

Chesapeake Bay TMDL Simulation and Management Support to the Army

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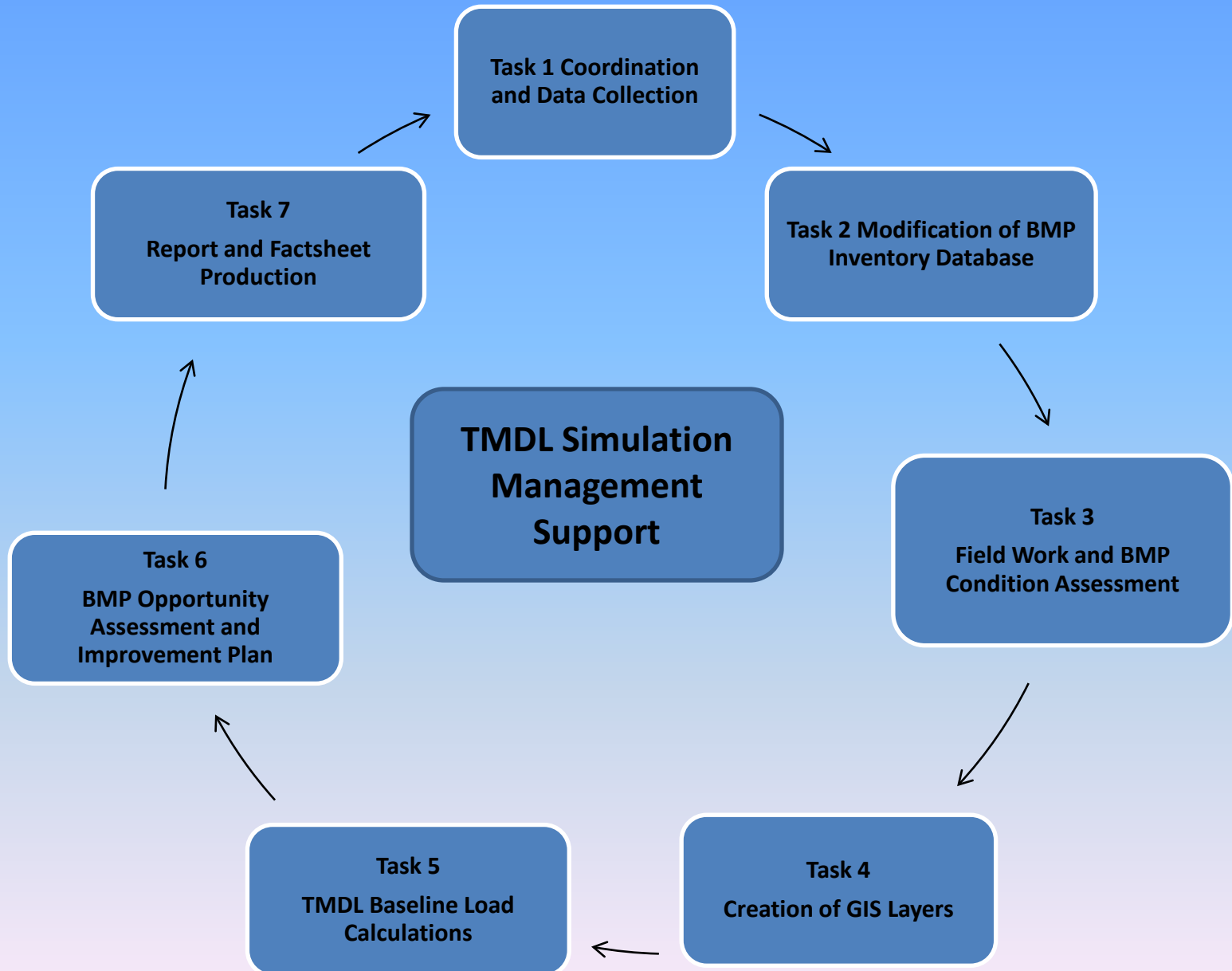
17 April 2012

Army Customers

- Army National Guard
- IMCOM Atlantic Region
- Army Reserves (draining to the CB Watershed)

Over 200 Facilities!

