcels.

Figure 2 identifies the address and owner of the Investigation Parcels.

1.2 Summary of Findings

This study finds that the study area meets the statutory criterion for designation as an Area in Need of Redevelopment. It qualifies under Criterion D because of clear evidence that the area was used as an orchard during the time at which there was heavy use of pesticides, particularly lead arsenate, and that such pesticides are known to remain in the soil for substantial periods of time and have deleterious impact on human health. The subject site also qualifies under Criterion C because the nature of the soil, as reported by the United States Department of Agriculture - Natural Resources Conservation Service, will limit the potential for development of residential or commercial uses on the site. As a result, it is unlikely that the site will redevelopment through the instrument of private capital.

1.3 Non-Condemnation

Pursuant to the 2013 amendments to the Local Redevelopment and Housing Law, N.J.S.A. 40A:12A-1, et seq., the Legislature requires that Preliminary Investigations state whether the redevelopment area determination shall authorize the municipality to use all those powers provided by the Legislature for use in a redevelopment area, including or excluding the power of eminent domain.

Both Resolution Nos. 190-2017 and 102-208 have authorized a preliminary investigation to determine whether the study area qualifies as a "Non-condemnation Redevelopment Area," such that the municipality may use all those powers provided by the Legislature for use in a redevelopment area, other than the use of eminent domain.

Figure 1. Location of Redevelopment Site

Source: NJ Division of Taxation - MOD-IV

Figure 2. Ownership Information

Block	Lot	Owner Name	Address	City & State
32	4	Damminger, Rudolph O Jr & Oscar E	810 Jackson Rd	Mullica Hill, Nj
33	2	Damminger, Rudolph O & Joanne	810 Jackson Rd	Mullica Hill, Nj
33	3.01	Gedaka, Kenneth & Lisa	130 Bishop Rd	Mullica Hill, Nj
33	3	Bartel, Sarah K	128 Bishop Rd	Mullica Hill, Nj
33	2.03			
33	14	Shelmire, J Olin & Elaine	374 Mullica Hill Rd	Mullica Hill, Nj
33	2.01	Hoagland, Richard S	222 Williamson Ln	Richwood, Nj

Source: NJ Division of Taxation - MOD-IV

2.0 REDEVELOPMENT PLANNING IN NEW JERSEY

2.1. Purpose of the Act

New Jersey's Local Redevelopment and Housing Law (LRHL or Redevelopment Law), empowers municipalities and local governments with the ability to initiate a process that transforms qualified underutilized or poorly designed properties into healthier, more vibrant, or economically productive land areas. The process has been used successfully across New Jersey to creatively improve properties meeting statutory redevelopment criteria. In addition to providing greater flexibility in the development process, projects approved for redevelopment are often also eligible for certain types of technical and financial assistance from the State.

2.2. Redevelopment Procedure

The LRHL requires municipalities to perform a number of steps before it may exercise its Redevelopment powers. This process is meant, in part, to ensure that the Governing Body acts in concert with the goals and objectives of the Township's Master Plan. Recognizing the Planning Board's role as the steward of the Master Plan, these steps require the Planning Board to make certain findings and recommendations to the governing body of the municipality. The required steps are as follows:

The Governing Body must adopt a resolution directing the Planning Board to perform a preliminary investigation to determine whether a specified area, in whole or part, meets the requirements for designation as an area in need of redevelopment according to criteria set forth in the LRHL (N.J.S.A. 40A:12A-5). Here, the Township authorized such an investigation pursuant to the adoption of Resolution Nos. 190-2017 and 102-2018

The Planning Board must prepare and make available to the public a map showing the boundaries of the proposed redevelopment area, and the location of the various parcels of property included therein. The map shall be accompanied by a statement setting forth the basis of the investigation.

The Planning Board must then conduct the investigation and produce a report presenting the findings. The Board must also hold a duly noticed hearing to present the results of the investigation and to hear persons who are interested in or would be affected by a determination that the delineated area is a redevelopment area. After completing its hearing on the matter, the Planning Board shall recommend that the delineated area, or any part thereof, be determined, or not be determined, by the municipal governing body to be a redevelopment area. The Board may adopt a resolution setting forth its findings and recommendations to the Governing Body.

