

Quality Assurance Project Plan

For

Maryland Urban Best Management Practices (BMP) Data

Prepared by:

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Prepared for:


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Date: 2/2/2017



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Date: 2/3/17

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1.0 PROJECT MANAGEMENT

1.1 - Title and Approval Page – See page i.

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1.3 - Distribution List

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1.4 - Project Organization

This project will be managed primarily by MDE, with general administrative oversight by senior WMA and SSA staff. The following individuals will be involved with project management:

MDE Project Lead Erosion and Sediment Control Data – Jesse Salter & Mary Dewa will be responsible for overall project management of the Erosion & Sediment Control data. Ms. Dewa will oversee obligations for completing all work assigned; maintaining communications with the associated data providers to ensure that data reporting are completed in a timely manner and meet CBP requirements including:

- Conduct outreach with internal/external data providers
- Provide data to National Environmental Information Exchange Network (NEIEN) Project Manager

MDE Project Lead MS4 Permit Stormwater Data– Ray Bahr will be responsible for overall project management of the MS4 regulated stormwater data. Mr. Bahr will oversee obligations for tracking permit reported information; maintaining communications with the associated stormwater data providers to ensure that assigned tasks are completed in a timely manner and meet CBP requirements including:

- Conduct outreach with internal/external data providers
- Provide the data to the SSA for QA/QC review

MDE Project Lead Non-MS4 Permit Stormwater Data– Mike McMahon will be responsible for overall project management of the non-MS4 stormwater data. Mr. McMahon will oversee obligations for tracking reported information; maintaining communications with the associated stormwater data providers to ensure that assigned tasks are completed in a timely manner and meet CBP requirements including:

- Conduct outreach with internal/external data providers
- Provide the data to the NEIEN Project Manager
- Through the period of this QAPP, these responsibilities will be transferred to the MDE Sediment, Stormwater and Dam Safety (SSDS) division and managed through the newly developed geodatabase.

MDE Project Lead Septic Data– Joshua Flatley will be responsible for overall project management of the regulated septic data. Mr. Flatley will oversee obligations for tracking reported information; maintaining communications with the associated septic upgrade data providers to ensure that assigned tasks are completed in a timely manner and meet CBP requirements including:

- Conduct outreach with internal/external data providers
- Provide the data to the NEIEN Project Manager

MDE QA Manager – Ray Bahr will be responsible for reviewing and approving the QAPP.

Additional personnel involved in project implementation are listed in Table 1. Figure 1 shows connections to BMP data originators. The BMPs reported by each partner and data contributor, and their contact information are listed in Appendix A.

Table 1: Project Implementation Personnel

Individual	Role in Project	Data Provided	Organizational Affiliation
Kathy Stecker	QAPP Primary Author	NA	Maryland Dept of the Environment
Gregorio Sandi	QAPP Author	NA	Maryland Dept of the Environment
Mike McMahon	Data Contributor	Non-MS4 Urban Stormwater BMPs	Maryland Dept of the Environment
Christina Lyerly	Data Review	MS4 Data	Maryland Dept of the Environment
Ray Bahr	Data Contributor	MS4 Urban Stormwater BMPs	Maryland Dept of the Environment
Jesse Salter	Data Contributor	Non-delegated authority Erosion and Sediment Control	Maryland Dept of the Environment
Mary Dewa	Data Contributor	Delegated authority Erosion & Sediment Control	Maryland Dept of the Environment
Josh Flatley	Data Contributor	Septic Upgrades	Maryland Dept of the Environment
Water Quality Financing Administration (WQFA)	Data Contributor	Septic Connections to WWTP	Maryland Dept of the Environment
Stew Comstock	Data Review	MS4 Data	Maryland Dept of the Environment
Michelle Crawford	Data Review	MS4 Data	Maryland Dept of the Environment
Deborah Cappucitti	Data Review	MS4 Data	Maryland Dept of the Environment
Andrew Tagoe	Data Review	MS4 Data	Maryland Dept of the Environment
Mary Dewa	Data Review	MS4 Data	Maryland Dept of the Environment
Brian Cooper	Data Review	MS4 Data	Maryland Dept of the Environment

