APPENDIX A

Lackawanna Cut-Off Restoration - Passenger Rail Study

- A.1 WATER GAP STATION ALTERNATE 1
- A.2 WATER GAP STATION ALTERNATE 2 SITE EVALUATION

Appendix A.1 – Water Gap Station Alternate 1

COUNTY ROUTE SECTION SHEET MONROE 0F 1 DELAWARE WATER GAP RIVER ROAD ELEVATOR & STAIR TOWER (TYP.) 710 FT LONG HIGH LEVEL PLATFORM & 200 FT CANOPY W/ RETRACTABLE EDGE — 08/ SA 2028 5-LEVEL PROPOSED PARKING GARAGE EXISTING STORMWATER FORMWATER MANAGEMENT DETENTION MANAGEMENT DETENTION POND <u>PLAN</u> CONCEPTUAL SCALE WATER GAP STATION ALTERNATE 1

Appendix A.2 – Water Gap Station Alternate 2 Site E	valuation

Conceptual Layout of Parking Garage and Rail Station

A Conceptual Parking Garage Site Plan Layout is shown in Attachment A. The conceptual Parking Garage contains five enclosed floors and parking on the roof and will provide restrooms and vending for commuters. The facility will also include a 710 ft long rail station platform located 4'3" above the rail with a 200 ft long canopy. The following research was considered in developing the sketch and conclusions.

A. Parcel Research

Zoning Requirements

- The site is identified by Monroe County as Parcel #16/92722, Pin 16731100919889; Owner is Township of Smithfield; acreage is 4.13 ac; and deed is recorded in Deed Book 2065, Page 7977. A copy of the website information is included as Attachment B.
- The site is located on River Road between I-80 and the Delaware, Lackawanna, and Western Railroad in the R-1, Low Density Residential Zoning District of Smithfield Township. A copy of the Smithfield Township Zoning Map is included in Attachment C.
- The site is identified as Existing Conserved Land on the map titled "Draft Official Map of Smithfield Township Monroe County, Pennsylvania" prepared by Monroe County Planning Commission dated November 2009 which is listed as Smithfield Official Map on the Township's webpage and is included in Attachment D.
- Rail Stations are not a Permitted or Conditional Use in the R-1 Zoning District.
- Bulk Zoning Requirements:
 - The Following Bulk Requirements are for Lots with Central Water and Sewer.
 Both Public Water and Sewer Services must be extended to service the site.
 - The C-1 Commercial Zoning District is adjacent to the site and permits Public Transportation Facilities as a Conditional Use.
 - The M-1 Industrial Zoning District is adjacent to the site and permits Railroad Yards as a Conditional Use.

Minimums	Zone R-1 Low Density Residential	Zone C-1 Commercial	Zone M-1 Industrial
Lot Area	20,000 sf	30,000 sf	40,000 sf
Lot Width	100 ft	125 ft	150 ft
Lot Depth	150 ft	150 ft	200 ft
Front Yard - Building	25 ft	50 ft	50 ft
Front Yard - Parking	35 ft	50 ft	50 ft
Side Yard	20 ft	20 ft + 25 adj to res	20 ft + 25 adj to res
Rear Yard	20 ft	30 ft + 35 adj to res	20 ft + 35 adj to res

** No Side or Rear Yards required abutting operating rail Right-of-Way

Maximums			
Building Coverage	25%	35%	35%
Impervious Coverage	30%	65%	70%
Building Height	35 ft	35 ft ** Exceptions	35 ft
		Max 50 ft with 42 ft	
		occupied & 8 ft roof	
		mounted equipment	

The site meets the Bulk Zoning Requirements associated with lot areas, widths and depths for all three zones. The lot area must be confirmed by boundary survey in relation to the I-80 Legal

Right-of-Way Line for Limited Access and the Legal Slope Easements. The site meets the yard requirements in Zone R-1, but the location of the parking garage does not meet front yard setbacks in Zone M-1 and does not meet front yard setbacks for a 35 ft high building in Zones C-1. The required front yard for Buildings and Parking in Zones M-1 and C-1 is 50 ft for 35 ft high buildings. The garage is located 45 ft from the north edge of pavement on River Road. The actual building setback will be determined after the boundary of the property is surveyed. The parking garage Building Coverage is approximately 30 percent of the lot and the Impervious Coverage is approximately 65 percent. The garage meets the Building and Impervious Coverage Requirements in Zones C-1 and M-1 but exceeds both coverage requirements in Zone R-1.

The parking garage does not meet the building height requirements or the exceptions allowed in Zoning District C-1. To provide floor to floor heights of at least 10'2" with a 7'2" clearance and 3 ft structure depth, a 10.5 ft floor to floor height is assumed. The first-floor height is assumed to be 11.5 ft to provide at least 11'4" floor to floor height to allow a minimum 8'2" clearance for ADA accessible vans. The total height of the garage assuming a four (4) high parapet is 57.5 ft. The specifics of the Building Height Exceptions are included in Attachment E. The Building Height Exceptions significantly increases the yard requirements and reduces the allowable building coverage. The building setbacks and building coverages based on the Height Exception Criteria in the Smithfield Township Ordinances are not met on the attached sketch and will require approvals from the Township.

Flood Plain Requirements

- The site is illustrated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 42089C0432E, dated May 2, 2013, within Flood Zone AE. The 100-year flood elevation, or the Base Flood Elevation (BFE), is 323 in the vicinity of the site. The adjacent roadway and rail elevations in the vicinity of the site are approximately 316. Therefore, the Smithfield Township Floodplain Ordinance is applicable to any development of the site. A sketch illustrating the floodplain on the site and the Flood Profile are included in Attachment F.
- The lowest allowable floor elevation is set at 324.5 to be consistent with the Regulatory Flood Elevation. The Regulatory Flood Elevation is defined as the BFE plus a freeboard safety factor of one and one-half (1 ½) feet.
- Electric Distribution Panels must be at least three feet above BFE which equals 327, and electrical, mechanical, and utility equipment shall be above BFE which is 323.
- Flood Insurance will be required for the structure.

The parking garage first floor elevation is set at the Regulatory Flood Elevation of 324.5 and the rail platform is set at 320.5 to provide the appropriate height above the rail. The rail platform and the entrance and exit driveways are expected to be inundated during the 100-year flood event and the platform is just above the anticipated 50-year flood event. Therefore, the site will be impacted during flooding events. Additional information regarding the floodplain requirements is included in Attachment F.

Wetland Requirements

Development is regulated in areas identified as wetlands. The National Wetlands
Inventory Map, included in Attachment G, does not illustrate wetlands on the site and the
NCRS Web Soil Survey, included in Attachment M, does not identify the soils as hydric,
but Pope Silt Loam soils are reported to have minor hydric components. For Township
submittals, a specific wetlands investigation of the site is required.

Stream Buffer Requirements

• The Smithfield Township Ordinance requires a fifty (50) ft inner buffer and a one hundred (100) ft outer buffer, for a total of one hundred fifty (150) ft stream buffer, measured perpendicular and horizontally from the top of bank. The parking garage and rail station is more than five hundred (500) ft from Brodhead Creek. Stormwater system conveyance that will be needed to discharge the stormwater flows from the site to Brodhead Creek are permitted within the stream buffer setback area.

Land Development Requirements

- A Land Development Submittal is required for the development of a Parking Garage and Rail Station on the site. A Sketch Plan submittal is recommended, and Preliminary and Final Submittals are required. Submittals are reviewed by the Township Engineers, Professionals, Planning Commission, and Board of Supervisors.
- A Soil Erosion and Sediment Control Plan Approval and a National Pollutant Discharge Elimination System (NPDES) Permit are required from Monroe County Conservation District.
- An Existing Resources/Site Analysis Plan (ER/SA) is required. Details for Smithfield Township's design process requirements are included in Attachment H.
- The Smithfield Township Ordinance does not specifically address parking garages.
 Parking Requirements include appropriate buffering, landscaping, lighting, and setbacks from streets and property lines. Traffic Studies are required.
- Public Transportation Facilities require a minimum lot size of 3 acres and shall be buffered and landscaped in accordance with the Ordinance. The site meets the minimum lot size requirements.

Master Plan Review

• The Smithfield Township's Comprehensive Plan, last updated in 2001, discusses the development of a passenger rail station in the Township, but doesn't provide any clear recommendations. The Monroe County Comprehensive Plan Update, which is dated December 2014, generally encourages future commuter rail service but notes the lack of funding. Excerpts from each of the Plans are included in Attachment I.

Highway Occupancy Requirements

- Smithfield Township Highway Occupancy and Street Opening Permits, fees, and restoration charges are required for Driveway Access and Utility Street Openings.
- The maximum grade for commercial driveways is eight percent (8%) and the maximum change in grade is six percent (6%). The driveways are consistent with the Ordinance Requirements.
- In accordance with Chapter 21 Streets and Sidewalks, Part 2, two driveways are permitted with 15 ft minimum and 35 ft maximum widths for commercial driveways. Chapter 22 Section 1012 states that driveway minimum widths are 12 ft for one-way commercial driveways and 24 ft minimum for two-way driveways. The driveway is 36 ft wide which is slightly wider than the Ordinance Requirements since the driveway includes three (3) lanes.
- In accordance with Chapter 22 Part 10, the separation distance between driveways is required to be two hundred (200) feet on Collector Streets. River Road (T-663) is classified as a Collector Street in the Smithfield Township 2001 Comprehensive Plan Update. The entrance and exit drives are adjacent to each other, so separation distance is not a consideration.

Sketch Right-of-Way/Legal Slope Easements from I-80 As-Builts

 A Sketch of the I-80 Legal Right-of-Way Lines for Limited Access and the Legal Slope Easement Lines is included in Attachment O. The Legal Right-of-Way Lines for Limited Access and the Legal Slope Easement Lines were plotted from the I-80 As-Built Plans and are approximate.

B. Preliminary Stormwater Management

Permit Requirements

 Township Land Development, Monroe County Planning, Erosion and Sediment Control, and National Pollutant Discharge Elimination System (NPDES) Approvals are required. A Pennsylvania Department of Environmental Protection (PADEP) Chapter 106 Permit for development in a floodplain may be required since the property in the floodplain is expected to be developed by a public entity.

Township Stormwater Regulations and Act 167 Stormwater Management Plan

- The Smithfield Township Stormwater Ordinances are consistent with the Brodhead Creek Act 167 Plan.
- The site is located within Brodhead Creek Watershed District C. District C is a Provisional Discharge District allowing direct discharge of runoff, if the existing downstream drainage system meets the Ordinance requirements. A copy of the Stormwater Management District Map and Additional Stormwater Management Requirements are included in Attachment J.
- Off-site areas that drain through a development site are not subject to release rate
 criteria when determining allowable peak rate, but on-site drainage facilities shall be
 designed to safely convey off-site flows through the development.

The downstream conveyance system consists of a series of swales, headwalls, and culverts. The system appears to include dry laid stone culverts and corrugated metal pipes. The pipes and culverts are obstructed with silt and overgrowth. The downstream system must be analyzed to determine the capacity and replaced if larger pipes are needed to convey the discharge from the site. If the existing system is adequate, it will require cleaning and repairs. The offsite areas that discharge to the site and are conveyed to Brodhead Creek through the downstream conveyance system will have to be collected on site and discharged into the downstream system.

Preliminary Hydrological Analysis

- The Ordinance provides Appendices that outline the requirements for the hydrologic calculations. The information is outdated but is used for this analysis. The site is located at the border of PennDOT Region 4 and 5 on the rainfall duration map, so Region 5 information is used to be conservative. The 1-year/ 24-hour storm rainfall amount is assumed to be 2.64 inches and the 2-year/ 24-hour storm rainfall amount is assumed to be 3.36 inches.
- Based on the Pennsylvania Department of Environmental Protection (PADEP)
 Spreadsheet for Volume Management dated December 2019, the required Water Quality Storage is 30,612 CF.
- The Infiltration Volume, referred to as Groundwater Recharge Volume, is calculated based on the Ordinance requirements:
 - \circ I= (200/CN)-2 => (200/55)-2 = 1.64 in

 \circ Re_v = I x impervious area SF/12 = (1.64 in)(112,850 sf)/12 = 15,423 CF => 15,500 CF

The Required Stormwater Management Facilities can be provided on site but may not meet the required impervious to infiltration area ratio of 5:1. The Parking Garage Site Plan Layout Sketch in Attachment A illustrates a preliminary stormwater management facility size and location to accommodate a portion of the required water quality and recharge volumes. An underground stormwater storage facility with a footprint of approximately 12,600 sf is anticipated below the pavement. The basin and underground storage facility are assumed to be infiltration facilities. Additional water quality treatment including bioretention swales and innovative stormwater re-use techniques will likely need to be incorporated to meet the regulatory volume reduction and infiltration requirements. Innovative stormwater management facilities including filtering inlets and re-use of stormwater for township athletic field irrigation can be considered for final design. The stormwater runoff exceeding the 2-yr 24-hr storm runoff must bypass the infiltration basin and underground storage facilities. With the site being located within the 100-year floodplain, the elevations of the infiltration facilities will be below the 100-year flood elevation and potentially below the 10-year flood elevation. The location of the stormwater facilities below the flood elevations will increase the operation and maintenance activities and costs. The infiltration basin and underground storage will have to be evaluated after each major storm event to determine any impacts. The facilities may require cleaning and potential replacement of key components such as stone bases, filter media, geotextiles, soils, and plantings to assure proper infiltration capacities.

Evaluation of Site Constraints

Site Constraints include Zoning Requirements; Conservation Designation; Floodplain Development Requirements; the lack of public water and sewer service; the I-80 Legal Right-of-Way Line for Limited Access and the Legal Slope Easements; the elevations relative to the surrounding roadways and rail; the proximity of the road frontage to the highway overpass and existing railroad; Township Stormwater, NPDES and infiltration requirements; and potential Wetlands. These constraints must be resolved to develop the site as a Commuter Rail Station and Parking Garage. Several of the constraints are regulatory and will require the cooperation of the Smithfield Township governing body and community to resolve.

The rail station is not a permitted use in the existing R-1 Low Density Residential Zoning District. Public Transportation Facilities are defined as railroad, bus, and other public transportation passenger terminals and facilities and are permitted as a Conditional Use in the adjacent C-1 Commercial Zoning District. Approvals for the use will be required from the Township. The height of the parking garage will also require approvals from the Township. In Zone C-1, there are specific height exceptions which can be granted as a Conditional Use, but the height of the parking garage will not be consistent with the conditions. The building setbacks and building coverages are related to the height exceptions with the building setbacks increasing as the height of the building increases and the allowable building coverage decreasing as the height of the building increases. The building setbacks and building coverages required by Ordinance cannot be met on the site for a 60 ft high building.

The site is designated as Conserved Lands on the Township's Official Map. This designation must be changed to develop the site and the land designation change must be approved by the Township.

The site is located in a regulated floodplain. The elevation of the 100-yr flood is 323 in the vicinity of the site and the rail is at approximately elevation 316. The flood elevation is approximately seven (7) ft above the rail elevation. A permit is required to construct in the floodplain. Elevations of certain building components are regulated such as the lowest occupied floor elevation is 324.5 and the lowest elevation of electrical panels and equipment is 327 and 323 respectively. These elevations are considerably higher than the adjacent roadway and rail elevations and will require fill to accomplish. A flood analysis of the development would be needed to determine whether there are any impacts to flood elevations and whether any impacts can be mitigated

Public Water and Sewer services are required to develop the site. The public systems are not adjacent to the site and will have to be extended to serve the site.

The recorded lot area must be confirmed since the Legal Right-of-Way Line for Limited Access appears to encroach into the lot and it is not clear if this line is included in the Monroe County information. Any adjustment to the lot area will impact the building and impervious coverage calculations. The Legal Slope Easements impact the development of the site but may be able to be modified to accommodate the construction of a parking garage and rail station.

The topography of the site includes steep slopes adjacent to I-80 and the railroad tracks. The surrounding areas are higher than the site and the site must be filled to develop the parking garage and rail station. I-80 is approximately twenty (20) ft higher than the site with slope easements. Approvals for highway encroachments will be required to work within the slope easements and to fill the site. River Road and the railroad tracks are approximately eight (8) ft higher than the site.

The Stormwater Management Ordinance requires infiltration as a component of the Water Quality and Groundwater Recharge requirements. Field tests will be required to demonstrate the infiltration rates. If infiltration is not practical on the site, additional water quality treatment will be required.

There appears to be areas of the site that are retaining water. The site will have to be investigated to demonstrate that there are no wetlands on site. If any portion of the site is determined to be wetlands, the area will have to be avoided or mitigation may be required if the impacted area is more than de minimus.

Environmental/Cultural Desktop Research (Chapter 93 Use of Stream, PNDI Search, Historic Properties, Waste Sites)

- Brodhead Creek is designated in PADEP Chapter 93 as a Trout Stocking (TSF) and Migratory Fishes (MF) stream. The Existing Use is Cold Water Fishes (CWF) and Migratory Fishes (MF) stream. Supporting Documentation is included in Attachment K.
- A PNDI Search was conducted. Additional Project Specific information must be forwarded to the PA Fish and Boat Commission and the US Fish and Wildlife Service to clear potential impacts on Special Concern Species and Sensitive Species. The Special Concern Species include three species of mussels. A copy of the PNDI Search is included in Attachment L.
- A Soils Report is included in Attachment M.

- Historic Properties The Delaware, Lackawanna and Western Railroad Line that is adjacent to the site and will provide rail service is identified as a Historical Property on Pennsylvania One Map. The Delaware Water Gap Environmental Research results from the on-line Pennsylvania One Map Report is included in Attachment N.
- Waste Sites A Waste Site is identified on Pennsylvania One Map along River Road on the west side of I-80. The waste site is associated with Five Star Precision Printing. The Delaware Water Gap Environmental Research results from the on-line Pennsylvania One Map Report is included in Attachment N.

Volume/footprint of stormwater management facilities

- To provide an infiltration footprint to meet the 5:1 impervious coverage to infiltration ratio, approximately 22,600 sf of infiltration surface is required.
- An infiltration basin with a footprint of 10,000 sf and a depth of 4 ft could be used to
 treat a portion of the required water quality volume and to infiltrate a portion of the
 required recharge volume. A maximum ponding depth of 1.5 ft is used in the
 conceptual layout. Field verification of the infiltration rate and the depth to restrictive
 layers will be required.
- The additional infiltration surface could be accomplished through underground storage with a footprint of approximately 12,600 sf and a ponding depth of 1.5 ft.
 Field verification of the infiltration rate and the depth to restrictive layers will be required.

