Transcontinental Gas Pipe Line Company, LLC

Requirement M – Erosion and Sediment Control Plan Narrative & Drawings
(as provided in the ESCP Application)

Regional Energy Access Expansion Project – Effort Loop

April 2021
(Revised July 2021)
(Revised March 2022)

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NARRATIVE

1. Project Description

Transcontinental Gas Pipe Line Company, LLC (Transco), indirectly owned by the Williams Companies, Inc. (Williams) is seeking authorization from the Federal Energy Regulatory Commission (FERC) under Section 7(c) of the Natural Gas Act and Part 157 of the Commission's regulations, to construct, own, operate, and maintain the proposed Project facilities associated with the Regional Energy Access Expansion Project (Project). The Project is an expansion of Transco's existing natural gas transmission system that will enable Transco to provide an incremental 829,400 dekatherms per day (Dth/d) of year-round firm transportation capacity from the Marcellus Shale production area in northeastern Pennsylvania to multiple delivery points along Transco's Leidy Line in PA and Mainline in PA, NJ, and MD.

The Effort Loop component of the Project will consist of approximately 13.8 miles of 42-inch pipeline co-located with existing Transco Leidy Lines between Mileposts 43.72 and 57.50 in Ross, Chestnuthill and Tunkhannock Townships, Monroe County. The new pipeline will tie-in to the existing 42-in Leidy Line "D" on both ends, completing the segment. With the segment completed, the existing pig traps (industry term for manifolds that launch or receive in-line inspection tools) at both tie-ins will no longer be needed and will therefore be removed, while the existing mainline valves will remain. Transco will be installing a new mainline valve and appurtenant equipment at Milepost 49.6 off of Sugar Hollow Road. The valve installation is a means to isolate gas flows. One Contractor Yard is proposed at the east end of the pipeline at MP 43.72 (CY-MO-001). One remote anode groundbed is proposed at MP 43.72.

The E&SC and SR Plan shall be designed and implemented to be consistent with the Post Construction Stormwater Management (PCSM) Plan under 25 Pa. Code § 102.8 (relating to PCSM requirements). Transco will use and implement the practices, measures and details outlined herein to control soil erosion and off-site sedimentation. The work and disturbed areas are located within Transco property, existing easements or legally obtained workspace. The limit of disturbance (LOD) for the Effort Loop Pipeline will be approximately 262.2 acres. Subject to FERC's certification of the Project and receipt of the necessary permits and authorizations, Transco anticipates construction of the Project to start in second quarter 2023 to meet a proposed in-service date in fourth quarter 2024.

1.1 MLV-505LD86

The mainline valve site, MLV-505LD86, is located at milepost 49.6 on the Effort Loop Pipeline. During construction of the Effort Loop Pipeline, two temporary freshwater storage tanks

will be placed adjacent to the valve. These tanks will provide water for hydrostatic testing of the pipeline before it is placed into service. The overall temporary earth disturbance at the site is approximately 8.64 acres. Upon completion of construction activities, the majority of the site will be restored to original conditions.

Proposed E&S Best Management Practices (BMPs) for MLV-505LD86 include rock construction entrances, compost filter socks, diversion and collection channels, sediment traps, and level spreaders. E&S BMPs have been designed in accordance with the PaDEP E&S BMP Manual. Design calculations, where needed, are provided in this document as attachments. E&S BMPs are depicted in the Effort Loop E&S Plans.

Upon completion of construction, the increased impervious area of MLV-505LD86 site will utilize several PCSM BMPs to control stormwater runoff, attenuate peak flow rate and volume, and provide infiltration. Excess stormwater runoff will be directed to the basin, berms, and subsurface infiltration beds via a series of collection channels for infiltration and controlled discharge. BMP design calculations and drawings are provided in Attachment 4 and the PCSM Plan set.

1.2 Contractor Yards

One contractor yard, CY-MO-001, is proposed for the Effort Loop Pipeline project. It is located at the east end of Effort Loop Pipeline at MP 43.72. The yard is a temporary facility with an approximate disturbance of 51 acres.

Proposed E&S BMPs include rock construction entrances, compost filter socks, and compost filter sock sediment traps. E&S BMPs have been designed in accordance with the PaDEP E&S BMP Manual. Design calculations, where needed, are provided in this document as attachments. E&S BMPs are depicted in the Effort Loop E&S Plans.

Upon completion of construction, CY-MO-001 will be restored to original conditions. No permanent features are proposed at the yard.

2. Topographic Features of the Area

A Project Location Map for the Effort Loop Pipeline is included in Attachment 1. This map shows the topographical features of the general site vicinity and is based on the USGS 7.5 Minute topographical mapping of the Blakeslee, Brodheadsville, Pocono Pines, and Saylorsburg, Pennsylvania quadrangles.

3. Receiving Surface Waters

The following table (Table 1) list each watershed located Effort Loop Pipeline Project Area, its Chapter 93 Water Quality Standards, and Pennsylvania Fish and Boat Commission classifications. A Wetland and Watercourse Delineation Report is included in Attachment A of the ESCP permit application.

Table 1 – Receiving Waters

Watershed Name	Designated Use	Existing Use	PFBC Classification	Stream Restriction
Lake Creek	HQ-CWF, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
Princess Run	CWF, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
Weir Creek	CWF, MF	-	Class A Wild Trout	Oct 1 – Apr 1
UNT to McMichael Creek	HQ-CWF, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
UNT to McMichael Creek	EV, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
UNT to Weir Creek	CWF, MF	-	Class A Wild Trout	Oct 1 – Apr 1
UNT to Pohopoco Creek	CWF, MF	HQ-CWF, MF	Class A Wild Trout	Oct 1 – Apr 1
Sugar Hollow Creek	CWF, MF	HQ-CWF, MF	Class A Wild Trout	Oct 1 – Apr 1
Poplar Creek	CWF, MF	EV, MF	Class A Wild Trout	Oct 1 – Apr 1
UNT to Poplar Creek	CWF, MF	EV, MF	Class A Wild Trout	Oct 1 – Apr 1
Mud Run	HQ-CWF, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
UNT to Mud Pond Run	HQ-CWF, MF	EV, MF	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
Long Pond to Tunkhannock Creek	HQ-CWF, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
UNT to Tunkhannock Creek (Keiper Run)	HQ-CWF, MF	-	Naturally Producing Wild Trout Stream	Oct 1- Dec 31
EV: Exceptional Value, MF: Migratory Fishes, HQ-CWF: High Quality- Cold Water Fishes, CWF: Cold Water Fishes				

4. Types, Depth, Slope, Locations & Limitation of the Soils and Geologic Formations

The soil associations on site were identified by soil map units as mapped in the Web Soil Survey website (https://websoilsurvey.sc.egov.usda.gov/) by the United States Dept. of Agriculture (USDA), Natural Resources Conservation Service (NRCS). There are 55 soil mapping units located within the LOD, see Table 2 below:

Table 2 – Soils mapping units within the LOD	
Soil Mapping Unit	**Soil Series**
AnB	Allenwood gravelly silt loam, 3 to 8 percent slopes
AwB	Alvira and Watson very stony loams, 0 to 12 percent slopes
BbC	Bath channery silt loam, 8 to 25 percent slopes, extremely stony
BrA	Braceville gravelly loam, 0 to 3 percent slopes
BrB	Braceville gravelly loam, 3 to 8 percent slopes
BxB	Buchanan channery loam, 8 to 25 percent slopes, rubbly
BxC	Buchanan channery loam, 8 to 25 percent slopes, rubbly
ChA	Chenango gravelly loam, 0 to 3 percent slopes
ChB	Chenango gravelly loam, 3 to 8 percent slopes
ChC	Chenango gravelly loam, 8 to 15 percent slopes
CnB	Chippewa and Norwich soils, 0 to 8 percent slopes, extremely stony
CpA	Clymer loam, 0 to 3 percent slopes
CxB	Clymer extremely stony loam, 0 to 8 percent slopes
Cy	Cut and fill land
DxB	Dekalb channery loam, 0 to 8 percent slopes, rubbly
DxC	Dekalb very channery loam, 8 to 25 percent slopes, extremely stony
DxE	Dekalb very stony loam, 25 to 100 percent slopes, very stony
GP	Pit, Shale, and Gravel
HaB	Hartleton channery silt loam, 2 to 8 percent slopes
HaC	Hartleton channery silt loam, 8 to 20 percent slopes
Hy	Holly silt loam
KaB	Kedron silt loam, 2 to 8 percent slopes
KvB	Klinesville channery silt loam, 3 to 8 percent slopes
KvC	Klinesville channery silt loam, 8 to 15 percent slopes
KvD	Klinesville channery silt loam, 15 to 25 percent slopes
LgB	Laidig extremely stony loam, 0 to 8 percent slopes
LgC	Laidig extremely stony loam, 8 to 25 percent slopes
LkB	Leck kill channery silt loam, 2 to 8 percent slopes
LkC	Leck kill channery silt loam, 8 to 15 percent slopes
LkD	Leck kill channery silt loam, 15 to 25 percent slopes
LsC	Lordstown channery silt loam, 8 to 15 percent slopes
LxC	Lordstown channery silt loam, 8 to 25 percent slopes, rubbly
MeB	Meckesville gravelly loam, 3 to 8 percent slopes
MeC	Meckesville gravelly loam, 8 to 15 percent slopes
MfB	Meckesville very stony loam, 0 to 8 percent slopes
MoB	Morris channery silt loam, 0 to 8 percent slopes

Pp	Pope silt loam, high bottom
ReA	Rexford gravelly silt loam, 0 to 3 percent slopes
SpB	Shelmadine very stony silt loam, 0 to 8 percent slopes
VaE	Very stony land and Rock outcrops, steep
W	Water
WaB	Watson silt loam, 2 to 8 percent slopes
Wb	Wayland silt clay loam
WeB3	Weikert channery silt loam, 3 to 8 percent slopes, eroded
WeC3	Weikert channery silt loam, 8 to 15 percent slopes, eroded
WeD3	Weikert channery silt loam, 15 to 25 percent slopes, eroded
WhB	Weiker-Hartleton channery silt loams, 3 to 8 percent slopes
WhC	Weikert-Hartleton channery silt loams, 8 to 15 percent slopes
WhD	Weikert-Hartleton channery silt loams, 15 to 25 percent slopes
WKE	Weikert and Klinesville soils, steep
WyA	Wyoming gravelly sandy loam, 0 to 3 percent slopes
WyB	Wyoming gravelly sandy loam, 3 to 8 percent slopes
WyC	Wyoming gravelly sandy loam, 8 to 15 percent slopes
WyD	Wyoming gravelly sandy loam, 15 to 25 percent slopes

Detailed descriptions and mapping of soil mapping units are provided in the Attachment 2. Soil use limitations (outlined in Table 3) were reviewed in relation to the Effort Loop Pipeline and resolutions were identified in Section 4.1.

Table 3 – Limitations of Pennsylvania Soils Pertaining to Earth Disturbance Projects (Erosion and Sediment Control Best Management Practice (BMP) Manual – Technical Guidance Number 363-3134-008/Page 401)

SOIL NAME	SOIL WITH SLOPE CLASS	CUTBANKS CAVE	CORROSIVE TO CONCRETE\STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH / LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK - SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
Allenwood	AnB	X	C/S					X	X	X	X	X	X				
Alvira	AwB	X	C/S	X	X		X	X	X	X	X	X	X				X
Bath	BbC	X	C/S				X	X		X		X	X				
Braceville	BrA, BrB	X	C/S	X	X		X	X	X	X	X	X	X				X
Buchanan	BxB, BxC	X	C/S	X	X		X	X	X	X	X	X	X				X

Table 3 – Limitations of Pennsylvania Soils Pertaining to Earth Disturbance Projects (Erosion and Sediment Control Best Management Practice (BMP) Manual – Technical Guidance Number 363-3134-008/Page 401)

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Chenango	ChA, ChB, ChC	X	C	X		X	X	X		X	X	X	X				
Chippewa	CnB	X	C/S	X	X		X	X	X	X	X		X	X		X	
Clymer	CpA, CxB	X	C	X	X			X	X	X	X	X	X				X
Cut and Fill*	Cy																
Dekalb	DxB, DxC, DxE	X	C	X					X	X	X	X	X				
Pit, Shale and Gravel*	GP																
Hartleton	HaB, HaC	X	C	X					X	X	X	X	X				
Holly	Hy	X	C/S			X	X	X	X	X	X	X	X			X	X
Kedron	KaB	X	C/S				X	X	X	X	X	X	X				X
Klinesville	KvB, KvC, KvD	X	C/S	X	X			X		X		X	X				
Laidig	LgB, LgC	X	C/S	X	X		X	X	X	X	X	X	X				
Leck Kill	LkB, LkC, LkD	X	C						X	X	X	X	X				X
Lordstown	LsC, LxC	X	C	X	X				X	X	X		X				
Meckesville	MeB, MeC, MfB	X	C/S				X		X	X	X	X	X				X
Morris	MoB	X	C/S	X	X		X	X	X	X		X	X				X
Pope	Pp	X	C/S		X	X		X	X	X	X	X	X				
Rexford	ReA	X	C/S	X		X	X	X	X	X	X	X	X				X
Shelmadine	SpB	X	C/S	X			X	X	X	X	X	X	X				
Very Stony*	VaE																
Water	W																
Watson	WaB	X	C/S	X			X	X	X	X	X		X	X			
Wayland	Wb	X	S		X	X	X	X	X	X	X	X	X			X	X
Weikert	WeB3, WeC3, WeD3, WhB, WhC, WhD, WKE	X	C/S	X				X	X	X	X	X	X				
Wyoming	WyA, WyB, WyC, WyD	X	C	X				X		X		X					

*Soils have similar limitations to the dominant soil or soils in the area.

4.1 Resolution of Soil Limitations

Transco proposes the following resolutions to compensate for soil limitations summarized in Table 3 above:

1. To offset the caving of cutbanks, trenching operations will be conducted in accordance with the OSHA Technical Manual for Trenching.
2. Preventative coatings shall be used to prevent corrosion of concrete and/ or steel.
3. When bedrock is encountered it will be removed by mechanical methods or blasting. Blasting operations will conform with local, state, and federal regulations.
4. Precautions will be taken to prevent slope failure when working within low strength soils by flattening cut / fill slopes, not overloading, maintaining lateral support, and preventing saturation of soils. Low strength soils will not be used for roadway construction.
5. Excavation in soils prone to flooding, slow percolation, ponding, wetness, located in a seasonal high water table, or which are hydric, will likely encounter water. Compensation will involve dewatering with appropriate means such as pump water filter bags, sediment traps, etc.
6. Soils that have the potential to swell, shrink, or heave due to frost action may cause damage to roadways or pads. Where foundations are critical, compensation may require removal and replacement of soils with suitable material.
7. In circumstances where soils appear to be a poor source of topsoil, drought or prone to wetness, soil testing will be performed to determine the appropriate applications of soil amendments to promote growth. Soils onsite that are fair sources of topsoil, will be identified, stripped and stockpiled for use during restoration.
8. In order to minimize erosion of soils that are easily erodible, compensation may involve providing a protective lining, to apply seed, mulch, erosion control blankets (either in rolls or hydraulically applied), tracking slopes, upstream diversions, waterbars, etc. to minimize soil erosion.