Data Contributors will be responsible for the following activities:

- Provide BMP data in electronic format
- Provide MD NEIEN Project Lead with BMP data that has been verified, validated and compiled according to the procedures cited in this QAPP document
- Provide updates and corrections to data as needed

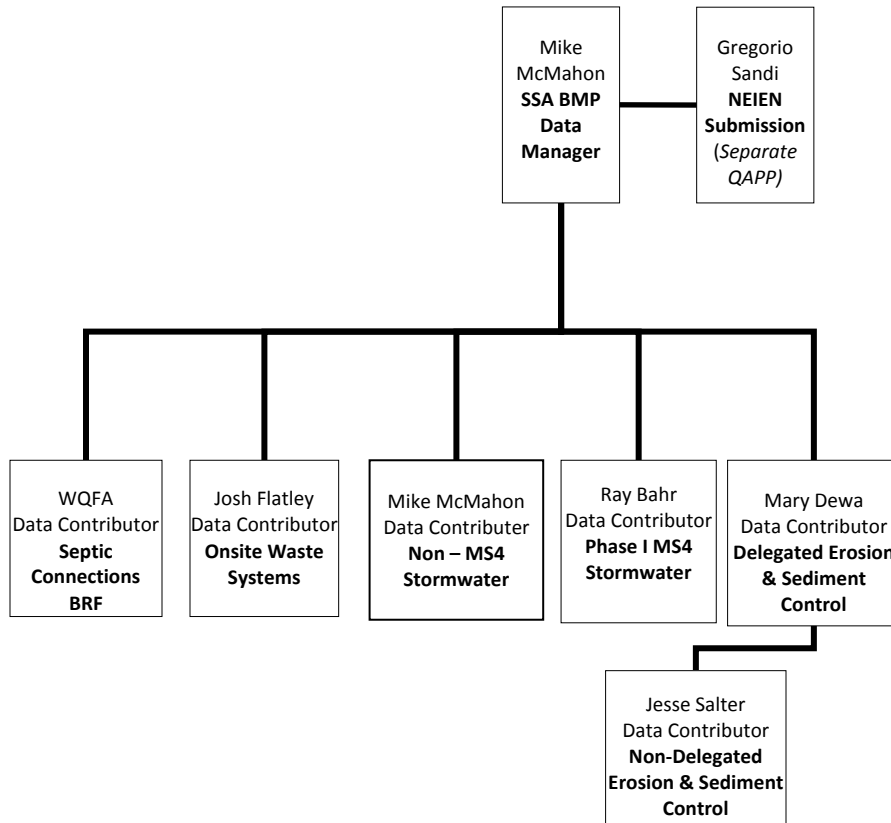
Data Reviewers will be responsible for the following activities:

- Ensuring data are received in a timely manner
- Communication with local jurisdictions providing raw data

- Documenting data deficiencies (e.g. SSDS Geodatabase reports) and giving feedback to the local jurisdictions

This document is intended to clearly lay out the process of collecting, QA/QC and reporting of urban nonpoint source BMP data from MDE to MD's NEIEN submission manager, whose process is detailed in a separate QAPP supplied to CBPO. Verification procedures for all BMPs identified in this QAPP are addressed in the State's BMP Verification Protocols document located [here](#).

Figure 1: Overall Project Organizational Chart



1.5 - Problem Definition/Background

The purpose of this QAPP is to document procedures used to process and submit nonpoint urban Best Management Practice (BMP) data to the Chesapeake Bay Program Office (CBPO) for Maryland's annual progress and historic BMP clean-up efforts. It addresses stormwater and septic system data. Urban wetland and stream restoration practices are not explicitly discussed as separate urban BMP sectors. In Maryland, both urban wetlands and stream restorations are tracked and reported in conjunction with urban stormwater BMPs. This is because most wetland practices implemented in the urban sector are for the treatment of stormwater. The vast majority of urban stream restoration projects are designed and constructed to help MS4 jurisdictions meet their impervious surface treatment requirements.

The State has developed comprehensive stormwater management and erosion and sediment control (E&SC) programs to reduce the adverse impacts of development on stormwater runoff. These programs address both the temporary and the permanent impacts associated with land development activities.