Conceptual layout within available site footprint

• The stormwater facility layout is illustrated on the Conceptual Parking Garage Site Plan Layout Sketch included in Attachment A.

C. Conceptual Parking Garage/Internal Layout

Improvements Footprint

• The garage and rail station footprint is 420 ft long by 130 ft wide with a 710 ft long by 10 ft wide platform. A conceptual footprint as shown in Attachment A provides parking for approximately 850 vehicles in six floors including roof parking. Nine hundred (900) parking spaces could be accommodated through layout revisions or with additional floors of parking. Township approval of any height garage over 35 ft, the building setbacks, and the building coverages is required.

Evaluation of Site Access – Number and Locations of Driveways, Autoturn analysis of driveways and internal maneuvers

• One (1) two-way driveway is illustrated on the Conceptual Parking Garage Site Plan Layout Sketch in Attachment A. Three (3) twelve (12) ft wide lanes are shown along the western side of the building. Along the northern side of the building, the driveways expand to provide four (4) twelve (12) ft wide lanes. The center lanes are reversible to provide three (3) lanes into the garage during the morning commute and three lanes exiting the garage during the evening commute. Two (2) lanes along the western side of the building will be used to enter the site during the morning commute and two (2) lanes will be used to exit during the evening commute. An Autoturn analysis was performed for the driveways, the cul-de-sac, and internal garage maneuvers to evaluate that adequate lane widths are provided.

Flood Event Contingency Evaluation

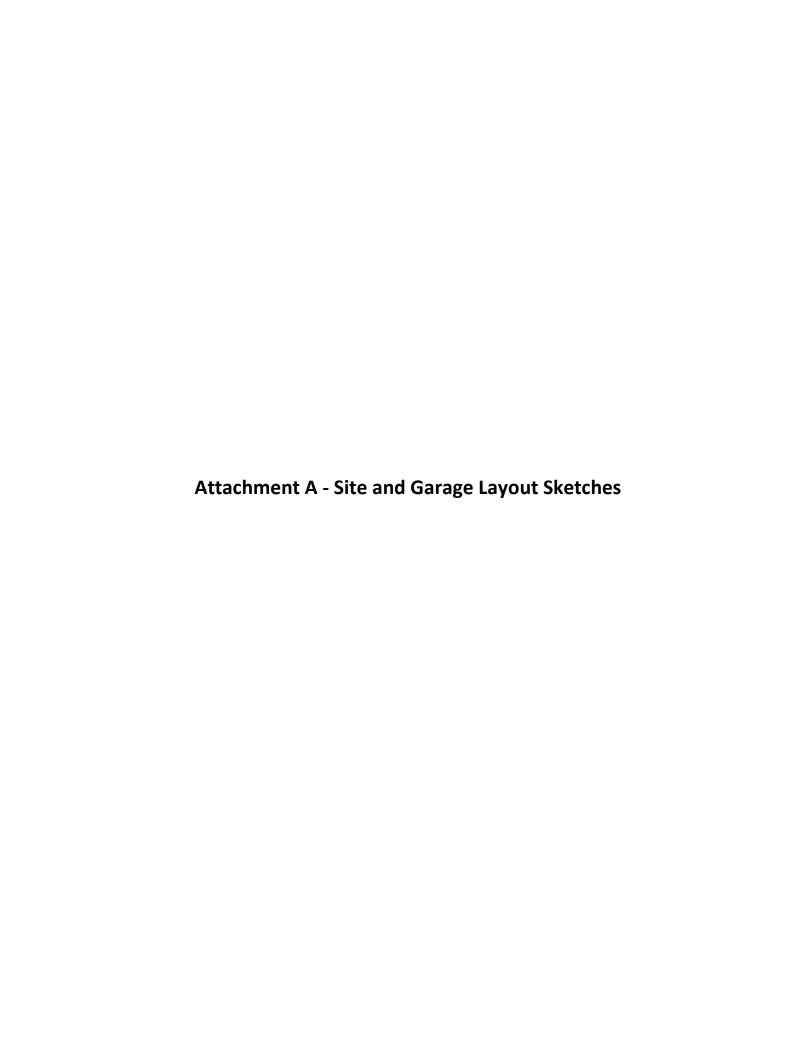
• The concept garage elevation is set with the first floor at the Regulatory Flood Elevation of 324.5. The platform, rail, the entrance and exit driveway intersection with River Road, and River Road are expected to be inundated during the 50-year and 100-year flood event. Since the rail will be inundated, it is expected that rail service will be suspended during these events. Provisions for the emergency shutoff of utilities will be designed into the building systems.

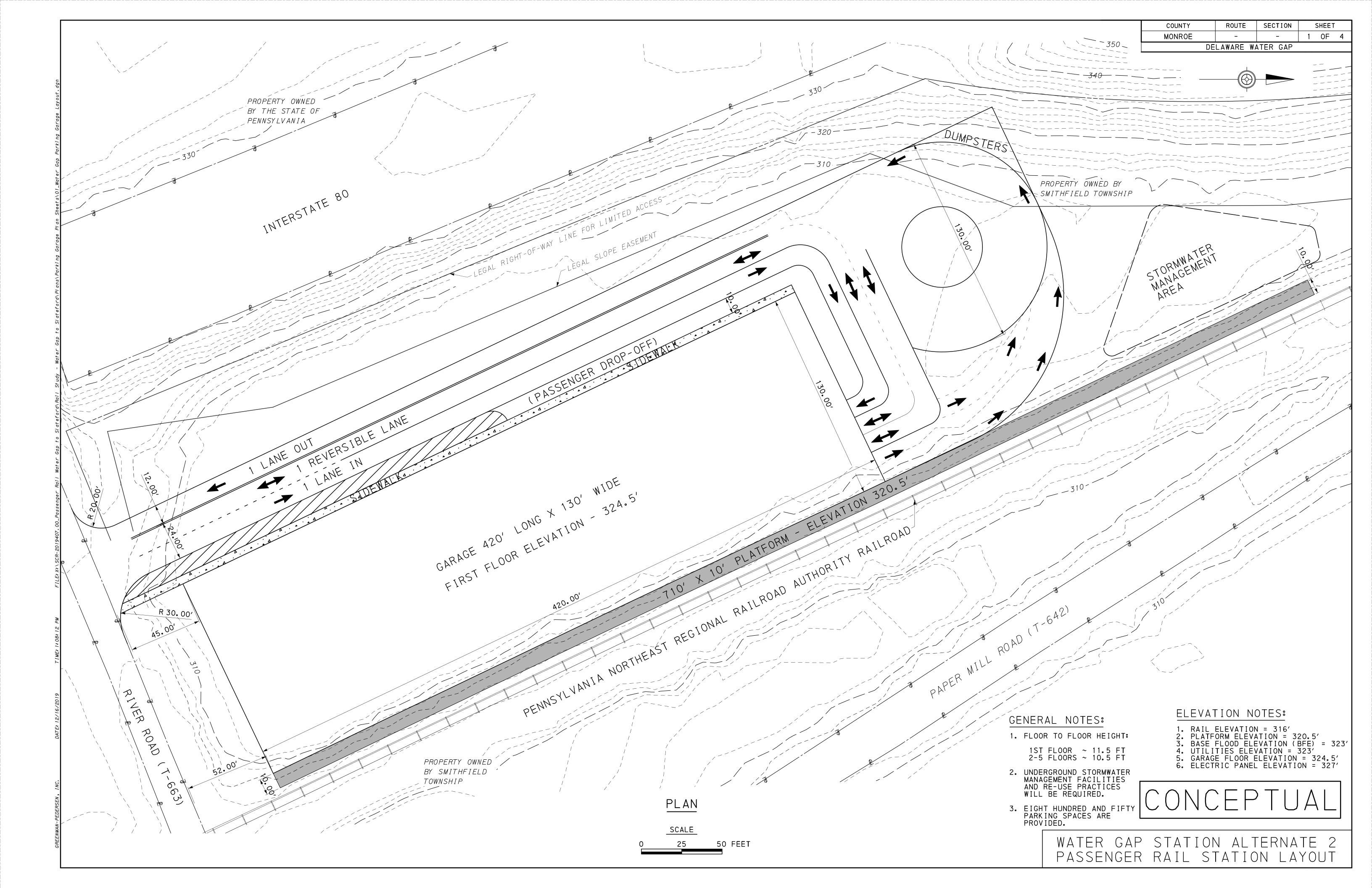
Service/Facility Maintenance Needs: supplies deliveries, garbage truck maneuvering, emergency and maintenance vehicle accommodations

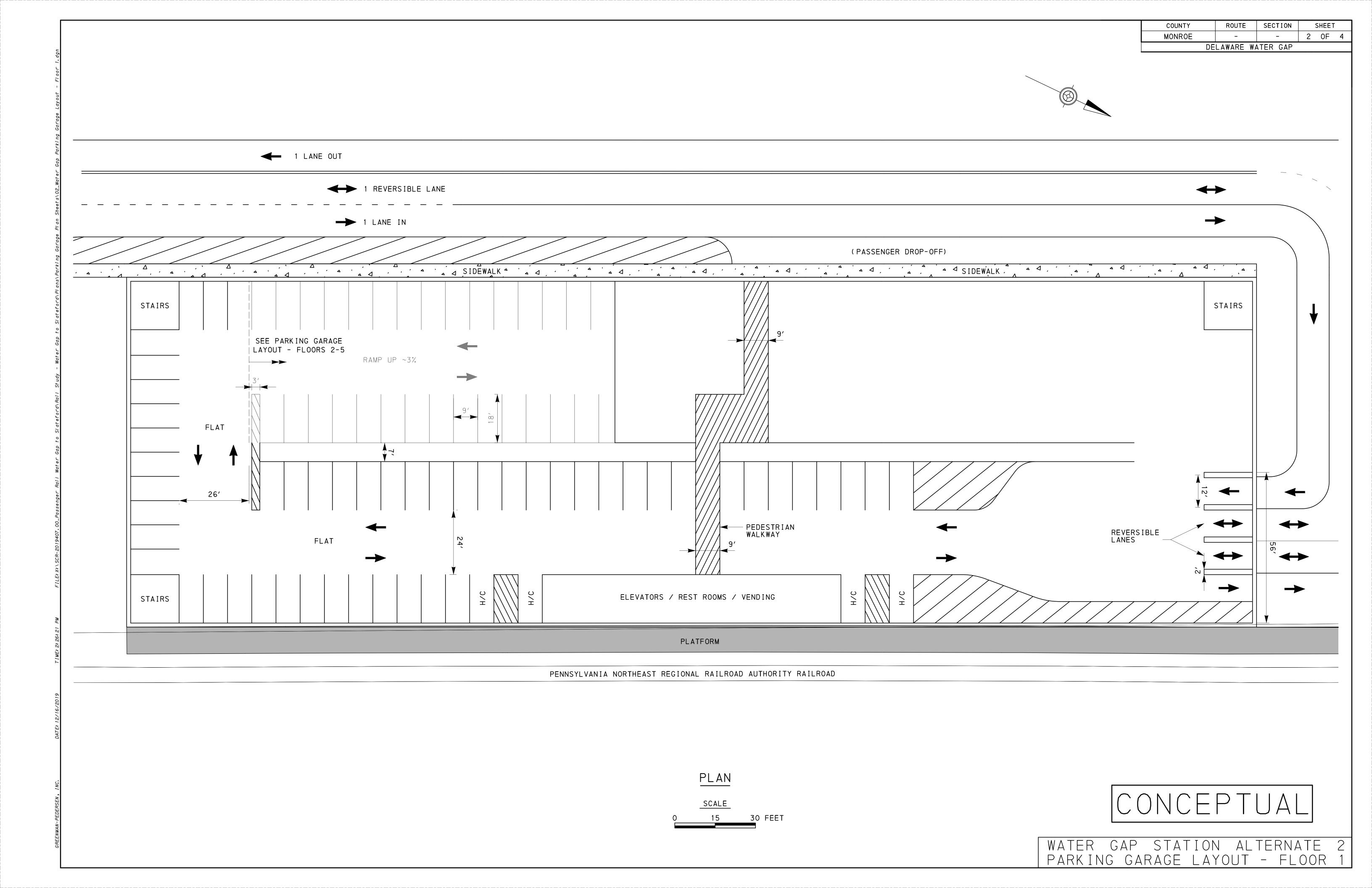
- The cul-de-sac illustrated on the Conceptual Parking Garage Site Plan Layout Sketch in Attachment A at the north end of the building is designed to accommodate deliveries, garbage truck maneuvering, emergency vehicles and maintenance vehicles.
- The first floor of the garage has areas that can be used for Maintenance and Utility rooms.

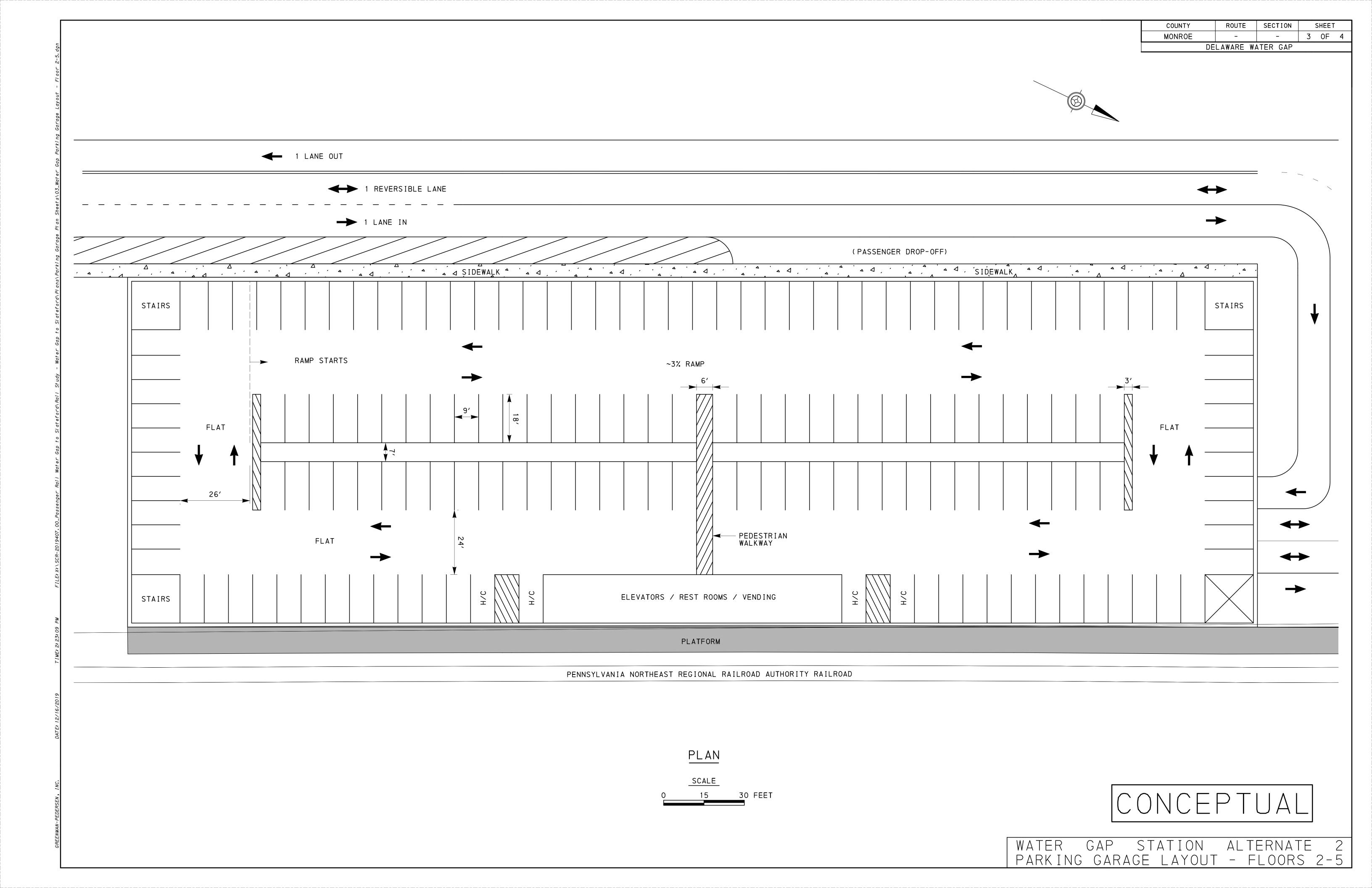
Utility needs and conceptual layout of service lines, mechanical needs, sewer/water needs, lighting, etc.

