



5696.0004

5696.0005

5696.0006

September 2025

ENGINEER'S REPORT

for

MINOR SITE PLAN APPROVAL

WEST WINDSOR PLAINSBORO REGIONAL SCHOOL'S SOLAR CARPORTS

BLOCK 2001; LOT1

BLOCK 1902; LOT 23

BLOCK 1901; LOT 3

located in

PLAINSBORO TOWNSHIP,
MIDDLESEX COUNTY
NEW JERSEY

PREPARED BY:

FWH ASSOCIATES, P.A.

1658 ROUTE 9

TOMS RIVER, NEW JERSEY 08755

A blue ink signature of Christopher P. Rosati, which appears to read "Christopher P. Rosati".

CHRISTOPHER P. ROSATI

PROFESSIONAL ENGINEER

NEW JERSEY LICENSE NO. 41981

TABLE OF CONTENTS

	<u>Page Number</u>
I. EXECUTIVE SUMMARY.....	3
II. SITE ENGINEERING.....	3
a. LAND USE / LAND COVER ANALYSIS.....	3
b. STORMWATER QUANTITY CONTROL.....	4
c. STORMWATER QUALITY.....	5
d. GROUNDWATER RECHARGE.....	5
e. NON-STRUCTURAL STROMWATER MANAGEMENT STRATEGIES.....	5
f. UTILITY SERVICES.....	5

APPENDIX

- A. AERIAL MAP
- B. 75 & 95 GROVERS MILL ROAD SOIL MAP
90 GROVERS MILL ROAD SOIL MAP
- C. 75 & 95 GROVERS MILL ROAD FEMA FLOOD MAP
90 GROVERS MILL ROAD FEMA FLOOD MAP

I. Executive Summary

Greenskies Clean Energy, LLC (Applicant) is proposing the construction of solar carport systems over portions of the existing parking lots of three schools operated and owned by the West Windsor Plainsboro Regional School District. The project sites known as,

Millstone River School – 75 Grovers Mill Road – Block 2001; Lot 1

High School North – 90 Grovers Mill Road – Block 1902; Lot 23

Community Middle School – 95 Grovers Mill Road – Block 1901; Lot 3

were chosen to install solar carports for the purposes of generating clean electrical power to reduce the dependence on fossil fuels and to provide an electrical cost savings to the school district. All school properties are fully developed consisting of school buildings, parking lots, activity fields and existing utilities including stormwater management facilities. Under the proposed conditions, the solar carports will be constructed within the existing parking lots of the schools with no change to traffic circulation or negative impacts on the parking layout or space count.

The solar carport systems will be constructed using a 545W double glass bi-facial solar module by JA Solar. The canopy structures will be designed using a cantilever tee-shaped design, which is an industry standard for large commercial solar systems nationwide. In accordance with the Section 85-34 of Plainsboro Township’s subdivision and Site Plan Review – Improvements and Design standards, all column and beams will be constructed with high quality components, and consist of boxed vertical structural elements, with a proper finish approved by the Township Planner. The solar carports systems will have solar inverters mounted to the boxed vertical columns with underground conduits being run to proposed switchgear equipment. Switchgear equipment will be located in close proximity to the existing school and within landscaped areas. Canopy lights will be utilized to replace the light pole fixtures that will be removed in order to install the solar carport systems.

II. Site Engineering

a. LAND USE / LAND COVER ANALYSIS

This section demonstrates the impacts from the proposed Project’s improvements on the existing stormwater management system.

Existing Project Methodology

As previously described, the school project sites are fully developed and consist of school buildings, parking lot areas and recreational fields. All project site are within the Residential Zone (R-100). The school properties also have in place stormwater management facilities that collect stormwater, especially from the parking lots, and convey it to existing basins located on site to be treated and released. The project will not change the existing site topography or drainage patterns.

Proposed Project Methodology

As discussed, the proposed project includes the construction of solar carport systems over a majority of the existing parking lots of the schools. Other improvements include trenching for

conduit installation, installation of switchgear equipment and light pole removal. The project will not impact or change the current runoff patterns of the site. As the solar carport arrays will be constructed over the existing parking lot, only proposed columns that are within existing landscape islands and switchgear equipment pads will contribute towards any new impervious surfaces. Therefore, only a minimal amount of new impervious surface will be constructed as part of these projects. The existing parking lots for the schools do not have landscape islands, therefore impacts to existing landscaping are extremely minimal.