The Governing Body may act on this recommendation by adopting a resolution designating the area, or any part thereof, an "Area in Need of Redevelopment". The Governing Body must make the final determination as to the Redevelopment Area boundaries. The designation shall be subject to the review and approval of the Commissioner of the Department of Community Affairs.

A Redevelopment Plan must be prepared establishing the goals, objectives, and specific actions to be taken with regard to the "Area in Need of Redevelopment."

The Governing Body may then enact the Plan by passing an ordinance adopting the Plan as an amendment to the Township's Zoning Ordinance.

Only after completion of this process is the Township able to exercise the powers granted to it under the Redevelopment Law.

2.3. Statutory Criteria

A study area qualifies as being an "Area in Need of Redevelopment" if it meets at least one of the eight statutory criteria listed in Section 40A:12A-5 of the Redevelopment Law:

A. The generality of buildings are substandard, unsafe, unsanitary, dilapidated, or obsolescent, or poses any of such characteristics, or are so lacking in light, air, or space, as to be conducive to unwholesome living or working conditions.

B. The discontinuance of the use of buildings previously used for commercial, manufacturing, or industrial purposes; the abandonment of such buildings; or the same being allowed to fall into so great a state of disrepair as to be untenable.

C. Land that is owned by the municipality, the county, a local housing authority, redevelopment agency or redevelopment entity, or unimproved vacant land that has remained so for a period of ten years prior to adoption of the resolution, and that by reason of its location, remoteness, lack of means of access to developed sections or portions of the municipality, or topography, or nature of the soil, is not likely to be developed through the instrumentality of private capital.

D. Areas with buildings or improvements which, by reason of dilapidation, obsolescence, overcrowding, faulty arrangement or design, lack of ventilation, light and sanitary facilities, excessive land coverage, deleterious land use or obsolete layout, or any combination of these or other factors, are detrimental to the safety, health, morals, or welfare of the community.

E. A growing lack or total lack of proper utilization of areas caused by the condition of the title, diverse ownership of the real properties therein or other similar conditions which impede land assemblage or discourage the undertaking of improvements, resulting in a stagnant and unproductive condition of land potentially useful and valuable for contributing to and serving the public health, safety and welfare, which condition is presumed to be having a negative social or economic impact or otherwise being detrimental to the safety, health, morals, or welfare of the surrounding area or the community in general.

F. Areas, in excess of five contiguous acres, whereon buildings or improvements have been destroyed, consumed by fire, demolished or altered by the action of storm, fire, cyclone, tornado, earthquake or other casualty in such a way that the aggregate assessed value of the area has been materially depreciated.

G. In any municipality in which an enterprise zone has been designated pursuant to the "New Jersey Urban

Enterprise Zones Act," P.L.1983, c.303 (C.52:27H-60 et seq.) the execution of the actions prescribed in that act for the adoption by the municipality and approval by the New Jersey Urban Enterprise Zone Authority of the zone development plan for the area of the enterprise zone shall be considered sufficient for the determination that the area is in need of redevelopment pursuant to sections 5 and 6 of P.L.1992, c.79 (C.40A:12A-5 and 40A:12A-6) for the purpose of granting tax exemptions within the enterprise zone district pursuant to the provisions of P.L.1991, c.431 (C.40A:20-1 et seq.) or the adoption of a tax abatement and exemption ordinance pursuant to the provisions of P.L.1991, c.441 (C.40A:21-1 et seq.). The municipality shall not utilize any other redevelopment powers within the urban enterprise zone unless the municipal governing body and planning board have also taken the actions and fulfilled the requirements prescribed in P.L.1992, c.79 (C.40A:12A-1 et al.) for determining that the area is in need of redevelopment or an area in need of rehabilitation and the municipal governing body has adopted a redevelopment plan ordinance including the area of the enterprise zone.

H. The designation of the delineated area is consistent with smart growth planning principles adopted pursuant to law or regulation.

N.J.S.A. 40A:12A-3 further states that "A redevelopment area may include lands, buildings, or improvements which of themselves are not detrimental to the public health, safety or welfare, but the inclusion of which is found necessary, with or without change in their condition, for the effective development of the area of which they are a part." This is commonly referred to as the "Section 3 Criteria."