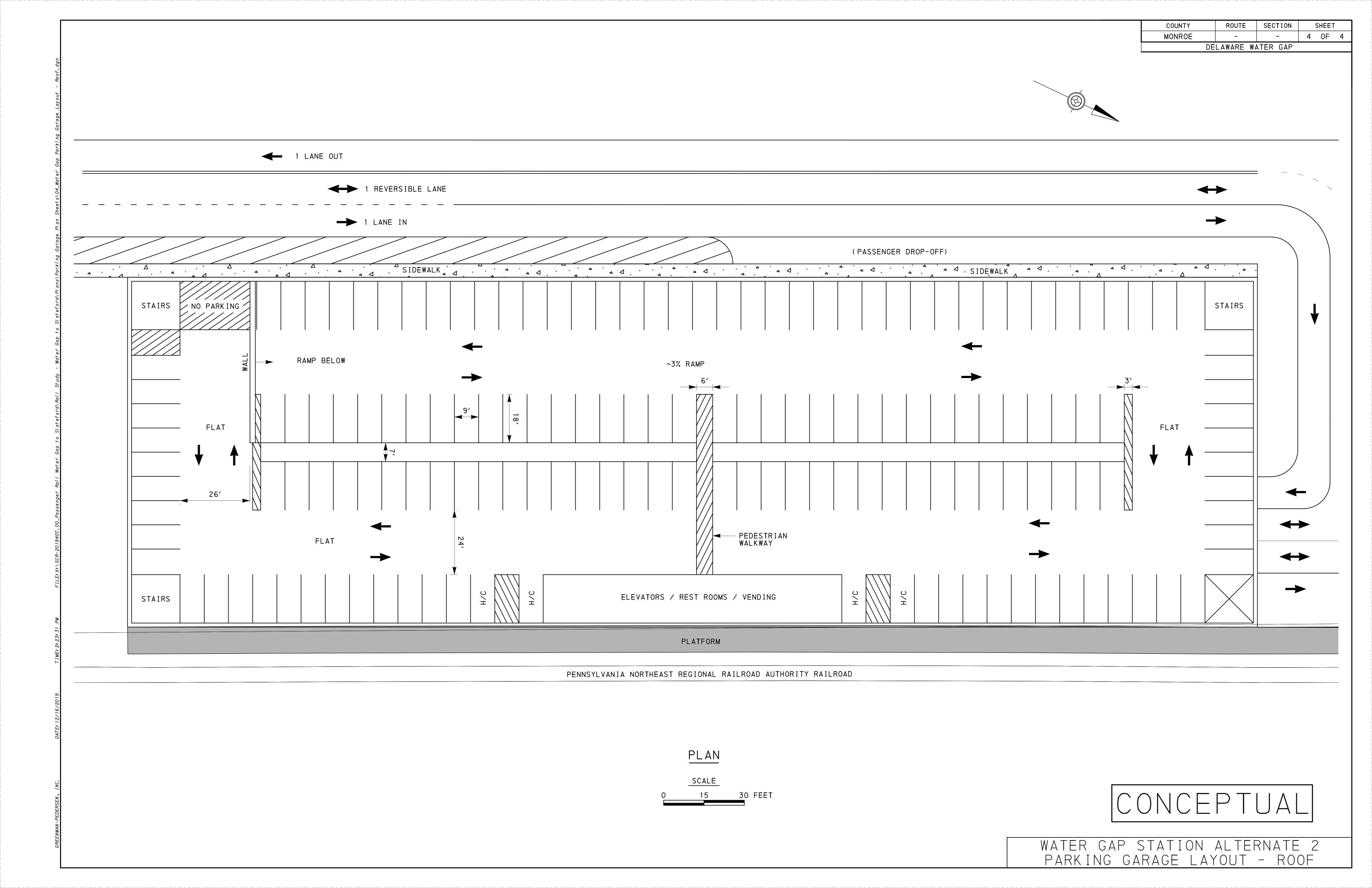
 Domestic Water, Fire Water, Sanitary Sewer, Electric and Telecommunication Services will need to be extended to provide the services to the site. Mechanical and Lighting Systems will be included in the project.

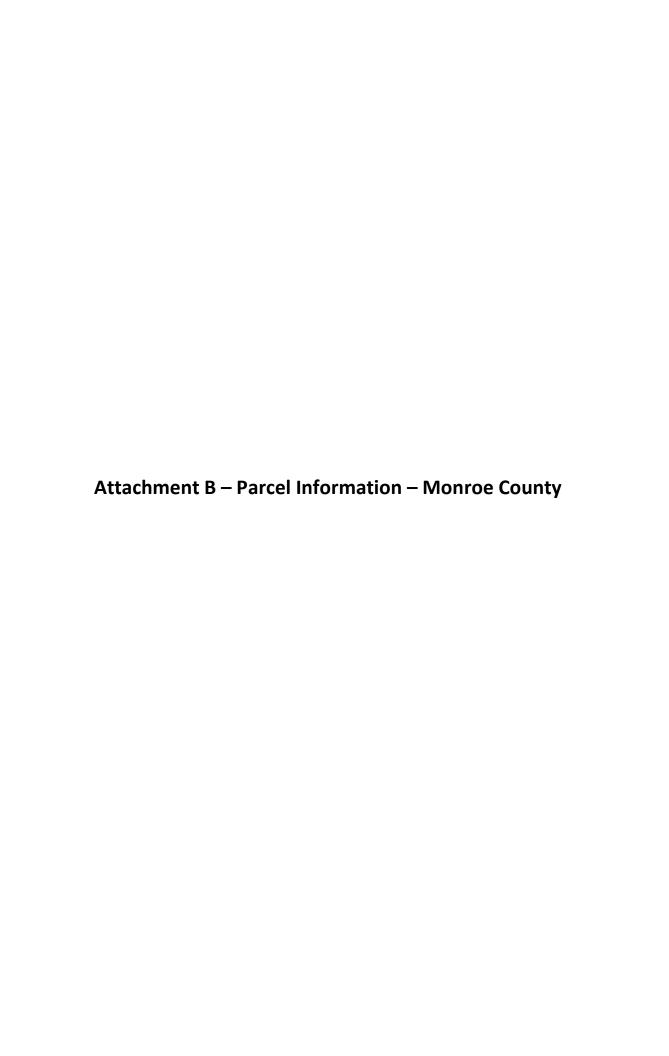


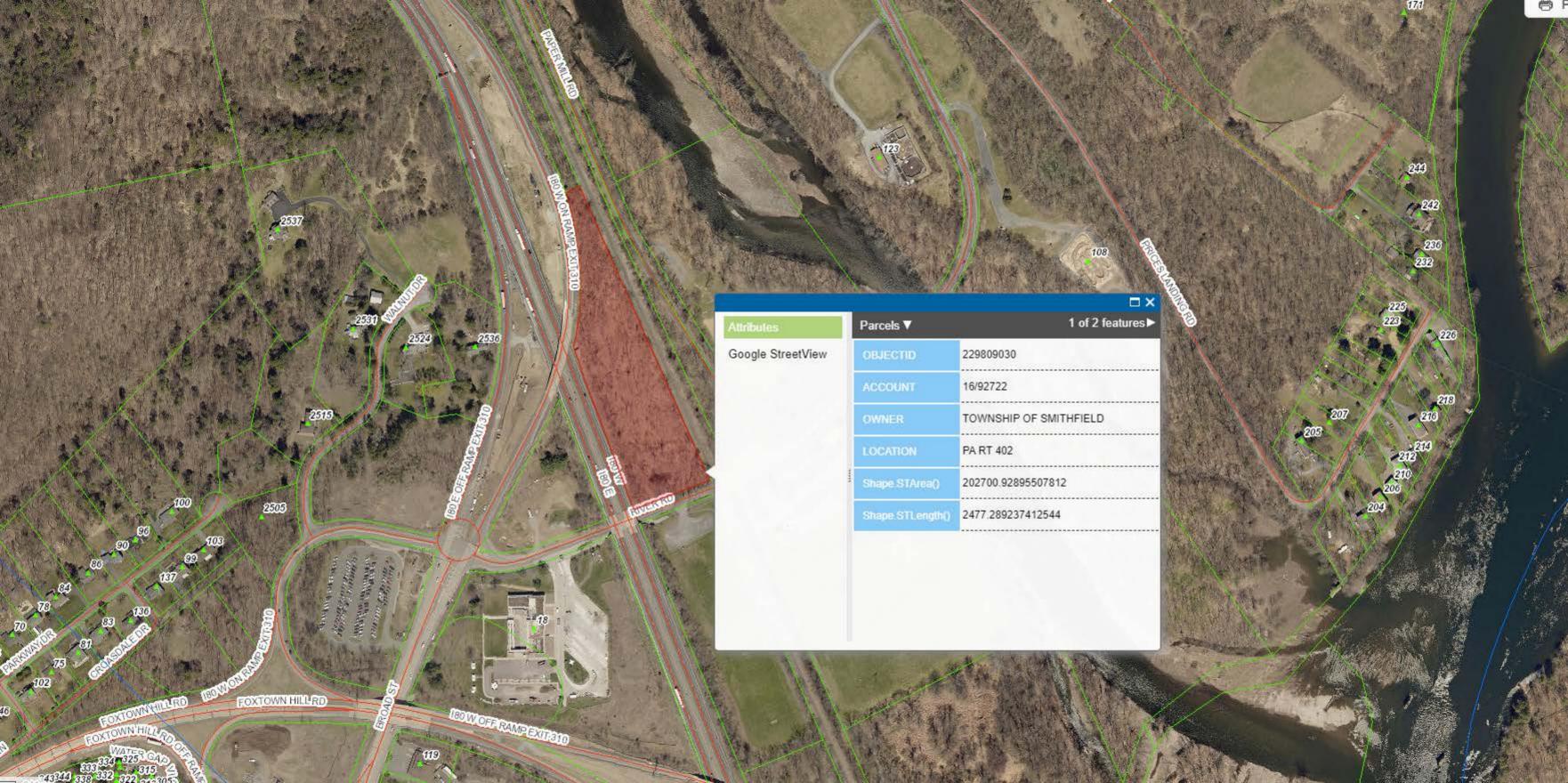












Monroe County

Parcel # 16/92722 - PIN: 16731100919889

Property Owner: TOWNSHIP OF SMITHFIELD

Address: RD 5 BOX 5229

EAST STROUDSBURG PA 18301

Township: Smithfield Township

Property Location: PA RT 402

Acreage: 4.13

Legal Description: PARCEL A

Land Use: PARKS

Class: Exempt

Deed Book/Page: 2065-7977

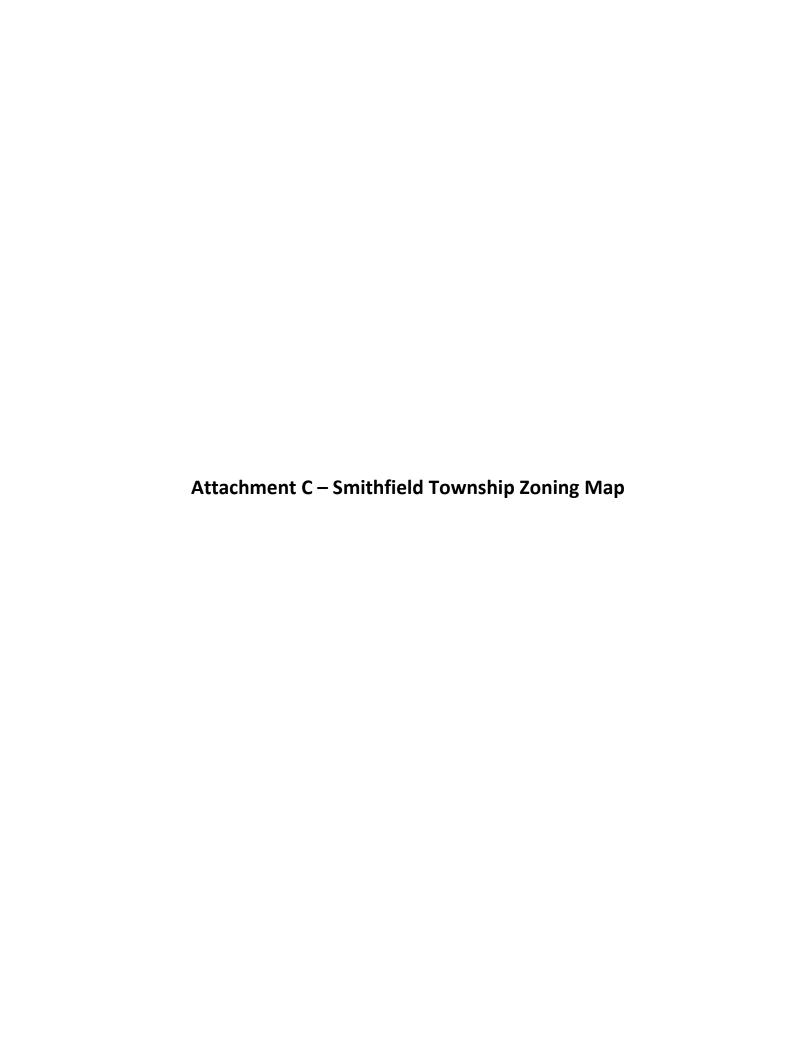
Sale Date: 6/30/1999

Sale Amount: \$1.00

Homestead:

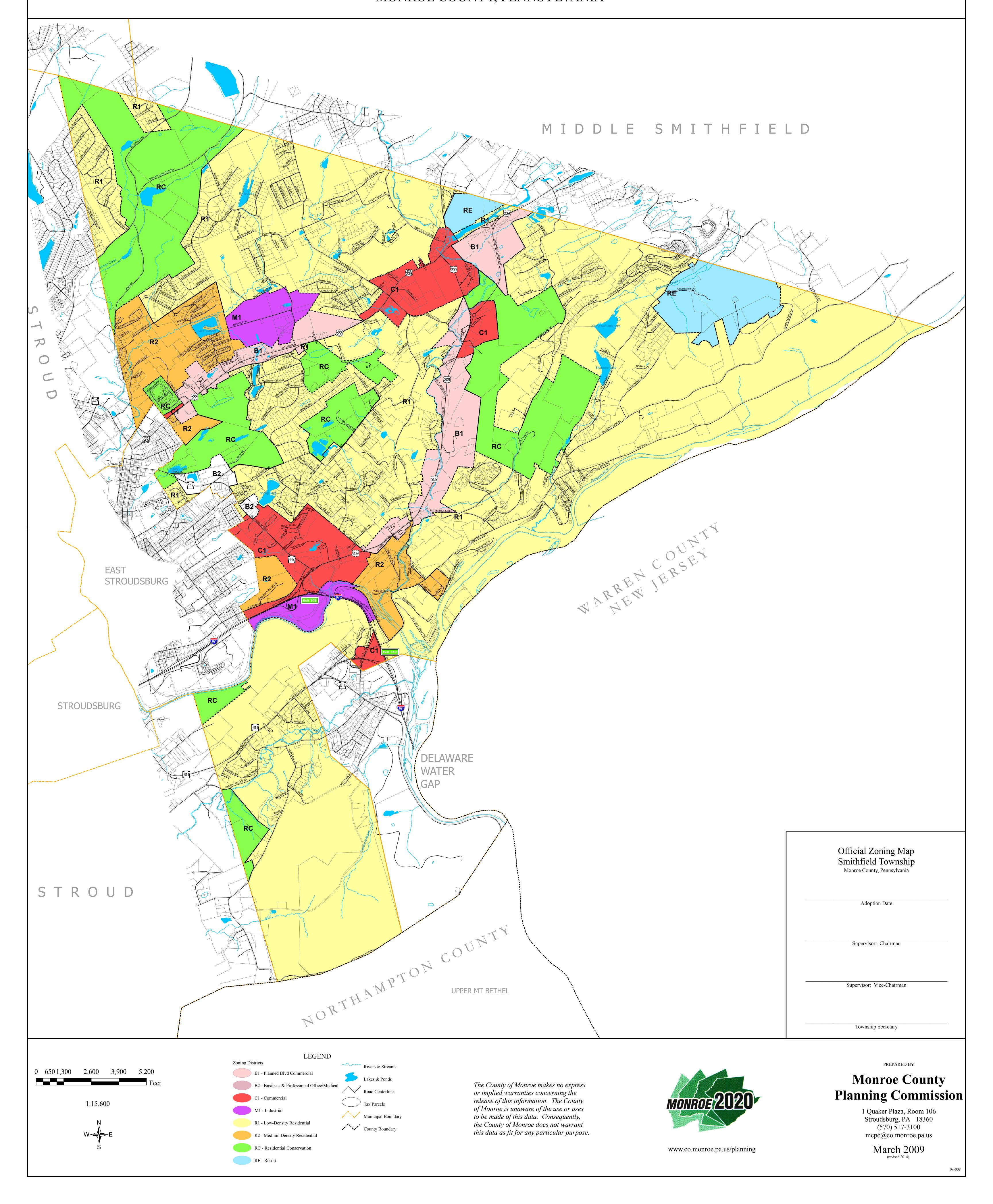
Land Value: \$10,510.00

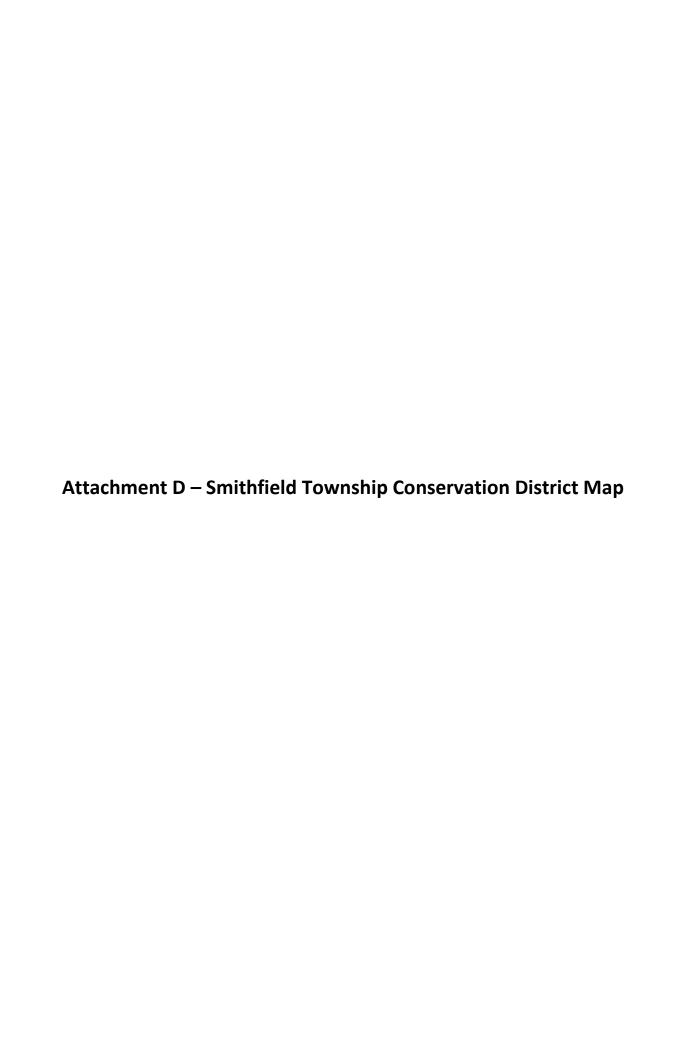
Building Value: \$0.00



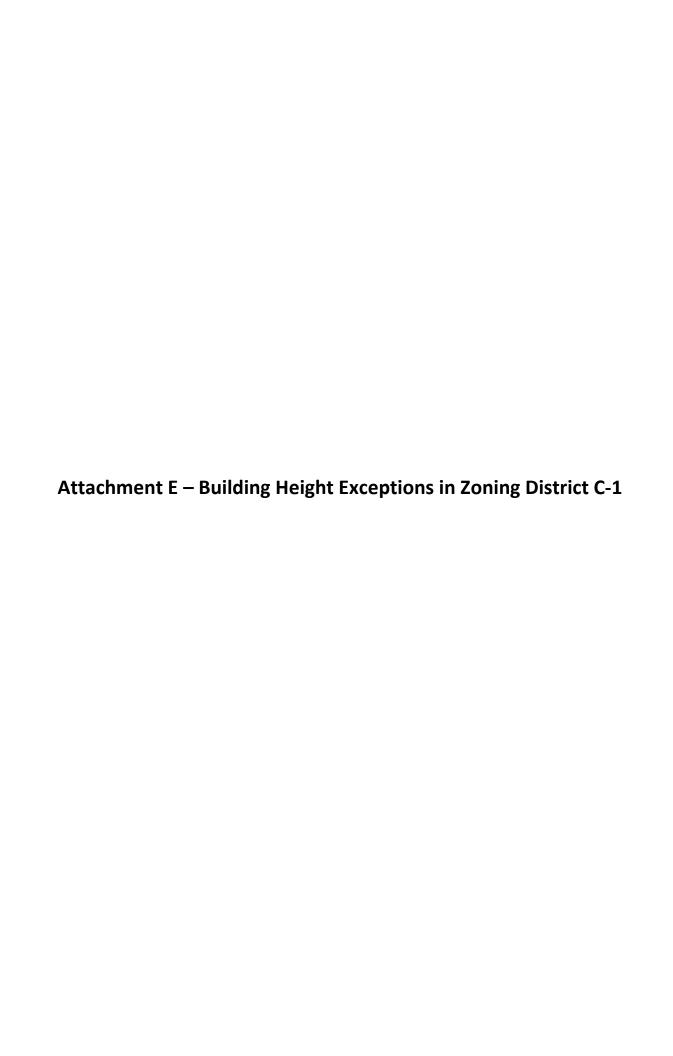
OFFICIAL ZONING MAP OF SMITHFIELD TOWNSHIP