The columns for the solar array will be mounted to a 3' diameter concrete footing which equate to approx. 7 square feet of impervious surface per column. Each site will also have concrete pads for switchgear and transformer equipment. The table below shows the negligible impervious surface for each project site.

	75 Grovers Mill Road	90 Grovers Mill Road	95 Grovers Mill Road
# Columns in landscape areas	17	0	16
Area Per Column	7sf	7sf	7sf
Column Impervious	119 sf	0 sf	112 sf
Equipment Pad Impervious	0 sf	228 sf	0 sf
Total Site Increase in Impervious	119 sf	228 sf	112 sf

b. STORMWATER QUANTITY CONTROL

The water quantity standard per N.J.A.C. 7:8-5.4(a)3 and the Township's ordinance 85-28.1 D (6) [3b] applies for any project that disturbs at least one acre of land or increases impervious surface by 0.25 acres. As the site improvements disturb less than one acre of land and the negligible increase in impervious surface is less than 0.00 acres, the water quantity standards are not triggered.

As noted above, the electrical equipment pads only add up to 228 sf and are located within landscape areas close to the building. Any runoff associated with the installation of the concrete pads, will have the ability to be absorbed into the soil of the landscape areas prior to any sheetflow over the existing paved surfaces. This matches existing conditions flow. The remaining new impervious surfaces are from the columns located over landscape islands. These columns will have minimal impact on any increase in runoff as the rain will be deflected by the solar panels themselves and splattering, prior to being hit by the rain themselves.

c. STORMWATER QUALITY

The runoff quality standards at N.J.A.C. and the Township's ordinance 85-28.1D (7) apply if there is a net increase in impervious surface of 0.25 acres or more. Even if the impervious coverages for each school were combined, the total increase in impervious surface would be 0.01 acres. This increase is less than the 0.25 acres threshold. The Project does not propose any new drivable impervious surfaces, which are the only surfaces that generate "dirty" runoff requiring quality treatment. As the project does not increase the impervious surface by more than 0.00 acres and no new vehicular impervious is proposed, the runoff quality standards have been addressed.

d. GROUNDWATER RECHARGE

The groundwater recharge standards at N.J.A.C. 7:8-5.5 and the Township's ordinance 85-28.1 D (6) [2] applies for any project that disturbs at least one acre of land or increases impervious surface by 0.25 acres. As indicated in section above, the proposed project will have no net increase in impervious area exceeding 0.00 acres nor disturb more than one acre of land. Therefore, groundwater recharge standards do not apply.

e. NON-STRUCTURAL STORMWATER MANAGEMENT STRATEGIES

In accordance with N.J.A.C. 7:8-5.2(a) and the Township's ordinance 85-28.1D (Sb), the design of any development that disturbs at least one acre of land or increases impervious surface by 0.25 acres must incorporate non-structural stormwater management strategies. Since this project will not disturb more than one acre of land and does not have an increase in impervious area greater than 0.00 acres, non-structural stormwater management strategies are not required to be incorporated in to the design of the site.

