



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 Cecil County, Maryland



January 27, 2016

Custom Soil Resource Report Soil Map








































Map Scale: 1:5,060 if printed on A landscape (11" x 8.5") sheet.



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

MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soils	 Stony Spot
 Soil Map Unit Polygons	 Very Stony Spot
 Soil Map Unit Lines	 Wet Spot
 Soil Map Unit Points	 Other
Special Point Features	 Special Line Features
 Blowout	Water Features
 Borrow Pit	 Streams and Canals
 Clay Spot	Transportation
 Closed Depression	 Rails
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	Background
 Mine or Quarry	 Aerial Photography
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 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: Cecil County, Maryland
 Survey Area Data: Version 12, Sep 30, 2015

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

Date(s) aerial images were photographed: Jun 17, 2010—May 10, 2011

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

Cecil County, Maryland (MD015)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HbB	Hambrook sandy loam, 2 to 5 percent slopes	10.9	9.4%
HbC	Hambrook sandy loam, 5 to 10 percent slopes	6.4	5.5%
HkB	Hambrook-Urban land complex, 0 to 5 percent slopes	18.1	15.6%
McA	Marshyhope loam, 0 to 2 percent slopes	9.0	7.7%
MkC	Matapeake silt loam, 5 to 10 percent slopes	1.3	1.1%
MpB	Matapeake-Urban land complex, 0 to 5 percent slopes	6.7	5.8%
MtB	Mattapex silt loam, 2 to 5 percent slopes	0.0	0.0%
MuB	Mattapex-Urban land complex, 0 to 5 percent slopes	3.3	2.9%
SaB	Sassafras sandy loam, 2 to 5 percent slopes	0.1	0.1%
UwA	Udorthents, wet substratum, 0 to 2 percent slopes	0.1	0.1%
VnaB	Urban land-Nassawango complex, 0 to 5 percent slopes	15.1	13.0%
VsB	Urban land-Sassafras complex, 5 to 10 percent slopes	7.9	6.8%
W	Water	37.3	32.1%
Totals for Area of Interest		116.3	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

April 25, 2016

Valerie Woodruff, President
West View Shores Civic Association
18 Short Road
Earleville, MD 21919

Re: West View Shores Drainage Improvements

Dear Ms. Woodruff:

AECOM is pleased to present the enclosed Preliminary Drainage Improvement Plans and Drainage Report for West View Shores Community. These documents have been prepared in accordance with the Letter Agreement for Professional Services, dated August 7, 2015.

A. BACKGROUND

On July 9, 2015, representatives from the West View Shores community met with AECOM staff on site to identify problematic drainage areas. The community is divided into two sub-areas, east and west. Each of these sub-areas is identified by their own drainage area (See Appendix A – Drainage Area Plan). The project limits for the east portion of the community extend along Basin Road east from North Drive to the Elk River. It also includes Short Street from Basin Road to Circle Drive. The project limits for the west portion of the community extend along Basin Road west from North Drive to the Elk River. A short portion of Low Street was also included in our study. According to the representatives, both of these areas are subject to flooding and generally have poor drainage after rain events.

B. SURVEY

AECOM conducted a field survey on December 15, 2015. Our survey included utility inverts, sizes, material, top elevations and their connecting gradients. This field survey was combined with an aerial topography conducted as part of the Pearce Creek project. The results of the survey determined that many inlets and pipes were failing and generally in poor condition. The other pipes that were in good condition were filled with debris and, therefore, their capacities were limited. In some cases, pipes were too shallow and subsequently exposed above grade. The existing storm drain pipe network is comprised of reinforced concrete pipe (RCP), high density polyethylene (HDPE), ductile iron pipe (DIP) and corrugated metal pipe (CMP).

C. SOIL SURVEY

A desktop soils analysis (Appendix B) was conducted of the site using the online Web Soil Survey software provided by the United States Department of Agriculture. The soils are generally well draining throughout the site. They range from USGS Hydrologic Soil Group B to C. Group B soils have moderate infiltration rates with a range of water transmission (0.15-0.30 inch/hour). Group C soils have low infiltration rates with a low rate of water transmission (0.05-0.15 inch/hour).

Soil Name and Symbol	USGS Hydrologic Soil Group
HbB Hambrook	B
HbC Hambrook	B
HkB Hambrook-Urban	B

Soil Name and Symbol	USGS Hydrologic Soil Group
McA Marshyhope	B
MkC Matapeake	C
MpB Matapeake-Urban	C
MtB Mattapex	C
MuB Mattapex-Urban	C
SaB Sassafras	B
UwA Udorthents	C
VnaB Urban land-Nassawango	B
VsB Urban land-Sassafras	B

D. HYDROLOGY

The hydrology for this site was modeled using WinTR-55 Small Watershed Hydrology, developed by the USDA. As mentioned earlier, the site is divided into two drainage areas with two independent outfalls. The east drainage area is 8.88 acres with a combination of closed storm drain systems, culverts, swales wetlands and over land flow. All of this flow is concentrated to the north side of Basin Road and discharges through an 18 inch HDPE pipe to the Elk River (refer to Point of Interest – EAST in Appendix A, Drainage Area Plan). The west drainage area is roughly 18.64 acres comprised of closed storm drain systems, culverts, swales and overland flow. The west drainage area discharges through twin 24 inch CMP pipes (refer to Point of Interest – WEST in Appendix A, Drainage Area Plan) located on the far west end of Basin Road. These existing 24 inch pipes appear to be in good condition and should remain.