According to the Redevelopment Handbook, this section allows for the inclusion of properties that do not meet the statutory criteria but are,"essential to be included in the designation to effectively redevelop the area." Examples of such properties include properties located within and surrounded by otherwise blighted area, property that are needed to provide access to an area to be redeveloped, areas needed for infrastructure or utilities, or properties that otherwise could be determined to be critical to the area's successful redevelopment.

3.0 STATUTORY CRITERION "D"

3.1 Statutory Language

Areas with buildings or improvements which, by reason of dilapidation, obsolescence, overcrowding, faulty arrangement or design, lack of ventilation, light and sanitary facilities, excessive land coverage, deleterious land use or obsolete layout, or any combination of these or other factors, are detrimental to the safety, health, morals, or welfare of the community.

3.2 Findings

According to a review of historical aerial photographs of the Study Parcels on Google Earth and HistoricalAerials.com showed that the study area parcels were used for agricultural production in the late 1960s and early 1970s. Of particular importance, aerials from both 1963 and 1970 (Figure 3) clearly indicates that all of the parcels were used as orchards. Conversations with local residents who were lived in the area at that time confirm this to be the case. As a result, it is likely that pesticides, herbicides, fungicides, spray oil and assorted other chemical applicants have been used in support of the agricultural activities on these parcels.

A report published in Environmental Health Perspectives[1] noted that orchards were

> routinely treated with pesticides and other chemicals during their agricultural lifetimes… These toxic by-products are left from the days before DDT and before organophosphates, when arsenical pesticides, particularly lead arsenate (LA), were the treatment of choice to prevent the ravages of insect damage.… LA and the other arsenical pesticides were designed to be persistent, and it is that persistence that is causing environmental contamination problems decades after their use ended.

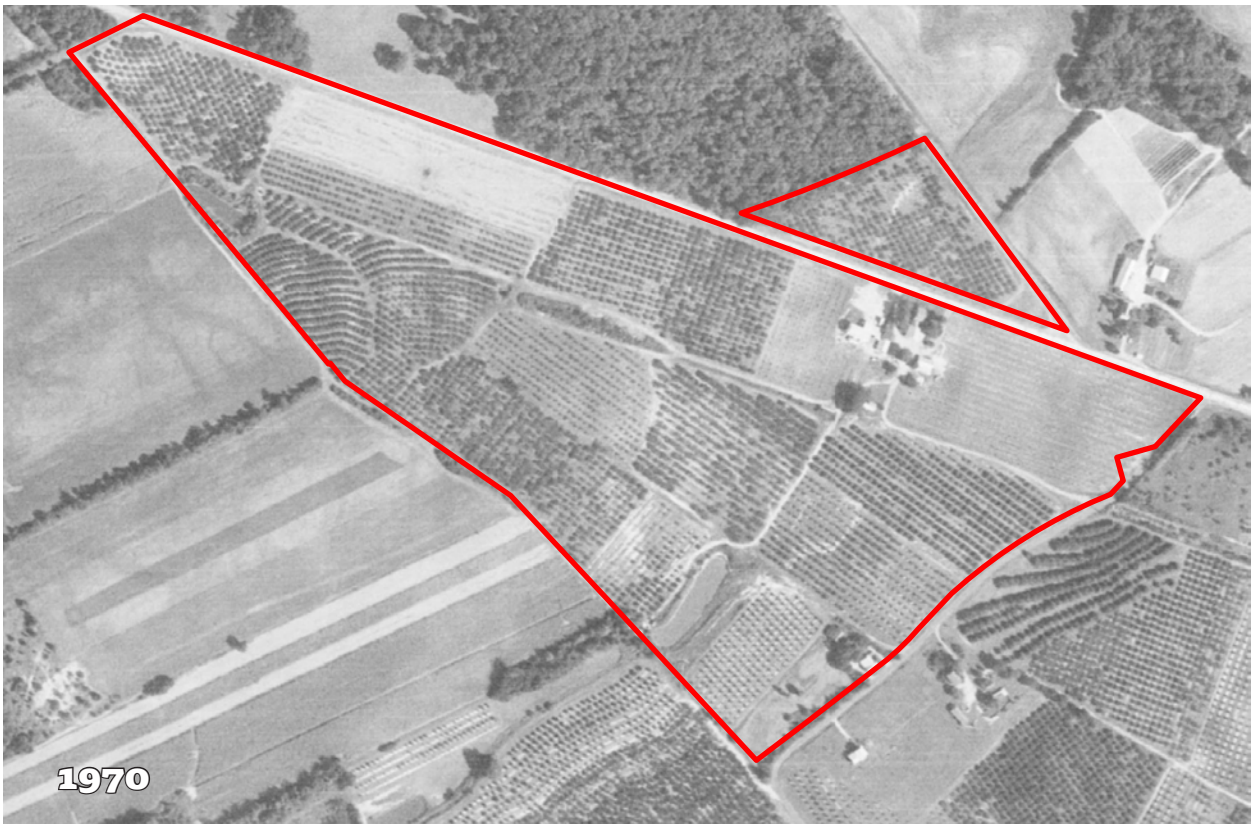
According to the US Department of Agriculture Natural Resources Conservation Service, old orchards that used insecticides containing arsenic as an active ingredient are likely to lead to excessive heavy metal accumulation in soils that are toxic to humans and other animals. Chronic problems associated with long-term Arsenic exposure include skin poisoning and such exposure has adverse affects on the kidneys and central nervous systems.[2]