4.2 Geologic Formations

Transco retained Civil & Environmental Consultants, Inc. (CEC) of Pittsburgh, PA to perform a geohazard assessment, the following is provided from their 2020 report. Transco utilized United States Geological Survey (USGS), Geologic Map of Pennsylvania - Map 1, dated 1980 (online), to evaluate geologic hazards on the Project. The desktop analysis completed for the Project by CEC revealed that the Effort Loop Pipeline does not cross any known, mapped, or inferred faults. No mines or Karst formations were identified in the site vicinity. However, the

analysis outlined that Effort Loop Pipeline lies within a zone of moderate to high landslide incidence and susceptibility.

Due to the moderate to high landslide incidence and susceptibility, a Geological Hazard Assessment and Mitigation Plan was completed by CEC and is submitted with this application (Attachment B). The Geological Hazard Assessment and Mitigation Plan identifies appropriate best management practices to avoid and mitigate for conditions encountered during construction.

5. Characterizations of Earth Disturbance Activities, Including Past, Present, and Proposed Land Uses

The Effort Loop Pipeline will consist of approximately 13.8 miles of 42-inch pipeline co-located with existing Transco Leidy Lines between Mileposts 43.72 and 57.50 in Ross, Chestnuthill and Tunkhannock Townships, Monroe County. The new pipeline will tie-in to the existing 42-in Leidy Line "D" on both ends, completing the segment. With the segment completed, the existing pig traps (industry term for manifolds that launch or receive in-line inspection tools) at both tie-ins will no longer be needed and will therefore be removed, while the existing mainline valves will remain. Transco will be installing a new mainline valve and appurtenant equipment at Milepost 49.6 off Sugar Hollow Road. The valve installation is a means to isolate gas flows. One Contractor Yard is proposed at the east end of the pipeline at MP 43.72 (CY-MO-001).

Work and disturbed areas are located within Transco property, existing easements, or legally obtained workspace where the past, present, and proposed land use is primarily an existing pipeline ROW. Along the edges of the ROW land use is primarily forested. The proposed contractor yard and staging areas will be used temporarily and subsequently removed after the completion of the Project. Staging areas will be used for parking, equipment turn-arounds, and temporary storage of equipment. Transco will use a contractor yard for parking, contractor offices, and the storage of construction equipment and pipes. This contactor yard consists of an agricultural field. Disturbed areas within these temporary workspaces will be restored to the original contours. Transco will use and implement the practices, measures, and details to control soil erosion and off-site sedimentation during construction. Using data taken from Google Earth and Multi-Resolution Land Characteristics (MRLC) Consortium website (https://www.mrlc.gov/viewer/), it appears that the Effort Loop Pipeline site has been an existing and maintained gas pipeline right-of-way for the past 20 years and will continue to be an existing and maintained gas pipeline right-of-way once the Project is complete. Portions of the existing ROW's will be expanded upon as a result of the Project's construction. Based on the surrounding

land characteristics, land use prior to ROW construction within the past 50 years likely would have been either forested land or meadow.

6. Erosion and Sediment Control Best Management Practices

Various erosion and sediment control measures will be used during the construction of the Effort Loop Pipeline. BMPs proposed to be used at the Site to control soil erosion and sediment pollution are listed below. Details of BMPs proposed to be used at the Project location is included in the Erosion and Sedimentation Control Plan sheets. BMPs listed will be used at the Project location at the discretion of the environmental inspector, when found necessary to comply with 25 PA Code Chapter 102 and to adequately address potential erosion and sediment control issues.

Rock Construction Entrances

Rock construction entrances shall be installed whenever sediment tracking onto road surfaces is a potential or if required by the county conservation district or other agency. Soil erosion control measures shall be installed, if required and as needed. In special protection watersheds, either a 100’ long rock construction entrance or a standard 50’ rock construction entrance with a wash rack will be used at the construction entrance to wash construction vehicle wheels before they enter the public roadway. The wash rack will discharge to a 24” compost filter sock (min.). Rock construction entrance thickness shall be constantly maintained to the specified dimensions by adding rock. Sediment deposited on roadways shall be removed and returned to the construction site immediately.

Compost Filter Sock

Compost filter socks shall be placed downslope of disturbed areas to serve as a sediment barrier and filter. Filter socks shall be placed at existing level grade, parallel to contours, with both ends of the sock extended up slope at a 45-degree angle. In areas where it is not feasible to install compost filter sock parallel to contours, compost filter sock j-hooks will be utilized. Compost filter sock j-hooks will be installed in accordance with DEP’s list of approved alternative E&S and PCSM BMPs. Socks can be used on both steep and rocky slopes. Socks can range in size from 12” to 32” diameter depending on the site conditions. The maximum permissible slope lengths above compost filter socks will be used to determine the sizes of compost filter.

Compost Filter Sock Sediment Trap

Runoff may be directed into the Compost Filter Sock Sediment Traps of sheet flow into the trap. Compost sock sediment traps shall not exceed three socks in height and shall be stacked

in pyramidal form. Minimum trap height is one 24" diameter sock. Additional storage may be provided by means of an excavated sump 12" deep extending 1 to 3 feet upslope of the socks along the lower side of the trap. The maximum tributary drainage area is 5.0 acres. Since compost socks are "flow-through," no spillway is required. Installation of an excavated sump immediately above the socks may increase trap efficiency where soil conditions permit their construction.

Earthen Sediment Trap

At MLV-505LD086, runoff will be directed into an earthen Sediment Trap. The maximum tributary drainage area is 5.0 acres. The sediment trap is designed with a minimum sediment storage capacity of 700 cf/acre, and 1,300 cf/ acre of dewatering storage. The sediment trap will dewater through a perforated riser pipe.

Broad Based Dips

Broad-based dips may be used to direct runoff from access roads to well-vegetated areas. In HQ/EV watersheds, sump with compost filter sock should be utilized at the discharge end of the broad-based dip.

Waterbars

Waterbars will be aligned along the pipeline ROW to direct runoff towards the downslope side of the disturbed area and to avoid backflow into the ROW. Compost filter sock shall be installed along the edge of the limit of disturbance to slow run off. Compost filter sock hooks shall be installed at an upslope angle and shall discharge to a well-vegetated area. Upslope of the CFS, a sump shall be constructed to reduce velocity and provide a sheet flow condition to the CFS. Permanent waterbars within the ROW shall be left in place after permanent stabilization has been achieved.

Compost Filter Sock Waterbar Discharge / Waterbar Sump

An 18" Compost Filter Sock shall be installed at the edge of the LOD where waterbar cross the LOD. Upslope of the CFS a 24" x 24" sump shall be constructed to reduce velocity and provide a sheet flow condition to the CFS. The sump shall be filled and stabilized when the CFS is removed after site stabilization.

Diversion Channels / Mountable Berms

Diversion channels or mountable berms shall be used to divert runoff from disturbed areas and convey it to appropriate BMPs such as a sedimentation basin sediment trap or clean water crossing.

Trench Plug

These will be placed at the banks of waterbodies in order to maintain stable working conditions and keep sediment from entering the waterways. Earth filled sacks will be used to secure the plug. The spacing of these structures varies based on the site and the slope of the dig location, as indicated in the plan drawings.

Erosion Control Blankets

A suitable erosion control blanket or soil stabilizer shall be used wherever earth disturbance occurs within 50 feet of surface waters, or 100 feet if special protection water, especially if site conditions make use of conventional E&S BMPs difficult. Erosion control blankets should be used on finished slopes greater than 3:1.

Timber Mats

Timber mats can be used for temporary wetland crossings. The timber mats are placed over the wetland to allow equipment to cross and then are removed.

Temporary Equipment Bridges

A temporary bridge equipment crossing will be built in order to cross any streams along the pipeline installation. The bridge equipment crossing will utilize geotextile material, timber mats, and a timber or metal bridge with side rails any may include instream supports (where necessary). Culvert Equipment crossings may be used in areas where equipment must cross stream channels. Culverts shall be placed in the stream channel sized appropriately to convey the flow within the channel and shall be placed at least one-half their diameter apart. Coarse aggregate may be used for fill surrounding the culverts. Upon completion, all material placed in the stream channel shall be completely removed.

Flumed Crossing/ Dam and Pump Crossing

These may be used when work is to be completed in a waterway. A flumed crossing involves the placement of a flume pipe within the waterway and using diversion structures up and down gradient to divert flow through the flume pipe and out of the work area. A dam and pump crossing involves placing sandbag barriers on the upstream and downstream sides of the workspace to prevent water from entering the maintenance area. A pump shall be placed to move any water from the upstream side, around the workspace and back to the downstream side of the work area. Trench plugs may be used on the banks of the stream to keep water from leaving the bed and banks limit of the waterway.

Pumped Water Filter Bag

Filter bags shall be placed in well-vegetated grassy areas and discharge onto stable, erosion resistant areas, and staked if the slope is greater than 5 percent. In the event that this is not possible, a geotextile path will be provided. A compost filter sock shall be placed below the filter bag when placed within 50 of streams or wetlands located within a HQ/EV watershed.

Trench Dewatering

Trench dewatering may be required, depending on the site conditions during the excavation. Water shall be pumped out and discharged into a filter bag or a dewatering structure when deemed necessary.

Safety Fence

Safety fence shall be installed to protect sensitive environmental features as depicted on the plan drawings. The fencing shall remain in place during the phases of construction.

Siltron Pollution Prevention Fence

Siltron Pollution Prevention Fence may be used throughout the project where environmental features make it necessary in lieu of Compost Filter Sock (CFS). The site specific sediment barriers will be selected by the environmental inspector on a site by site basis. These barriers will be placed at existing level grade, with both ends of the barrier extending at least 8' upslope at a 45 degree angle. Sediment must be removed when accumulations reach ½ the above ground height of the fence. The size and type of fence will be selected based on slope lengths as determined in the maximum slope length for Multi-Layer Geotextile Filter Fence figures. The 16-inch filter fence is equivalent to an 18-inch compost filter sock, the 21-inch filter fence is equivalent to a 24-inch compost filter sock, and a 28-inch filter fence is equivalent to a 32-inch compost filter sock. Approved for use as an Alternative E&S and PCSM BMP by PA DEP on 8/22/18.

Rock Filter Outlet

Rock filter outlets may be used to address areas where concentrated flows intersect sediment barriers. They may also be used in instances where sediment barriers such as silt fence or compost filter socks have failed due to concentrated flow.

Inlet Protection/Rock Filter

Rock filters may be used to control runoff within constructed channels or at the inlet of stormwater piping to reduce erosion and collect sediment. The efficiency may be raised by

anchoring a 6" layer of compost on the upgradient side.

Wetland Installation Procedures

During the course of pipeline maintenance and replacement within wetland areas, BMPs including slope breakers, equipment mats, sediment barriers, and trench plugs may be used to prevent altering the hydrology of the wetland and to prevent sediment from entering the wetland. Work within the wetland boundaries shall be limited to the extent possible. Upon completion of work the wetland area shall be restored to pre-construction grades and seeded with an appropriate wetland seed mixture.

Hydrostatic Dewatering Structure

A hydrostatic dewatering structure will be placed on a level, well vegetated site such that water will flow away from the structure and work areas. Flow rates through discharge and diverter pipes will be such that structures will not overflow. Contractor will properly remove and dispose of the dewatering structure immediately upon completion of dewatering operations.

Bored Road Crossing/Trenched Road Crossing

These may be used where pipeline installation or maintenance under a bored road is necessary. Sediment barriers shall be used around the work area. Culverts will be placed where required to maintain water flow for stormwater ditches.

Riprap Apron

Riprap aprons may be used at pipe or channel outfalls. The aprons will help dissipate flow velocity before entering vegetated areas and/or receiving stream(s).

Structural Level Spreader

Structural level spreaders are used to collect concentrated runoff in a plunge pool and distribute flow uniformly across a weir to a vegetative surface, such that the velocity of the flow is reduced and the risk of erosion is minimized.

Perforated Pipe Level Spreader

Perforated pipe level spreaders are used to distribute stormwater runoff to established vegetative surfaces as sheet flow using perforated pipes. The perforated pipe is placed subsurface within a gravel bed.

Clean Water Crossings

Temporary diversion channels or mountable berms shall be used to divert runoff from

undisturbed upslope areas and convey the runoff around areas of earth disturbance within the pipeline ROW corridor. From the diversion, the flow will outlet to a temporary pipe(s) crossing, which is installed across the right-of-way, and discharge to an outlet basin. Clean water leaving the outlet basin will return to sheet flow downslope of the disturbed ROW.

Revegetation Plan and Procedures

The construction site should be stabilized as soon as possible after completion. Establishment of final cover must be initiated no later than 7 days after reaching final grade. Temporary erosion and sedimentation control BMPs can be removed when the site meets final stabilization. Final stabilization means that soil-disturbing activities are completed, and that either a permanent vegetative cover with a density of 70% or greater has been established or that the surface has been stabilized by hard cover such as pavement or buildings. It should be noted that the 70% requirement refers to the total area vegetated and not just a percent of the site.

Surface Roughening

Surface roughening is the practice of providing a rough soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. Surface roughening should be applied to slopes 3H:1V or steeper unless a stable rock face is provided or it can be shown that there is not a potential for sediment pollution to surface waters. For roughened surfaces within 50 feet of a surface water, and where blanketing of seeded areas is proposed as the means to achieving permanent stabilization, spray-on type blankets are recommended.

Typical Topsoil Stockpile

The maximum stockpile height shall not exceed 35 feet. Stockpile slopes shall be no steeper than 2H:1V. Stockpiles shall be stabilized in accordance with temporary seeding specifications and mulch is to be maintained until the stockpile is stabilized. Stockpile location shown on the plans are illustrative and may vary in location as construction proceeds.