The peak flow rates of the east and west drainage area were computed by routing the 2, 10 and 100 year storms through the existing conditions of the site. The peak flow rates are summarized below:

24 Hour Storm Event	Hydrograph Peak Flowrates (cfs)	
	East Subarea	West Subarea
2-year	8.04	14.79
10-year	16.53	29.06
100-year	33.77	57.1

(See Appendix C for the Hydrology Analysis.)

E. HYDRAULICS

Closed storm drain systems, culverts and swales are typically designed to handle the 10-year storm event or 25-year storm event at sumps. The existing drainage structures were analyzed to see if they were adequately sized for the expected 10-year flow rates. It was determined the pipes in the East drainage area were dramatically undersized. The existing 18 inch HDPE outfall at 1.0% slope has a capacity of 7 cubic feet per second (cfs). The entire East drainage system is made up of 18 inch pipes or smaller; therefore, significant upgrades should be made to properly drain the site. The existing twin 24 inch CMP pipes at 1.9% slope that drain the western drainage area have a capacity of 30 cfs which is adequately sized for the 10-year storm event. Many of the other pipes upstream of the outfall are undersized and need to be upgraded. See Appendix D for the Hydraulic Analysis.

F. RECOMMENDATIONS

The Preliminary Drainage Improvement Plan contained in Appendix D indicates the proposed improvements for each drainage area and are generally described as follows:

East Drainage Area

A combination of new swales and closed storm drain piping system is proposed to address the drainage issues in the Eastern Drainage Area. Basin Road south of Short Street generally drains across the road to the west side of Basin Road. This side of the road is lacking any drainage. A swale is a relatively low cost but effective way of controlling the runoff. Swale #1 has a bottom width of 3 feet, a depth of 1.5 feet, 3:1 side slopes and a slope of 3.0%. The swale is designed to handle the 10-year storm event. Swale #2 has the same dimensions, except the slope is 1.0% due to the existing site grades. Swales typically follow the existing grade which keeps the cost to a minimum. Beyond the limits of the swale, the existing grade flattens out significantly and a swale is no longer an option. From this point to the outfall, we are proposing a closed storm drain system. The west side of Basin Road drains a majority of the drainage area and, therefore, we are proposing 30 inch drain basins and 30 inch HDPE. The pipe system has a similar capacity to the open channel swale system. The piping system is fairly flat due to the existing elevation restrictions at the outfall. The proposed inlets are circular PVC Nyloplast drain basins. These inlets are watertight, easy to install, and much more cost effective than typical concrete inlets. A few 15 inch drain basins are proposed along the east side of Basin Road to capture flow from the side streets and any existing low points. The existing 8 inch culvert in the existing swale along Short Street is being upgraded to 15 inch HDPE. The capacity of the swale exceeds the 8 inch capacity, so runoff has the potential to back up at this point. In addition, all pipes to remain shall be properly cleaned and all debris removed.

West Drainage Area

The proposed improvements consist of a closed storm drain piping system to address the drainage issues in the Western Drainage Area. Similar to the East Drainage Area, a majority of the West Drainage Area drains across Basin Road to the north side of the street. The existing grade along the north side of Basin Road is flat; therefore, a swale was not an option for this portion of the site. We have proposed 30 inch drain basins and 30 inch HDPE which are sufficient to handle the 10-year storm event. The proposed storm drain will begin at the Low Street intersection. The existing swale east of Low Street is adequate to drain the site to this point. The existing 30 inch ductile iron pipe (DIP) south of Basin Road on the west side of Short Street shall remain and connect to our proposed storm drain system. Once again, it is recommended that all existing pipes to remain should be properly cleaned. The proposed 30 inch HDPE shall daylight at the existing stone outfall. The existing twin 24 inch CMP outfall appears to be in good shape and shall remain. We have added an additional 15 inch drain basin and 15 inch HDPE on the south side of Basin Road and just east of Bluff Road to drain the existing low point.

G. PERMITTING

As per our proposal dated August 7, 2015, permit applications and coordination were not part of our scope of services. The following agencies should be contacted to coordinate the required permitting efforts well in advance prior to the start of construction. Some of these permit approvals may take several weeks to obtain.