That same report notes that once metals are introduced and contaminate the environment, they will remain. Metals do not degrade like carbon-based (organic) molecules. As a result, contamination that was introduced many years ago is likely to remain on site and continue to pose a threat to the health, safety, and welfare of the community unless remediated.

1 Ernie Hood, "The Apple Bites Back: Claiming Old Orchards for Residential Development"; *Environmental Health Perspectives*, 114.08 (2006) A470–A476.

2 "Heavy Metal Soil Contamination," Department of Agriculture Natural Resources Conservation Service < http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053279.pdf>

Figure 3. Historic Aerial Photography



Source: HistoricAerials.com

4.0 STATUTORY CRITERION "C"

4.1 Statutory Language

Land that is owned by the municipality, the county, a local housing authority, redevelopment agency or redevelopment entity, or unimproved vacant land that has remained so for a period of ten years prior to adoption of the resolution, and that by reason of its location, remoteness, lack of means of access to developed sections or portions of the municipality, or topography, or nature of the soil, is not likely to be developed through the instrumentality of private capital.

4.2 Findings

The Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service, is an agency of the United States Department of Agriculture that provides technical assistance to farmers and private landowners. The NRCS publishes soil surveys that include information that affects land use planning in survey areas. Specifically 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… 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.[3]

A report was generated on the study area (Appendix B). As illustrated in Figure 4, the study area contains seven different soil types. The report identifies that approximately 20% of the site experience limitations in the construction of either dwellings without basements, dwellings with basements, or small commercial buildings because of the conditions of the soil. The areas that are limited for one of these development types are identified as FmhAt, SabD, and WokA on Figure 4.

These findings indicate that there are sections of the study area which are unlikely to be developed because the nature of the soil places limitations on how they can be developed. These areas transect the study area and their inclusion would be necessary for the redevelopment of the site. As such, it is unlikely that without the aid of Redevelopment designation that these areas would be developed through the instrumentality of private capital.

3 Custom Soil Resource Report for Gloucester County, New Jersey. United States Department of Agriculture, Natural Resources Conservation Service (Include in Appendix B)

Figure 4. Soil Map and Table

Label	Name	Percent of Area
DocB	Downer loamy sand, 0 to 5 percent slopes, Northern Coastal Plain	9.60%
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	2.30%
SabC	Sassafras loamy sand, 5 to 10 percent slopes	4.90%
SabD	Sassafras loamy sand, 10 to 15 percent slopes	9.90%
SacB	Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	58.30%
WeeB	Westphalia fine sandy loam, 2 to 5 percent slopes	6.70%
WokA	Woodstown-Glassboro complex, 0 to 2 percent slopes	8.30%

Source: Web Soil Survey (WSS) published by the Natural Resources Conservation Service