Typical Channel and Vegetation Restoration

The impacted riparian zone will be restored for a minimum of 15 feet landward of the top of bank. If the pre-impact riparian buffer of native herbaceous and shrub vegetation exceeds 15 feet beyond the top of bank, the area to be seeded should be as follows: 150 feet in High-Quality waters, 100 feet in other waters, or existing width of the riparian zone if it is less than the minimum requirements. Ernst Seed Mix 178 (Riparian Buffer Mix) or similar shall be applied on restored

banks and riparian zones. In addition, where existing forested buffers are impacted these shall be replanted outside of the existing maintained ROW, as indicated in forest replanting plans for the Project outlined in the Chapter 105 permit.

7. Recycling and Disposal of Materials

The restoration of the pipeline right-of-way will require the removal of the temporary materials. The temporary materials include, but may not be limited to, stone surfaces and associated geotextiles. The contractors are required to dispose of the materials at suitable disposal or recycling sites and in compliance with local, state and federal regulations.

Contractors are required to inventory and manage their construction site materials. The goal is to be aware of the materials on-site, ensure they are properly maintained, used, and disposed of, and to make sure the materials are not exposed to stormwater. The following materials or substances are expected to be present on-site during construction (Note: this list is not an all-inclusive list and the materials management plan can be modified to address additional materials used on-site):

- Acids
- Detergents
- Fertilizers (nitrogen/phosphorus)
- Hydroseeding mixtures
- Petroleum based products
- Sanitary wastes
- Soil stabilization additives
- Solder
- Solvents

These materials must be stored as appropriate and shall not contact storm or non-stormwater discharges. Contractor shall provide a weatherproof container to store chemicals or erodible substances that must be kept on the site. Contractor is responsible for reading, maintaining, and making employees and subcontractors aware of Safety Data Sheets (SDSs).

8. Thermal Impacts

Due to the overall nature of the Project, thermal impacts to surface waters are not anticipated. The pipeline installation activities will primarily take place within an existing cleared and maintained pipeline right-of-way. There will be no increase in stormwater discharge. The primary means to address thermal impacts on this Project is to limit the size and duration of exposed earth. Revegetation procedures and the Sequence of Construction outline disturbed

areas being immediately revegetated.

Stormwater runoff associated with the installation of the MLV's will be routed through the stormwater BMPs designed to retain and infiltrate the first surge of water from the site. The first surge of water will be the warmest water for the duration of the storm event and will quickly cool as the storm event progresses. The BMPs are designed to capture and infiltrate this warmest surge of stormwater. Based on routing calculations, stormwater is not discharged from the BMPs for the first 8 hours during a 100-year/24-hour storm event. The retention period is longer for less intense storms. Therefore, as a result of these measures, no significant thermal impact to the receiving waters is anticipated.

9. Antidegradation Requirements

Transco is meeting the state antidegradation requirements contained in Chapters 93, 95, 102 and 105 through various measures provided in the Project design, such as proposed construction measures and requests for permit approvals for activities associated with the Project. Where the Project is located within Exceptional Value (EV) or High Quality (HQ) watersheds or impacts EV wetlands, as defined by Chapter 93 and Chapter 105, Transco will install required antidegradation best available combination of technologies (ABACT) best management practices (BMPs), protecting the designated and existing uses of the resources. BMPs outlined in the erosion and sediment control and site restoration plans will be installed, monitored, and maintained until the Project meets the vegetative cover requirements required by the approved permits for earth disturbance and water obstruction and encroachment. During the Project's construction, any issues identified with the BMPs shall be repaired as described in the permits and plans.

Transco evaluated the feasibility of non-discharge alternatives that would be located outside of exceptional value (EV) or high-quality (HQ) watersheds. Hydraulic models were analyzed from an efficiency and effectiveness point of view to confirm and minimize the necessary pipeline lengths and diameters to meet the Project purpose and need. In order for the Project to meet the required purpose and need, siting the Effort Loop Pipeline outside of EV and HQ watersheds, is not feasible.

Therefore, Transco determined that there are no cost-effective and environmental sound viable non-discharge alternatives for the project. Transco has minimized project impacts to EV and HQ watersheds through the use of co-location with existing pipelines and protecting riparian

buffers within the project workspace. Earth disturbance will be minimized to the extent practical and will be phased or sequenced to only disturbed portions that are necessary for the specific scope of work. Wherever possible, the LOD was decreased to avoid disturbing additional ground and will be kept to the minimum width and depth necessary to safely complete construction activities.

ABACT standards have been proposed for the Effort Loop because there are no viable non-discharge alternatives. The Erosion and Sediment Control Plan prepared for the Project outlines a more stringent design and E&S BMPs that meet ABACT standards.

Pipeline installation activities along the pipeline ROW and at the contractor yards/staging areas will not result in increase in discharge of stormwater to surface waters. The existing / designated use of the streams within the Project area are to be protected through E&S and post-construction stormwater management (PCSM) measures taken by Transco.

The MLV-505LD86 site will result in increased discharge of stormwater to surface waters which will be mitigated by the implementation of PCSM BMPs. Proposed PCSM BMPs are designed with stormwater volume reduction and water quality treatment maximized to the extent practicable within the site constraints to maintain and protect existing water quality and existing and designated uses.

No changes to the aquatic community or water chemistry within the streams or wetlands crossed or impacted by the Project are anticipated to occur. All streams crossed by the Project shall utilize clean water bypass BMPs during construction to allow continuous flow of all streams crossed, and these streams will be restored to pre-existing conditions once construction is complete. The wetland impacts associated with temporary disturbance will be restored and stabilized upon final restoration with PSS and PFO impacted wetlands outside the proposed maintained corridor being replanted. The wetland, stream, and floodway impacts are considered isolated to their disturbance area and do not extend beyond the Projects LOD.

As part of the Project design, impacts to resources were avoided and minimized where possible and include the following measures: pipeline collocation within/adjacent to an existing ROW, restoration of disturbed areas to pre-existing conditions with the exception of above ground facilities, and limiting the extent and duration of earth disturbance. Transco has provided a nominal workspace of 75 feet in wetlands and floodways and 50 feet within the stream top-of-bank for the pipeline installation where possible. Where these nominal workspaces were

exceeded, site specific justification has been provided in the Chapter 105 Joint Permit Application. During construction, excavated trenches will be kept to the minimum width and depth necessary to safely complete construction activities. Project access has been designed to utilize existing access roads as much as possible, thereby minimizing the need for new road construction.

Consultation with state and federal agencies regulating threatened and endangered (T&E) species has occurred and is ongoing. The agencies include the Pennsylvania Game Commission, Pennsylvania Fish and Boat Commission, Department of Conservation of Natural Resources and the United States Fish and Wildlife Service. Transco has completed surveys, as required by the appropriate agency, and is still coordinating with these agencies. Transco is conducting a concurrent review of the PNDI coordination and will obtain necessary approvals prior to commencing construction of the Project.

During construction, Transco's Construction Spill Prevention and Response Procedures for Oil and Hazardous Materials (Spill Plan) outlined in Section 1-10 will be implemented to minimize the potential for spills and the effects of any spills that may occur. Details of how the site materials are managed, including the storage of equipment, hazardous materials, fuels, and lubricating oils and other construction items are identified in the Spill Plan. The plan defines the procedures for spill notification, emergency response, spill response, personal protective equipment, clean-up procedures and spill presentation practices.

The cumulative effect of the Project will not result in the impairment of the Commonwealth's "Exceptional Value" and "Other" wetland resources. A review of the Section 303(d) list of the Clean Water Act indicated that no surface waters crossed by the Project are classified as impaired waterbodies. The wetland impacts will involve temporary disturbance while the pipeline is being installed, and the wetlands will be restored in accordance with the Onsite Restoration Plan, as outlined in Attachment 2 – Wetland and Riparian Reforestation Plan of Section 1.7, and the Chapter 102 permit. The wetland impacts are isolated to their disturbance area. The Project has been collocated with Transco's existing gas pipeline system, to avoid fragmentation and to minimize resource impacts. Construction BMPs, including erosion control devices and timber matting, to mitigate for soil compaction within the wetlands, will be utilized to minimize impacts throughout the Project.

The impacted wetlands, their Chapter 105.17 Classification, Cowardin Code, Milepost, Palustrine Community Classification, and Hydrogeomorphic Classification are provided in Table

1. The Palustrine Community Classification identifies the wetland vegetation cover type impacted by the Project. The Hydrogeomorphic Classification identifies the hydrologic source for the impacted wetlands. Table 1 identifies the existing conditions of the impact wetlands, including both “EV” and “Other” wetlands.

Table 4
Wetland Resource Classification

Milepost or Access Road	Wetland ID	Chapter 105.17 Classification	HGM Classification	Cowardin Classification	Palustrine Community Classification
45.23	W1-T5	EV	Depression Seasonal	PEM	Mixed Forb - Graminoid Wet Meadow
45.83	W4-T6	EV	Depression Seasonal	PEM, PSS	Bluejoint - Reed Canary - grass marsh, Circumneutral Mixed Shrub Wetland
46.09	W1-T2	EV	Depression Seasonal	PEM	Mixed Forb Marsh
46.31	W2-T2	Other	Depression Seasonal	PSS	Mixed Forb - Graminoid Wet Meadow, Circumneutral Mixed Shrub Wetland, Oak – Mixed Hardwood Palustrine Forest
49.43	W1-T1	EV	Riverine Floodplain Complex	PEM, PSS	Floodplain Meadow, Alder – Dogwood Floodplain Thicket
52.66	W2-T1	EV	Riverine Floodplain Complex	PEM	Floodplain Meadow
53.65	W9-T2	EV	Riverine Floodplain Complex	PEM, PFO	Mixed Forb - Graminoid Wet Meadow, Red maple – Highbush Blueberry Palustrine Woodland
55.20	W12-T2	EV	Depression Temporary	PEM, PFO	Mixed Forb - Graminoid Wet Meadow, Red maple – Highbush Blueberry Palustrine Woodland
56.57	W14-T2	EV	Depression Temporary	PEM	Mixed Forb - Graminoid Wet Meadow
56.62	W4-T3	EV	Depression Temporary	PEM, PFO	Mixed Forb - Graminoid Wet Meadow, Red maple – Highbush Blueberry Palustrine Woodland
56.90	W3-T1	EV	Riverine Floodplain Complex	PEM, PFO	Mixed Forb - Graminoid Wet Meadow, Red maple – Highbush Blueberry Palustrine Woodland
56.91	W15-T2	EV	Depression Temporary	PFO	Red maple – Highbush Blueberry Palustrine Woodland
56.99	W3A-T1	Other	Riverine Floodplain Complex	PFO	Red maple – Highbush Blueberry Palustrine Woodland
57.1	W4-T1	EV	Depression Seasonal	PEM	Mixed Forb - Graminoid Wet Meadow
57.23	W4A-T1	EV	Depression Seasonal	PEM	Cat-tail Marsh
57.27	W6-T1	EV	Depression Temporary	PEM	Mixed Forb - Graminoid Wet Meadow
57.44	W8-T1	EV	Riverine Floodplain Complex	PEM, PSS	Mixed Forb - Graminoid Wet Meadow, Red Maple - Mixed Shrub Palustrine Woodland
57.45	W10-T1	EV	Depression Seasonal	PEM	Mixed Forb -Graminoid Wet Meadow

9.1 Primary Wetland Impacts

To minimize adverse impacts at wetland crossings, Transco will implement its Plan and Procedures during the construction, post-construction restoration, and operation of the Project. Transco developed the Procedures to address temporary wetland effects associated with construction of the Project. The Procedures are intended to satisfy the wetland restoration requirements of applicable resource protection agencies with jurisdiction over areas affected by the Project.

Transco will use pipeline construction crossing methods based on site-specific conditions and resource sensitivity. These methods are conventional dry open-cut and conventional bore. Operation of construction equipment through wetlands will be limited to only what is necessary for each stage of construction (e.g., clearing, trenching, staging). Transco will minimize compaction of topsoil within unsaturated wetlands by stripping, segregating, and stockpiling topsoil separately from subsoil during construction. Topsoil segregation techniques will be used in unsaturated wetlands to preserve the seed bank and to facilitate successful restoration. Construction workspaces have been minimized to the extent practicable within these resources. Pipeline construction will use the conventional dry open-cut method at most locations. Construction equipment will use timber mats to prevent soil rutting for construction access through the wetlands. Matting and geotextile will be used for topsoil segregation within wetland resources. Trench plugs will be installed at the entrance and exit of the pipeline through the wetland to ensure that the wetland is not drained along the pipeline. In forested and scrub-shrub wetlands, Transco will minimize clearing to the extent practicable while maintaining safe construction conditions.

Pipe stringing and fabrication may occur within saturated and unsaturated wetlands adjacent to the trench or adjacent to the wetland. Soil structure and the presence of standing water commonly found in wetlands along with the large surface loads of construction equipment and materials to construct large diameter pipelines contribute to the need for additional workspace adjacent to wetland crossings. Hydric soils typically are lower in strength and become weaker when saturated. Handling weak material during the excavation/stockpile process further reduces the strength of the soil mass by disturbance/remolding/mixing, thus requiring a larger area to stockpile the soils. Additionally, buoyancy control (e.g., weights, concrete-coated pipe) may be necessary in wetland environments, which require the trench to be larger in both width and depth, resulting in additional stockpile material.

Upon completion of construction within wetlands, Transco will promptly restore wetlands to their original configurations and contours and stabilize disturbed adjacent upland areas. Wetland areas will be revegetated with Ernst FACW Meadow Mix (ERNMX-122), or an alternative wetland seed mix that contains similar species, where standing water is not present, to stabilize disturbed soils. PEM wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation, will revert to emergent vegetation following construction, resulting in no permanent change to wetland type. PSS and PFO wetlands affected during construction will be seeded with the wetland seed mix and also replanted with native trees and shrubs outside of the proposed maintained ROW. Following construction, Transco will monitor disturbed wetlands and adjacent uplands until restoration and long-term stabilization is documented.

Vegetation Impacts

Construction of the Project will result in temporary impacts to eighteen PEM, PSS and PFO wetlands. Permanent functional conversion impacts (PFO/PSS to PEM) of wetlands located within the proposed maintained pipeline ROW will occur to nine wetlands, for a total of 0.29 acres. Temporary functional conversion impacts of wetlands located within the temporary workspace will occur to ten wetlands, for a total of 0.53 acres. Wetlands outlined as temporary functional conversion impacted wetlands will be replanted onsite. Forested riparian areas, PFO and PSS wetlands shall be restored with the exception of portions located within the proposed maintained ROW. Riparian areas and wetlands will be revegetated using approved seed mixes. Transco will replant existing forested riparian buffers, PFO and PSS wetlands impacted outside of the permanent maintained ROW. A 10-foot-wide herbaceous corridor will be maintained over the center of the pipeline within the riparian buffer areas. Trees within 15 feet of the centerline or between existing pipelines will be removed to maintain the integrity of the pipelines. Wetlands outlined as temporary functional conversion impacted wetlands will be replanted onsite, as outlined in Attachment 2 – Wetland and Riparian Reforestation Plan of Section 1.7.