Project Overview



Critical Data Needs

- Boundary and acreage
- Land Use
- Best Management Practices (BMPs)
 - Lat/long
 - Installation Dates
 - Acres Treated
 - Efficiencies (using CB tables)

Early -Lessons Learned

DATA LACKING FOR MOST FEDERAL FACILITIES !!

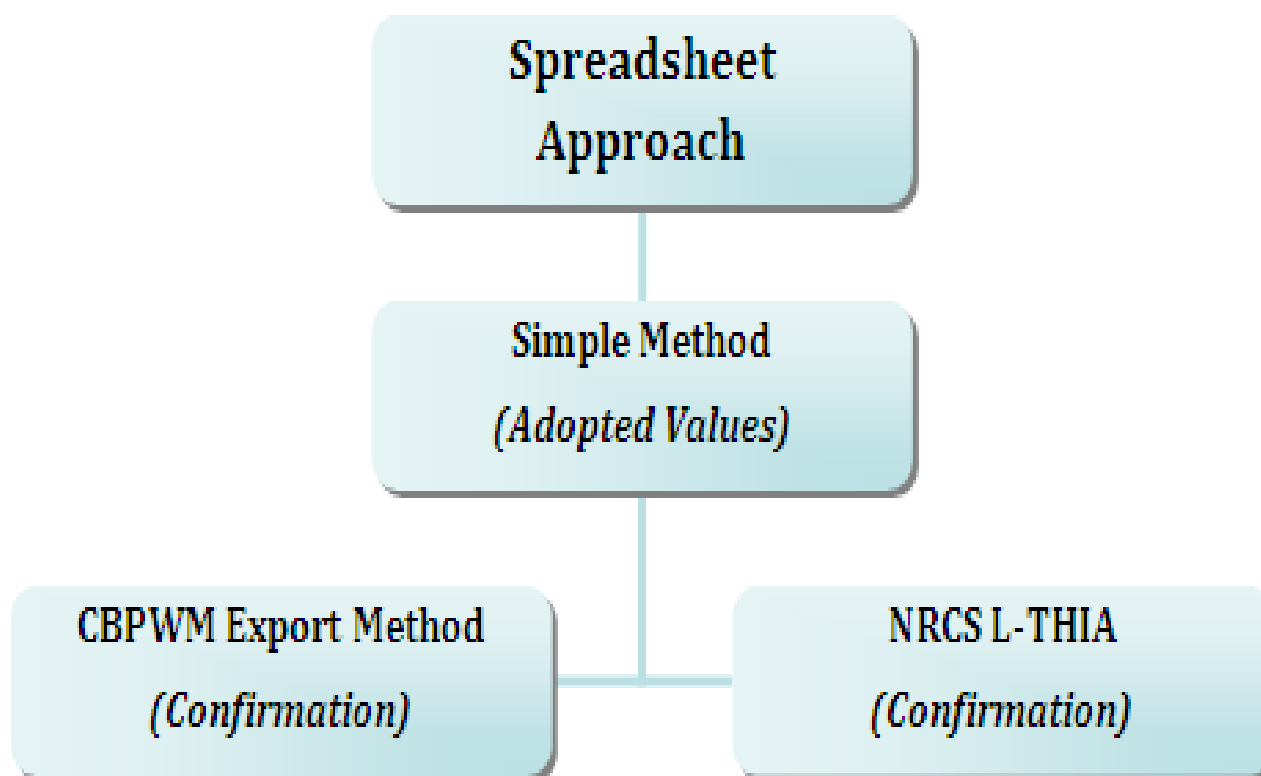
- *Little Current Boundary and Land Use data**
- *No BMP Inventory or *Mapping of BMPs**
- *No BMP O&M Program**
- * No BMP Repository or Tracking System**



- *Required Additional Field Verification:**
 - GPS Delineations for Property; Land Use, BMPs and Condition Assessments**

Modeling Approaches

Figure 4.1: Spreadsheet Modeling Approach



Simple Method

- Where:
- P = Rainfall (inches per year)
- R_v = Runoff Fraction (percent of rain that is runoff)
- A = Area (acres)
- EMC = Event Mean Concentration (mg/l)
- K = Conversion Factor