MONROE COUNTY, PENNSYLVANIA





DRAFT OFFICIAL MAP SMITHFIELD TOWNSHIP MONROE COUNTY, PENNSYLVANIA TWIN FALLS ROAD @ STATE ROUTE 209 STROUDSBURG / DELAWARE SMITHFIELD TOWNSHIP MONROE COUNTY, PENNSYLVANIA OFFICIAL MAP MAP ELEMENT NOTES Delaware Water Gap National Recreation Area SMITHFIELD TOWNSHIP MONROE COUNTY, PENNSYLVANIA OFFICIAL MAP SMITHFIELD TOWNSHIP Adopted in accord with Article IV of the Pennsylvania Municipalities Planning Code as part of the 2009 Official PLANNING COMMISSION Chairman Vice Chairman Supervisor Recording Secretary Supervisor Attest: This is to certify that this is the Official Map of Smithfield Township referred to in the Official Map Ordinance of Smithfield Township, Monroe County, Pennsylvania. Member Date Township Secretary PREPARED BY **Monroe County** LEGEND The County of Monroe makes no express Planning Commission or implied warranties concerning the Existing Conserved Lands Appalachian Trail Potential Conservation Acquisitions 1:12,000 release of this information. The County of Monroe is unaware of the use or uses McDade Trail 1 Quaker Plaza, Room 106 Stroudsburg, PA 18360 (570) 517-3100 Potential Road Improvement Educational Services Land Use to be made of this data. Consequently, Existing Railroad NWI Wetlands County Boundary Government Services Land Use the County of Monroe does not warrant this data as fit for any particular purpose. Municipal Boundary Abandoned Railroad mcpc@co.monroe.pa.us www.co.monroe.pa.us/planning November 2009



Delaware Water Gap Rail Station Parking Garage Smithfield Township, Monroe County, PA Attachment E – Building Height Exceptions in Zoning District C-1

In accordance with the Smithfield Ordinance Chapter 27 Zoning, Section 401.1.A.(1)(b), Building Height Exceptions in the C-1 Zoning District may be permitted by Conditional Use Permit provided:

- No building may exceed fifty (50) feet with no more than forty-two (42) feet of occupied space and eight (8) feet of mechanical equipment on the roof, or three (3) stories under any circumstances.
- The building is served with central sewer and water.
- The front yard shall be twice the height of the building, less 5 feet.
- o Each side yard shall be fifteen (15) feet plus the height of the building.
- The rear yard shall be twenty (20) feet plus the height of the building.
- The lot area shall be forty-three thousand five hundred sixty (43,560) square feet or one acre plus thirty thousand (30,000) square feet per each additional five (5) feet of building height exceeding thirty-five (35) feet.
- Building coverage shall be limited to a maximum thirty-five (35) percent of lot area but shall be reduced by two (2%) percent for each additional five (5) feet of building height exceeding thirty-five (35) feet.
- Plans must be reviewed and approved by the Fire Chief and Emergency Services
 Providers; buildings must be fully sprinklered with a Class III Standpipe System on each
 floor; buildings must have an addressable fire alarm system; and buildings must have
 appropriate signage and emergency lighting.



Delaware Water Gap Rail Station Parking Garage Smithfield Township, Monroe County, PA Attachment F – Floodplain Requirements

Chapter 8, Floodplains, Part 1 Floodplain Management of the Smithfield Township Code of Ordinances includes the Floodplain regulations and requirements.

- Construction in the floodplain requires a Conditional Use Permit and any development causing a
 rise in the 100-yr flood elevation referred to as the Base Flood Elevation (BFE) in the floodway
 will require a Letter of Map Revision (LOMR) from FEMA.
- Activities that do not alter the cross-sectional dimension of the floodplain and storage capacity
 are permitted, but new construction or development that retards, diverts, or alters the natural
 flow of flood waters is prohibited.
- Stormwater Conveyance and Management Facilities are permitted.
- Any building permitted by variance shall be elevated to the regulatory flood elevation. In AE Zones, any new construction shall have the lowest floor, including basement, elevated to or above the regulatory flood elevation. The regulatory flood elevation is defined as the BFE plus a freeboard safety factor of one and one-half (1 ½) feet which equals 324.5.
- Fully enclosed space below the lowest floor, excluding basements, which will be used for the
 parking of a vehicle, building access, or incidental storage, shall be designed or constructed to
 allow for the automatic entry and exit of flood waters for the purpose of equalizing hydrostatic
 forces on exterior walls. A minimum of two openings with minimum net total area of one
 square inch of every square foot of enclosed space with the bottom of the openings no higher
 than one foot above grade.
- Electric Distribution Panels must be at least three feet above BFE which equals 327, and electrical, mechanical, and utility equipment shall be above BFE which is 323.

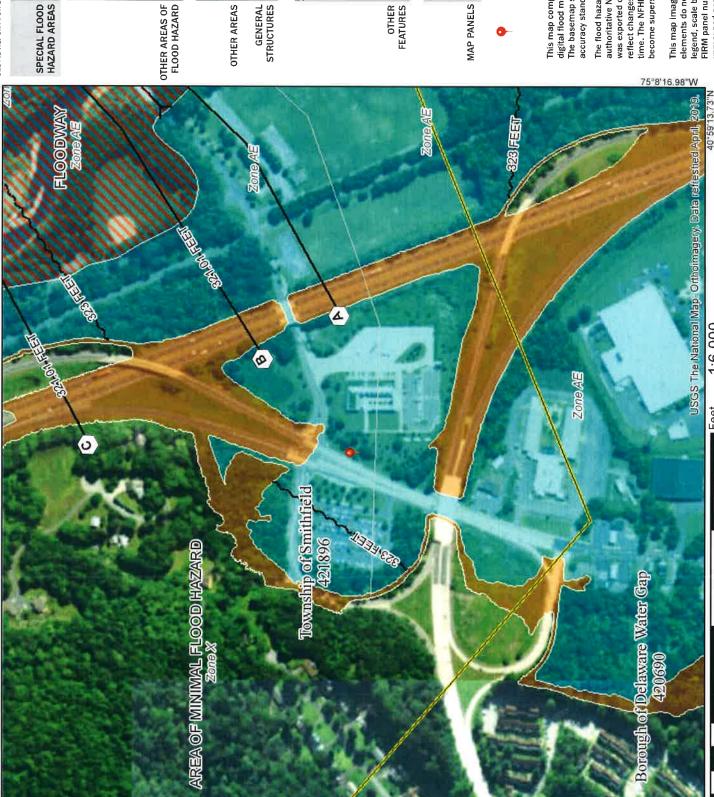


PASSENGER RAIL STUDY
DELAWARE WATER GAP BOROUGH, MONROE COUNTY
UPPER MOUNT BETHEL TOWNSHIP, NORTHAMPTON COUNTY



National Flood Hazard Layer FIRMette





Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

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

Without Base Flood Elevation (BFE) 20ne A, V. A99

0.2% Annual Chance Flood Hazard, Are: of 1% annual chance flood with average depth less than one foot or with drainag areas of less than one square mile Zone Regulatory Floodway

Future Conditions 1% Annual

Area with Flood Risk due to Levee Zone E Area with Reduced Flood Risk due to Chance Flood Hazard Zone X Levee. See Notes. Zone X

NO SCREEN Area of Minimal Flood Hazard Zone X

Effective LOMRs

Area of Undetermined Flood Hazard Zon

Channel, Culvert, or Storm Sewer

STRUCTURES | 1111111 Levee, Dike, or Floodwall

Cross Sections with 1% Annual Chance

Base Flood Elevation Line (BFE) Water Surface Elevation Jurisdiction Boundary Coastal Transect : Limit of Study ----- 513 -----

Coastal Transect Baseline

Hydrographic Feature Profile Baseline

Digital Data Available

No Digital Data Available

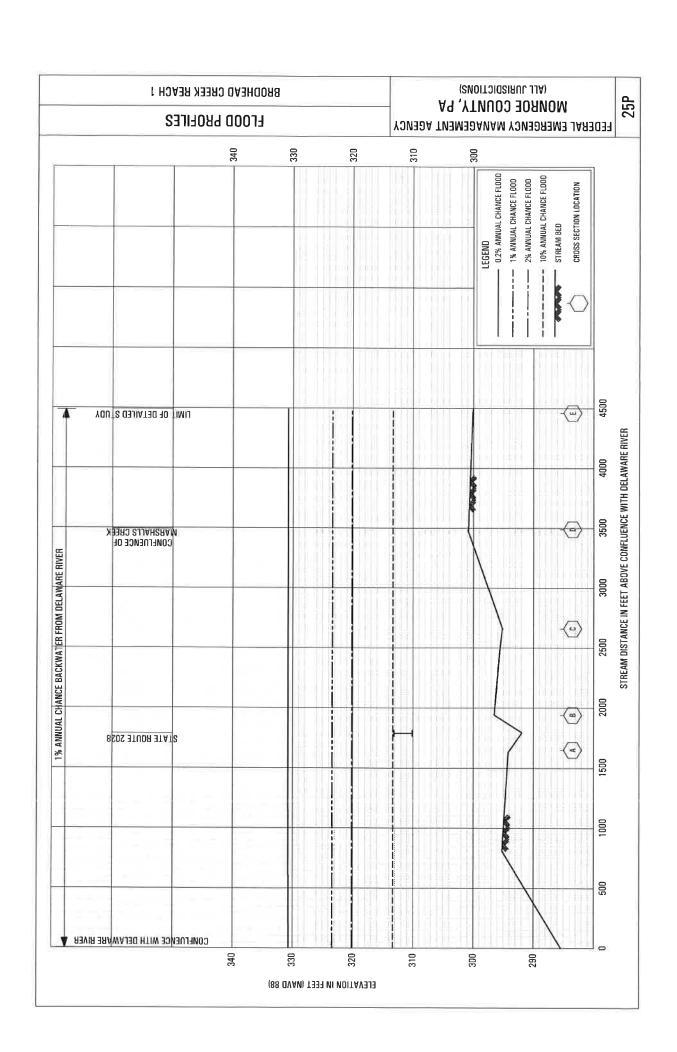
Unmapped

The pin displayed on the map is an approximal point selected by the user and does not represt 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

authoritative NFHL web services provided by FEMA. This map reflect changes or amendments subsequent to this date and was exported on 11/4/2019 at 4:11:22 PM and does not time. The NFHL and effective information may change or The flood hazard information is derived directly from the 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, FIRM panel number, and FIRM effective date. Map images for legend, scale bar, map creation date, community identifiers, unmapped and unmodernized areas cannot be used for

1,500







1:9,028 40.998 | -75.136



Delaware Water Gap Rail Station Parking Garage Smithfield Township, Monroe County, PA Attachment H – Land Development Process Requirements

Chapter 22 Subdivision and Land Development, Part 10 Design Standards and Improvement Requirements Sections 1002 and 1003 of the Smithfield Township Code of Ordinances requires the following:

A Stepped Design Process-

- o Delineate Conservation Land and identify Stormwater Management Areas.
- Locate buildings considering topography and avoiding Conservation Land and Stormwater Management Areas.
- Locate driveways and parking areas to provide safe vehicular and pedestrian access.
 Trail networks should be incorporated into properties as appropriate.

Natural Features Protection-

The Township Ordinances emphasizes Natural Features Protection. Woodlands are to be preserved to the maximum extent possible and existing woodlands along roadways and property lines should be retained for buffers. Development should minimize adverse impact on flood hazard areas, lakes, ponds, freshwater wetlands, and steep slopes. No structure, filling, piping, diverting or stormwater detention basins shall be permitted within floodplain areas unless the use, activity or development is in strict compliance with the Floodplain Ordinance. On sites with steep slopes, the use of retaining wall for grade changes is encouraged and the following development restrictions apply:

	Slope Percent	Maximum Area of Disturbance
Moderate	15% to 25%	60%
Very Steep	25% or greater	10%



- j) Provide for a balanced tax base and community where homes, services and jobs can be secured with minimal travel by encouraging the development of small office buildings, research facilities, small wood manufacturing enterprises (e.g. crafts and furniture) and other light manufacturing.
- Encourage the development of alternative means of transportation through further development of public transportation services. The Township also needs to carefully evaluate the impacts of rail commuter service and, more specifically, a local train station (the current proposal is to locate the local station in East Stroudsburg). A train station located in New Jersey or East Stroudsburg could create congestion and growth impacts similar to one located in Delaware Water Gap without the associated convenience to Township residents. Therefore, the Township should not support such a project without considering both the site-specific and community-wide impacts.
- 2.3.2 Protect the health and safety of residents and visitors through education and enforcement of building code requirements, on-site sewage system regulations and floodplain development standards.
- 2.3.3 Preserve the character of existing residential streets and rural highways and promote safe, efficient and uncongested circulation of pedestrian and vehicular traffic.
 - a) Streets should, whenever possible, be designed in such a manner as to preserve natural topography and tree cover, minimize cut and fill and preserve and enhance views on or off the subject parcel.
 - b) Developers should be required to provide for walking, as well as vehicular, connections within developments and with adjacent land uses. These should include trails and bikeways (but not necessarily sidewalks). Such facilities can be provided in some instances by setting the cartway to one side of a right-of-way to allow a trail or bikeway on the other side.

There are other land use/traffic issues related to the Bypass. The impact of the Mosier Dairy development and on-going studies of the two I-80 interchanges are among them. There will be ever more pressure to limit future highway construction needs by controlling land use. There are already what appear to be an endless succession of studies about what to do, the fundamental problem being that most of the Monroe and Pike County development taking place serves residents using only one way in and out - the I-80 bridge

Ultimately, the only solution on both a local and regional level is the creation of local jobs, services and attractions that minimize the need for extensive travel. Ironically, this may result in more development, not less, which is a very difficult sell in an area facing major congestion problems. The challenge is to find the right balance of commercial and residential growth and employ mechanisms that allow growth without exacerbating traffic problems. Many of the CTLUMS recommendations fall into these categories.

Other Factors:

There are still other factors that will influence Smithfield's growth. Two of the most important are the Monroe County Open Space Initiative and the proposed commuter rail service. The former will provide access to some funding that can be used to help acquire valuable open spaces contributing to the character of the area or important as linkages to other open spaces.

Train service could reduce travel but the primary beneficiaries will be the State of New Jersey and the individual residents who are able to make use of the service. Smithfield Township as a whole will gain little because most of the persons using such a service will drive to the train station by traveling through Smithfield. A linked bus service into Middle Smithfield and Lehman Townships could help alleviate this problem but train service will also stimulate more residential growth offsetting these gains. It will also worsen the imbalance between residential and commercial/industrial activity that now exists. Train service may well be a good thing for

Monroe County and even Smithfield Township in terms of resident convenience but the land use impacts on Smithfield are arguably negative.

These various factors have been taken together in developing the land use recommendations that follow.

3.2.4 Proposed Land Use Plan.

The following are the specific recommendations constituting the Smithfield Township Land Use Plan:

a) Density Changes

Smithfield Township must strike the right balance between residential and commercial/industrial growth as it moves forward. It is a maturing community with slowing rates of residential growth but a great desire to improve the quality of future development. As it has developed over the last 30 years its remaining open spaces have become more difficult to develop and more valuable as open space.