APPENDIX A

RESOLUTION NO. 113-2019

RESOLUTION OF THE MAYOR AND COMMITTEE OF THE TOWNSHIP OF HARRISON AUTHORIZING THE JOINT LAND USE BOARD TO CONDUCT A PRELIMINARY INVESTIGATION TO DETERMINE WHETHER LOT 4 IN BLOCK 32 (MULLICA HILL ROAD) AND BLOCK 33, LOTS 2, 2.03, 2.01, 3, 3.01 AND 14 ON THE OFFICIAL TAX MAP OF THE TOWNSHIP OF HARRISON QUALIFY AS AREAS IN NEED OF REDEVELOPMENT

WHEREAS, the Local Redevelopment and Housing Law, N.J.S.A. 40A:12A-1, et seq., provides a mechanism to empower and assist local governments in efforts to promote programs of redevelopment; and

WHEREAS, the Local Redevelopment and Housing Law sets forth a specific procedure for establishing an area in need of redevelopment; and

WHEREAS, N.J.S.A. 40A:12A-6 authorizes the governing body of the municipality by Resolution, to cause its Planning Board to conduct a preliminary investigation to determine whether the proposed area is an area in need of redevelopment according to the criteria set forth in N.J.S.A. 40A:12A-5; and

WHEREAS, the proposed Redevelopment Area, Block 32, Lot 4 (Mullica Hill Road), and Block 33, Lots 2, 2.03, 2.01, 3, 3.01 and 14, determination shall authorize the municipality to use all those powers provided by the Legislature for use in a Redevelopment Area, other than the use of eminent domain; and, as such, the Redevelopment Area shall be established and be referred to as a "Non-Condemnation Redevelopment Area"; and

WHEREAS, the Township Committee of the Township of Harrison, Gloucester County, has determined that an investigation and inquiry should be made to see if said area is in need of redevelopment pursuant to the aforementioned State Statute; and

WHEREAS, the Township of Harrison governing body wishes to direct the Joint Land Use Board to undertake a preliminary investigation to determine whether the property identified as and consisting of Block 32, Lot 4 and Block 33, Lots 2, 2.03, 2.01, 3, 3.01 and 14 qualifies as an area in need of redevelopment pursuant to N.J.S.A. 40A:12A-5; and

WHEREAS, the Township Committee considers it to be in the best interest of the Township to directs its Joint Land Use Board to conduct such an investigation regarding said area/property.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Committee of the Township of Harrison, County of Gloucester and State of New Jersey as follows:

1. The Joint Land Use Board of the Township of Harrison is hereby directed to undertake a preliminary investigation to determine whether Block 32, Lot 4 (Mullica Hill Road) and Block 33, Lots 2, 2.03, 2.01, 3, 3.01 and 14 is a "Non-Condemnation Redevelopment Area such that the municipality may use all those powers provided by the Legislature for use in a Redevelopment Area", other than the use of eminent domain, according to the criteria set forth in N.J.S.A. 40A:12A-1, et seq.; and

2. The staff of the Joint Land Use Board and its consultants are hereby directed to assist the Joint Land Use Board in conducting the area in need of redevelopment investigation; and

3. The Township Clerk shall forward a copy of this Resolution to the Chairman and Secretary of the Joint Land Use Board for immediate action; and

4. The preliminary investigation, once completed, shall be submitted to the Township Committee for review and approval in accordance with the provisions of the Redevelopment and Housing Law, N.J.S.A. 40A:12A-1, et seq.

ADOPTED at a regular meeting of the Mayor and Township Committee of the Township of Harrison, County of Gloucester, State of New Jersey held on May 20, 2019.

TOWNSHIP OF HARRISON

BY: _____
LOUIS F. MANZO, MAYOR

ATTEST:

_____
DANEEN FUSS
Acting Municipal Clerk

ROLL CALL VOTE				
COMMITTEE MEMBER	AYES	NAYS	ABSTAIN	ABSENT
Manzo	✓			
DeLaurentis	✓			
Heim	✓			
Williams	✓			
Jacques	✓			

CERTIFICATION

I hereby certify that the above resolution is a true copy of a resolution adopted by the Township Committee of the Township of Harrison, County of Gloucester, State of New Jersey, at a meeting held by the same on May 20, 2019, in the Harrison Township Municipal Building, 114 Bridgeton Pike, Mullica Hill, New Jersey 08062.

