USDA United States Department of Agriculture | Forest Service | Monongahela National Forest | 200 Sycamore Street Elkins, WV 26241 304-636-1800

File Code: 2720; 1900
Date: January 12, 2016

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St., N.E., Room 1A
Washington, DC 20426

Dear Ms. Bose:

Subject: Forest Service Comments and Questions Regarding ACP's Soil Slippage Analysis
OEP/DG2E/Gas 4
Atlantic Coast Pipeline, LLC
Docket No. CP15-554

The Forest Service submits a reply to the document filed by Atlantic Coast Pipeline, LLC (ACP) with the Federal Energy Regulatory Commission on December 22, 2015, in response to the Forest Service's Soil Slippage Analysis filed on November 27, 2015, for the proposed Atlantic Coast Pipeline Project. In the attachments to this letter, the Forest Service provides clarifications on data and methods used to execute the analysis on soil slippage. The attachments also contain additional comments and questions regarding ACP's response and soil slippage analysis.

For questions, please contact Jennifer Adams, Special Project Coordinator, by phone at (540) 265-5114 or by email at jenniferpadams@fs.fed.us.

Sincerely,

CLYDE THOMPSON
Forest Supervisor

Attachment 1

Forest Service's Reply to the Response to Comments on Soil Information filed by Atlantic Coast Pipeline, LLC

Forest Service's Response to Comments on the Soil Slippage Analysis for the Monongahela National Forest filed by Atlantic Coast Pipeline, LLC

ACP states that "Several of the soil series crossed by the proposed ACP pipeline route in the Monongahela National Forest (MNF) (i.e., Calvin, Kanawha, Mandy, Shouns and Wildell soil series) were not included in the Slippage Potential by Soil Series and Slope Class lists provided in the USFS letter." The list to which ACP refers was prepared by the USDA NRCS and therefore does not wholly represent the Forest Service's knowledge regarding soil types that are prone to slippage. Rather, the list and documents from NRCS were simply some of many resources used to complete the Soil Slippage Analysis. Please refer to the Forest Service's Soils Slippage Analysis for the Monongahela National Forest, as filed with FERC on November 27, 2015 for the detailed description of the methods used in the analysis.

Data Sources

NRCS data regarding soils prone to slippage (pages 5-9 of the November 27, 2015 filing) is based on soil and landscape characteristics described on pages 5-6. WV DEP data (pages 10-42 of the filing) is based on "on the ground" observations of soil slippage following the occurrence on the landscape of human disturbance related to pipeline construction, implementation, and operation. The Forest Service used these two data sources, in conjunction with Forest Service staff expertise, to create the final soil slippage analysis. Soil series that ACP believed to be excluded from the MNF analysis (including Calvin, Kanawha, Mandy, Shouns and Wildell) are shown in Attachments 2 and 3 of this report, and those soil series were used in the original analysis (refer to the shapefile properties table submitted with the original filing). Specifically, Calvin, Shouns and Mandy-Wildell complex (Mandy and Wildell are not mapped as individual components but as a complex) are included in soil series that have high risk for soil slippage. Kanawha (loam and variant) were included in our analysis under soil series that have low risk for soil slippage. To develop the information provided in the analysis, the Monongahela National Forest (MNF) utilized mineralogy data, soil texture data, and water table data from soils known to slip (data for pedon characterization for the soil series used in these analyses are stored in the National Soil Survey Laboratory which can be accessed at http://ncsslabdatamart.sc.egov.usda.gov/) (National Cooperative Soil Survey, 2016). In the Forest Service's Soils Slippage Analysis filed on November 27, 2015, only soils determined to be at high risk for soil slippage were displayed (shown as a pdf map in the document).