Simultaneously, the Township has extended infrastructure and made infill development more practical in several areas. The Bypass project will address the one missing piece of infrastructure anticipated long ago but never realized as the expected growth of the surrounding area materialized. Given this background it is recommended Smithfield Township:

 Lower density on remaining large vacant parcels, generally now zoned R-1 Low Density Residential District, by creating a R-C Residential-Conservation District that would include these parcels. A brief comparison of the proposed R-C District with existing R-1 District follows along with a Proposed Land Use and Zoning Districts Map illustrating the locations of proposed R-C Residential-Conservation Districts:

3.5.2 Other Observations and Recommendations.

- a) There are two stone arch bridges on Township roads, those being on Green Mountain Estates and Post Office Roads and these should be preserved if at all possible.
- There are two park and ride facilities in the Township, one at the Information Center and the other being a private facility on Route 447. The former will be enlarged in conjunction with the establishment of a new Welcome Center. The latter needs enlarging and better maintenance. Another facility is planned nearby in Middle Smithfield as part of the Bypass.
- c) There is little public transportation in the Township except that provided by the Monroe County Transportation Authority and Martz to sites on the fringe of the Township. There are no good connections into East Stroudsburg or Stroudsburg for bus riders and this is a problem that should be addressed by the Authority in its planning.
- d) Railroad freight service is available to the Township and could get improved by alternative connections proposed by the County Railroad Authority. Commuter rail service between New York City (actually Hoboken, NJ) and the Poconos is also being advanced with three proposed stops in Monroe County, one of which is proposed for East Stroudsburg. (See Section 3.2.3 for additional discussion of this proposal and its potential impacts on Smithfield Township.)
- e) Air service is available for smaller planes at the Stroudsburg Airport on Airport Road. There is no room for expansion, however, nor any pressing needs to expand.
- f) Development of additional pedestrian and bikeway systems will be important as the Township grows. This should be addressed in the context of both new highway designs and the review of subdivision proposals. Bicycling safety is essential to address. Designated bikeways along East Brown Street, Route 209 and Route 447 should



"Martha," one of MCTA's Trolley Buses

Transit

The Monroe County Transit Authority (MCTA) has made significant improvements to its facilities and services over the past six years:

- Branded themselves as the Pocono Pony, expanded services and increased ridership
- Added the Featherman Wing to the main building
- Separated Fixed Route and Shared Ride departments to operate more efficiently
- Grew their fleet from 37 revenue vehicles to 48
- Acquired a thirty acre adjacent parcel and began work on Land Development Planning
- Added farebox technology to the Shared Ride and Fixed Route operations to support operator and accounting department performances
- Continued participating on multiple boards throughout the region, promoting the many benefits of public transportation for riders and non-riders alike

From 2007-2013, fixed route ridership increased 36% to over 240,000 riders and shared ride has increased 19% to almost 70,000 riders. These increases demonstrate the need for transit services and also reflect the service improvements made by the MCTA.

MCTA has updated their Strategic Plan for the next 5-6 years and this document is currently in final draft form. Some of the items expected to be in the plan are a 250 car Park and Ride. a Bus Transfer Center, Ride Share/ Vanpool programs, and potentially converting the fleet to natural gas. The MCTA is to be commended for their efforts in enhancing mobility in the county, and the updated strategic plan should be incorporated in the Comprehensive Plan update as soon as it is available.

Rail Freight and Rail Passenger Service

The Pennsylvania Northeast Regional Railroad Authority (PNRRA) oversees the provision of rail freight service in the county and has been successful in increasing the number of cars per year that service industries in the county. Interchanges with CP Rail and Norfolk Southern provide excellent connections to other parts of the country, and expansion of rail freight service should be encouraged. The availability of service is included in marketing efforts by the PMEDC and this should continue.

The restoration of passenger rail service between Scranton and Hoboken, NJ is an on-going project that has received much attention over the last 20 years. Currently, a seven mile section of the former Lackawanna Cut-off is being restored between Port Morris and Andover, NJ as the first phase of the restoration. Funding for the second phase (Andover to Delaware Water Gap) has not been secured, nor has funding for the third phase (Delaware Water Gap to Scranton). These additional phases will require major capital investment, and given the current

funding constraints, these phases may be delayed for some time. While few would argue against the provision of alternative modes of transportation, the reality of the difficulty of securing funding for these phases cannot be overlooked. It is recommended that the PNRRA continue to participate in the restoration process and advise the county of progress and opportunities.

Pocono Mountains Municipal Airport

The Pocono Mountains Municipal Airport (PMMA) has undergone recent improvements and changes which include the following;

Completion of improvements to runway 13-31. a 5.000 foot runway and a second hangar is now complete and this is a public/private partnership project in which the Authority has leased the land to a private developer who is constructing the hangar. Moyer Aviation has returned to the airport and this company provides charter service, flight instruction, and maintenance.

As a result of the runway expansion, larger equipment for snow removal has also been acquired.

There has been a notable increase in charter traffic due to the runway extension. The NASCAR races at Pocono International Raceway have generated part of this increase and the return of Indy cars for a third major race this year should also generate increased charter traffic.

The PMMA has had a long range plan for improvement for many years and has made significant progress in achieving stated goals. It is recommended that the Authority continue to improve facilities and expand services, and that they be actively involved in the preparation of the regional long range transportation plan.

The Pocono Mountains Municipal Airport near Mount Pocono [top]

A Delaware Lackawanna freight train heading north out of East Stroudsburg [bottom]







Delaware Water Gap Rail Station Parking Garage Smithfield Township, Monroe County, PA Attachment J – Stormwater Management Requirements

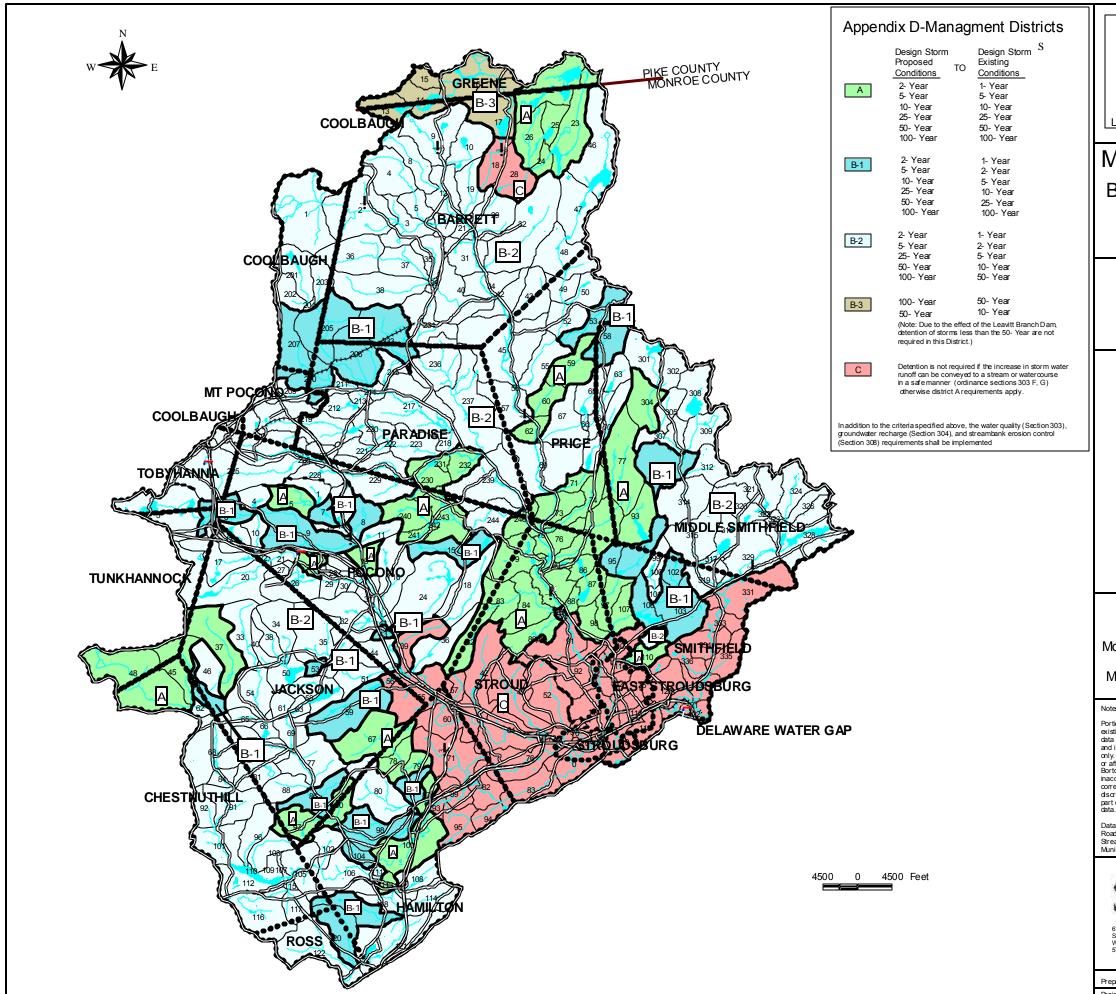
Township Stormwater Regulations and Act 167 Stormwater Management Plan – Stormwater is addressed in the Smithfield Township Code of Ordinances, Chapter 26 Water Part 2 Stormwater Management Subpart C Stormwater Management and Chapter 22 Subdivision and Land Development Part 13 Stormwater Management, Erosion and Sediment Control and Grading.

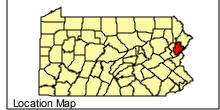
- The Smithfield Township Stormwater Ordinances are consistent with the Brodhead Creek Act 167 Plan.
- The site is located within Brodhead Creek Watershed District C. District C is a Provisional Discharge District allowing direct discharge of runoff, if the existing downstream drainage system meets the Ordinance requirements for a Downstream Hydraulic Capacity Analysis or can be improved to meet the requirements. If the downstream system cannot safely convey the runoff from the site, District A requirements must be met. The site must comply with water quality, stream bank erosion and groundwater recharge requirements. The Downstream Analysis must confirm that:
 - Existing natural or man-made channels or swales are able to convey the increased runoff associated with a two (2) year return period event within their banks and the twenty-five (25) year return period runoff safely.
 - Culverts, bridges, storm sewers or any other conveyance facilities are able to convey the twenty-five (25) year return period runoff.
- Water Quality and Streambank Erosion requirements state that water quality BMPs must be designed to detain the proposed two (2) year twenty-four (24) hour design storm to the existing conditions one (1) year flow using SCS Type II distribution. The one (1) year storm must drain in a minimum of twenty-four (24) hours, typically by providing a small orifice at the bottom of the outlet structure. Larger storms shall not be attenuated in District C. This can be accomplished by the configuration of the outlet structure or by installing a bypass to divert only the two (2) year storm to the basin and directing flows in excess of the two (2) year storm away from the basin. Wet basins preferred where practicable. BMPs must be buffered from wetlands and be at least one hundred (100) feet from streams.
- Ground Water Recharge requires the following:
 - All regulated activities shall infiltrate a portion of the runoff created. Volume to be determined as outlined in the Ordinance.
 - A minimum of twenty-four (24) inches must be maintained between bottom of BMP and Limiting Zone. The limiting zone must be field verified. The Natural Resources Conservation Service (NRCS) Soil Survey lists the Depth to Restrictive Layer for both the Cut and Fill Land, Symbol Cy, and Pope Silt Loam, Symbol Pp, as greater than 80 inches, but the depth to the water table varies from 12 inches to 72 inches.
 - Infiltration Rate must be determined by field tests and must prove to be sufficient for the site.
 - The BMP must be capable of infiltrating the recharge volume in four (4) days.
 - Pretreatment is required for all infiltration facilities.

• Off-site areas that drain through a development site are not subject to release rate criteria when determining allowable peak rate, but on-site drainage facilities shall be designed to safely convey off-site flows through the development.

Preliminary Hydrological Analysis

- The Ordinance provides Appendices in Chapter 26 Water Part 2 Stormwater Management that outline the requirements for the hydrologic calculations. The information is outdated but is used for this analysis. The site is located at the border of PennDOT Region 4 and 5 on the rainfall duration map, so Region 5 information is used to be conservative. The 1-year/24-hour storm rainfall amount is assumed to be 2.64 inches and the 2-year/24-hour storm rainfall amount is assumed to be 3.36 inches.
- Based on the Pennsylvania Department of Environmental Protection (PADEP) Spreadsheet for Volume Management dated December 2019, the required Water Quality Storage is 30,612 CF.
- The Infiltration Volume, referred to as Groundwater Recharge Volume is calculated based on the Ordinance requirements:
 - o I= (200/CN)-2 => (200/55)-2 = 1.64 in
 - \circ Re_v = I x impervious area SF/12 = (1.64 in)(112,850 sf)/12 = 15,423 CF => 15,500 CF





Management Districts **Brodhead-McMichaels** Watershed Monroe County, PA

ACT 167 Stormwater Management Plan Update Phase II

Appendix D

Map Legend



Prepared For:

Monroe County Planning Commission Monroe County Conservation District

Portions of these maps were generated from existing data sources as listed below. This existing data was utilized for base mapping purposes and is shown on the maps for spatial reference and its from the high of spatial relative mily. This data did not enter into any computations or affect the reliability of the hydrologic analysis. Borton-Lawson Engineering has found some inaccuracies in some of this data and has corrected the data in locations where these discrepancies were obvious, however, it was not a part of this Act 167 Plan to correct all the base data.

Data Sources: Roads - PennDOT Streams, Lakes - PennDOT Municipal Boundaries - PennDOT

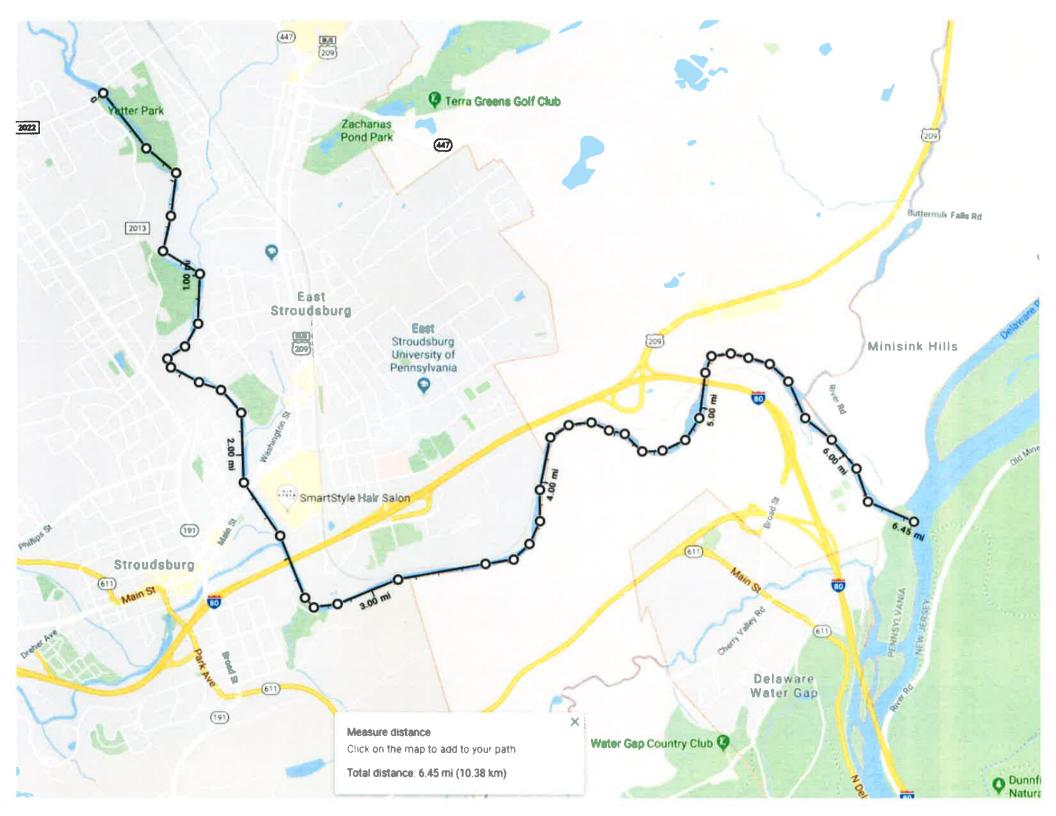


World Wide Web: http://www.borton-lawson.com

Project Number: 2001-1014-00 Date: November 2003



			HQ-CWF, MF	
3Leas Run	Basin	Monroe	HQ-CWF, MF	None
3—Paradise Creek	Basin, Source to Devils Hole Creek	Monroe	HQ-CWF, MF	None
4—Devils Hole Creek	Basin, Source to South Boundary of State Game Lands No. 221 (about 0.25 mile north of Erie-Lackawanna R. R.)	Monroe	EV, MF	None
4—Devils Hole Creek	Basin, South Boundary of State Game Lands No. 221 to Mouth	Мопгое	HQ-CWF, MF	None
3—Paradise Creek	Basin, Devils Hole Creek to Forest Hills Run	Monroe	HQ-CWF, MF	None
4—Forest Hills Run	Basin, Source to Swiftwater Creek	Monroe	HQ-CWF, MF	None
5—Swiftwater Creek	Basin, Source to UNT 04960 at 41°5'58.5"N; 75°20'4.8"W	Monroe	EV, MF	None
6—UNT 04960	Basin	Monroe	HQ-CWF, MF	None
5—Swiftwater Creek	UNT 04960 to Mouth	Monroe	HQ-CWF, MF	None
4—Forest Hills Run	Basin, Swiftwater Creek to Mouth	Monroe	HQ-CWF, MF	None
3—Paradise Creek	Basin, Forest Hills Run to Mouth	Monroe	HQ-CWF, MF	None
3—Michael Creek	Basin	Monroe	HQ-CWF, MF	None
2—Brodhead Creek	Main Stem, LR 45060 (SR 2022) Bridge to Mouth	Monroe	TSF, MF	None
3—Unnamed Tributaries to Brodhead Creek	Basins, LR 45060 Bridge to Mouth	Monroe	TSF, MF	None
3—Sambo Creek	Basin	Monroe	CWF, MF	None
3—McMichael Creek	Basin, Source to T434	Monroe	EV, MF HQ-CWF,	None
	Basin, T434 to Pocono Creek	Monroe	MF	None
4—Pocono Creek 5—Dry Sawmill Run	Basin, Source to Sand Spring Run	Monroe	HQ-CWF,	None
•			1411	
6—Sand Spring Run	Basin, Sand Spring Run to confluence with	Monroe	EV, MF HQ-CWF,	None
5—Dry Sawmill Run	Wolf Swamp Run	Monroe	MF	None
5Wolf Swamp Run	Basin, Source to a Confluence Point (41°3'35.2"N; 75°22'2.4"W) approximately 185 meters upstream of the mouth	Monroe	EV, MF	None
5—Wolf Swamp Run	Basin, Point of Confluence (41°3'35.2"N; 75°22'2.4"W) Downstream to Confluence with Dry Sawmill Run	Монгое	HQ-CWF, MF	None
4—Pocono Creek	Basin, Confluence of Dry Sawmill Run and Wolf Swamp Run to Mouth	Monroe	HQ-CWF, MF	None
3—McMichael Creek	Basin, Pocono Creek to Mouth	Monroe	TSF, MF	None
3—Marshall Creek	Basin	Monroe	HQ-CWF, MF	None
2—Unnamed Tributaries to Delaware River	Basins, Brodhead Creek to Lehigh River	Monroe- Northampton	CWF, MF	None
2—Cherry Creek	Basin, Source to LR 45010 (SR 2006) Bridge	Monroe	HQ-CWF, MF	None