_____
DANEEN FUSS
Acting Municipal Clerk

APPENDIX B

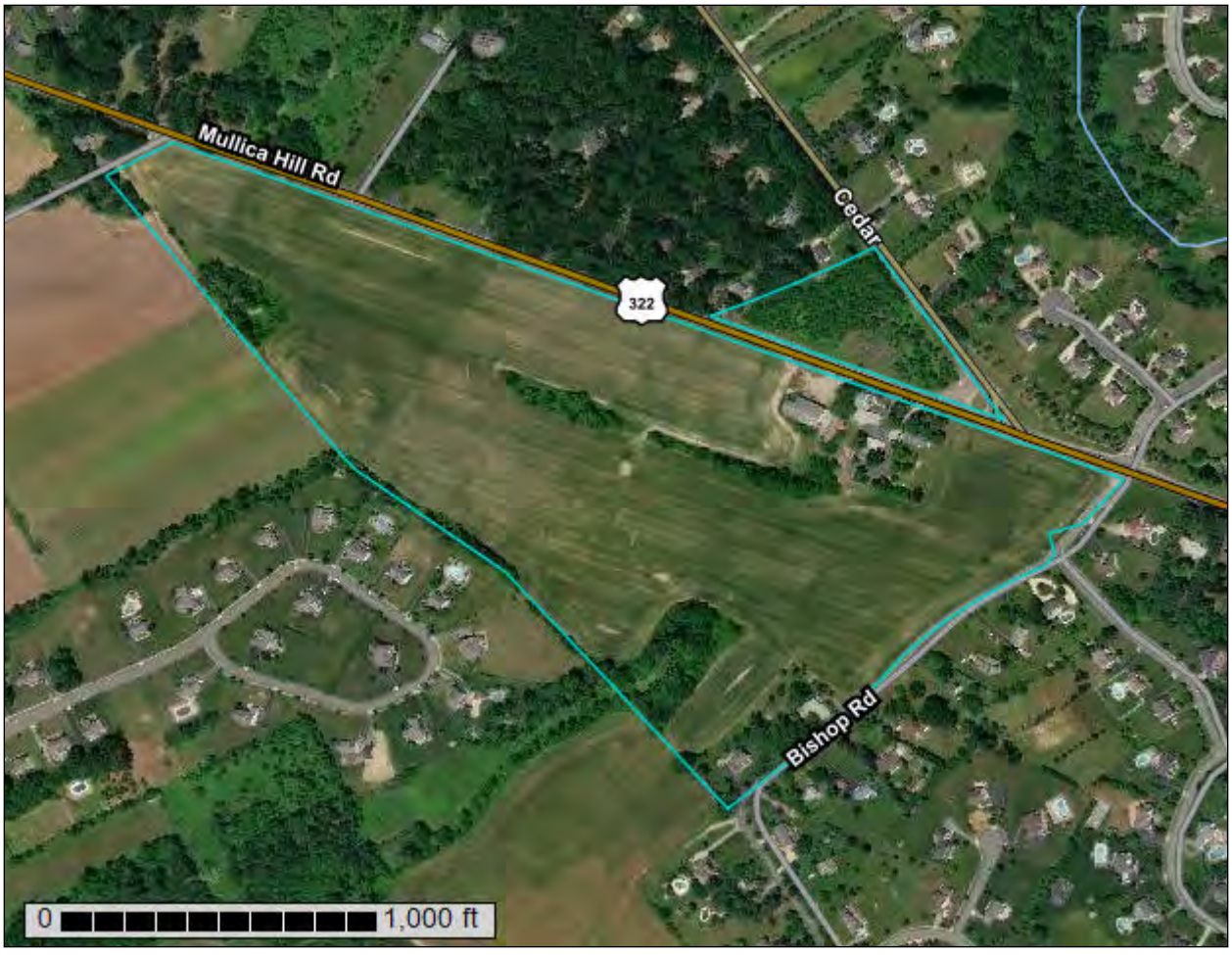
United States Department of Agriculture

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 Gloucester County, New Jersey



May 30, 2019

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

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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: 1:5,440 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

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 1:24,000.