f. UTILITY SERVICES

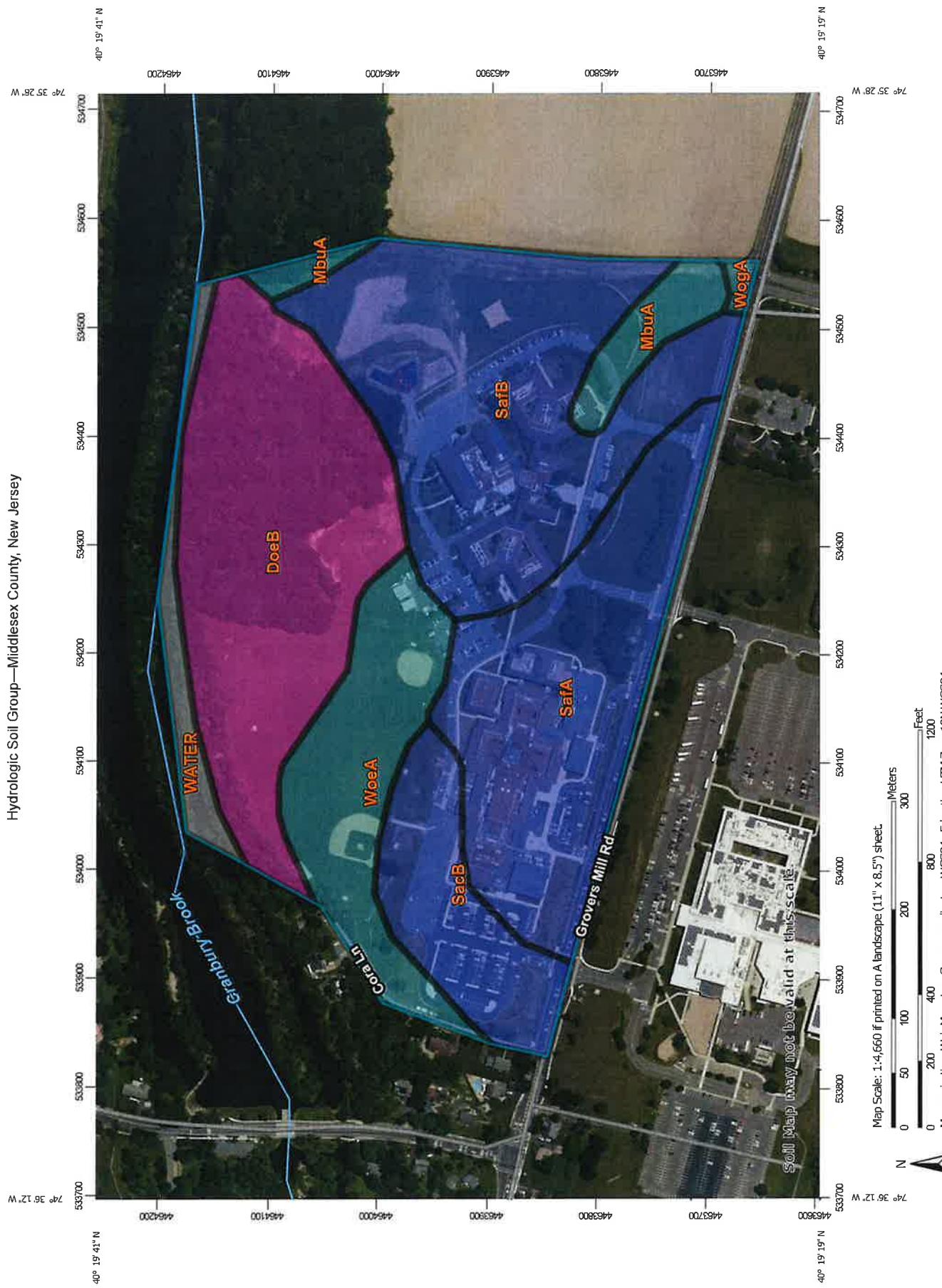
All existing utility services that supply the existing buildings are to remain and not be impacted by this project. The solar carport system will be implemented in accordance with the current New Jersey State Standards. Coordination with Public Service Electric and Gas (PSE&G) will be handled by Greenskies Clean Energy, LLC as required by PSE&G requirements.

JMF/jmf

K:\FWH Documents\5696\0004\Reports\20250922 Engineer's Report.docx

APPENDIX

Hydrologic Soil Group—Middlesex County, New Jersey



MAP LEGEND

Area of Interest (AOI)	 Area of Interest (AOI)	C
Soils		C/D
Soil Rating Polygons		D
A		Not rated or not available
A/D		Water Features
B		Streams and Canals
B/D		Transportation
C		Rails
C/D		Interstate Highways
D		US Routes
Not rated or not available		Major Roads
Soil Rating Lines		Local Roads
A		Background
A/D		Aerial Photography
B		
B/D		
C		
C/D		
D		
Not rated or not available		
Soil Rating Points		
A		
A/D		
B		
B/D		

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 for 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: Middlesex County, New Jersey
Survey Area Data: Version 20, Sep 3, 2024

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

Date(s) aerial images were photographed: Jun 4, 2022—Jul 22, 2022

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.