EXISTING USE CLASSIFICATION

(LAST REVISED ON 10/31/2019)



COUNTY	STREAM CODE	STREAM NAME	DESIGNATED USE	EXISTING USE	QUALIFIER	LOCATION	DATE OF EVALUATION	AFFECTED STREAM MILES
LYCOMING	20501	LYCOMING CREEK	WWF, MF/CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	MAINSTEM, SUGAR WORKS RUN TO MOUTH	6/16/11	31,8
LYCOMING	19806	MILL CREEK (EAST)	TSF, MF	HQ-TSF	RBP SURVEY- ANTIDEGRADATION	BASIN, SOURCE TO SIMPLER HOLLOW ROAD	6/10/10	32,856
LYCOMING	19836	MILL CREEK (WEST)	TSF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, SOURCE TO AND INCLUDING SUGARCAMP RUN	6/10/10	14.649
LYCOMING	20929	MOSQUITO CREEK	CWF, MF	HQ-CWF, MF	DESIGNATED CLASS A WILD TROUT	BASIN, SOURCE TO WILLIAMSPORT WATER AUTHORITY INTAKE AT 41° 12' 11.305"N 77° 2' 45.671"W	4/18/16	21.37
LYCOMING	20929	MOSQUITO CREEK	CWF, MF	HQ-CWF, MF	DESIGNATED CLASS A WILD TROUT	BASIN, WILLIAMSPORT WATER AUTHORITY INTAKE AT 41° 12' 11.305"N 77° 2' 45.671"W TO MOUTH	2/1/17	6.41
LYCOMING	21249	OTTER RUN	CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, FROM AND INCLUDING HACKETT FORK TO MOUTH	3/14/11	6.431
LYCOMING	21249	OTTER RUN	CWF, MF	HQ-CWF, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, FROM AND INCLUDING SILVER BRANCH TO HACKETT FORK	3/14/11	11.072
LYCOMING	21166	PINE CREEK	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	MAINSTEM, TOMBS RUN TO MOUTH	2/8/12	7.7
LYCOMING	19650	ROARING RUN	HQ-CWF, MF	EV,MF	RBP SURVEY- ANTIDEGRADATION	BASIN	7/10/12	5.1
LYCOMING	20720	ROCK RUN	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	MAINSTEM, YELLOW DOG RUN TO DOE RUN	2/17/11	1.207
LYCOMING	20720	ROCK RUN	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, DOE RUN TO MINERS RUN	2/17/11	3.689
LYCOMING	20720	ROCK RUN	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, MINERS RUN TO MOUTH (EXCLUDING MINERS RUN)	2/17/11	3,514
LYCOMING	21047	SECOND FORK LARRYS CREEK	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN	3/29/10	42.515
LYCOMING	19581	WEST BRANCH LITTLE MUNCY CREEK	CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN	7/10/12	8
LYCOMING	21111	WOLF RUN	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN	3/29/10	3.464
LYCOMING	21130	ANTES CREEK	CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	MAINSTEM FROM NIPPONO SPRINGS (AT RMI 3.5) TO MOUTH	7/19/06	4.049
LYCOMING, CLINTON	21150	RAUCHTOWN CREEK	CWF, MF	HQ-CWF, MF	DESIGNATED CLASS A WILD TROUT	BASIN, CONFLUENCE OF GOTTSHALL AND ROCKEY RUNS TO MOUTH	4/18/16	19.32
LYCOMING, CLINTON, UNION	19262	WHITE DEER HOLE CREEK	HQ-CWF, MF	EV, MF	RBP SURVEY - ANTIDEGRADATION	BASIN, SOURCE TO CIRCLE J RD.	5/3/16	25.2
LYCOMING, SULLIVAN	20665	PLEASANT STREAM	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, SOURCE TO MOUTH (EXCLUDING LONG RUN)	2/17/11	47.056
LYCOMING, SULLIVAN	19678	ROCK RUN	HQ-CWF, MF	EV,MF	RBP SURVEY- ANTIDEGRADATION	BASIN	7/10/12	20.7
LYCOMING, SULLIVAN	20720	ROCK RUN	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, SOURCE TO YELLOW DOG RUN	2/17/11	30.275
LYCOMING, TIOGA	21166	PINE CREEK	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	MAINSTEM, MARSH CREEK TO TOMBS RUN	8/31/11	50.5
LYCOMING, TIOGA	20794	ROARING BRANCH	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN	6/16/11	76.4
LYCOMING, TIOGA	21302	TEXAS CREEK (ZIMMERMAN CREEK)	HQ-CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN, FROM CONFLUENCE WITH AND INCLUDING LITTLE FALLS CREEK TO CONFLUENCE WITH BLOCKHOUSE CREEK	3/14/11	51.587
MCKEAN	50671	BUCK RUN	CWF, MF	EV, MF	RBP SURVEY- ANTIDEGRADATION	BASIN	2/28/12	13.2
MCKEAN	57738	UNT BLACKSMITH RUN	CWF, MF	HQ-CWF, MF	DESIGNATED CLASS A WILD TROUT	BASIN	6/9/16	4.8
MONROE	04750	BRODHEAD CREEK	TSF,MF	CWF,MF	TROUT REPRODUCTION	MAINSTEM, FROM SR2022 (APPROX RMI 6.6) TO MOUTH	7/10/07	8.899



1. PROJECT INFORMATION

Project Name: Delaware Water Gap Rail Station

Date of Review: 11/7/2019 09:35:29 AM

Project Category: Transportation, Railroads (track, bridge, roadway crossing - new, maintenance, removal)

Project Area: **6.50 acres** County(s): **Monroe**

Township/Municipality(s): SMITHFIELD

ZIP Code: 18327

Quadrangle Name(s): STROUDSBURG

Watersheds HUC 8: Middle Delaware-Mongaup-Brodhead

Watersheds HUC 12: Lower Broadhead Creek Decimal Degrees: 40.993234, -75.141352

Degrees Minutes Seconds: 40° 59' 35.6408" N, 75° 8' 28.8677" W

This is a draft receipt for information only. It has not been submitted to jurisdictional agencies for review.

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Furth <mark>er Review Required</mark>
PA Fish and Boat Commission	Potential Impact	FURTHER REVIEW IS REQUIRED, See Agency Response
U.S. Fish and Wildlife Service	Potential Impact	FURTHER REVIEW IS REQUIRED, See Agency Response

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 must comply with the bog turtle habitat screening requirements of the PASPGP.

Delaware Water Gap Rail Station

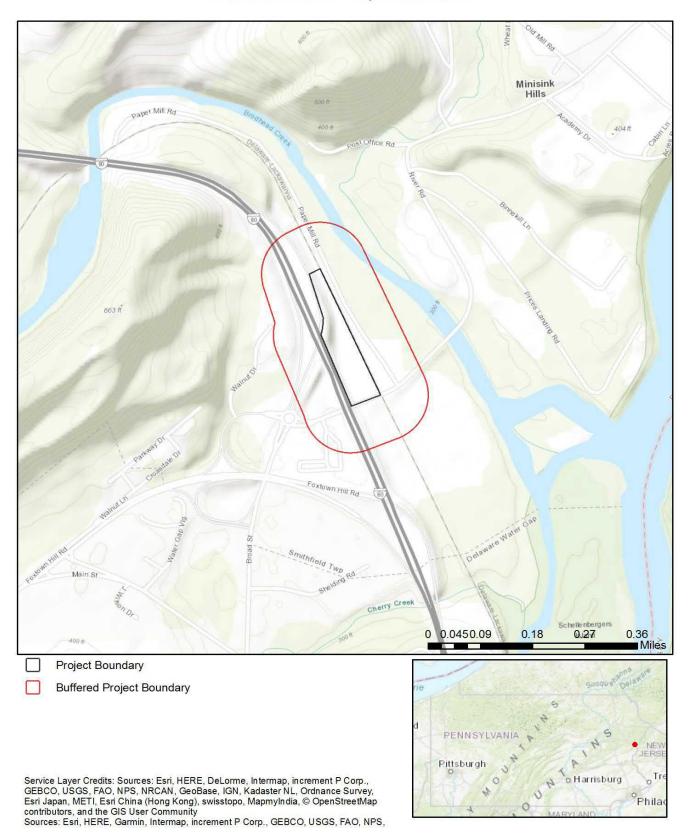


Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, Mapmylndia, © OpenStreetMap contributors, and the GIS User Community Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Delaware Water Gap Rail Station



RESPONSE TO QUESTION(S) ASKED

Q1: Will the entire project occur within an existing building, parking lot, driveway, road, street, or maintained (periodically mowed) lawn?

Your answer is: No

Q2: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).

Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q3: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?

Your answer is: No

Q4: Select the statement below that accurately describes where the proposed project and project-associated activities will occur. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.).

Your answer is: This project and all project activities will occur at least 100 feet from all waterways and waterbodies (rivers, creeks, streams, tributaries, lakes, ponds).

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Project Search ID: PNDI-697475

Scientific Name	Common Name	Current Status
Sensitive Species**		Endangered
Sensitive Species**		Endangered
Sensitive Species**		Endangered
Alasmidonta undulata	Triangle Floater	Special Concern Species*
Alasmidonta varicosa	Brook Floater	Special Concern Species*
Anodonta implicata	Alewife Floater	Special Concern Species*

U.S. Fish and Wildlife Service RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

- * Special Concern Species or Resource Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
- ** Sensitive Species Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email* the following information to the agency(s). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies. Alternatively, applicants may email or mail their project materials (see AGENCY CONTACT INFORMATION).

*Note: U.S.Fish and Wildlife Service requires applicants to mail project materials to the USFWS PA field office (see AGENCY CONTACT INFORMATION). USFWS will not accept project materials submitted electronically (by upload or email).

Check-list of Minimum Materials to be submitted:

Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.

A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)

In addition to the materials listed above, USFWS REQUIRES the following

SIGNED copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.

____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)

____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.



5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.







Natural

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
Monroe County,
Pennsylvania, and
Warren County, New
Jersey



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

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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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

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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

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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.



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

LEGEND

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 scales ranging from 1:12,000 to 1:20,000.

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: Monroe County, Pennsylvania Survey Area Data: Version 14, Sep 17, 2019

Soil Survey Area: Warren County, New Jersey Survey Area Data: Version 14, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 20, 2011—Oct 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

Custom Soil Resource Report

MAP LEGEND

MAP INFORMATION

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
As	Alluvial land	78.5	11.0%
ВаВ	Bath channery silt loam, 3 to 8 percent slopes	3.4	0.5%
BaC	Bath channery silt loam, 8 to 15 percent slopes	12.4	1.7%
BbC	Bath channery silt loam, 8 to 25 percent slopes, extremely stony	1.3	0.2%
BeC	Benson-Rock outcrop complex, 8 to 25 percent slopes	7.5	1.1%
BeF	Benson-Rock outcrop complex, 25 to 70 percent slopes	25.1	3.5%
BrA	Braceville gravelly loam, 0 to 3 percent slopes	9.2	1.3%
BrB	Braceville gravelly loam, 3 to 8 percent slopes	7.0	1.0%
CmA	Chippewa and Norwich silt loams, 0 to 5 percent slopes	2.9	0.4%
Су	Cut and fill land	134.3	18.9%
Ну	Holly silt loam	24.7	3.5%
LBE	Lackawanna and Bath soils, steep, rubbly	18.8	2.6%
LxC	Lordstown channery silt loam, 8 to 25 percent slopes, rubbly	28.8	4.1%
LyE	Lordstown and Oquaga extremely stony soils, 25 to 70 percent slopes	28.8	4.1%
МаВ	Mardin channery silt loam, 3 to 8 percent slopes	6.1	0.9%
OkB	Oquaga-Lackawanna channery loams, 3 to 8 percent slopes	6.3	0.9%
OkC	Oquaga-Lackawanna channery loams, 8 to 15 percent slopes	1.7	0.2%
ОхВ	Oquaga-Lackawanna complex, 0 to 8 percent slopes, extremely stony	8.6	1.2%
OxC	Oquaga-Lackawanna complex, 8 to 25 percent slopes, extremely stony	41.8	5.9%
Рр	Pope silt loam, high bottom	93.2	13.1%
ReA	Rexford gravelly silt loam, 0 to 3 percent slopes	8.7	1.2%
W	Water	45.2	6.4%
Wb	Wayland silty clay loam	1.8	0.3%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI		
WyA	Wyoming gravelly sandy loam, 0 to 3 percent slopes	23.4	3.3%		
WyB	Wyoming gravelly sandy loam, 3 to 8 percent slopes	55.5	7.8%		
WyC	Wyoming gravelly sandy loam, 8 to 15 percent slopes	12.6	1.8%		
WyD	Wyoming gravelly sandy loam, 15 to 25 percent slopes	11.0	1.5%		
WyE	Wyoming gravelly sandy loam, 25 to 70 percent slopes	9.4	1.3%		
Subtotals for Soil Survey Area		708.1	99.5%		
Totals for Area of Interest		711.6	100.0%		

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI			
ArvE	Arnot-Lordstown-Rock outcrop complex, 35 to 60 percent slopes	0.3	0.0%			
WATER	Water	3.2	0.4%			
Subtotals for Soil Survey Area		3.5	0.5%			
Totals for Area of Interest		711.6	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.

Monroe County, Pennsylvania

As—Alluvial land

Map Unit Setting

National map unit symbol: 9y92 Elevation: 200 to 3,000 feet

Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 59 degrees F

Frost-free period: 110 to 200 days

Farmland classification: Not prime farmland

Map Unit Composition

Fluvents, (alluvial land), and similar soils: 75 percent

Minor components: 25 percent

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

Description of Fluvents, (alluvial Land)

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 42 inches: sandy loam
H3 - 42 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 3 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 (0.60 to 2.00 in/hr)

Depth to water table: About 0 to 36 inches

Frequency of flooding: Frequent Frequency of ponding: None

Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: B/D Hydric soil rating: No

Minor Components

Holly

Percent of map unit: 15 percent

Landform: Depressions on flood plains, backswamps Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: Yes

Philo

Percent of map unit: 5 percent

Landform: Flood plains

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Mountainbase

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Chippewa

Percent of map unit: 5 percent Landform: Depressions Down-slope shape: Concave Across-slope shape: Concave

Hydric soil rating: Yes

BaB—Bath channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v30x Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Bath and similar soils: 85 percent Minor components: 15 percent

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

Description of Bath

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Parent material: Loamy till derived mainly from gray and brown siltstone,

sandstone, and shale

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw1 - 9 to 15 inches: channery silt loam
Bw2 - 15 to 25 inches: channery loam
E - 25 to 29 inches: channery loam

Bx - 29 to 52 inches: very channery silt loam C - 52 to 72 inches: very channery silt loam

Properties and qualities

Slope: 3 to 8 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 26 to 38 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 24 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Mardin

Percent of map unit: 10 percent Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Mountaintop, interfluve, crest

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

BaC—Bath channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2v314 Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Bath and similar soils: 90 percent Minor components: 10 percent

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

Description of Bath

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Linear

Parent material: Loamy till derived mainly from gray and brown siltstone,

sandstone, and shale

Typical profile

Ap - 0 to 9 inches: channery silt loam Bw1 - 9 to 15 inches: channery silt loam Bw2 - 15 to 25 inches: channery loam E - 25 to 29 inches: channery loam

Bx - 29 to 52 inches: very channery silt loam C - 52 to 72 inches: very channery silt loam

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 26 to 38 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 24 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Lordstown

Percent of map unit: 5 percent Landform: Hills, mountains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountaintop, side slope, nose slope

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Mardin

Percent of map unit: 5 percent

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

BbC—Bath channery silt loam, 8 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2v31v Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Bath, extremely stony, and similar soils: 90 percent

Minor components: 10 percent

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

Description of Bath, Extremely Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Interfluve, nose slope, side slope

Down-slope shape: Linear, convex

Across-slope shape: Linear

Parent material: Loamy till derived mainly from gray and brown siltstone,

sandstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: channery silt loam
Bw1 - 3 to 15 inches: channery silt loam
Bw2 - 15 to 25 inches: channery loam
E - 25 to 29 inches: channery loam

Bx - 29 to 52 inches: very channery silt loam C - 52 to 72 inches: very channery silt loam

Properties and qualities

Slope: 8 to 25 percent

Percent of area covered with surface fragments: 7.0 percent Depth to restrictive feature: 26 to 38 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 24 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Swartswood, extremely stony

Percent of map unit: 5 percent

Landform: Hills

Landform position (two-dimensional): Footslope, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear Across-slope shape: Linear, convex

Hydric soil rating: No

Mardin, extremely stony

Percent of map unit: 5 percent Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder, backslope Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex, concave Across-slope shape: Convex, linear

Hydric soil rating: No

BeC—Benson-Rock outcrop complex, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9y9c Elevation: 90 to 2.460 feet

Mean annual precipitation: 28 to 70 inches Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 100 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Benson and similar soils: 60 percent

Rock outcrop: 20 percent Minor components: 20 percent

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

Description of Benson

Setting

Landform: Hillslopes

Landform position (two-dimensional): Backslope, summit Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear, convex Across-slope shape: Convex, linear

Parent material: Loamy till

Typical profile

H1 - 0 to 8 inches: channery silt loam H2 - 8 to 18 inches: very channery silt loam

Properties and qualities

Slope: 8 to 25 percent

Depth to restrictive feature: 12 to 20 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 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: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydric soil rating: No

Minor Components

Bath

Percent of map unit: 4 percent

Landform: Mountains

Landform position (two-dimensional): Summit

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

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Wyoming

Percent of map unit: 4 percent

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Chenango

Percent of map unit: 4 percent Landform: Outwash terraces

Landform position (three-dimensional): Riser

Down-slope shape: Convex, linear Across-slope shape: Convex, linear

Hydric soil rating: No

Volusia

Percent of map unit: 4 percent

Landform: Hills

Landform position (two-dimensional): Footslope, summit Landform position (three-dimensional): Base slope, side slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: No