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: Gloucester County, New Jersey
Survey Area Data: Version 16, Sep 15, 2018

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

Date(s) aerial images were photographed: Aug 14, 2015—Sep 16, 2017

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
DocB	Downer loamy sand, 0 to 5 percent slopes, Northern Coastal Plain	6.2	9.6%
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	1.5	2.3%
SabC	Sassafras loamy sand, 5 to 10 percent slopes	3.2	4.9%
SabD	Sassafras loamy sand, 10 to 15 percent slopes	6.4	9.9%
SacB	Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	37.7	58.3%
WeeB	Westphalia fine sandy loam, 2 to 5 percent slopes	4.4	6.7%
WokA	Woodstown-Glassboro complex, 0 to 2 percent slopes	5.4	8.3%
Totals for Area of Interest		**64.7**	**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.

Gloucester County, New Jersey

DocB—Downer loamy sand, 0 to 5 percent slopes, Northern Coastal Plain

Map Unit Setting

National map unit symbol: 2thw0
Elevation: 80 to 100 feet
Mean annual precipitation: 41 to 50 inches
Mean annual air temperature: 46 to 64 degrees F
Frost-free period: 190 to 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Downer

Setting

Landform: Knolls, low hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 10 inches: loamy sand
BE - 10 to 16 inches: loamy sand
Bt - 16 to 28 inches: sandy loam
C1 - 28 to 48 inches: loamy sand
C2 - 48 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 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 (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 0.2 mmhos/cm)
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

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

Minor Components

Hammonton

Percent of map unit: 10 percent
Landform: Broad interstream divides, flats
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Dip
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Atsion

Percent of map unit: 5 percent
Landform: Flats, depressions, drainageways, deflation flats
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear
Hydric soil rating: Yes

Evesboro

Percent of map unit: 5 percent
Landform: Flats, fluviomarine terraces, dunes, knolls
Landform position (three-dimensional): Riser, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

FmhAt—Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 15kn8
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

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

Description of Fluvaquents, Loamy, Frequently Flooded

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Recent alluvium

Typical profile

A1 - 0 to 5 inches: loam
A2 - 5 to 12 inches: silt loam
C1 - 12 to 18 inches: sandy clay loam
C2 - 18 to 24 inches: sandy clay loam
C3 - 24 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
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 6 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
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: B/D
Hydric soil rating: No

Minor Components

Udifluvents, frequently flooded

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Fluvaquents, loamy, frequently flooded

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

SabC—Sassafras loamy sand, 5 to 10 percent slopes

Map Unit Setting

National map unit symbol: 15krt
Elevation: 10 to 330 feet

Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Sassafras

Setting

Landform: Knolls
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy and/or gravelly fluviomarine deposits

Typical profile

Ap - 0 to 12 inches: loamy sand
Bt1 - 12 to 18 inches: sandy loam
Bt2 - 18 to 28 inches: sandy clay loam
BC - 28 to 40 inches: loamy sand
C1 - 40 to 58 inches: sand
C2 - 58 to 80 inches: sand

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

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

Minor Components

Aura

Percent of map unit: 5 percent
Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Downer

Percent of map unit: 5 percent

Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

SabD—Sassafras loamy sand, 10 to 15 percent slopes

Map Unit Setting

National map unit symbol: 15krv
Elevation: 10 to 330 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Sassafras

Setting

Landform: Knolls
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy and/or gravelly fluviomarine deposits

Typical profile

Ap - 0 to 12 inches: loamy sand
Bt1 - 12 to 18 inches: sandy loam
Bt2 - 18 to 28 inches: sandy clay loam
BC - 28 to 40 inches: loamy sand
C1 - 40 to 58 inches: sand
C2 - 58 to 80 inches: sand

Properties and qualities

Slope: 10 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

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

Minor Components

Aura

Percent of map unit: 5 percent
Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Downer

Percent of map unit: 5 percent
Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Westphalia

Percent of map unit: 5 percent
Landform: Hillslopes, knolls
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

SacB—Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain

Map Unit Setting

National map unit symbol: 2thxd
Elevation: 0 to 470 feet
Mean annual precipitation: 41 to 49 inches
Mean annual air temperature: 53 to 58 degrees F
Frost-free period: 190 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Sassafras

Setting

Landform: Fluviomarine terraces, flats
Landform position (three-dimensional): Riser, rise

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 12 inches: sandy loam
Bt1 - 12 to 18 inches: sandy loam
Bt2 - 18 to 28 inches: sandy clay loam
BC - 28 to 40 inches: loamy sand
C1 - 40 to 58 inches: sand
C2 - 58 to 80 inches: sand