Hydrologic Soil Group—Middlesex County, New Jersey

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DoeB	Downer sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	A	17.8	24.8%
MbuA	Mattapex silt loam, 0 to 2 percent slopes, northern coastal plain	C	2.8	3.8%
SacB	Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	B	6.1	8.5%
SafA	Sassafras loam, 0 to 2 percent slopes	B	15.1	21.0%
SafB	Sassafras loam, 2 to 5 percent slopes	B	19.6	27.3%
WATER	Water		2.0	2.8%
WoeA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	C	8.3	11.5%
WogA	Woodstown loam, 0 to 2 percent slopes, Northern Coastal Plain	C	0.3	0.4%
Totals for Area of Interest			72.0	100.0%

Description

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.

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.

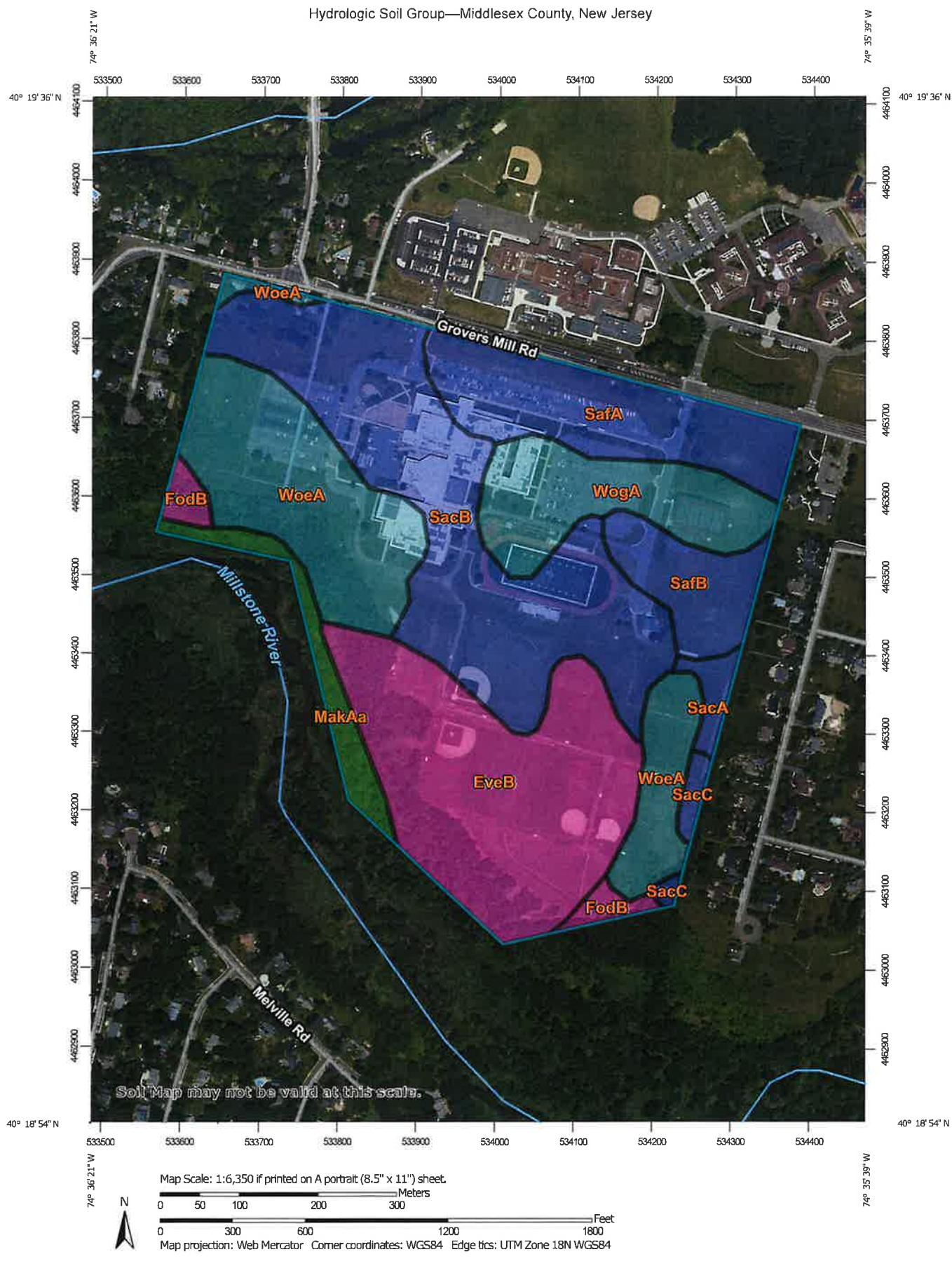
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Middlesex County, New Jersey