Final TMDL Report and Factsheet

CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD (TMDL) STUDY FOR DELAWARE ARMY NATIONAL GUARD



Prepared for:

Prepared by:

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Delaware Army National Guard Stormwater Total Maximum Daily Load (TMDL) Factsheet 10A90: Pigman Armory



I. GENERAL INFORMATION



Facility: 10A90, Pigman Armory

Address: 601 Bridgeville Highway
Seaford, Delaware 19973

County: Sussex County, Delaware

Facility Size: 3.0 acres

Local Watershed: Williams Pond

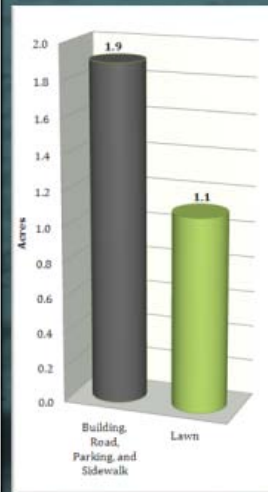
Regional Watershed: Nanticoke River



The Pigman Armory is located in the City of Seaford, Sussex County, Delaware. The 3.0 acre

II. EXISTING LAND USE

The Pigman Armory is located in a moderately urbanized setting. 64-percent of the 3.0 (1.9 acres) is categorized as high intensity impervious urban land cover. This includes rooftops, parking areas, and sidewalks. 36-percent of the site (1.1 acres) is categorized as intensity pervious urban land cover, or lawns.



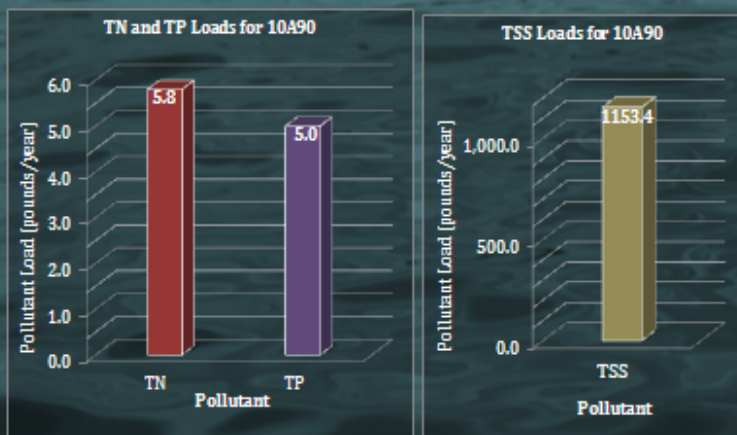
III. EXISTING STORMWATER INFRASTRUCTURE AND BMPs

There are no existing stormwater BMPs or stormwater infrastructure located at the Armory. All runoff from the site flows overland off-site and into the City of Seaford stormwater system.

Final TMDL Report and Factsheet

IV. POLLUTANT LOADS

The Pigman Armory is located in Land Segment A10005 and discharges to River Segment EL2_4630_0000 in the Chesapeake Bay Programs Watershed Model. The expected pollutant loads (in pounds/year) from the site contribute less than .05-percent of the load from Land Segment A10005 to the Chesapeake Bay. The site contributes a below average TN load per acre (pounds/acre/year), a below average TP load per acre, and a slightly above average TSS load per acre when compared to other land in Land Segment A10005.



Site 10A90 Pollutant Load Estimates	
Pounds/Year	
TN	5.8
TP	5.0
TSS	1153.4
Pounds/Acre/Year	
TN	1.9
TP	1.7
TSS	384.58

Pollutant	Load (Pounds/Acre/Year)		Status
	Site	Land Segment A10005	
TN	1.9	25.9	👁️
TP	1.7	2.3	👁️
TSS	384.5	163.2	✅

V. OPPORTUNITY ASSESSMENT

Because of the low percentage of pollutant contribution to the Chesapeake Bay Model Land Segment and the relatively below average or average pollutant load per acre contribution, physical stormwater improvements (BMP Retrofits) at Site 10A90 are not necessary at this time.