In conclusion, the soil slippage risk analysis conducted by the Forest Service utilized NRCS and WVDEP data as well as MNF data to determine areas at high risk for slope failure. Furthermore, unlike an analysis that solely uses NRCS data (which predicts soil slippage risks based on soil characteristics mapped at a 1:24000 scale), the Forest Service's analysis incorporated WVDEP data, which is validated by on-the-ground observations of slips as a result of anthropogenic

activities including pipeline construction, and USFS MNF data that also includes on-the-ground observations of known slips within the landscape on the associated mapped soil series. We believe these empirical data present a better picture of the true risk of soil slippage than 1:24000 scale mapping based largely on remote sensing. Such data were never intended by NRCS to be the primary support for development of high risk projects. We have commented several times that relying only on 1:24000 scale soils data is inadequate for this project. The fact that WVDEP and the Forest Service have documented a much higher actual risk of slippage on a site-specific basis illustrates the limitations of relying on data inappropriate for the scale and risk of the activity. The Forest Service's stands by its original assessment that at least 2/3 of the soils that the pipeline is proposed to be constructed through are at high risk for slope failure if disturbed.

Forest Service's Comments Regarding the Report on Soil Slippage Potential within the Monongahela National Forest filed by Atlantic Coast Pipeline, LLC

The Forest Service provides comments and questions regarding the Soil Slippage analysis conducted by ACP and filed with FERC on December 22, 2015. Content reviewed in this section includes *Supplemental Information- Response to Comments on Soil Information* as well as *Attachment 2, Table 1: Soil Slippage Potential within the Monongahela National Forest*.

According to information found in *Response to Comments on Soil Information*, a Geohazard Analysis Program to "identify, categorize and perform a risk analysis of potential geologic hazards, including slope failures, along the proposed ACP pipeline routes and at aboveground facility sites" has been implemented. ACP also states that an assessment has been recently completed by Geosyntec Consultants, Inc. (Geosyntec). Because ACP has provided no data to the Forest to date for soils information or geology information, the Forest cannot fully assess the validity of the conclusions. In regards to the soils portion of this assessment, please see the Forest Service's letter and supporting information filed with FERC on November 5, 2015, that calls into question the soils data collected by Geosyntec in 2015 and the relevancy of qualifications of those collecting the data. The Forest Service stands firm on the position that we will not accept the soils data collected by Geosyntec Consultants, Inc. (Geosyntec). ACP continued to use Geosyntec Consultants, Inc. (Geosyntec) as a subcontractor for the Geohazard Assessment. Although the Forest Service had no disagreement with the methods proposed and accepted the qualifications of the Geohazard Assessment crew, that crew's work focused on assessing the risk to the pipeline itself from natural movement of deep geologic strata; that crew was not qualified to assess the soil properties related to the stability of the project because there was not a professional soil scientist employed within that crew. It should be noted that the Geosyntec assessment mentioned above for the Geohazard Assessment is mostly derived from data mapped at a 1:24000 scale (which again, does not provide accurate information for a project of this size and does not meet the requirements for the soil survey methods required for this

project). ACP's documentation also suggests that any on-the-ground observations of soil slippage conducted by Geosyntec centers around natural landslides rather than anthropogenically induced slips. Using data that is based on slips that have occurred naturally does not accurately predict how these landscapes will react during and after anthropogenic disturbances that will occur as a result of pipeline construction.

ACP also states that "Geosyntec's analysis examined a 1,200-foot-wide study corridor along the proposed ACP pipeline route. The results of the slope hazard analysis indicate that only 2 percent (78.8 acres) of the study corridor within the proclamation boundary of the MNF has a high slope hazard classification." Without the data produced by the analysis, we cannot fully assess the validity of this statement. Based on what we know about the study methods, at best these numbers represent the risk of natural movement of the geologic strata below the soil profile. As stated in the Forest Service's Analysis of Soil Slippage filed on November 27, 2015, the surveys conducted by Geosyntec were not conducted by soil scientists with the qualifications required by the Forest Service, so these results do not accurately represent the potential for soil slippage. Additionally, data collected for ACP's analysis does not meet the requirements of an order 1 level soil survey, also required by the Forest Service. In conclusion, although ACP states that "Based on the results of the first phase of the Geohazards Analysis Program and the implementation of site specific mitigation, Atlantic believes that impacts from slope failures will be minimized or avoided," the validity of this statement is questionable due to the lack of an order 1 level soil survey. Empirical evidence shows that slope failures are occurring on these soils in other parts of the region, even with the implementation of required mitigation and design features (personal communications with WVDEP personnel). To date the Forest has received no data from ACP for either the Geohazard Assessment or soil survey. Because the Forest Service has not received any data, the assertions regarding slope stability are unsupported.