Hydrology Impacts

The characteristics of water quantity, stream flow, and sources, groundwater basal flows, drainage patterns, flushing characteristics, flow currents, natural recharge or source areas, stormwater and floodwater storage and control are discussed below.

Water Quantity, Stream Flow and Sources

Transco will cross waterbodies with flowing water present at the time of construction using primarily dry-ditch construction methodology. One wetland resource (W2-T2) will be conventionally bored as it is adjacent to a state highway and the highway bore will also include the boring of this resource. The trenchless construction methodology proposed would not result in effects to water quantity, stream flow and sources. The dry-ditch construction method shall be completed with a clean water bypass that may include dam and pump or flume pipe. Each option passes water around the crossing location, minimizing construction impacts downstream. The pipeline is installed in the dry, with the trench excavation, pipe installation, and backfill completed at this time. Once complete, the stream banks and streambed will be restored to pre-construction contours. To stabilize the banks, stream banks and riparian areas will be revegetated using approved seed mixes and/or erosion control blankets or matting.

Groundwater Basal Flows and Natural Recharge or Source Areas

No impacts to groundwater basal flows and natural recharge or source areas are anticipated as part of the Project. Impacts to groundwater basal flows and natural recharge or source areas will be avoided and minimized through the utilization of Transco's Plan and Procedures. Additionally, potential impacts will also be minimized through the use of the Spill Plan for Oil and Hazardous Materials (Spill Plan) if incidents occur.

With the exception of the new main line valve at MP 49.6, no new impervious areas are required. The valve settings will have some impervious area, however, stormwater impacts will be mitigated for through a stormwater management design, which will promote infiltration at the site. All areas associated with the pipeline installation will be restored to approximate pre-construction contours to preserve the existing condition. This restoration shall limit the pipeline facilities from having adverse effects on groundwater basal flows and natural recharge or source areas.

Drainage Patterns, Flushing Characteristics and Flow Currents

The proposed Project will have minimal impacts to drainage patterns, flushing characteristics and flow currents to wetlands and waterbodies during construction with no long-term impacts anticipated.

Pipeline components of the Project will take place within or adjacent to a previously disturbed pipeline ROW. Stormwater controls, which will be installed during construction, have

been designed to avoid impacts to natural drainage features. These controls will only have temporary impacts while installed and will be removed once the site is stabilized with vegetation. Minimal impacts to wetland resources are anticipated, as these functions are generally limited when compared to watercourses. Transco will restore pipeline facility workspaces to pre-construction contours.

Stormwater and Floodwater Storage and Control

The proposed Project will have minimal impacts to stormwater and floodwater storage and control during construction, with no long-term impacts anticipated. Aboveground facilities are located outside of Federal Emergency Management Agency (FEMA) Floodplains, FEMA Floodways and 50-foot floodways.

Restoration of pre-construction contours along the Effort Loop will preserve the existing condition of the FEMA floodplains, 50-foot floodways, and wetlands. This restoration shall limit the pipeline facilities from having adverse effects on flood-storage capacity or stormwater control. With the exception of the Main Line Valve at MP 49.6, no impervious areas are to be added as a result of the pipeline component of the Project. The Main Line Valve site will have impervious area and will include a stormwater management design that promotes infiltration at the site.

Hydrodynamics

Stream and wetland crossings will be restored to pre-existing conditions. Natural streambed materials will be replaced in the streambed and the pre-existing stream alignment should be restored to pre-construction alignments. Erosion control blankets shall be placed on restored stream banks to the ordinary high-water mark and surrounding wetland areas. If streams have existing bank protection, these bank protection measures shall be restored.

9.2 Secondary Impacts

This section describes the potential secondary impacts to aquatic resources associated with the Project's wetland crossings, including aquatic habitats, water quantity and water quality.

Water Quantity

Potential secondary impacts on water quantity or wetland hydrology could result from changes in the existing drainage patterns and alteration in flow and water levels from construction. However, the Project does not involve any addition of structures or impervious surfaces in the wetlands. Because the Project does not involve direct impacts to natural and current drainage

patterns and wetlands will be restored to approximate original contours following construction, the Project will not result in secondary impacts to existing drainage patterns. A Post-Construction Wetland and Watercourse Monitoring Plan will include monitoring for potential secondary impacts to hydrology.

Compaction of wetland soils and rutting within wetlands could temporarily impact wetland hydrology. These impacts will be minimized by using temporary equipment mats. The segregation of topsoil within the trench line of wetland crossings will also limit the potential for soil compaction. The replacement of topsoil to the original soil horizons and elevations will promote the return of native vegetation along with the return of natural groundwater direction and flow rates.

Water Quality

As noted above, secondary impacts related to the loss of water quality to adjacent wetland locations have the opportunity to occur during construction and restoration of the Project. Construction activities can disturb surface soils and cause subsequent sediment transport into adjacent wetlands. Sedimentation will be minimized by installing temporary sediment control measures between the upland construction areas and the wetlands, as described above. Permanent erosion controls, including slope breakers, trench breakers, and vegetative cover, will be used in adjacent upland areas to minimize long-term sedimentation into the wetlands. During construction, potential secondary impacts will be minimized by installing energy-dissipation devices at the down-slope end of slope breakers to minimize erosion of soil off the ROW into wetlands. Trench plugs will be installed in upland slopes adjacent to wetlands to prevent trench erosion. Trench plugs also will be installed at the edges of the wetland and on either side of waterbody crossings to prevent subsurface drainage along the pipeline.

Habitat

General construction related impacts on wildlife species, as it relates to wetlands, will result from habitat disturbance and human activities. Secondary impacts on wildlife will include those associated with increased human activity. Construction of the Project is likely to result in the temporary displacement of, or stress on, animals in areas adjacent to construction and cause movement of some wildlife away from the Project area. Stress on wildlife could affect general health, reproduction, and viability of young animals, depending on the sensitivity of a particular species, season of the year, and other factors. Other temporary impacts on wildlife species could

include those from pipeline trenching activities and associated spoil piles, which could result in a short-term barrier to movement to some species.

During clearing and grading activities, more mobile wildlife species (e.g., larger mammals, birds, and reptiles) will be able to avoid the construction area, and many are expected to temporarily leave the area during construction and migrate to surrounding areas. Construction activity will generally be temporary and will occur in a given area for only a few weeks, in general. Habitat recovery will occur, aided by the use of the impact minimization and restoration measures thereby minimizing secondary impacts.

Transco does not anticipate the Project will reduce or degrade habitat for terrestrial, aquatic, or avian species significantly due to the pipeline co-location. Habitat fragmentation has been minimized through the use of pipeline collocation. While temporary impacts on food, cover, and water sources may occur, none of the species located within the Project area are specialized in such a way that construction of the Project will inhibit the overall fitness or reproductive output of the populations as a whole. Minimal changes to existing habitat types will occur due to this Project siting. Wildlife populations that utilize the Project area are not expected to be permanently adversely affected by the proposed Project.

10. Riparian Buffers

Pipeline installation will take place within an existing cleared and maintained pipeline ROW and forested areas. Due to the linear nature of the project, temporary impacts within riparian buffers are unavoidable. At locations where it was impossible to avoid riparian impacts due to safety issues, Transco will implement BMPs to minimize the impacts. After completing the construction activities, areas used for pipeline installation and as contractor yards/staging areas will be restored back to pre-existing contours and reseeded with a riparian seed mix in areas where slopes are less than 10%. Tree and shrub plantings will occur in forested riparian buffers outside of the maintained ROW as outlined in riparian reforestation plans outlined in the Chapter 105 permit.

At MLV-505LD86, where permanent increase in impervious area is proposed, Sugar Hollow Creek recently changed from CWF to HQ-CWF. Trees are proposed to be cleared along Sugar Hollow Road; which is within the 150 buffer. Transco will apply for the waiver for earth disturbance needed to improve the sight distance as a public health or safety issue in accordance with §102.14(d)(2)(i). Installation of the driveway and storm pipe work would be considered an

allowable activity in accordance with 102.14(f)(2)(i) if these activities are located within the buffer. Section 1-7 - Riparian Buffer Waiver Request has been revised to include this updated information.

Linear projects including pipelines are eligible for the Riparian Buffer Waiver under 25 PA Code §102.14(d)(2)(ii) if riparian buffers are undisturbed to the extent practicable. As such, a Riparian Buffer Waiver has been requested along with this ESCP application (Section 1-7).

11. Project Site Runoff

Changes in Project site runoff are not anticipated for the Project except at the MLV-505LD86 site, where increase in the impervious area is proposed. The Project site is primarily existing and maintained pipeline right-of-way in meadow condition with a forested fringe. The ROW will be restored to meadow condition upon the completion of construction. Proposed BMPs were sized based on the maximum tributary drainage area anticipated during construction. An analysis of pre- and post-development stormwater runoff was performed for the MLV site. Absent controls, the installation of the valves and associated access road will increase the volume of stormwater runoff due to the increase in the type and size of the impervious area. The contractor will construct stormwater BMPs to mitigate the increase in volume and peak rates associated with construction. Refer to the Post-Construction Stormwater Management (PCSM) Plan for additional information (Section 3 of this ESCP Application). Changes in stormwater runoff between pre- and post-development conditions for 2-year rainfall event and changes in peak discharge rates for 1-, 2-, 10-, 25-, 50- and 100-yr storms are given in the tables below.

11.1 MLV-505LD86

Pre- and Post-Construction Stormwater Volume for 2-yr Rainfall event

Pre-construction (cf)	Post-construction before BMPs (cf)	Post-construction after BMPs (cf)	Net (cf)
14,876	17,783	12,329	-2,547

DA-1: Pre-Construction Peak Discharge Rates (cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.00	0.01	0.15	0.83	2.00	3.90

DA-1: Post-Construction Peak Discharge Rates (cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.02	0.07	1.36	3.57	6.23	10.01

DA-1: Post-Construction w/ BMPs Peak Discharge Rates (cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.00	0.00	0.13	0.64	1.54	3.58

DA-1: Difference between Pre-Construction and Post-Construction w/ BMPs

	1-year	2-year	10-year	25-year	50-year	100-year
NET Difference	-0.00	-0.01	-0.02	-0.19	-0.46	-0.32

DA-2: Pre-Construction Peak Discharge Rates(cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.38	0.93	3.22	5.40	7.61	10.45

DA-2: Post-Construction Peak Discharge Rates (cfs)

1-year	2-year	10-year	25-year	50-year	100-year
1.06	1.76	4.01	5.91	7.75	10.03

DA-2: Post-Construction w/ BMPs Peak Discharge Rates (cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.27	0.39	1.80	4.28	5.94	7.82

DA-2: Difference between Pre-Construction and Post-Construction w/ BMPs

	1-year	2-year	10-year	25-year	50-year	100-year
NET Difference	-0.11	-0.54	-1.42	-1.12	-1.67	-2.63

DA-3: Pre-Construction Peak Discharge Rates(cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.00	0.00	0.05	0.33	1.25	3.12

DA-3: Post-Construction Peak Discharge Rates (cfs)

1-year	2-year	10-year	25-year	50-year	100-year
0.00	0.00	0.05	0.33	1.25	3.12

12. Offsite Discharge Analysis

The stormwater BMPs being constructed at the MLV-505LD86 site are in areas that will discharge stormwater to offsite non-surface water. These areas have been analyzed to reduce the likelihood that these discharges will be erosive to adjacent property owners. The analysis has been performed in accordance with PADEP Document 3150-FS-DEP4124, “Off-Site Discharges of Stormwaters to Areas That Are Not Surface Waters”. The full analysis is presented in Attachment 4 – Offsite Discharge Report. A summary of the findings is presented below.

12.1 MLV-505LD86

The MLV-505LD86 Yard site utilizes two infiltration berms, an infiltration basin and two subsurface infiltration beds. A series of PCSM channels along the access road will direct

stormwater to discharge locations on both the north and south sides of the access road. On the south side of the access road, stormwater from the PCSM channels enters Infiltration Berm 1, flows into Infiltration Berm 2 and discharges to a wooded area near the southeastern part of the MLV-505LD86 site. The remainder of PCSM channels direct stormwater water into two subsurface infiltration beds south of the access road and an infiltration basin that is north of the access road. The Infiltration Basin has an outlet that discharges into an 24" diameter pipe which directs stormwater to the Sugar Hollow Road ditch. Infiltration Bed #1 and Infiltration Bed #2 discharge below the access road and flow into the Sugar Hollow Road ditch. Stormwater from the Sugar Hollow Road ditch leaves the site via an 18" Sugar Hollow Road PennDOT culvert.

The infiltration berms discharge water as sheet flow which travels along a vegetative flow path, eventually entering Sugar Hollow Creek. The area downstream of the outfall is over 90% vegetated. In the E&S and PCSM Narrative, site calculations are provided that show the Pre- and Post-Construction runoff flow rates and volume. These calculations show a reduction in the post-construction discharge rates and volumes. Calculations indicated that the discharge velocity at the proposed Infiltration Berm 2 is 1.31 fps for the 25 year, 24-hour storm event. Since the outlet velocity is below 2.5 fps, downstream erosion will be minimal, if not negligible.

The infiltration basin discharges stormwater to a basin riser pipe outlet. Infiltration Bed #1 has a 4" outlet pipe and Infiltration Bed #2 has a 6" outlet pipe which discharge upgradient of the Sugar Hollow Road ditch. The stormwater from these BMPs is discharged as sheet flow and travels along a vegetative flow path until it enters a Sugar Hollow Roadside ditch near the site entrance and then a PennDOT culvert south of the Limits of Disturbance. The area downstream of the outfall is over 90% vegetated. In the E&S and PCSM Narrative, site calculations are provided that show the Pre- and Post-Construction runoff flow rates and volume. These calculations show a reduction in the post-construction discharge rates and volumes. Calculations indicated that the discharge velocity at the proposed Infiltration Basin outlet is 0.0 feet per second for the for the 25 year, 24-hour storm event. The discharge velocity from subsurface Infiltration Bed #1 is 1.61 feet per second and the discharge velocity from Infiltration Bed #2 is 1.88 feet per second for the 25 year, 24-hour storm event. Since the outlet velocity is below 2.5 fps, downstream erosion will be minimal, if not negligible.