MAP LEGEND

Area of Interest (AOI)	Area of Interest (AOI)	C
		C/D
Soils		D
Soil Rating Polygons	A	Not rated or not available
	A/D	Water Features
	B	Streams and Canals
	B/D	Transportation
	C	Rails
	C/D	Interstate Highways
	D	US Routes
	Not rated or not available	Major Roads
Soil Rating Lines	A	Local Roads
	A/D	Background
	B	Aerial Photography
	B/D	
	C	
	C/D	
	D	
	Not rated or not available	
Soil Rating Points	A	
	A/D	
	B	
	B/D	

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: Middlesex County, New Jersey
Survey Area Data: Version 20, Sep 3, 2024

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

Date(s) aerial images were photographed: Jun 4, 2022—Jul 22, 2022

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.

Hydrologic Soil Group—Middlesex County, New Jersey

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
EveB	Evesboro sand, 0 to 5 percent slopes	A	23.5	22.4%
FodB	Fort Mott loamy sand, 0 to 5 percent slopes	A	1.8	1.7%
MakAa	Manahawkin muck, 0 to 2 percent slopes, frequently flooded, Northern Coastal Plain	A/D	3.4	3.3%
SacA	Sassafras sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	B	1.3	1.2%
SacB	Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	B	27.7	26.4%
SacC	Sassafras sandy loam, 5 to 10 percent slopes, Northern Coastal Plain	B	1.0	0.9%
SafA	Sassafras loam, 0 to 2 percent slopes	B	11.6	11.1%
SafB	Sassafras loam, 2 to 5 percent slopes	B	5.4	5.1%
WoeA	Woodstown sandy loam, 0 to 2 percent slopes, Northern Coastal Plain	C	19.6	18.7%
WogA	Woodstown loam, 0 to 2 percent slopes, Northern Coastal Plain	C	9.6	9.2%
Totals for Area of Interest			105.0	100.0%



Description

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.

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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