To better facilitate our assessment of the slope hazard classification provided by ACP, we request the information listed below.

- A more detailed description of methodology and all data, field notes, etc. produced to date.
- Explain how the depth of observed deformations, or possible slips, were and will be determined. Existing evidence suggests that some ancient slips that appear to be shallow in nature are actually hundreds of feet deep as observed by MNF staff on Forest – examples cited include slips along the Highland Scenic Highway State Route 151; US Route 33 heading east out of Elkins near Alpena; Middle Mountain Road USFS Road FR 14 and also FR44 in the upper Greenbrier watershed; in the Chemung and Hampshire geologic formation in the Pheasant Mountain area and near Parsons, WV in the Sugarcamp Run watershed (coordinate points of the locations mentioned are available upon request).

Clarification is needed regarding the following statement, from page 2 of the ACP filing, "These measures could involve burial of the pipeline below the potential landslide depth." Please explain how the potential landslide depth of all areas included in the proposed pipeline route will be determined. If the plan is to use depth to bedrock, please recall the Forest Service's comments in previous filings stating the need for an order 1 level soil survey to accurately determine this highly variable soil characteristic (see the Forest Service's comments filed on July 30, 2015; November 5, 2015; and December 14, 2015). Also, please elaborate on how simply burying the pipeline below the landslide depth will help prevent resource damage. It seems that this practice would only ensure that the pipeline itself is protected, while doing nothing to prevent soil slippage leading to erosion and sedimentation problems.

Attachment 2

Soil Series and Acreage Determined to Have Low or Moderate Risk for Soil Slippage

Map Symbol	Map Unit Name	GIS Acres
CcC	Calvin stony silt loam, high base substratum, 3 to 15 percent slopes	2.0
CaF	Calvin channery silt loam, 35 to 70 percent slopes	11.1
CaD	Calvin channery silt loam, 15 to 25 percent slopes	4.5
CcE	Calvin stony silt loam, high base substratum, 25 to 35 percent slopes	0.5
DbC	Dekalb channery loam, moist, 8 to 15 percent slopes	2.6
BtC	Buchanan and Ernest stony soils, 3 to 15 percent slopes	3.0
BtC	Buchanan and Ernest stony soils, 3 to 15 percent slopes	17.0
BtC	Buchanan and Ernest stony soils, 3 to 15 percent slopes	2.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	7.9
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	4.4
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	4.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	3.8
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	6.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	2.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	6.1
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	0.2
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	1.1
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	1.4
DaC	Dekalb channery loam, 8 to 15 percent slopes	2.8
BbD	Belmont stony silt loam-Rock outcrop complex, 15 to 25 percent slopes	2.3
CaE	Calvin channery silt loam, 25 to 35 percent slopes	5.6
BkC	Berks-Weikert complex, 8 to 15 percent slopes	3.5
BkC	Berks-Weikert complex, 8 to 15 percent slopes	0.2
CbC	Calvin silt loam, high base substratum, 8 to 15 percent slopes	0.8
BbE	Belmont stony silt loam-Rock outcrop complex, 25 to 35 percent slopes	7.0
BkD	Berks-Weikert complex, 15 to 25 percent slopes	0.6
BkD	Berks-Weikert complex, 15 to 25 percent slopes	1.4
BkD	Berks-Weikert complex, 15 to 25 percent slopes	3.6
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	2.5
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	10.3
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	1.9
BrB	Brinkerton variant silt loam, 3 to 8 percent slopes	1.8
BrB	Brinkerton variant silt loam, 3 to 8 percent slopes	5.3
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	0.4