13. Site Restoration Plan

13.1 Previous Land Use

The Project sites are primarily existing and maintained pipeline right-of-way in meadow

condition with a forested fringe. Using data taken from Google Earth and Multi-Resolution Land Characteristics (MRLC) Consortium website (https://www.mrlc.gov/viewer/), it appears that the Effort Loop has been an existing and maintained gas pipeline right-of-way for the past 20 years and will continue to be an existing and maintained gas pipeline right-of-way once the Project is complete. Based on the surrounding land characteristics, land use prior to ROW construction within the past 50 years likely would have been either forested land or meadow.

13.2 Disturbance Activities, Changes to Permanent Topographic Land Cover Along Pipeline Alignment

The Effort Loop Pipeline will consist of approximately 13.8 miles of 42-inch pipeline co-located with existing Transco Leidy Lines between Mileposts 43.72 and 57.50 in Ross, Chestnuthill and Tunkhannock Townships, Monroe County. The new pipeline will tie-in to the existing 42-in Leidy Line “D” on both ends, completing the segment. With the segment completed, the existing pig traps (industry term for manifolds that launch or receive in-line inspection tools) at both tie-ins will no longer be needed and will therefore be removed, while the existing mainline valves will remain. Transco will be installing a new mainline valve, MLV-505LD86, and appurtenant equipment at Milepost 49.6 off Sugar Hollow Road. The valve installation is a means to isolate gas flows. One Contractor Yard is proposed at the east end of the pipeline at MP 43.72 (CY-MO-001).

The work and disturbed areas are located within Transco property, existing easements, or legally obtained workspace where the past, present, and proposed land use is primarily an existing pipeline ROW. Along the edges of the ROW land use is primarily forested. The proposed contractor yard and staging areas will be used temporarily and subsequently removed after the completion of the Project. Staging areas will be used for parking, equipment turn-arounds, and temporary storage of equipment. Transco will use a contractor yard for parking, contractor offices, and the storage of construction equipment and pipes. This contactor yard consists of an agricultural field. Disturbed areas within these temporary workspaces will be restored to the original contours. In addition to the E&S BMP measures listed in Section 6.0 Transco will use and implement the following practices, measures, and details to control soil erosion and off-site sedimentation during construction.

13.3 Restoration Measures

Pipeline components of the Project will take place within or adjacent to a previously disturbed pipeline ROW. Stormwater controls which will be installed during construction have

been designed to avoid impacts to natural drainage features. These controls will only have temporary impacts while installed and will be removed once the site is stabilized with vegetation. Minimal impacts to wetland resources are anticipated, as these functions are generally limited when compared to watercourses. The Effort Loop workspaces will be restored by to pre-construction contours.

Cleanup operations will commence immediately following backfill operations. Final grading, topsoil replacement, and installation of permanent erosion control structures will be completed within 20 days after backfilling the trench (10 days in residential areas). Construction debris will be removed from construction work areas unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration. Rock in excess of four inches from at least the top 12 inches of soil in cultivated or rotated cropland, managed pastures, hayfields, and residential areas, as well as other areas will be removed at the landowner's request. Construction right-of-way will be graded to restore pre-construction contours and leave the soil in the proper condition for planting. Temporary sediment barriers will be removed and replaced by permanent erosion control measures or when revegetation is successful.

Wetland Restoration Procedures

The wetlands will be revegetated with annual ryegrass at 40 lbs / acre pure live seed and with the recommended wetland seed mix, unless standing water is present. Lime, fertilizer or mulch will not be used in wetland areas. In the event that final seeding and mulching is deferred more than 20 days after the trench is backfilled, slopes adjacent to wetlands shall be blanketed for a minimum of 100 feet on each side of the crossing.

Specific procedures will be developed in coordination with the appropriate land management or state agency, where necessary, to prevent the invasion or spread of undesirable exotic vegetation (such as purple loose strife and phragmites). It will be ensured that disturbed areas permanently revegetate.

Equipment mats will be removed upon completion of construction, as well as temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are successful.

Permanent Erosion Control Measures

Trench plugs are intended to slow the flow of subsurface water along the trench. Trench

plugs may be constructed of materials such as sandbags or polyurethane foam. Do not use topsoil in trench breakers. At a minimum, install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland. Trench breakers will be installed in wetlands to prevent water from traveling along the trench and altering micro-watersheds within the wetlands.

Waterbars are intended to reduce runoff velocity, divert water and prevent sediment deposition into sensitive resources. Waterbars shall be constructed using spacing recommendations outlined below. In the absence of written recommendations, use the following spacing unless closer spacing is necessary to avoid excessive erosion on the construction right-of-way:

Slope (%)	Spacing (feet)
<5	250
5-15	150
>15-30	100
>30	50

Waterbars will be constructed to divert surface flow to a stable area without causing water to pool or erode behind the breaker. In the absence of a stable area, construct appropriate energy-dissipating devices at the end of the waterbar.

Soil Compaction Measures

Topsoil and subsoil will be tested for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Tests will be conducted on the same soil type under similar moisture conditions in undisturbed areas to approximate preconstruction conditions. Penetrometers or other appropriate devices will be used to conduct tests.

Severely compacted agricultural areas will be plowed with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling. Refer to the Transco Project-specific Agricultural Construction and Monitoring Plan. Appropriate soil compaction mitigation will be performed in severely compacted residential areas.

Revegetation Plan and Procedures

The construction site should be stabilized as soon as possible after completion. Establishment of final cover must be initiated no later than 7 days after reaching final grade. Temporary erosion and sedimentation control BMPs can be removed when the site meets final stabilization. Final stabilization means that soil-disturbing activities are completed, and that either a permanent vegetative cover with a density of 70% or greater has been established or that the surface has been stabilized by hard cover such as pavement or buildings. It should be noted that the 70% requirement refers to the total area vegetated and not just a percent of the site.

Surface Roughening

Surface roughening is the practice of providing a rough soil surface with horizontal depressions for the purpose of reducing runoff velocity, increasing infiltration, aiding the establishment of vegetation, and reducing erosion. Surface roughening should be applied to slopes 3H:1V or steeper unless a stable rock face is provided or it can be shown that there is not a potential for sediment pollution to surface waters. For roughened surfaces within 50 feet of a surface water, and where blanketing of seeded areas is proposed as the means to achieving permanent stabilization, spray-on type blankets are recommended.

Typical Channel and Vegetation Restoration

The impacted riparian zone will be restored for a minimum of 15 feet landward of the top of bank. If the pre-impact riparian buffer of native herbaceous and shrub vegetation exceeds 15 feet beyond the top of bank, the area to be seeded should be as follows: 150 feet or the existing width of the riparian zone if it is less than the minimum requirements. Ernst Seed Mix 178 (Riparian Buffer Mix) or similar shall be applied on restored banks and riparian zones. In addition, where existing forested buffers are impacted these shall be replanted outside of the existing maintained ROW, as indicated in forest replanting plans for the Project outlined in the Chapter 105 permit.

13.4 Maintenance and Evaluation for Effectiveness

Follow-up inspections of disturbed areas will be conducted as necessary, to determine the success of revegetation and address landowner concerns. At a minimum, conduct inspections after the first and second growing seasons. Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful when upon visual survey, crop growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise.

Continue revegetation efforts until revegetation is successful.

BMPs should be properly maintained to ensure their effectiveness. Sheet flow conditions and infiltration must be sustained throughout the life of the BMP. BMPs should be inspected for clogging from sediment of debris, damage by foot or vehicular traffic, and flow channelization. Inspections should be made on a quarterly basis for the first two years following installation, and then twice per year thereafter. Inspections should also be made after every storm event greater than 1 inch during the establishment period.

Channel linings should be inspected for signs of erosion or dislodging, as applicable. Channels should be inspected for debris, overgrown vegetation, and other blockages. Vegetated areas will be inspected weekly and after runoff events until permanent vegetation is achieved. Once the vegetation is established, inspections of health, diversity, and density should be performed at least twice per year, during both the growing and non-growing season. Vegetative cover should be sustained at 85% and reestablished if damage greater than 50% is observed. Damaged BMPs will be repaired as soon as possible upon discovery. Repairs will be made to restore to BMPs to the original design condition.

Drainage and irrigation systems problems resulting from pipeline construction in agricultural areas will be monitored and corrected until restoration is successful. Restoration will be considered successful when the surface condition is similar to adjacent undisturbed lands, construction debris is removed, revegetation is successful, and proper drainage has been restored.

Vegetated areas will be inspected weekly and after runoff events until permanent vegetation is achieved. Once the vegetation is established, inspections of health, diversity, and density should be performed at least twice per year, during both the growing and non-growing season. Vegetative cover should be sustained at 85% and reestablished if damage greater than 50% is observed. Damaged BMPs will be repaired as soon as possible upon discovery. Repairs will be made to restore damaged BMPs to the original design condition.

Routine vegetation mowing or clearing over the full width of the permanent right-of-way in uplands will not be done more frequently than every three years. Transco will limit routine vegetation mowing or clearing within wetlands and adjacent to waterbodies. A 10-foot-wide herbaceous corridor will be maintained over the center of the pipeline within the wetland and riparian buffer areas. Trees and other woody vegetation will also be allowed to reestablish

naturally within the construction ROWs that were cleared for construction of the pipeline. However, trees within 15 feet of the centerline and between existing pipelines will be removed to maintain the integrity of the pipeline. In no case will routine vegetation mowing or clearing occur during the migratory bird nesting season between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency or the U.S. Fish and Wildlife Service. Transco will not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.

Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and permanent access roads as necessary.

Wetlands and waterbodies will be protected through use of waterbars, diversion/collection channels, trench plugs, and erosion control blankets. Broad-based dips may be used to direct runoff from access roads to well-vegetated areas. In HQ/EV watersheds, sump with compost filter sock should be utilized at the discharge end of the waterbar. Diversion channels shall be used to divert runoff from disturbed areas and convey it to appropriate BMPs such as a sedimentation basin sediment trap or clean water crossing. These will be placed at the banks of waterbodies in order to maintain stable working conditions and keep sediment from entering the waterways. Earth filled sacks will be used to secure the plug. The spacing of these structures varies based on the site and the slope of the dig location, as indicated in the plan drawings. A suitable erosion control blanket or soil stabilizer shall be used wherever earth disturbance occurs in close proximity of surface waters especially if site conditions make use of conventional E&S BMPs difficult. Erosion control blankets should be used on finished slopes greater than 3:1.

Post-Construction Wetland and Watercourse Monitoring shall occur annually for a period of five years following construction and include wetlands and watercourses impacted by the Project, and a monitoring report submitted thereafter. Each monitoring report will include, at a minimum, the following information:

- Information describing the presence or absence of hydrology at the time of inspection and a narrative comparison to hydrology present in the wetland or watercourse during pre-permitting field investigation(s);
- Photographic Documentation;

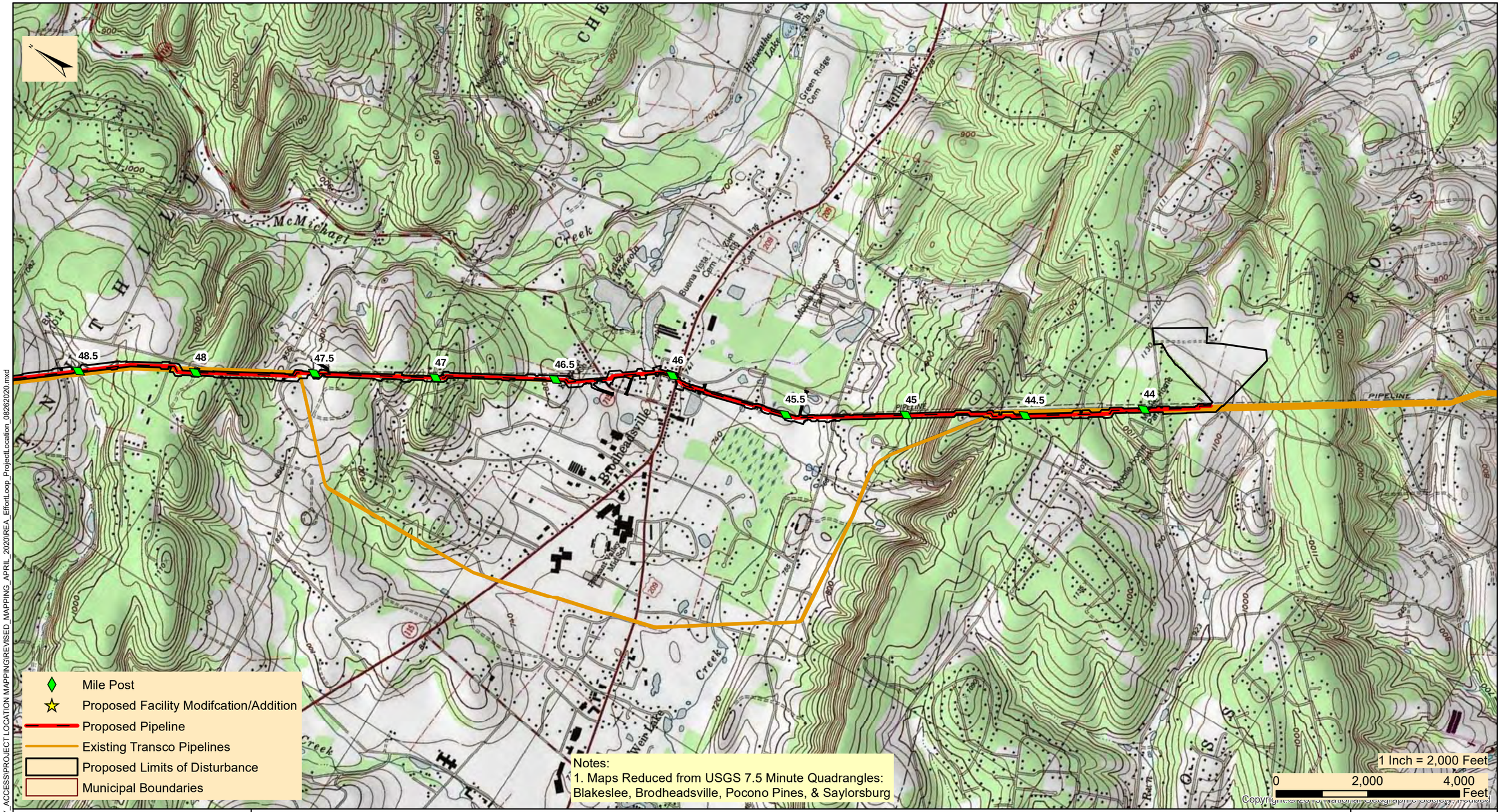
- Vegetation data including inventory of plant species, percent coverage of native hydrophytic species (wetlands), and stem counts survival; and
- Identification of any problems or concerns that require remedial measures, including loss of hydrology, and a plan to address the deficiencies.