Properties and qualities

Slope: 2 to 5 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 (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Aura

Percent of map unit: 4 percent
Landform: Fluviomarine terraces, low hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope, riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Fallsington, drained

Percent of map unit: 4 percent
Landform: Swales, depressions, flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Woodstown

Percent of map unit: 4 percent
Landform: Fluviomarine terraces, flats, depressions, broad interstream divides
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: No

Downer

Percent of map unit: 4 percent
Landform: Flats, fluviomarine terraces, knolls
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve, riser, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: No

Ingleside

Percent of map unit: 4 percent
Landform: Flats
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

WeeB—Westphalia fine sandy loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 15kth
Elevation: 10 to 160 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Westphalia

Setting

Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy eolian deposits and/or loamy fluviomarine deposits

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bt - 6 to 15 inches: fine sandy loam
BC - 15 to 30 inches: loamy fine sand
C1 - 30 to 48 inches: fine sand
C2 - 48 to 80 inches: stratified fine sand to loamy fine sand

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

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

Minor Components

Buddtown

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: No

Evesboro

Percent of map unit: 5 percent
Landform: Dunes
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Freehold

Percent of map unit: 5 percent
Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Jade run

Percent of map unit: 5 percent
Landform: Depressions, flats
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

WokA—Woodstown-Glassboro complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 15kv0
Elevation: 0 to 150 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodstown and similar soils: 70 percent
Glassboro and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodstown

Setting

Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium and/or sandy marine deposits

Typical profile

Ap - 0 to 8 inches: sandy loam
Bt1 - 8 to 26 inches: sandy loam
Bt2 - 26 to 30 inches: sandy clay loam
Bt3 - 30 to 36 inches: sandy loam
C - 36 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

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

Description of Glassboro

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy fluviomarine deposits

Typical profile

Ap - 0 to 11 inches: sandy loam
Bt1 - 11 to 16 inches: sandy loam
Bt2 - 16 to 21 inches: coarse sandy loam
Btg - 21 to 26 inches: coarse sandy loam
Cg - 26 to 40 inches: loamy coarse sand
C1 - 40 to 56 inches: coarse sand
C2 - 56 to 80 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

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

Minor Components

Mullica

Percent of map unit: 5 percent
Landform: Flood plains, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Hydric soil rating: Yes

Downer

Percent of map unit: 5 percent
Landform: Low hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Fallsington

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

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Building Site Development

This folder contains a collection of tabular reports that present soil interpretations related to building site development. The reports (tables) include all selected map units and components for each map unit, limiting features and interpretive ratings. Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally

cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

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

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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Report—Dwellings and Small Commercial Buildings

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Dwellings and Small Commercial Buildings–Gloucester County, New Jersey							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DocB—Downer loamy sand, 0 to 5 percent slopes, Northern Coastal Plain							
Downer	80	Not limited		Not limited		Not limited	
FmhAt—Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded							
Fluvaquents, loamy, frequently flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
SabC—Sassafras loamy sand, 5 to 10 percent slopes							
Sassafras	90	Not limited		Not limited		Somewhat limited	
						Slope	0.88
SabD—Sassafras loamy sand, 10 to 15 percent slopes							
Sassafras	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
SacB—Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain							
Sassafras	80	Not limited		Not limited		Not limited	
WeeB—Westphalia fine sandy loam, 2 to 5 percent slopes							
Westphalia	80	Not limited		Not limited		Not limited	

Dwellings and Small Commercial Buildings–Gloucester County, New Jersey							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WokA—Woodstown-Glassboro complex, 0 to 2 percent slopes							
Woodstown	70	Not limited		Very limited		Not limited	
				Depth to saturated zone	1.00		
Glassboro	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

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Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

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

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Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
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Downer	80	Not limited		Not limited		Not limited	

Dwellings and Small Commercial Buildings–Gloucester County, New Jersey							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
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Fluvaquents, loamy, frequently flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
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		Slope	0.63	Slope	0.63	Slope	1.00
SacB—Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain							
Sassafras	80	Not limited		Not limited		Not limited	
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Data Source Information

Soil Survey Area: Gloucester County, New Jersey
Survey Area Data: Version 16, Sep 15, 2018