Map Symbol	Map Unit Name	GIS Acres
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	1.6
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	1.1
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	8.1
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	4.6
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	3.5
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	7.8
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	6.0
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	1.5
CcD	Calvin stony silt loam, high base substratum, 15 to 25 percent slopes	0.6
BeF	Berks channery silt loam, 35 to 70 percent slopes	5.4
BeF	Berks channery silt loam, 35 to 70 percent slopes	0.6
BeF	Berks channery silt loam, 35 to 70 percent slopes	5.7
BkE	Berks-Weikert complex, 25 to 35 percent slopes	1.6
At	Atkins silt loam, moist, 0 to 3 percent slopes, frequently flooded	0.6
At	Atkins silt loam, moist, 0 to 3 percent slopes, frequently flooded	1.4
BkE	Berks-Weikert complex, 25 to 35 percent slopes	4.3
DrF	Dekalb extremely stony loam, moist, 35 to 70 percent slopes	4.6
DrF	Dekalb extremely stony loam, moist, 35 to 70 percent slopes	2.8
EsC	Ernest rubbly silt loam, 3 to 15 percent slopes	12.8
EsE	Ernest rubbly silt loam, 15 to 35 percent slopes	2.6
BkF	Berks-Weikert complex, 35 to 70 percent slopes	12.4
BkF	Berks-Weikert complex, 35 to 70 percent slopes	2.5
BkF	Berks-Weikert complex, 35 to 70 percent slopes	1.1
Py	Purdy silt loam	3.9
DbB	Dekalb channery loam, moist, 3 to 8 percent slopes	2.6
Rn	Rubble land	2.5
DrC	Dekalb extremely stony loam, moist, 3 to 15 percent slopes	3.6
DrC	Dekalb extremely stony loam, moist, 3 to 15 percent slopes	3.2
DrC	Dekalb extremely stony loam, moist, 3 to 15 percent slopes	4.5
DrC	Dekalb extremely stony loam, moist, 3 to 15 percent slopes	0.0
CcF	Calvin stony silt loam, high base substratum, 35 to 70 percent slopes	10.0
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	0.2
Kv	Kanawha variant gravelly loam	0.0
Kv	Kanawha variant gravelly loam	0.1
Kv	Kanawha variant gravelly loam	8.0

Map Symbol	Map Unit Name	GIS Acres
Kv	Kanawha variant gravelly loam	1.7
Kv	Kanawha variant gravelly loam	3.8
Po	Pope and Linden fine sandy loams	8.3
GkE	Gilpin-Dekalb stony complex, moist, 15 to 35 percent slopes	0.5
Pv	Pope variant gravelly sandy loam	6.4
Pv	Pope variant gravelly sandy loam	12.4
Pv	Pope variant gravelly sandy loam	5.6
Pv	Pope variant gravelly sandy loam	2.9
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	0.2
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	2.4
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	9.3
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	7.1
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	0.0
Ud	Udifluvents, cobbly	6.4
Ud	Udifluvents, cobbly	9.8
Ud	Udifluvents, cobbly	5.0
MoB	Monongahela silt loam, moist, 3 to 8 percent slopes	4.9
MoB	Monongahela silt loam, moist, 3 to 8 percent slopes	12.5
MoB	Monongahela silt loam, moist, 3 to 8 percent slopes	1.8
LeD	Leetonia rubbly loamy sand, 3 to 25 percent slopes	0.2
U5	Udorthents, mudstone and shale, low base	49.0
U5	Udorthents, mudstone and shale, low base	32.9
U5	Udorthents, mudstone and shale, low base	5.2
Ka	Kanawha loam	11.7
Ph	Philo loam	2.6
W	Water	0.8
W	Water	1.0
Tv	Tygart variant silt loam	6.7
Pm	Philo variant silt loam	2.2
BfF	Berks channery silt loam, 35 to 55 percent slopes, very stony	53.1
BfF	Berks channery silt loam, 35 to 55 percent slopes, very stony	49.4
MfdD	Mandy-Wildell complex, 15 to 25 percent slopes	8.5
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	6.7
MfdE	Mandy-Wildell complex, 25 to 35 percent slopes	15.2
MfdE	Mandy-Wildell complex, 25 to 35 percent slopes	23.2