Contractor shall provide a weatherproof container to store chemicals or erodible substances that must be kept on the site. Contractor is responsible for reading, maintaining, and making employees and subcontractors aware of Safety Data Sheets (SDSs).

14. Erosion and Sediment Control Plan Shall be Prepared by a Person Trained and Experienced in Erosion Control Methods and Techniques

These plans and narrative were prepared by Patrick Wozinski, PE (BAI Group, LLC) of State College, PA in accordance with the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual, March 2012. Plan preparer's resume is provided in Attachment C of the ESCP permit package.

ATTACHMENT 1
PROJECT LOCATION MAP



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Williams®

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

REGIONAL ENERGY ACCESS EXPANSION PROJECT

PROPOSED 42" LEIDY D EFFORT LOOP

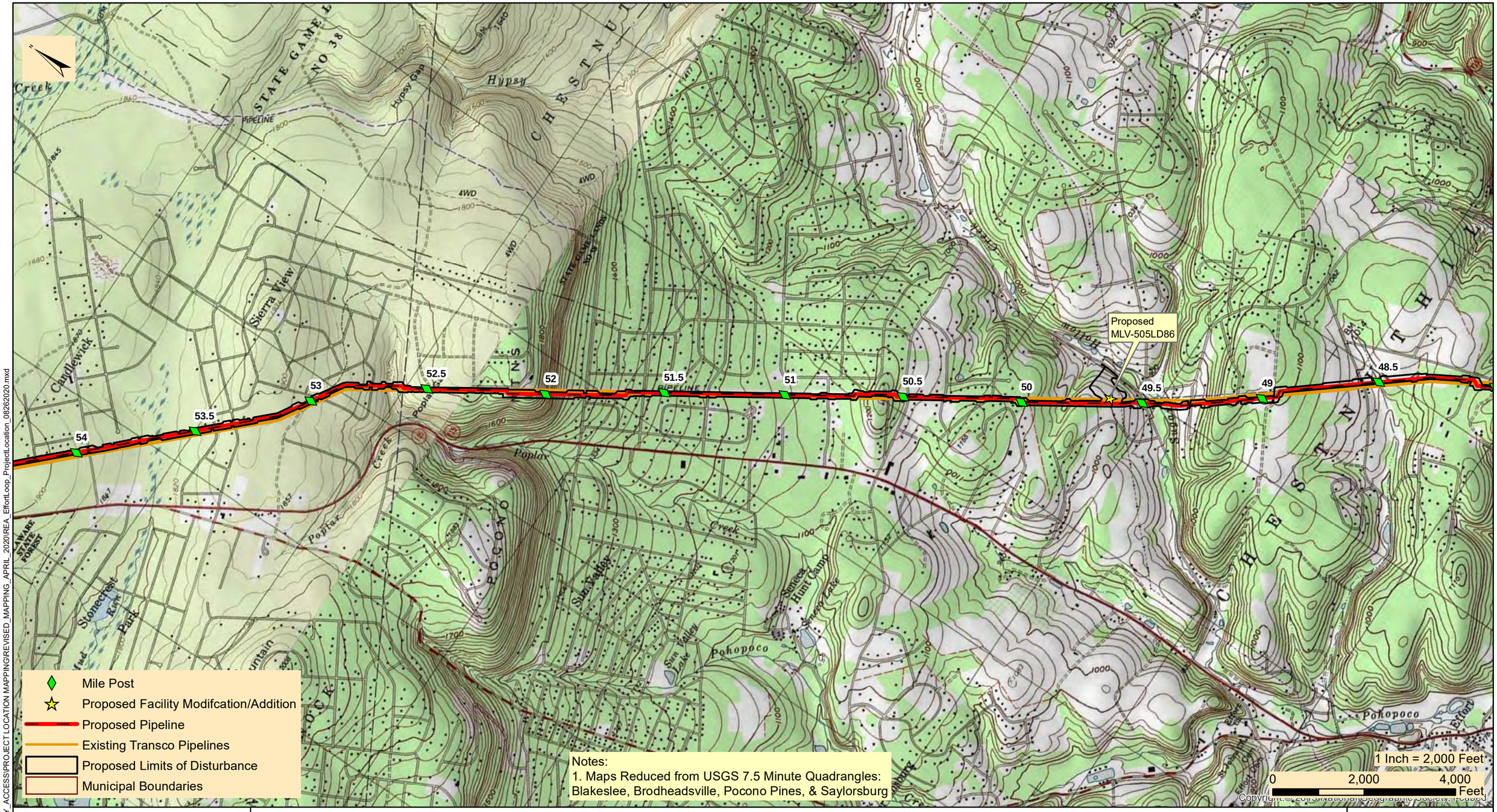
PROJECT LOCATION MAP

CHESTNUT HILL & ROSS TOWNSHIP | MONROE COUNTY | PENNSYLVANIA

Date: 2/10/2022

Drawn By: FTN

Figure Number: EL-1



TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

REGIONAL ENERGY ACCESS EXPANSION PROJECT

PROPOSED 42" LEIDY D EFFORT LOOP

PROJECT LOCATION MAP

CHESTNUT HILL & TUNKHANNOCK TOWNSHIP | MONROE COUNTY | PENNSYLVANIA

Date: 2/10/2022

Drawn By: FTN

Figure Number: EL-2

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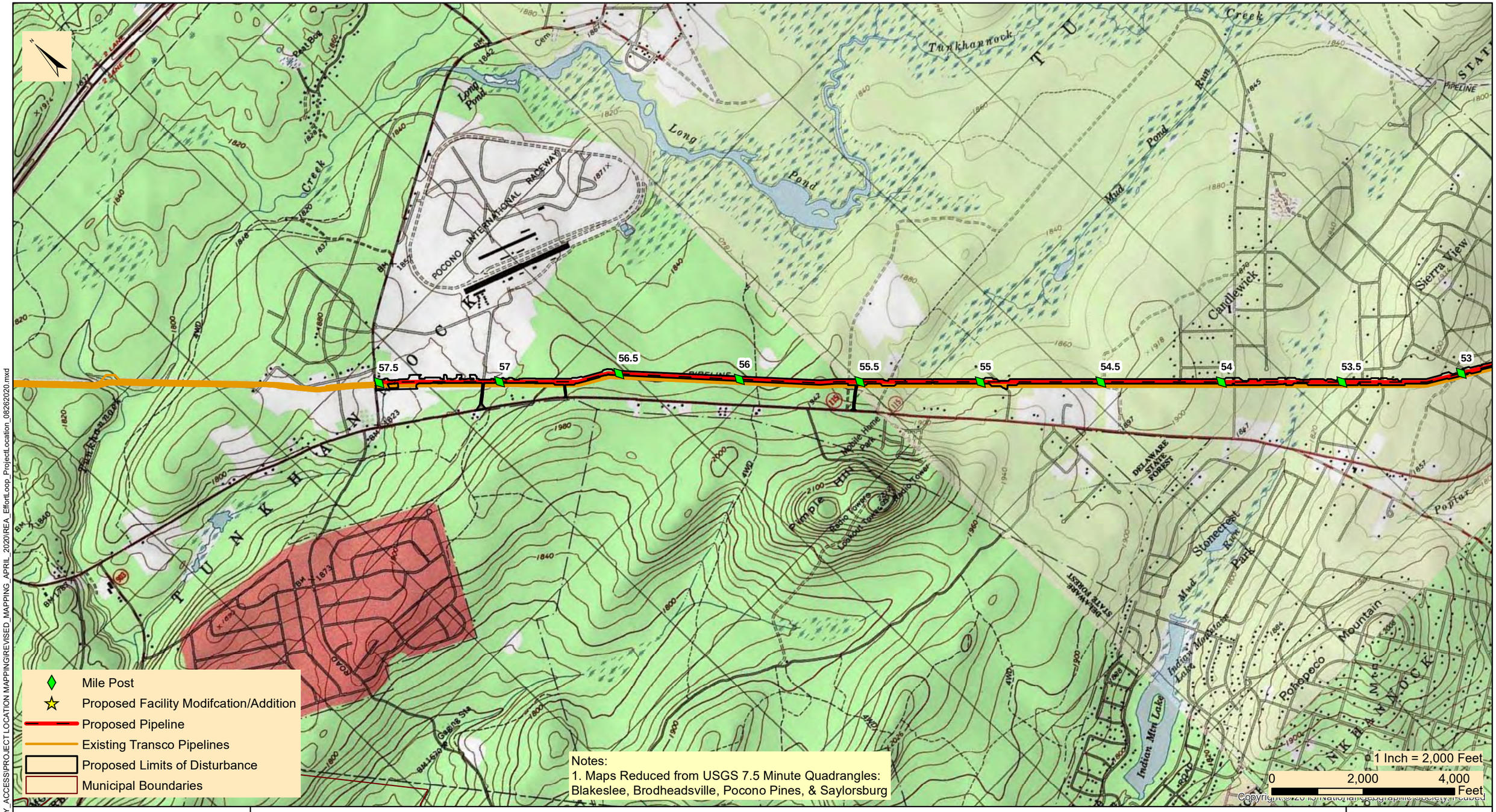

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Williams®

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC

REGIONAL ENERGY ACCESS EXPANSION PROJECT

PROPOSED 42" LEIDY D EFFORT LOOP

PROJECT LOCATION MAP

TUNKHANNOCK TOWNSHIP | MONROE COUNTY | PENNSYLVANIA

Date: 2/10/2022

Drawn By: FTN

Figure Number: EL-3

ATTACHMENT 2
SOILS MAP AND REPORT

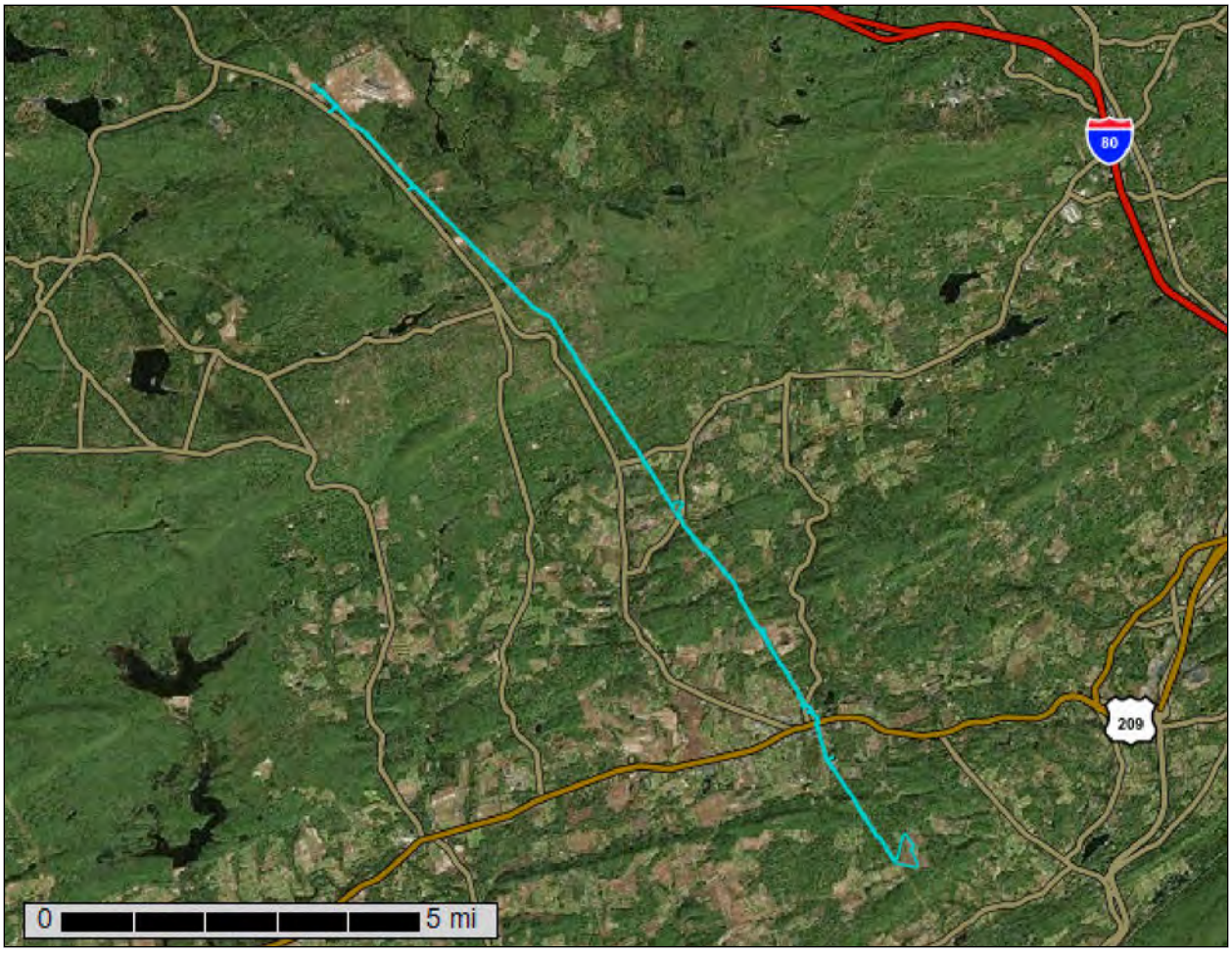
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Monroe County, Pennsylvania