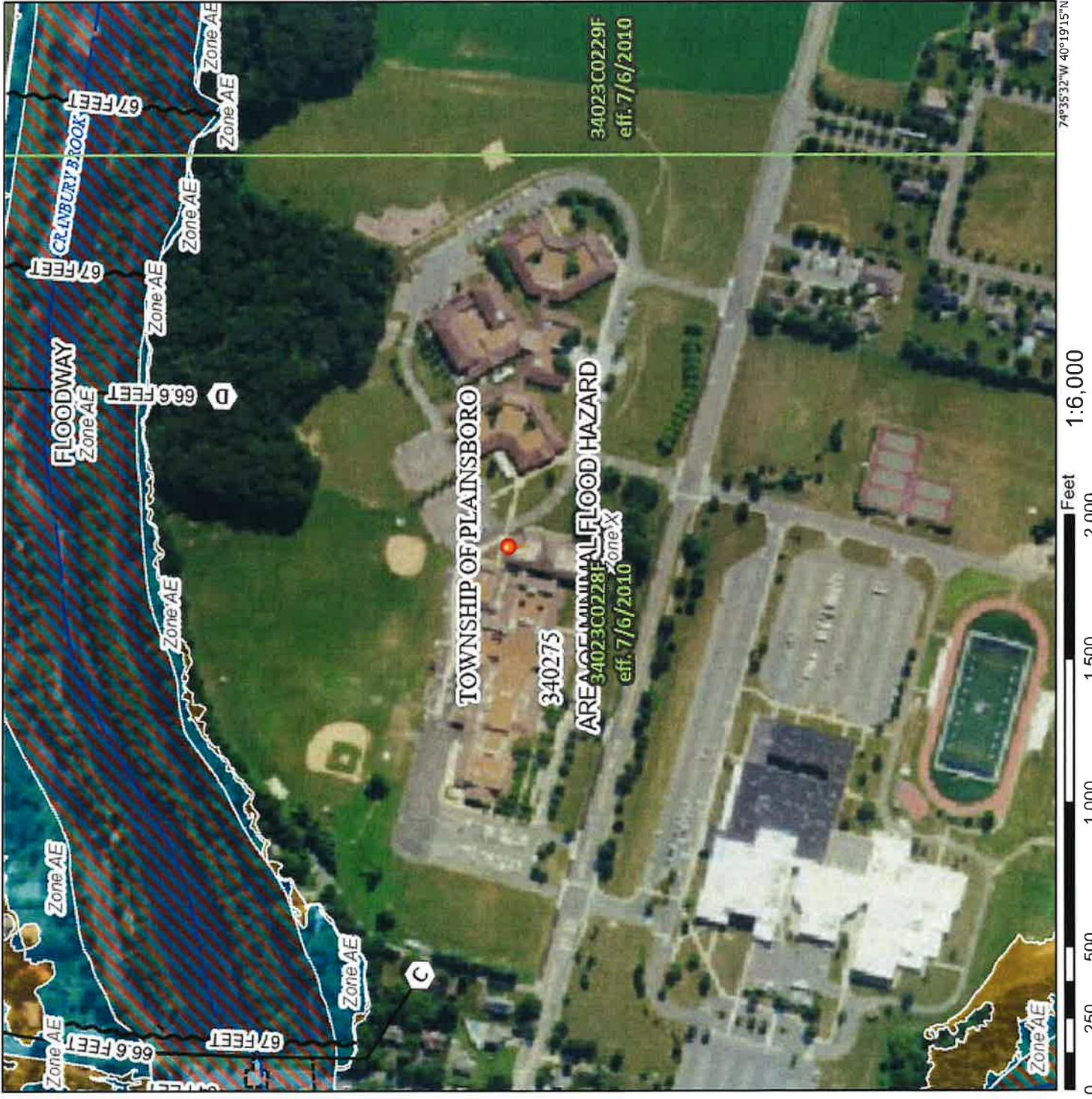
National Flood Hazard Layer FIRMette



Legend

74°36'10" W 40°19'42" N

SEE EIS REPORT EOB DETAILED LEGEND AND INDEX MAP EOB EIRM BANEI | AYOUT



National Flood Hazard Layer FIRMette



Legend

74°36'20" W 40°19'35" N

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL | AYOUT

Without Base Flood Elevation (BFE)
Zone A, V-159

With BFE or Depth Zone AE, AO, AH, VE, AF

Regulatory Floodway

SPECIAL FLOOD HAZARD AREAS

0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with draining areas of less than one square mile $Z_{0.2\%}$

Future Conditions 1% Annual Chance Flood Hazard $Z_{1\%}$

Area with Reduced Flood Risk due to Levee. See Notes. Z_{Levee}

Area with Flood Risk due to Levee $Z_{\text{Levee C}}$

OTHER AREAS OF FLOOD HAZARD

Map showing the study area with various flood hazard zones and other areas. The legend includes:

- NO SCREEN** (Yellow)
- Area of Minimal Flood Hazard Zone** (Blue)
- Effective LOMRs** (Blue)
- Area of Undetermined Flood Hazard Zone** (Yellow)
- GENERAL STRUCTURES** (Green)
- STRUCTURES** (Green)
- Channel, Culvert, or Storm Sewer** (Black dashed line)
- Levee, Dike, or Floodwall** (Black solid line)

P25-08 PB Submission 02/03/26

MAP PANELS

No Digital Data Available

Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFH web services provided by FEMA. This map was exported on **9/23/2025 at 1:57 PM** and does not reflect changes or amendments subsequent to this date and time. The NFH and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmapped areas cannot be used for regulatory purposes.