Mardin

Percent of map unit: 4 percent

Hydric soil rating: No

BeF—Benson-Rock outcrop complex, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9y9d Elevation: 90 to 1,800 feet

Mean annual precipitation: 28 to 51 inches Mean annual air temperature: 40 to 55 degrees F

Frost-free period: 100 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Benson and similar soils: 60 percent

Rock outcrop: 25 percent Minor components: 15 percent

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

Description of Benson

Settina

Landform: Hillslopes

Landform position (two-dimensional): Backslope, summit Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear, convex Across-slope shape: Convex, linear

Parent material: Loamy till

Typical profile

H1 - 0 to 8 inches: channery silt loam

H2 - 8 to 18 inches: very channery silt loam H3 - 18 to 22 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 70 percent

Depth to restrictive feature: 12 to 20 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 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: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D Hydric soil rating: No

Description of Rock Outcrop

Properties and qualities

Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydric soil rating: No

Minor Components

Bath

Percent of map unit: 8 percent

Landform: Mountains

Landform position (two-dimensional): Summit

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

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Wyoming

Percent of map unit: 7 percent

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

BrA—Braceville gravelly loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9y9f

Mean annual precipitation: 36 to 56 inches Mean annual air temperature: 46 to 54 degrees F

Frost-free period: 145 to 175 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Braceville and similar soils: 90 percent

Minor components: 10 percent

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

Description of Braceville

Setting

Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear, convex Across-slope shape: Linear, concave Parent material: Coarse-loamy outwash

Typical profile

H1 - 0 to 3 inches: gravelly loam
H2 - 3 to 30 inches: gravelly silt loam
H3 - 30 to 55 inches: very gravelly loam

H4 - 55 to 60 inches: stratified sand and gravel

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 18 to 30 inches to fragipan Natural drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Rexford, pd

Percent of map unit: 10 percent

Landform: Depressions Hydric soil rating: Yes

BrB—Braceville gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9y9g

Mean annual precipitation: 34 to 56 inches Mean annual air temperature: 40 to 54 degrees F

Frost-free period: 100 to 175 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Braceville and similar soils: 95 percent

Minor components: 5 percent

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

Description of Braceville

Setting

Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Coarse-loamy outwash

Typical profile

H1 - 0 to 3 inches: gravelly loam
H2 - 3 to 30 inches: gravelly silt loam
H3 - 30 to 55 inches: very gravelly loam

H4 - 55 to 60 inches: stratified sand and gravel

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 18 to 30 inches to fragipan Natural drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Rexford, poorly drained

Percent of map unit: 5 percent Landform: Depressions Down-slope shape: Concave Across-slope shape: Concave

Hydric soil rating: Yes

CmA—Chippewa and Norwich silt loams, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2v32p Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Chippewa and similar soils: 40 percent Norwich and similar soils: 40 percent Minor components: 20 percent

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

Description of Chippewa

Setting

Landform: Depressions

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Concave

Parent material: Loamy till dominated by siltstone, sandstone, and shale

fragments

Typical profile

Ap - 0 to 7 inches: silt loam

Eg - 7 to 15 inches: channery silt loam Bxg - 15 to 45 inches: channery silt loam C - 45 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 5 percent

Percent of area covered with surface fragments: 0.0 percent

Depth to restrictive feature: 8 to 20 inches to fragipan

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D Hydric soil rating: Yes

Description of Norwich

Setting

Landform: Depressions

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Concave

Parent material: Loamy till dominated by reddish sandstone, siltstone and shale

fragments

Typical profile

A - 0 to 6 inches: silt loam

Eg - 6 to 10 inches: channery silt loam
Bg - 10 to 16 inches: channery silt loam
Bgx - 16 to 46 inches: channery silt loam
C - 46 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 5 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 10 to 24 inches to fragipan

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D Hydric soil rating: Yes

Minor Components

Morris

Percent of map unit: 5 percent

Landform: Hills, mountains

Landform position (two-dimensional): Summit, footslope Landform position (three-dimensional): Interfluve, base slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: No

Volusia

Percent of map unit: 5 percent Landform: Hills, mountains

Landform position (two-dimensional): Footslope, summit

Landform position (three-dimensional): Base slope, interfluve, side slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: No

Chippewa, very poorly drained

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

Norwich, very poorly drained

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

Cy—Cut and fill land

Map Unit Setting

National map unit symbol: 9y9x

Mean annual precipitation: 34 to 51 inches
Mean annual air temperature: 40 to 50 degrees F

Frost-free period: 100 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, cut and fill, and similar soils: 100 percent

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

Description of Udorthents, Cut And Fill

Setting

Parent material: Man made and altered materials from mixed rock types

Properties and qualities

Slope: 0 to 25 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Depth to water table: About 12 to 72 inches

Frequency of flooding: None Frequency of ponding: None

Hy—Holly silt loam

Map Unit Setting

National map unit symbol: 9yb6 Elevation: 800 to 840 feet

Mean annual precipitation: 30 to 40 inches

Mean annual air temperature: 48 to 54 degrees F

Frost-free period: 133 to 187 days

Farmland classification: Not prime farmland

Map Unit Composition

Holly and similar soils: 100 percent

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

Description of Holly

Setting

Landform: Backswamps, depressions on flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Linear

Parent material: Loamy alluvium derived from sandstone and shale

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 28 inches: very fine sandy loam

H3 - 28 to 41 inches: loam

H4 - 41 to 60 inches: stratified gravelly sand to silt loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 to 2.00 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: Frequent

Frequency of ponding: None

Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B/D Hydric soil rating: Yes

LBE—Lackawanna and Bath soils, steep, rubbly

Map Unit Setting

National map unit symbol: 2v320 Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Lackawanna, rubbly, and similar soils: 40 percent

Bath, rubbly, and similar soils: 30 percent

Minor components: 30 percent

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

Description of Lackawanna, Rubbly

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, nose slope

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and

shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: channery loam
Bw1 - 3 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 25 to 70 percent

Percent of area covered with surface fragments: 20.0 percent Depth to restrictive feature: 17 to 36 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 16 to 36 inches

Frequency of flooding: None Frequency of pondina: None

Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Description of Bath, Rubbly

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, nose slope

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Loamy till derived mainly from gray and brown siltstone,

sandstone, and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: channery silt loam
Bw1 - 3 to 15 inches: channery silt loam
Bw2 - 15 to 25 inches: channery loam
E - 25 to 29 inches: channery loam

Bx - 29 to 52 inches: very channery silt loam C - 52 to 72 inches: very channery silt loam

Properties and qualities

Slope: 25 to 70 percent

Percent of area covered with surface fragments: 20.0 percent

Depth to restrictive feature: 26 to 38 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 24 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Lordstown, rubbly

Percent of map unit: 8 percent Landform: Mountains, hills

Landform position (two-dimensional): Backslope, shoulder

Landform position (three-dimensional): Mountainflank, crest, nose slope, side

slope

Down-slope shape: Convex, linear Across-slope shape: Linear Hydric soil rating: No

Oquaga, rubbly

Percent of map unit: 8 percent Landform: Mountains, hills

Landform position (two-dimensional): Shoulder, summit, backslope

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

side slope, crest, nose slope Down-slope shape: Convex, linear Across-slope shape: Linear Hydric soil rating: No

Wellsboro, extremely stony

Percent of map unit: 7 percent Landform: Hills, mountains

Landform position (two-dimensional): Backslope, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Mardin, rubbly

Percent of map unit: 7 percent Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Interfluve, side slope, head slope

Down-slope shape: Linear, concave

Across-slope shape: Linear Hydric soil rating: No

LxC—Lordstown channery silt loam, 8 to 25 percent slopes, rubbly

Map Unit Setting

National map unit symbol: 2wzm9 Elevation: 330 to 2.460 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Lordstown, rubbly, and similar soils: 85 percent

Minor components: 15 percent

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

Description of Lordstown, Rubbly

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, shoulder

Landform position (three-dimensional): Mountainflank, crest, nose slope, side

slope

Down-slope shape: Convex, linear Across-slope shape: Linear

Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 5 inches: channery highly organic silt loam

Bw1 - 5 to 17 inches: channery silt loam
Bw2 - 17 to 24 inches: very channery silt loam
C - 24 to 30 inches: extremely channery silt loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent

Percent of area covered with surface fragments: 15.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.14 to 1.42 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 1.9 mmhos/cm) Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Arnot, very stony

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Shoulder, backslope, summit

Landform position (three-dimensional): Mountaintop, mountainflank, crest, nose

slope, interfluve

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

Cadosia, extremely stony

Percent of map unit: 5 percent

Landform: Ridges

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Linear Hydric soil rating: No

Bath, rubbly

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Backslope, shoulder

Landform position (three-dimensional): Nose slope, interfluve, side slope

Down-slope shape: Linear, convex

Across-slope shape: Linear

Hydric soil rating: No

LyE—Lordstown and Oquaga extremely stony soils, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9ybz Elevation: 700 to 1,800 feet

Mean annual precipitation: 30 to 51 inches
Mean annual air temperature: 40 to 52 degrees F

Frost-free period: 100 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Lordstown and similar soils: 40 percent Oquaga and similar soils: 35 percent Minor components: 25 percent

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

Description of Lordstown

Settina

Landform: Hills

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex, linear Across-slope shape: Convex, linear

Typical profile

A - 0 to 7 inches: very channery silt loam
Bw - 7 to 26 inches: very channery loam
C - 26 to 30 inches: very channery silt loam
2R - 30 to 42 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 70 percent

Percent of area covered with surface fragments: 9.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 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: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Description of Oquaga

Setting

Landform: Hillslopes

Landform position (two-dimensional): Shoulder Landform position (three-dimensional): Side slope

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Reddish ablation till derived from sandstone and siltstone

Typical profile

A - 0 to 7 inches: very channery loam
Bw - 7 to 30 inches: very channery loam
R - 30 to 42 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 60 percent

Percent of area covered with surface fragments: 9.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 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: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Arnot

Percent of map unit: 10 percent

Landform: Valley sides

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, nose slope

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Lackawanna

Percent of map unit: 5 percent

Hydric soil rating: No

Bath

Percent of map unit: 5 percent

Landform: Mountains

Landform position (two-dimensional): Summit

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

Down-slope shape: Convex Across-slope shape: Convex Hydric soil rating: No

riyane son rating.

Swartswood

Percent of map unit: 5 percent

Landform: Hills

Landform position (two-dimensional): Footslope, backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear Across-slope shape: Linear, convex

Hydric soil rating: No

MaB—Mardin channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2srhb Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Mardin and similar soils: 85 percent Minor components: 15 percent

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

Description of Mardin

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex Parent material: Loamy till

Typical profile

Ap - 0 to 8 inches: channery silt loam

BE - 8 to 12 inches: channery silt loam
Bw1 - 12 to 16 inches: channery silt loam
Bw2 - 16 to 20 inches: channery silt loam
Bx1 - 20 to 36 inches: channery silt loam
Bx2 - 36 to 57 inches: channery silt loam
C - 57 to 72 inches: channery silt loam

Properties and qualities

Slope: 3 to 8 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 14 to 26 inches to fragipan Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 13 to 24 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: D Hydric soil rating: No

Minor Components

Volusia

Percent of map unit: 5 percent Landform: Hills, mountains

Landform position (two-dimensional): Footslope, summit

Landform position (three-dimensional): Base slope, interfluve, side slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: No

Lordstown

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Mountaintop, interfluve, crest

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Bath

Percent of map unit: 5 percent Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, backslope Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: No

OkB—Oquaga-Lackawanna channery loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w0b2 Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Oquaga and similar soils: 50 percent Lackawanna and similar soils: 35 percent

Minor components: 15 percent

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

Description of Oquaga

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Mountaintop, interfluve, crest, nose slope

Down-slope shape: Convex

Across-slope shape: Convex, linear

Parent material: Reddish loamy till derived from sandstone, siltstone, and shale

Typical profile

Ap - 0 to 7 inches: channery loam

Bw1 - 7 to 15 inches: very channery loam
Bw2 - 15 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.14 to 1.42 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C Hydric soil rating: No

Description of Lackawanna

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and

shale

Typical profile

Ap - 0 to 7 inches: channery loam
Bw1 - 7 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 3 to 8 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 17 to 36 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 16 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Wellsboro

Percent of map unit: 10 percent Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Arnot

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountaintop, mountainflank, nose slope,

interfluve, crest

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

OkC—Oquaga-Lackawanna channery loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w0b5 Elevation: 330 to 2.460 feet

Mean annual precipitation: 31 to 70 inches Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Oquaga and similar soils: 55 percent Lackawanna and similar soils: 30 percent

Minor components: 15 percent

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

Description of Oquaga

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, shoulder

Landform position (three-dimensional): Mountainflank, nose slope, crest

Down-slope shape: Convex Across-slope shape: Linear

Parent material: Reddish loamy till derived from sandstone, siltstone, and shale

Typical profile

Ap - 0 to 7 inches: channery loam

Bw1 - 7 to 15 inches: very channery loam
Bw2 - 15 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.14 to 1.42 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C Hydric soil rating: No

Description of Lackawanna

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, backslope Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Linear

Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and

shale

Typical profile

Ap - 0 to 7 inches: channery loam
Bw1 - 7 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 0.0 percent Depth to restrictive feature: 17 to 36 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 16 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Wellsboro

Percent of map unit: 10 percent Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Arnot

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank, mountaintop, side slope,

nose slope

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

OxB—Oquaga-Lackawanna complex, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w0by Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Oquaga, extremely stony, and similar soils: 55 percent Lackawanna, extremely stony, and similar soils: 35 percent

Minor components: 10 percent

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

Description of Oquaga, Extremely Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Mountainflank, nose slope, interfluve,

crest

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Reddish loamy till derived from sandstone and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 5 inches: channery highly organic loam Bw1 - 5 to 15 inches: very channery loam Bw2 - 15 to 24 inches: very channery loam C - 24 to 30 inches: extremely channery loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent

Percent of area covered with surface fragments: 5.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.14 to 1.42 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Description of Lackawanna, Extremely Stony

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and

shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: channery loam
Bw1 - 3 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 0 to 8 percent

Percent of area covered with surface fragments: 7.0 percent Depth to restrictive feature: 17 to 36 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 16 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Wellsboro, extremely stony

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

Arnot, extremely stony

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Mountainflank, mountaintop, interfluve,

crest

Down-slope shape: Convex Across-slope shape: Convex

Hydric soil rating: No

OxC—Oquaga-Lackawanna complex, 8 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w0bz Elevation: 330 to 2,460 feet

Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F

Frost-free period: 105 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Oquaga, extremely stony, and similar soils: 60 percent Lackawanna, extremely stony, and similar soils: 30 percent

Minor components: 10 percent

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

Description of Oquaga, Extremely Stony

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainflank, nose slope, interfluve,

crest

Down-slope shape: Convex

Across-slope shape: Convex, linear

Parent material: Reddish loamy till derived from sandstone and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 5 inches: channery highly organic loam Bw1 - 5 to 15 inches: very channery loam Bw2 - 15 to 24 inches: very channery loam C - 24 to 30 inches: extremely channery loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent

Percent of area covered with surface fragments: 5.0 percent Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.14 to 1.42 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Description of Lackawanna, Extremely Stony

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Interfluve, side slope, nose slope

Down-slope shape: Convex, linear Across-slope shape: Linear

Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and

shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: channery loam
Bw1 - 3 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 8 to 25 percent

Percent of area covered with surface fragments: 7.0 percent Depth to restrictive feature: 17 to 36 inches to fragipan

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 16 to 36 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Minor Components

Wellsboro, extremely stony

Percent of map unit: 5 percent Landform: Mountains, hills

Landform position (two-dimensional): Backslope, summit, shoulder Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex, linear Across-slope shape: Convex, linear

Hydric soil rating: No

Arnot, extremely stony

Percent of map unit: 5 percent Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Mountainflank, mountaintop, crest, nose

slope

Down-slope shape: Convex Across-slope shape: Linear Hydric soil rating: No

Pp—Pope silt loam, high bottom

Map Unit Setting

National map unit symbol: 9ycp Elevation: 800 to 840 feet

Mean annual precipitation: 30 to 51 inches Mean annual air temperature: 40 to 54 degrees F

Frost-free period: 100 to 187 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Pope and similar soils: 90 percent Minor components: 10 percent

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

Description of Pope

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Coarse-loamy alluvium derived from sandstone and siltstone

Typical profile

H1 - 0 to 10 inches: silt loam H2 - 10 to 30 inches: silt loam

H3 - 30 to 60 inches: loamy very fine sand

Properties and qualities

Slope: 0 to 3 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 (0.60 to 2.00 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: Rare Frequency of ponding: None

Available water storage in profile: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 1

Hydrologic Soil Group: B Hydric soil rating: No

Minor Components

Holly

Percent of map unit: 10 percent

Landform: Backswamps, depressions on flood plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Linear Hydric soil rating: Yes

ReA—Rexford gravelly silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9ycq

Mean annual precipitation: 34 to 56 inches
Mean annual air temperature: 40 to 54 degrees F

Frost-free period: 100 to 175 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Rexford, somewhat poorly drained, and similar soils: 50 percent

Rexford, poorly drained, and similar soils: 40 percent

Minor components: 10 percent

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

Description of Rexford, Somewhat Poorly Drained

Setting

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

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

Typical profile

Ap - 0 to 8 inches: silt loam
Bw - 8 to 18 inches: silt loam
Bx - 18 to 40 inches: gravelly loam

2C - 40 to 63 inches: Error

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 15 to 24 inches to fragipan Natural drainage class: Somewhat poorly drained

Runoff class: Very 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: About 2 to 10 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: D Hydric soil rating: No

Description of Rexford, Poorly Drained

Setting

Landform: Depressions

Down-slope shape: Concave

Across-slope shape: Concave

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

Typical profile

Ap - 0 to 8 inches: silt loam
Bw - 8 to 18 inches: silt loam
Bx - 18 to 40 inches: gravelly loam