March 3, 2022

Preface

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

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

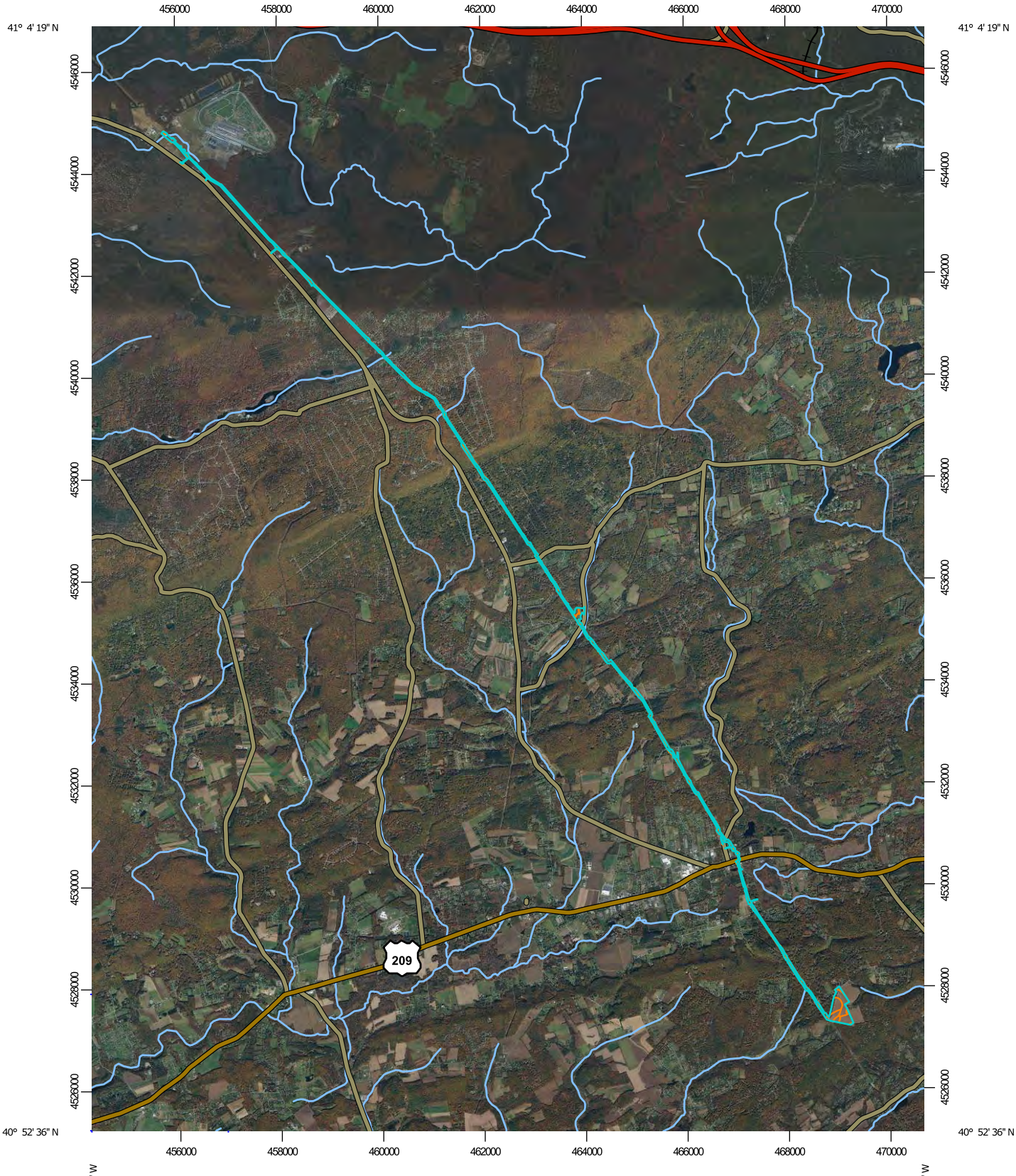
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:106,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1500 3000 6000 9000

Feet
0 5000 10000 20000 30000

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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 16, Sep 1, 2021

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

Date(s) aerial images were photographed: Jul 26, 2020—Nov 5, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AnB	Allenwood gravelly silt loam, 3 to 8 percent slopes	0.2	0.1%
AwB	Alvira and Watson very stony loams, 0 to 12 percent slopes	3.6	1.4%
BbC	Bath channery silt loam, 8 to 25 percent slopes, extremely stony	1.0	0.4%
BrA	Braceville gravelly loam, 0 to 3 percent slopes	2.7	1.0%
BrB	Braceville gravelly loam, 3 to 8 percent slopes	1.4	0.5%
BxB	Buchanan extremely stony loam, 0 to 8 percent slopes	16.9	6.5%
BxC	Buchanan channery loam, 8 to 25 percent slopes, rubbly	0.3	0.1%
ChA	Chenango gravelly loam, 0 to 3 percent slopes	2.4	0.9%
ChB	Chenango gravelly loam, 3 to 8 percent slopes	3.0	1.1%
ChC	Chenango gravelly loam, 8 to 15 percent slopes	0.0	0.0%
CnB	Chippewa and Norwich soils, 0 to 8 percent slopes, extremely stony	1.4	0.5%
CpA	Clymer loam, 0 to 3 percent slopes	4.3	1.6%
CxB	Clymer extremely stony loam, 0 to 8 percent slopes	16.2	6.2%
Cy	Cut and fill land	8.2	3.2%
DxB	Dekalb channery loam, 0 to 8 percent slopes, rubbly	2.9	1.1%
DxC	Dekalb very channery loam, 8 to 25 percent slopes, extremely stony	8.6	3.3%
DxE	Dekalb very stony loam, 25 to 100 percent slopes, very stony	3.7	1.4%
GP	Pit, Shale, and Gravel	0.3	0.1%
HaB	Hartleton channery silt loam, 2 to 8 percent slopes	18.1	6.9%
HaC	Hartleton channery silt loam, 8 to 20 percent slopes	4.8	1.8%
Hy	Holly silt loam	0.6	0.2%
KaB	Kedron silt loam, 2 to 8 percent slopes	1.6	0.6%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KvB	Klinesville channery silt loam, 3 to 8 percent slopes	11.4	4.4%
KvC	Klinesville channery silt loam, 8 to 15 percent slopes	2.1	0.8%
KvD	Klinesville channery silt loam, 15 to 25 percent slopes	1.0	0.4%
LgB	Laidig extremely stony loam, 0 to 8 percent slopes	11.8	4.5%
LgC	Laidig extremely stony loam, 8 to 25 percent slopes	5.6	2.1%
LkB	Leck kill channery silt loam, 2 to 8 percent slopes	23.0	8.8%
LkC	Leck kill channery silt loam, 8 to 15 percent slopes	7.6	2.9%
LkD	Leck kill channery silt loam, 15 to 25 percent slopes	4.2	1.6%
LsC	Lordstown channery silt loam, 8 to 15 percent slopes	1.1	0.4%
LxC	Lordstown channery silt loam, 8 to 25 percent slopes, rubbly	3.0	1.2%
MeB	Meckesville gravelly loam, 3 to 8 percent slopes	9.4	3.6%
MeC	Meckesville gravelly loam, 8 to 15 percent slopes	1.0	0.4%
MfB	Meckesville very stony loam, 0 to 8 percent slopes	9.4	3.6%
MoB	Morris channery silt loam, 0 to 8 percent slopes, extremely stony	0.9	0.3%
Pp	Pope silt loam, high bottom	0.6	0.2%
ReA	Rexford gravelly silt loam, 0 to 3 percent slopes	1.8	0.7%
SpB	Shelmadine very stony silt loam, 0 to 8 percent slopes	1.2	0.5%
VaE	Very stony land and Rock outcrops, steep	0.5	0.2%
W	Water	0.4	0.2%
WaB	Watson silt loam, 2 to 8 percent slopes	1.5	0.6%
Wb	Wayland silty clay loam	1.2	0.5%
WeB3	Weikert channery silt loam, 3 to 8 percent slopes, eroded	0.4	0.2%
WeC3	Weikert channery silt loam, 8 to 15 percent slopes, eroded	0.4	0.1%
WeD3	Weikert channery silt loam, 15 to 25 percent slopes, eroded	0.7	0.3%
WhB	Weikert-Hartleton channery silt loams, 3 to 8 percent slopes	25.6	9.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
WhC	Weikert-Hartleton channery silt loams, 8 to 15 percent slopes	14.1	5.4%
WhD	Weikert-Hartleton channery silt loams, 15 to 25 percent slopes	2.5	1.0%
WKE	Weikert and Klinesville soils, steep	6.7	2.6%
WyA	Wyoming gravelly sandy loam, 0 to 3 percent slopes	0.0	0.0%
WyB	Wyoming gravelly sandy loam, 3 to 8 percent slopes	6.6	2.5%
WyC	Wyoming gravelly sandy loam, 8 to 15 percent slopes	2.5	0.9%
WyD	Wyoming gravelly sandy loam, 15 to 25 percent slopes	0.5	0.2%
Totals for Area of Interest		**260.8**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

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

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

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

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

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

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

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

Monroe County, Pennsylvania

AnB—Allenwood gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9y90
Elevation: 490 to 1,130 feet
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: All areas are prime farmland

Map Unit Composition

Allenwood and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Allenwood

Setting

Landform: Valley sides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Old till derived from sedimentary rock

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 59 inches: gravelly silty clay loam
H3 - 59 to 72 inches: very gravelly clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

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

AwB—Alvira and Watson very stony loams, 0 to 12 percent slopes

Map Unit Setting

National map unit symbol: 9y94
Elevation: 660 to 1,940 feet
Mean annual precipitation: 34 to 56 inches
Mean annual air temperature: 40 to 54 degrees F
Frost-free period: 100 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Alvira and similar soils: 55 percent
Watson and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alvira

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Till

Typical profile

H1 - 0 to 10 inches: gravelly loam
H2 - 10 to 21 inches: gravelly silt loam
H3 - 21 to 60 inches: very gravelly silt loam

Properties and qualities

Slope: 0 to 12 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 15 to 28 inches to fragipan
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 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Watson

Setting

Landform: Valley sides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old till derived from sedimentary rock

Typical profile

H1 - 0 to 10 inches: gravelly loam
H2 - 10 to 27 inches: gravelly silty clay loam
H3 - 27 to 60 inches: gravelly clay loam

Properties and qualities

Slope: 0 to 12 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 18 to 32 inches to fragipan
Drainage class: Moderately well 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 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Shelmadine

Percent of map unit: 10 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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: Convex, 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: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 7.0 percent
Depth to restrictive feature: 26 to 38 inches to fragipan
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 content: 15 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Minor Components

Swartswood, extremely stony

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Backslope, footslope
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: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex, concave
Across-slope shape: Linear, convex
Hydric soil rating: No

BrA—Braceville gravelly loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9y9f
Elevation: 160 to 1,970 feet
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: Convex, linear
Across-slope shape: Concave, 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: 0 to 3 percent
Depth to restrictive feature: 18 to 30 inches to fragipan
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 supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F140XY020NY - Dense Outwash
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
Elevation: 160 to 1,970 feet
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
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 supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F140XY020NY - Dense Outwash
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

BxB—Buchanan extremely stony loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9y9j
Elevation: 600 to 2,500 feet
Mean annual precipitation: 34 to 55 inches
Mean annual air temperature: 40 to 57 degrees F
Frost-free period: 100 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Buchanan

Setting

Landform: Valley sides, mountain slopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank, base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Mountain slope colluvium derived from sedimentary rock

Typical profile

H1 - 0 to 4 inches: channery loam
H2 - 4 to 25 inches: gravelly loam
H3 - 25 to 60 inches: gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 15.0 percent
Depth to restrictive feature: 20 to 36 inches to fragipan
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: 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

Minor Components

Shelmadine

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Hazleton

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Upper third of mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

BxC—Buchanan channery loam, 8 to 25 percent slopes, rubbly

Map Unit Setting

National map unit symbol: 2z1nb
Elevation: 430 to 2,220 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 155 to 177 days

Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Buchanan

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Fine-loamy colluvium derived from sandstone and shale

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
Oe - 2 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: channery loam
BE - 4 to 12 inches: channery loam
Bt1 - 12 to 20 inches: channery loam
Bt2 - 20 to 29 inches: channery loam
Btx1 - 29 to 35 inches: channery loam
Btx2 - 35 to 50 inches: channery loam
C - 50 to 71 inches: very channery loam
R - 71 to 81 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 25.0 percent
Depth to restrictive feature: 24 to 30 inches to fragipan; 60 to 79 inches to lithic bedrock
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 15 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

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

Minor Components

Andover

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Convex

Across-slope shape: Linear, convex
Hydric soil rating: Yes

Laidig

Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Shelmadine

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: Yes

ChA—Chenango gravelly loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9y9l
Elevation: 600 to 1,800 feet
Mean annual precipitation: 30 to 56 inches
Mean annual air temperature: 40 to 54 degrees F
Frost-free period: 100 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Chenango

Setting

Landform: Outwash terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Gravelly outwash

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 32 inches: gravelly fine sandy loam
H3 - 32 to 72 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
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: Convex, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Rexford, somewhat poorly drained

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

ChB—Chenango gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9y9m
Elevation: 600 to 1,800 feet
Mean annual precipitation: 30 to 56 inches
Mean annual air temperature: 40 to 54 degrees F
Frost-free period: 100 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

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

Description of Chenango

Setting

Landform: Outwash terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly outwash

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 32 inches: gravelly fine sandy loam
H3 - 32 to 72 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
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: Convex, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Rexford, somewhat poorly drained

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

ChC—Chenango gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9y9n
Elevation: 600 to 1,800 feet
Mean annual precipitation: 30 to 56 inches
Mean annual air temperature: 40 to 54 degrees F
Frost-free period: 100 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Chenango and similar soils: 93 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Outwash terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Gravelly outwash

Typical profile

H1 - 0 to 8 inches: gravelly loam
H2 - 8 to 32 inches: gravelly fine sandy loam
H3 - 32 to 72 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
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: Convex, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Rexford, somewhat poorly drained

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

CnB—Chippewa and Norwich soils, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2vcjj
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, extremely stony, and similar soils: 41 percent
Norwich, extremely stony, and similar soils: 39 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chippewa, Extremely Stony

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

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery silt loam
Eg - 5 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 8 percent
Surface area covered with cobbles, stones or boulders: 7.0 percent
Depth to restrictive feature: 8 to 20 inches to fragipan
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 content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F140XY016NY - Mineral Wetlands
Hydric soil rating: Yes

Description of Norwich, Extremely Stony

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

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery silt loam
Eg - 5 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 8 percent
Surface area covered with cobbles, stones or boulders: 7.0 percent
Depth to restrictive feature: 10 to 24 inches to fragipan
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 supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

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

Ecological site: F140XY016NY - Mineral Wetlands
Hydric soil rating: Yes

Minor Components

Chippewa, extremely stony, 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

Volusia, extremely stony
Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Morris, extremely stony
Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Interfluve, head slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Norwich, extremely stony, 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

CpA—Clymer loam, 0 to 3 percent slopes

Map Unit Setting
National map unit symbol: 9y9r
Elevation: 670 to 1,950 feet
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: All areas are prime farmland