Programmatically, an opportunity to support on-going Chesapeake Bay pollutant reduction programs and efforts exists. The Delaware Army National Guard can do the following at Pigman Armory to support on-going efforts:

- Continue to support Delaware Department of Natural Resources and Environmental Control (DNREC) Watershed Implementation Plan (WIP) Phase II processes in the future.
- Continue to implement the Army Policy for Sustainable Design and Development (SDD), October 2010 and Low Impact Development (LID) under the Energy Independence and Security Act of 2007 (EISA) as a means to manage stormwater for all future construction and maintenance projects.


BMP Database

Select by SWM ID:

SWM ID:

Alternate ID:

Inspection date:



Stormwater BMP Inspection Database

[View Record in Inventory](#)

[Maintenance Report](#) [Exit Database](#)

[Open Report](#) [Add New Inspection](#) [Delete Inspection](#)

Inventory Information

General

Inventory date:

General BMP type:

Field surveyor:

Status:

Maintained by:

Jurisdiction:

Comments/Notes: ☐ As-Built plans? ☐

Multiple Roof drains for entire building 69 into vegetated buffer

Location

General

☒ Broad leaf application ☐ Mowing ☐ Repair fence

☐ Fix animal holes ☐ Remove trash ☐ Seeding

☒ Herbicide ☐ Remove woody vegetation ☐ Unclog low flow orifice

Maintenance completed by: Other:

Maintenance date: Maintenance/Inspection cycle:

Improvement Plan

☐ Repair of corrective maintenance

☐ Restore or replace activities

Corrective maintenance completed by:

Corrective maintenance date:

BMP Efficiency

	Calculated	Actual
Nitrogen	<input type="text"/>	<input type="text"/>
Phosphorus	<input type="text"/>	<input type="text"/>
Sediment	<input type="text"/>	<input type="text"/>

Report for SWMID: Alternate ID:

GENERAL

Inventory date: General BMP type: Type:

Field surveyor: Status:

BMP retrofit potential: Soil type: As-Built plans? ☐

Purpose:

LOCATIONAL

Latitude: Longitude: Waterbody BMP discharge into:

Location:

BMP INFORMATION

Across Treated: MS4: Other: CSO: Total: Year built: Included in CEM? ☐

CHESAPEAKE BAY TMDL

TMDL INFORMATION

	N	P	S
Efficiency (%)	<input type="text"/>	<input type="text"/>	<input type="text"/>
Calculated	<input type="text"/>	<input type="text"/>	<input type="text"/>
Across Treated	<input type="text"/>	<input type="text"/>	<input type="text"/>

Calculated Reduction

	N	P	S
CSO	<input type="text"/>	<input type="text"/>	<input type="text"/>
MS4	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>	<input type="text"/>

Inspection Date:

Inspection Type: Rating:

Accessibility <input type="checkbox"/> Inaccessible	Vegetation <input type="checkbox"/> Erosion <input type="checkbox"/> Area unstable <input type="checkbox"/> Area not mowed <input type="checkbox"/> Inlet malfunctions <input type="checkbox"/> Inlet on vegetation <input type="checkbox"/> Poor vegetation	Aggregates <input type="checkbox"/> Aggregate dirty <input type="checkbox"/> Replace top layer <input type="checkbox"/> Poor trench
Debris <input type="checkbox"/> Trench full of debris <input type="checkbox"/> Inlet pipe full of debris <input type="checkbox"/> Inlet under debris <input type="checkbox"/> Spillway full of debris	Clogging <input type="checkbox"/> Clogging Inlets, Outlets, and Overflow Spillway <input type="checkbox"/> Poor maintenance <input type="checkbox"/> Erosion at inlet/outlet	Sediment Deposition <input type="checkbox"/> Sedimentation <input type="checkbox"/> Remove accumulation
Sediment Traps, forebays, and pretreatment swales <input type="checkbox"/> No sediment trapping <input type="checkbox"/> 20% of volume taken	Overall Function of Facility <input type="checkbox"/> Flow bypass <input type="checkbox"/> Standing water <input type="checkbox"/> Odor	
Soil <input type="checkbox"/> Waterlogged soils <input type="checkbox"/> Low organic matter <input type="checkbox"/> Poor cover	Notes: <input type="text"/>	

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Long Term Reporting/Tracking of BMPs and Load Reductions to Gauge Progress Toward 2017 and 2025 Reduction Goals

Questions?