2C - 40 to 63 inches: Error

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 15 to 24 inches to fragipan

Natural drainage class: Poorly drained

Runoff class: Negligible

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 0 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: D Hydric soil rating: Yes

Minor Components

Braceville

Percent of map unit: 10 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear, convex Across-slope shape: Linear, concave

Hydric soil rating: No

W-Water

Map Unit Setting

National map unit symbol: 9ydz

Mean annual precipitation: 34 to 51 inches Mean annual air temperature: 40 to 50 degrees F

Frost-free period: 100 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent

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

Wb—Wayland silty clay loam

Map Unit Setting

National map unit symbol: 9yd9 Elevation: 200 to 1,500 feet

Mean annual precipitation: 30 to 40 inches Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 100 percent

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

Description of Wayland

Setting

Landform: Flood plains

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Talf

Down-slope shape: Concave

Across-slope shape: Linear Parent material: Recent alluvium

Typical profile

H1 - 0 to 9 inches: silty clay loam
H2 - 9 to 41 inches: silty clay loam
H3 - 41 to 60 inches: very gravelly loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Very poorly drained

Runoff class: Negligible

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 0 inches

Frequency of flooding: Frequent

Frequency of ponding: Frequent

Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C/D Hydric soil rating: Yes

WyA—Wyoming gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9ydt Elevation: 400 to 1,800 feet

Mean annual precipitation: 30 to 56 inches
Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Wyoming and similar soils: 90 percent

Minor components: 10 percent

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

Description of Wyoming

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear Across-slope shape: Linear

Typical profile

H1 - 0 to 7 inches: gravelly sandy loam H2 - 7 to 25 inches: very gravelly sandy loam

H3 - 25 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00

to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A Hydric soil rating: No

Minor Components

Braceville

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Unadilla

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

WyB—Wyoming gravelly sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ydv Elevation: 400 to 1,800 feet

Mean annual precipitation: 30 to 56 inches Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Wyoming and similar soils: 90 percent

Minor components: 10 percent

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

Description of Wyoming

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear Across-slope shape: Linear

Typical profile

H1 - 0 to 7 inches: gravelly sandy loam H2 - 7 to 25 inches: very gravelly sandy loam

H3 - 25 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00

to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A Hydric soil rating: No

Minor Components

Unadilla

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Braceville

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

WyC—Wyoming gravelly sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9ydw Elevation: 400 to 1,800 feet

Mean annual precipitation: 30 to 56 inches Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Wyoming and similar soils: 90 percent Minor components: 10 percent

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

Description of Wyoming

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear Across-slope shape: Linear

Typical profile

H1 - 0 to 7 inches: gravelly sandy loam
H2 - 7 to 25 inches: very gravelly sandy loam

H3 - 25 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00

to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A Hydric soil rating: No

Minor Components

Braceville

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

Unadilla

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

WyD—Wyoming gravelly sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9ydx Elevation: 400 to 1,800 feet

Mean annual precipitation: 30 to 50 inches Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Wyoming and similar soils: 95 percent

Minor components: 5 percent

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

Description of Wyoming

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear Across-slope shape: Linear

Typical profile

H1 - 0 to 7 inches: gravelly sandy loam H2 - 7 to 25 inches: very gravelly sandy loam

H3 - 25 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 15 to 25 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat excessively drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00

to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A Hydric soil rating: No

Minor Components

Unadilla

Percent of map unit: 5 percent Landform: Outwash terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

WyE-Wyoming gravelly sandy loam, 25 to 70 percent slopes

Map Unit Setting

National map unit symbol: 9ydy Elevation: 400 to 1.800 feet

Mean annual precipitation: 42 to 50 inches Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 110 to 145 days

Farmland classification: Not prime farmland

Map Unit Composition

Wyoming and similar soils: 100 percent

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

Description of Wyoming

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Water sorted gravelly outwash derived from sandstone and

siltstone and/or shale

Typical profile

H1 - 0 to 8 inches: very gravelly sandy loam H2 - 8 to 26 inches: very gravelly sandy loam

H3 - 26 to 60 inches: stratified sand to very gravelly loamy sand

Properties and qualities

Slope: 25 to 70 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Somewhat excessively drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00

to 20.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: A Hydric soil rating: No

Warren County, New Jersey

ArvE—Arnot-Lordstown-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

National map unit symbol: 17j14 Elevation: 400 to 1,800 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

Arnot and similar soils: 60 percent Lordstown and similar soils: 25 percent

Rock outcrop: 15 percent

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

Description of Arnot

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Loamy till derived from conglomerate

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 2 inches: loam

E - 2 to 3 inches: fine sandy loam

Bhs - 3 to 4 inches: fine sandy loam

Bw1 - 4 to 12 inches: very gravelly loam

Bw2 - 12 to 17 inches: extremely gravelly loam

2R - 17 to 80 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent

Percent of area covered with surface fragments: 25.0 percent Depth to restrictive feature: 10 to 20 inches to lithic bedrock Natural drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D Hydric soil rating: No

Description of Lordstown

Setting

Landform: Ground moraines

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Coarse-loamy till derived from conglomerate

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 2 inches: loam

E - 2 to 3 inches: fine sandy loam

Bw1 - 3 to 5 inches: loam

Bw2 - 5 to 17 inches: gravelly loam Bw3 - 17 to 22 inches: gravelly loam

C - 22 to 36 inches: very gravelly fine sandy loam

2R - 36 to 80 inches: bedrock

Properties and qualities

Slope: 35 to 60 percent

Percent of area covered with surface fragments: 25.0 percent Depth to restrictive feature: 20 to 39 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Very 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 storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C Hydric soil rating: No

Description of Rock Outcrop

Settina

Landform: Ground moraines

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear Across-slope shape: Linear Parent material: Conglomerate

Typical profile

R - 0 to 80 inches: bedrock

Properties and qualities

Percent of area covered with surface fragments: 25.0 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydrologic Soil Group: D Hydric soil rating: Unranked

WATER—Water

Map Unit Setting

National map unit symbol: b0ks

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

Water: 100 percent

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

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations 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 interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.



MAP LEGEND

Area of Interest (AOI) Transportation Area of Interest (AOI) Rails Soils Interstate Highways Soil Rating Polygons **US Routes** Hydric (100%) Major Roads Hydric (66 to 99%) Local Roads \sim Hydric (33 to 65%) Background Hydric (1 to 32%) Aerial Photography Not Hydric (0%) Not rated or not available Soil Rating Lines Hydric (100%) Hydric (66 to 99%) Hydric (33 to 65%) Hydric (1 to 32%) Not Hydric (0%) Not rated or not available **Soil Rating Points** Hydric (100%) Hydric (66 to 99%) Hydric (33 to 65%) Hydric (1 to 32%) Not Hydric (0%) Not rated or not available **Water Features** Streams and Canals

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:20,000.

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: Monroe County, Pennsylvania Survey Area Data: Version 14, Sep 17, 2019

Soil Survey Area: Warren County, New Jersey Survey Area Data: Version 14, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 20, 2011—Oct 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
As	Alluvial land	20	78.5	11.0%
ВаВ	Bath channery silt loam, 3 to 8 percent slopes	0	3.4	0.5%
BaC	Bath channery silt loam, 8 to 15 percent slopes	0	12.4	1.7%
BbC	Bath channery silt loam, 8 to 25 percent slopes, extremely stony	0	1.3	0.2%
BeC	Benson-Rock outcrop complex, 8 to 25 percent slopes	0	7.5	1.1%
BeF	Benson-Rock outcrop complex, 25 to 70 percent slopes	0	25.1	3.5%
BrA	Braceville gravelly loam, 0 to 3 percent slopes	10	9.2	1.3%
BrB	Braceville gravelly loam, 3 to 8 percent slopes	5	7.0	1.0%
CmA	Chippewa and Norwich silt loams, 0 to 5 percent slopes	90	2.9	0.4%
Су	Cut and fill land	0	134.3	18.9%
Ну	Holly silt loam	100	24.7	3.5%
LBE	Lackawanna and Bath soils, steep, rubbly	0	18.8	2.6%
LxC	Lordstown channery silt loam, 8 to 25 percent slopes, rubbly	0	28.8	4.1%
LyE	Lordstown and Oquaga extremely stony soils, 25 to 70 percent slopes	0	28.8	4.1%
МаВ	Mardin channery silt loam, 3 to 8 percent slopes	0	6.1	0.9%
OkB	Oquaga-Lackawanna channery loams, 3 to 8 percent slopes	0	6.3	0.9%
OkC	Oquaga-Lackawanna channery loams, 8 to 15 percent slopes	0	1.7	0.2%
ОхВ	Oquaga-Lackawanna complex, 0 to 8 percent slopes, extremely stony	0	8.6	1.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
OxC	Oquaga-Lackawanna complex, 8 to 25 percent slopes, extremely stony	0	41.8	5.9%
Рр	Pope silt loam, high bottom	10	93.2	13.1%
ReA	Rexford gravelly silt loam, 0 to 3 percent slopes	40	8.7	1.2%
W	Water	0	45.2	6.4%
Wb	Wayland silty clay loam	100	1.8	0.3%
WyA	Wyoming gravelly sandy loam, 0 to 3 percent slopes	0	23.4	3.3%
WyB	Wyoming gravelly sandy loam, 3 to 8 percent slopes	0	55.5	7.8%
WyC	Wyoming gravelly sandy loam, 8 to 15 percent slopes	0	12.6	1.8%
WyD	Wyoming gravelly sandy loam, 15 to 25 percent slopes	0	11.0	1.5%
WyE	Wyoming gravelly sandy loam, 25 to 70 percent slopes	0	9.4	1.3%
Subtotals for Soil Survey Area			708.1	99.5%
Totals for Area of Interest			711.6	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ArvE	Arnot-Lordstown-Rock outcrop complex, 35 to 60 percent slopes	0	0.3	0.0%
WATER	Water	0	3.2	0.4%
Subtotals for Soil Survey Area			3.5	0.5%
Totals for Area of Interest			711.6	100.0%

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

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.

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.



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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

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Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Warren County, New Jersey Survey Area Data: Version 14, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 20, 2011—Oct 15, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
As	Alluvial land	B/D	78.5	11.0%
ВаВ	Bath channery silt loam, 3 to 8 percent slopes	С	3.4	0.5%
BaC	Bath channery silt loam, 8 to 15 percent slopes	С	12.4	1.7%
BbC	Bath channery silt loam, 8 to 25 percent slopes, extremely stony	С	1.3	0.2%
BeC	Benson-Rock outcrop complex, 8 to 25 percent slopes	D	7.5	1.1%
BeF	Benson-Rock outcrop complex, 25 to 70 percent slopes	D	25.1	3.5%
BrA	Braceville gravelly loam, 0 to 3 percent slopes	С	9.2	1.3%
BrB	Braceville gravelly loam, 3 to 8 percent slopes	С	7.0	1.0%
CmA	Chippewa and Norwich silt loams, 0 to 5 percent slopes	D	2.9	0.4%
Су	Cut and fill land		134.3	18.9%
Ну	Holly silt loam	B/D	24.7	3.5%
LBE	Lackawanna and Bath soils, steep, rubbly	С	18.8	2.6%
LxC	Lordstown channery silt loam, 8 to 25 percent slopes, rubbly	С	28.8	4.1%
LyE	Lordstown and Oquaga extremely stony soils, 25 to 70 percent slopes	С	28.8	4.1%
МаВ	Mardin channery silt loam, 3 to 8 percent slopes	D	6.1	0.9%
OkB	Oquaga-Lackawanna channery loams, 3 to 8 percent slopes	С	6.3	0.9%
OkC	Oquaga-Lackawanna channery loams, 8 to 15 percent slopes	С	1.7	0.2%
ОхВ	Oquaga-Lackawanna complex, 0 to 8 percent slopes, extremely stony	С	8.6	1.2%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
OxC	Oquaga-Lackawanna complex, 8 to 25 percent slopes, extremely stony	С	41.8	5.9%
Рр	Pope silt loam, high bottom	В	93.2	13.1%
ReA	Rexford gravelly silt loam, 0 to 3 percent slopes	D	8.7	1.2%
W	Water		45.2	6.4%
Wb	Wayland silty clay loam	C/D	1.8	0.3%
WyA	Wyoming gravelly sandy loam, 0 to 3 percent slopes	A	23.4	3.3%
WyB	Wyoming gravelly sandy loam, 3 to 8 percent slopes	A	55.5	7.8%
WyC	Wyoming gravelly sandy loam, 8 to 15 percent slopes	A	12.6	1.8%
WyD	Wyoming gravelly sandy loam, 15 to 25 percent slopes	A	11.0	1.5%
WyE	Wyoming gravelly sandy loam, 25 to 70 percent slopes	A	9.4	1.3%
Subtotals for Soil Survey Area			708.1	99.5%
Totals for Area of Interest			711.6	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ArvE	Arnot-Lordstown-Rock outcrop complex, 35 to 60 percent slopes	D	0.3	0.0%
WATER	Water		3.2	0.4%
Subtotals for Soil Survey Area			3.5	0.5%
Totals for Area of Interest			711.6	100.0%

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2 053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2 053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2 053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



Delaware Water Gap Environmental Research (PA OneMap)

The project location for the Delaware Water Gap station is seen below. It is located off of River Road, slightly Northeast of the I-80 crossing over River Road.



100 Year Flood Plain

The project location is located inside the 100-year flood plain.



BRODHEAD CREEK

Wild or Stocked Trout Streams

Brodhead Creek is located east of the project site and runs underneath River Road. This creek is a Trout Natural Reproduction Stream and flows into the Delaware River.



HQ/EV Streams

Per the PA Code, Chapter 93.9c, Brodhead Creek is listed as TSF, MF.

- **TSF: Trout Stocking-** Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
- **MF: Migratory Fishes-** Passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which move to or from flowing waters to complete their life cycle in other waters.

Brodhead Creek is also considered a navigable waterway, per the book *Keystone Canoeing*. This book is an unofficial guide to stream navigability. No work is anticipated to be this far outside of the project area, but if necessary, an ATON plan would be required for boating hazards.

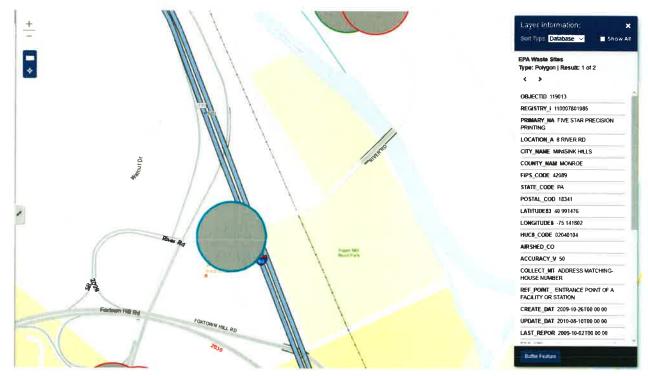
Wetlands

NWI Wetland areas are located along Brodhead Creek, located east of the project location.



Waste Sites

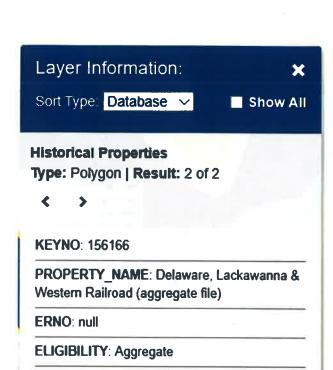
One waste site is located near the project location (across I-80). This waste site is listed from Five Star Precision Printing in Minisink Hills, PA.



Historical Properties

The historical property that runs through the project location is the Delaware, Lackawanna & Western Railroad: Line (Scranton to Slateford Junction) and (aggregate file).





HAS_GEOMETRY: Y

RESOURCE_TYPE: District

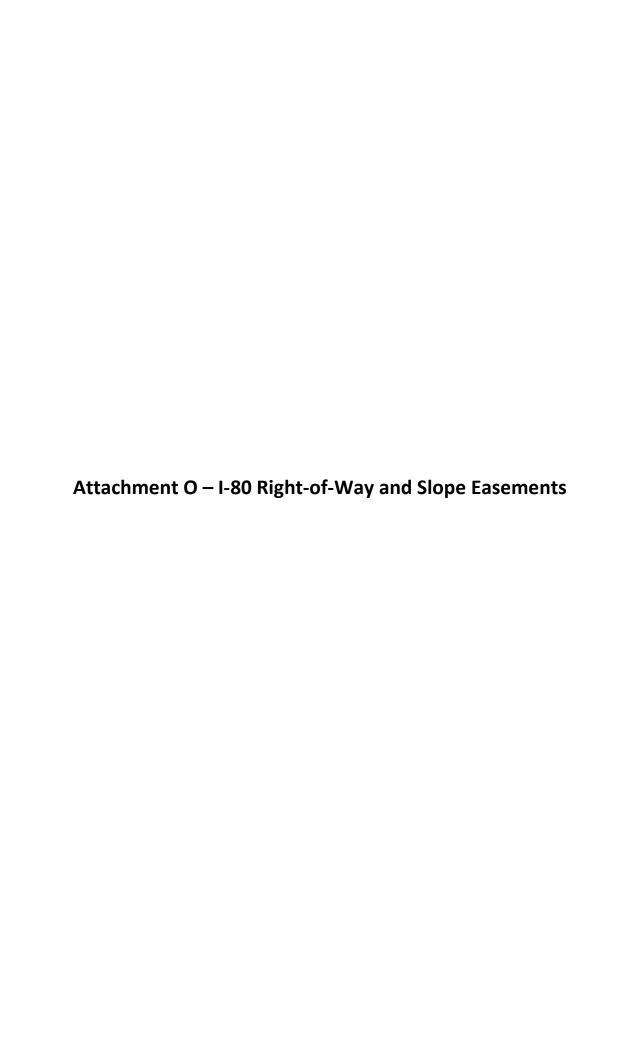
PRIMARYINVID: 134979

Buffer Feature

Agriculture

One agricultural soil is present over the project location. This area is considered "Prime Farmland Soils".





ROUTE SECTION MONROE DELAWARE WATER GAP RIVER ROAD <u>PLAN</u> CONCEPTUAL

SCALE

50 100 FEET

WATER GAP STATION ALTERNATE 2

2 OF 2