Map Unit Composition

Clymer and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clymer

Setting

Landform: Mountains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 49 inches: loam
H3 - 49 to 72 inches: channery clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

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

CxB—Clymer extremely stony loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9y9v
Elevation: 800 to 2,900 feet
Mean annual precipitation: 36 to 60 inches
Mean annual air temperature: 46 to 59 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Clymer and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clymer

Setting

Landform: Mountains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical profile

H1 - 0 to 9 inches: very channery loam
H2 - 9 to 49 inches: loam
H3 - 49 to 72 inches: channery clay loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: More than 80 inches
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

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

Cy—Cut and fill land

Map Unit Setting

National map unit symbol: 9y9x
Elevation: 590 to 1,970 feet
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
Drainage class: Well drained
Depth to water table: About 12 to 72 inches
Frequency of flooding: None
Frequency of ponding: None

DxB—Dekalb channery loam, 0 to 8 percent slopes, rubbly

Map Unit Setting

National map unit symbol: 2xvd8
Elevation: 790 to 1,950 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 155 to 177 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Dekalb

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 4 inches: channery loam
E - 4 to 6 inches: very channery sandy loam
Bw - 6 to 19 inches: very channery loam
C - 19 to 24 inches: extremely channery sandy loam
R - 24 to 34 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 25.0 percent
Depth to restrictive feature: 20 to 32 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very low
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 supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Dry Uplands (DU2)
Hydric soil rating: No

Minor Components

Hazleton

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Weikert

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Other vegetative classification: Droughty Shales (SD2)
Hydric soil rating: No

Lordstown

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

DxC—Dekalb very channery loam, 8 to 25 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2x8wh
Elevation: 530 to 2,200 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 155 to 177 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Dekalb

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 4 inches: very channery loam
E - 4 to 7 inches: very channery loam
Bw - 7 to 26 inches: very channery sandy loam
C - 26 to 34 inches: extremely channery sandy loam
R - 34 to 44 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
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 supply, 0 to 60 inches: Low (about 3.2 inches)

Interpretive groups

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

Minor Components

Clymer

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hazleton

Percent of map unit: 5 percent
Landform: Mountain slopes on mountains

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

DxE—Dekalb very stony loam, 25 to 100 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w6nl
Elevation: 370 to 2,070 feet
Mean annual precipitation: 39 to 43 inches
Mean annual air temperature: 50 to 53 degrees F
Frost-free period: 155 to 177 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Dekalb

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone and shale

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 4 inches: very channery loam
E - 4 to 7 inches: very channery loam
Bw - 7 to 26 inches: very channery sandy loam
C - 26 to 34 inches: extremely channery sandy loam
R - 34 to 44 inches: bedrock

Properties and qualities

Slope: 25 to 100 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

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

Minor Components

Hazleton

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

Clymer

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

GP—Pit, Shale, and Gravel

Map Unit Setting

National map unit symbol: bqyf
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 46 to 56 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, shale: 51 percent
Pits, gravel: 49 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Shale

Typical profile

C - 0 to 1 inches: channers
R - 1 to 2 inches: bedrock

Properties and qualities

Slope: 0 to 40 percent
Depth to restrictive feature: 0 to 2 inches to paralithic bedrock

Drainage class: Excessively drained
Runoff class: Medium

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8e
Hydric soil rating: No

Description of Pits, Gravel

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8e
Hydric soil rating: No

HaB—Hartleton channery silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9yb2
Elevation: 500 to 1,500 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 175 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hartleton and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 37 inches: very channery silt loam
H3 - 37 to 50 inches: very channery loam
R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
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 supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

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

HaC—Hartleton channery silt loam, 8 to 20 percent slopes

Map Unit Setting

National map unit symbol: 9yb3
Elevation: 500 to 1,500 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 175 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hartleton and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 37 inches: very channery silt loam
H3 - 37 to 50 inches: very channery loam
R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 8 to 20 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
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 supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

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

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: Depressions on flood plains, backswamps
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
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: FrequentNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: 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

KaB—Kedron silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9yb7
Elevation: 520 to 1,100 feet
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: All areas are prime farmland

Map Unit Composition

Kedron and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kedron

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Colluvium and/or till derived from sandstone, siltstone, and shale

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 24 inches: silt loam
H3 - 24 to 60 inches: gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 20 to 32 inches to fragipan
Drainage class: Moderately well 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 6 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

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

Minor Components

Shelmadine

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

KvB—Klinesville channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ybb
Elevation: 300 to 1,300 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Klinesville, frost churned, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Klinesville, Frost Churned

Setting

Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 40 inches: channers
R - 40 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 20 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

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

KvC—Klinesville channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9ybc
Elevation: 300 to 1,300 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Klinesville, frost churned, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Klinesville, Frost Churned

Setting

Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 40 inches: channers
R - 40 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 20 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Hydric soil rating: No

KvD—Klinesville channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9ybd
Elevation: 300 to 1,300 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 130 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Klinesville, frost churned, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Klinesville, Frost Churned

Setting

Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 40 inches: channers
R - 40 to 44 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 20 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Hydric soil rating: No

LgB—Laidig extremely stony loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ybm
Elevation: 400 to 3,800 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 120 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Laidig and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laidig

Setting

Landform: Mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Colluvium derived from sandstone and siltstone

Typical profile

H1 - 0 to 6 inches: very gravelly loam
H2 - 6 to 33 inches: gravelly loam
H3 - 33 to 65 inches: very gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 30 to 50 inches to fragipan
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.02 to 0.60 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

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

LgC—Laidig extremely stony loam, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9ybn
Elevation: 400 to 3,800 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 120 to 175 days
Farmland classification: Not prime farmland

Map Unit Composition

Laidig and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Laidig

Setting

Landform: Mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Colluvium derived from sandstone and siltstone

Typical profile

H1 - 0 to 6 inches: very gravelly loam
H2 - 6 to 33 inches: gravelly loam
H3 - 33 to 65 inches: very gravelly loam

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 30 to 50 inches to fragipan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.02 to 0.60 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

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

LkB—Leck kill channery silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ybq
Elevation: 500 to 1,500 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Leck kill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leck Kill

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Reddish residuum derived from sedimentary rock

Typical profile

H1 - 0 to 10 inches: channery silt loam
H2 - 10 to 27 inches: channery silty clay loam
H3 - 27 to 48 inches: very channery silt loam
R - 48 to 52 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

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

LkC—Leck kill channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9ybr
Elevation: 500 to 1,500 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 140 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Leck kill and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Leck Kill

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Reddish residuum derived from sedimentary rock

Typical profile

H1 - 0 to 10 inches: channery silt loam
H2 - 10 to 27 inches: channery silty clay loam
H3 - 27 to 48 inches: very channery silt loam
R - 48 to 52 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

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

LkD—Leck kill channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9ybs
Elevation: 300 to 2,800 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Leck Kill

Setting

Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 10 inches: channery silt loam
H2 - 10 to 43 inches: channery silt loam
H3 - 43 to 58 inches: very channery silt loam
R - 58 to 62 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

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

Minor Components

Calvin

Percent of map unit: 10 percent
Hydric soil rating: No

Klinesville

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

Meckesville

Percent of map unit: 5 percent
Landform: Mountain valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

LsC—Lordstown channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wzl1
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

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

Description of Lordstown

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountaintop, nose slope, crest
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Ap - 0 to 9 inches: channery silt loam
Bw1 - 9 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 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: 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

Mardin

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

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

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: Hills, mountains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope, crest
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
Surface area covered with cobbles, stones or boulders: 15.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
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
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: 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: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, interfluve, nose slope, crest
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): Shoulder, backslope
Landform position (three-dimensional): Interfluve, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

MeB—Meckesville gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9yc5
Elevation: 600 to 2,800 feet
Mean annual precipitation: 34 to 48 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Meckesville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Mountain valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandstone, siltstone and shale colluvium derived from sedimentary rock

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 36 inches: channery loam
H3 - 36 to 60 inches: channery loam
H4 - 60 to 64 inches: very channery loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 25 to 48 inches to fragipan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

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

MeC—Meckesville gravelly loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9yc6
Elevation: 600 to 2,800 feet
Mean annual precipitation: 34 to 48 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Meckesville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting

Landform: Mountain valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandstone, siltstone and shale colluvium derived from sedimentary rock

Typical profile

H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 36 inches: channery loam
H3 - 36 to 60 inches: channery loam
H4 - 60 to 64 inches: very channery loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 25 to 48 inches to fragipan

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

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

MfB—Meckesville very stony loam, 0 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9yc7
Elevation: 600 to 2,800 feet
Mean annual precipitation: 34 to 48 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 130 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition
Meckesville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Meckesville

Setting
Landform: Mountain valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandstone, siltstone and shale colluvium derived from sedimentary rock

Typical profile
H1 - 0 to 9 inches: gravelly loam
H2 - 9 to 36 inches: channery loam
H3 - 36 to 60 inches: channery loam

Properties and qualities
Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 25 to 48 inches to fragipan
Drainage class: Well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

MoB—Morris channery silt loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting
National map unit symbol: 2vxct
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
Morris, extremely stony, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Morris, Extremely Stony

Setting
Landform: Mountains, hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till from reddish sandstone, siltstone, and shale

Typical profile
Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery silt loam
Bw - 5 to 12 inches: channery silt loam
Eg - 12 to 16 inches: channery silt loam
Bx - 16 to 60 inches: channery silt loam
C - 60 to 72 inches: channery loam

Properties and qualities
Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 7.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Drainage class: Somewhat 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 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

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

Minor Components

Norwich, extremely stony

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Wellsboro, extremely stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, side slope
Down-slope shape: Concave, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Pp—Pope silt loam, high bottom

Map Unit Setting

National map unit symbol: 9ycp
Elevation: 590 to 1,970 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
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: RareNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: F140XY013PA - High Floodplain
Hydric soil rating: No

Minor Components

Holly

Percent of map unit: 10 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

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

Map Unit Setting

National map unit symbol: 9ycq
Elevation: 590 to 1,970 feet
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
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 supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F140XY020NY - Dense Outwash
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
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 supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F140XY016NY - Mineral Wetlands
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: Convex, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

SpB—Shelmadine very stony silt loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ycx
Elevation: 480 to 2,150 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 44 to 59 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Shelmadine

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Loamy till

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 24 inches: silty clay loam
H3 - 24 to 50 inches: channery loam
H4 - 50 to 70 inches: channery loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 18 to 30 inches to fragipan
Drainage class: 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 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Buchanan

Percent of map unit: 10 percent
Hydric soil rating: No

Alvira

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Watson

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

VaE—Very stony land and Rock outcrops, steep

Map Unit Setting

National map unit symbol: 9yd3
Elevation: 1,100 to 2,500 feet
Mean annual precipitation: 36 to 55 inches

Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 100 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Dystrochrepts, very stony, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dystrochrepts, Very Stony

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Typical profile

H1 - 0 to 6 inches: very channery loam
H2 - 6 to 32 inches: very channery loam
H3 - 32 to 56 inches: extremely channery loam
H4 - 56 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 99 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

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

WaB—Watson silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9yd8
Elevation: 430 to 1,850 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 40 to 60 degrees F
Frost-free period: 130 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Watson

Setting

Landform: Valley sides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old till derived from sedimentary rock

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 27 inches: gravelly silty clay loam
H3 - 27 to 45 inches: gravelly clay loam
H4 - 45 to 61 inches: channery loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 33 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

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

Minor Components

Allenwood
Percent of map unit: 10 percent
Hydric soil rating: No

Shelmadine
Percent of map unit: 5 percent
Landform: Drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Alvira
Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

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
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: NoneFrequent
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: 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

WeB3—Weikert channery silt loam, 3 to 8 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9ydb
Elevation: 500 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Weikert and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock

Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

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

WeC3—Weikert channery silt loam, 8 to 15 percent slopes, eroded

Map Unit Setting
National map unit symbol: 9ydc
Elevation: 500 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Weikert and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile
H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

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

WeD3—Weikert channery silt loam, 15 to 25 percent slopes, eroded

Map Unit Setting

National map unit symbol: 9ydd
Elevation: 500 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 46 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Weikert and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Hydric soil rating: No

WhB—Weikert-Hartleton channery silt loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ydf
Elevation: 300 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Weikert and similar soils: 50 percent
Hartleton and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

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

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 37 inches: very channery silt loam
H3 - 37 to 50 inches: very channery loam
R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

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

Minor Components

Klinesville, frost churned

Percent of map unit: 5 percent
Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Leck kill

Percent of map unit: 5 percent
Landform: Mountains
Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

WhC—Weikert-Hartleton channery silt loams, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9ydg
Elevation: 300 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Weikert and similar soils: 55 percent
Hartleton and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

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

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 37 inches: very channery silt loam
H3 - 37 to 50 inches: very channery loam
R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

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

Minor Components

Klinesville, frost churned

Percent of map unit: 5 percent
Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Leck kill

Percent of map unit: 5 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: No

WhD—Weikert-Hartleton channery silt loams, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9ydh
Elevation: 300 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Weikert and similar soils: 60 percent
Hartleton and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 37 inches: very channery silt loam
H3 - 37 to 50 inches: very channery loam
R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

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

Minor Components

Leck kill

Percent of map unit: 5 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Klinesville, frost churned

Percent of map unit: 5 percent
Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

WKE—Weikert and Klinesville soils, steep

Map Unit Setting

National map unit symbol: 9yd7
Elevation: 300 to 2,800 feet
Mean annual precipitation: 34 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Weikert and similar soils: 50 percent
Klinesville, frost churned, and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 80 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 40 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Hydric soil rating: No

Description of Klinesville, Frost Churned

Setting

Landform: Valleys, ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from siltstone

Typical profile

H1 - 0 to 6 inches: very channery silt loam
H2 - 6 to 15 inches: very channery silt loam
H3 - 15 to 45 inches: channers
R - 45 to 49 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 80 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock; 20 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

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

Minor Components

Leck kill

Percent of map unit: 8 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartleton

Percent of map unit: 8 percent
Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Hydric soil rating: No

Meckesville

Percent of map unit: 4 percent
Landform: Mountain valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

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
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 supply, 0 to 60 inches: 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
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 supply, 0 to 60 inches: 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

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
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 supply, 0 to 60 inches: 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
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 supply, 0 to 60 inches: 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

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ATTACHMENT 3

E&SC AND SR PLAN BMP DESIGN
WORKSHEETS AND CALCULATIONS
(See ESCP Application)

ATTACHMENT 4
OFFSITE DISCHARGE REPORTS
(See ESCP Application)