Map Symbol	Map Unit Name	GIS Acres
MfdE	Mandy-Wildell complex, 25 to 35 percent slopes	14.9
MfwE	Mandy-Wildell complex, 15 to 35 percent slopes, very stony	5.6
McC	Macove channery silt loam, 3 to 15 percent slopes, very stony	6.3
MfC	Mandy channery silt loam, 3 to 15 percent slopes, very stony	1.4
MfC	Mandy channery silt loam, 3 to 15 percent slopes, very stony	2.8
MfC	Mandy channery silt loam, 3 to 15 percent slopes, very stony	3.8
MfdC	Mandy-Wildell complex, 8 to 15 percent slopes	8.4
MfdC	Mandy-Wildell complex, 8 to 15 percent slopes	2.2
BgF	Berks-Dekalb complex, 35 to 55 percent slopes, very stony	6.7
CfE	Cateache channery silt loam, 15 to 35 percent slopes, very stony	2.7
CfF	Cateache channery silt loam, 35 to 55 percent slopes, very stony	3.7
MfwE	Mandy-Wildell complex, 15 to 35 percent slopes, very stony	4.3
MfwE	Mandy-Wildell complex, 15 to 35 percent slopes, very stony	4.9
MfwE	Mandy-Wildell complex, 15 to 35 percent slopes, very stony	5.7
BbF	Belmont silt loam, 35 to 55 percent slopes, very rocky	5.8
MfwG	Mandy-Wildell complex, 55 to 80 percent slopes, very stony	1.1
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	0.1
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	13.6
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	26.5
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	6.0
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	4.8
MaC	Macove channery silt loam, 8 to 15 percent slopes	0.3
MfwC	Mandy-Wildell complex, 8 to 15 percent slopes, very stony	1.4
PamE	Paddyknob-Madsheep complex, 15 to 35 percent slopes, very stony	0.9
Pt	Potomac very gravelly loam	5.9
PamC	Paddyknob-Madsheep complex, 8 to 15 percent slopes, very stony	0.1
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	102.1
Uf	Udifluvents-Fluvaquents complex	2.3
Uf	Udifluvents-Fluvaquents complex	2.0
Uf	Udifluvents-Fluvaquents complex	6.0
SsE	Shouns silt loam, 15 to 35 percent slopes, extremely stony	1.3
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	6.2
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	21.9
SsC	Shouns silt loam, 3 to 15 percent slopes, extremely stony	10.9
SwE	Snowdog silt loam, 15 to 35 percent slopes, extremely stony	6.4

Map Symbol	Map Unit Name	GIS Acres
MfE	Mandy channery silt loam, 15 to 35 percent slopes, very stony	12.5
EnD	Ernest silt loam, 15 to 25 percent slopes	0.6