- Cecil County Department of Public Works – Storm Water Management; 410-996-5267
- Cecil County Soil Conservation District – Erosion and Sediment Control; 410-398-4411 , ext. 3
- Cecil County Planning and Zoning - Critical Area Regulations; 410-996-5220
- Maryland Department of the Environment Tidal and Non-tidal Wetlands Division – Wetland Impacts; 410-537-3837

H. BIDDING / COST ESTIMATE

The West View Shores community should defer to their lawyer for the proper bidding and legal contract procedures when selecting and hiring a contractor. The permitting documents discussed above should be resolved prior to proceeding with any work. Sheet 1 of 4 of the attached plans (Appendix D) state that all piping and inlets shall be installed in accordance with the manufacturer's recommendations. As we stated in our proposal, dated August 4, 2015, we have prepared Preliminary Drainage Improvement Plans and they are not intended for construction. A cost estimate, based on the Preliminary Drainage Improvement Plan, is being prepared and will be provided to you shortly.

AECOM looks forward to any questions you have regarding this submission. If you need additional information, please do not hesitate to call Gerald Hayes at 302-781-5908.

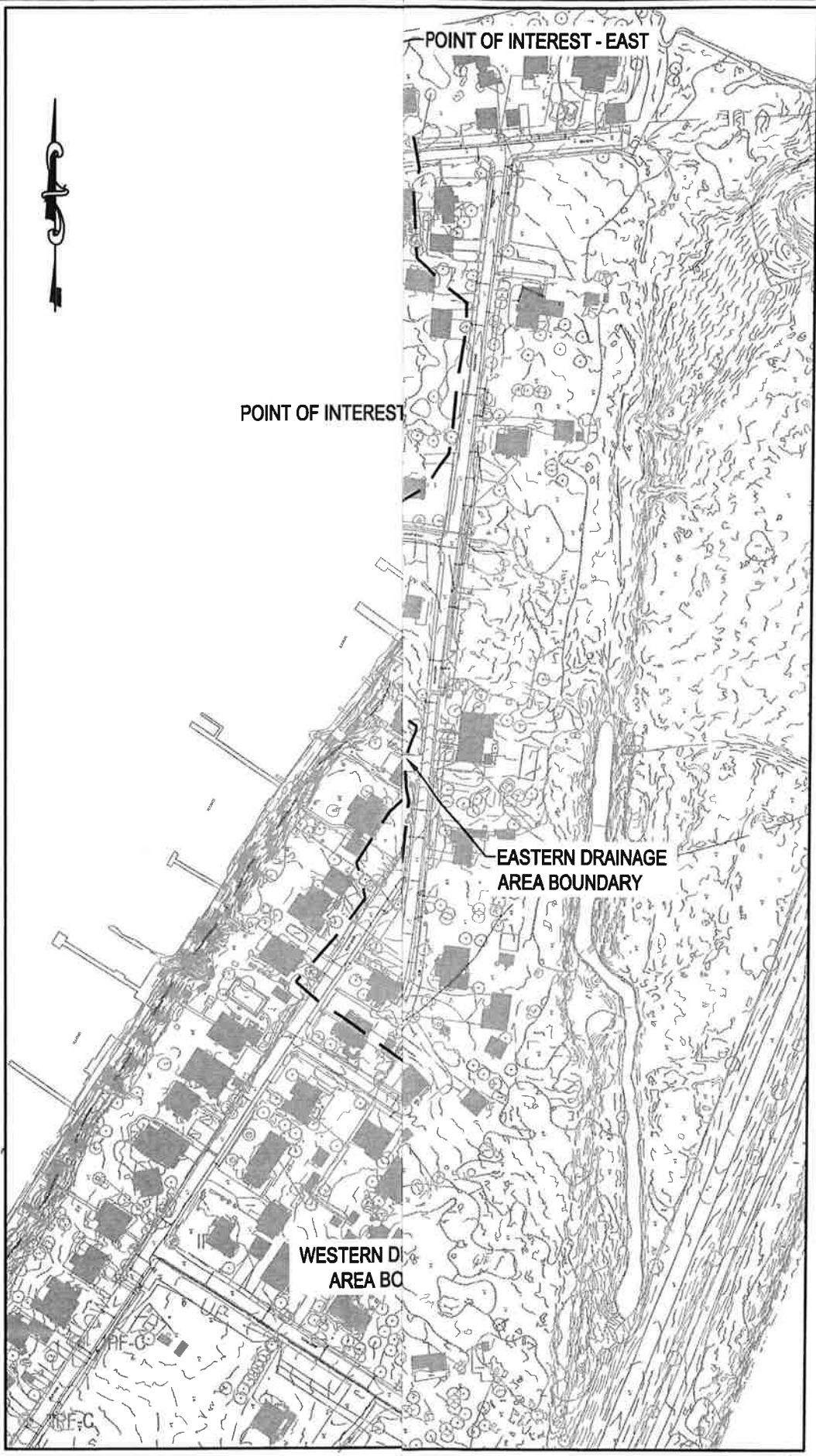
Sincerely,

AECOM Technical Services, Inc.

Gerald M. Hayes, PE
Senior Civil Engineer



Christopher J. Rogers, AICP
Principal Planner



Issue Status: PRELIMINARY



DRAINAGE AREA PLAN
WEST VIEW SHORES DRAINAGE IMPROVEMENTS
 EARLEVILLE, CECIL COUNTY, MARYLAND
 Project No.: 60476980