Attachment 3

Soil Series and Acreage Determined to Have High Risk for Soil Slippage

Map Symbol	Map Unit Name	GIS Acres
CcC	Calvin stony silt loam, high base substratum, 3 to 15 percent slopes	2.0
CaF	Calvin channery silt loam, 35 to 70 percent slopes	11.1
CaD	Calvin channery silt loam, 15 to 25 percent slopes	4.5
CcE	Calvin stony silt loam, high base substratum, 25 to 35 percent slopes	0.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	7.9
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	4.4
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	4.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	3.8
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	6.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	2.5
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	6.1
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	0.2
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	1.1
DrE	Dekalb extremely stony loam, moist, 15 to 35 percent slopes	1.4
BbD	Belmont stony silt loam-Rock outcrop complex, 15 to 25 percent slopes	2.3
CaE	Calvin channery silt loam, 25 to 35 percent slopes	5.6
CbC	Calvin silt loam, high base substratum, 8 to 15 percent slopes	0.8
BbE	Belmont stony silt loam-Rock outcrop complex, 25 to 35 percent slopes	7.0
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	2.5
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	10.3
DbD	Dekalb channery loam, moist, 15 to 25 percent slopes	1.9
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	0.4
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	1.6
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	1.1
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	8.1
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	4.6
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	3.5
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	7.8
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	6.0
BtE	Buchanan and Ernest stony soils, 15 to 35 percent slopes	1.5
CcD	Calvin stony silt loam, high base substratum, 15 to 25 percent slopes	0.6
BeF	Berks channery silt loam, 35 to 70 percent slopes	5.4
BeF	Berks channery silt loam, 35 to 70 percent slopes	0.6
BeF	Berks channery silt loam, 35 to 70 percent slopes	5.7

Map Symbol	Map Unit Name	GIS Acres
BkE	Berks-Weikert complex, 25 to 35 percent slopes	1.6
BkE	Berks-Weikert complex, 25 to 35 percent slopes	4.3
DrF	Dekalb extremely stony loam, moist, 35 to 70 percent slopes	4.6
DrF	Dekalb extremely stony loam, moist, 35 to 70 percent slopes	2.8
EsC	Ernest rubbly silt loam, 3 to 15 percent slopes	12.8
EsE	Ernest rubbly silt loam, 15 to 35 percent slopes	2.6
BkF	Berks-Weikert complex, 35 to 70 percent slopes	12.4
BkF	Berks-Weikert complex, 35 to 70 percent slopes	2.5
BkF	Berks-Weikert complex, 35 to 70 percent slopes	1.1
CcF	Calvin stony silt loam, high base substratum, 35 to 70 percent slopes	10.0
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	0.2
GkE	Gilpin-Dekalb stony complex, moist, 15 to 35 percent slopes	0.5
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	0.2
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	2.4
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	9.3
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	7.1
EnC	Ernest silt loam, moist, 8 to 15 percent slopes	0.0
U5	Udorthents, mudstone and shale, low base	49.0
U5	Udorthents, mudstone and shale, low base	32.9
U5	Udorthents, mudstone and shale, low base	5.2
BfF	Berks channery silt loam, 35 to 55 percent slopes, very stony	53.1
BfF	Berks channery silt loam, 35 to 55 percent slopes, very stony	49.4
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	6.7
BgF	Berks-Dekalb complex, 35 to 55 percent slopes, very stony	6.7
CfE	Cateache channery silt loam, 15 to 35 percent slopes, very stony	2.7
CfF	Cateache channery silt loam, 35 to 55 percent slopes, very stony	3.7
BbF	Belmont silt loam, 35 to 55 percent slopes, very rocky	5.8
MfwG	Mandy-Wildell complex, 55 to 80 percent slopes, very stony	1.1
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	0.1
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	13.6
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	26.5
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	6.0
BfE	Berks channery silt loam, 15 to 35 percent slopes, very stony	4.8
PamE	Paddyknob-Madsheep complex, 15 to 35 percent slopes, very stony	0.9
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	102.1

Map Symbol	Map Unit Name	GIS Acres
SsE	Shouns silt loam, 15 to 35 percent slopes, extremely stony	1.3
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	6.2
MfwF	Mandy-Wildell complex, 35 to 55 percent slopes, very stony	21.9
SsC	Shouns silt loam, 3 to 15 percent slopes, extremely stony	10.9
SwE	Snowdog silt loam, 15 to 35 percent slopes, extremely stony	6.4
EnD	Ernest silt loam, 15 to 25 percent slopes	0.6

Literature Cited

National Cooperative Soil Survey. National Cooperative Soil Survey Characterization Database. http://ncsslabdatamart.sc.egov.usda.gov/. Accessed Tuesday, January 05, 2016