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, septic upgrades are a small portion of the overall WIP reduction goals; however, these BMPs are significant to State strategies for shellfish production and human health concerns. Septic connections are not a strategy in the State's WIP reduction goals. Both practices are tracked and reported through State funded programs and local jurisdiction programs.

Stormwater

Of Maryland's total pollutant reductions required by the Chesapeake Bay TMDL, urban stormwater accounts for about 18% of the nitrogen and 30% of the phosphorus. Nine out of 23 counties, the Maryland State Highway Administration, and Baltimore City have a NPDES Phase I MS4 permit; two counties and over 50 municipalities and State and federal facilities have been designated as NPDES Phase II MS4 permit jurisdictions or facilities. Combined, a majority of the State's geographic area is managed under a federal NPDES stormwater permit that is administered by the State. This covers the majority of developed areas in the State and accounts for the vast majority of stormwater BMPs reported to EPA.

As part of the NPDES annual reporting process, permittees are required to complete databases for storm drain systems, urban best management practices, impervious surfaces, watershed restoration, monitoring site locations, chemical monitoring, pollutant load reductions, biological monitoring, illicit discharge detection, erosion and sediment control responsible personnel training, quarterly grading permit summaries, and fiscal analyses. (Figure 2)

Although only MS4 jurisdictions are required to report their BMP maintenance status through annual reports, non-MS4 jurisdictions are required to report BMPs to MDE within 45 days of construction completion. All jurisdictions have an incentive to report BMP information in order to receive full credit toward meeting Chesapeake Bay nutrient reduction targets. This interest is reflected in increased BMP reporting by local, federal, and State partners since Maryland adopted a Chesapeake Bay Watershed Implementation Plan.

Maryland is transitioning to a new data flow process (Figure 3). The new process will route all of the local information through an online stormwater database managed by MDE WMA's Sediment, Stormwater and Dam Safety (SSDS) Program. The online database will have three separate portals for Phase I, Phase II and Non-MS4 data intake from local sources. The portal for Phase I MS4 data will be linked to a GIS module of the database. The portals for the Phase II MS4 and non-MS4 data will be linked to database modules that do not require GIS information.

Erosion and Sediment Control (E&SC)

E&SC BMPs are temporary and address the transient impacts of construction. Because the annual rate of development is generally steady, and E&SC practices are generally implemented consistently, the change in Bay pollutants associated with construction is expected to remain relatively unchanged year-to-year. In addition, the annual pollutant loads associated with construction, relative to the Chesapeake Bay scale and other source sectors, is small. Thus, any changes in loads at the Chesapeake Bay scale associated with E&SC practices are very small, making these BMPs of modest significance. The practices are, however, of significance to water quality protection at the local scale.

Maryland Environment Article, Title 4, Subtitle 1, requires MDE to implement a statewide E&SC program. The COMAR 26.17.01.05 requires that any construction activity in Maryland that disturbs 5,000 square feet or more of land or results in 100 cubic yards or more of earth movement have an E&SC plan.

Currently 13 counties and nine municipalities are delegated, or partially delegated, by MDE. MDE is responsible for inspecting the remainder of the state.

Data from delegated jurisdictions are submitted to MDE on a quarterly basis. Data include the number of grading permits, disturbed acres, staff, inspections, and enforcement actions. For non-delegated areas of the State, MDE captures Construction General Permit data through NOIs and enters them into a database. Information in the database includes data on site location, drainage areas, and BMPs. SSA then aggregates data from both processes to capture a complete picture of construction activity and E&SC across the State for submission to NEIEN. (Figure 4)

Septic Systems

Maryland's strategy for reducing nitrogen loads from septic systems is to either upgrade to nitrogen removal technology or connect to an advanced wastewater treatment plant (WWTP). Upgrade information is stored in a Best Available Technology (BAT) database. Reporting requirements for BAT installation are dictated by State law for Health Departments and service providers include the name of the applicant, location, the date of the installation and the description of BAT technology installed. (Figure 5)

For septic connections to WWTPs, health department personnel conduct site visits and construction inspections; findings are documented as Construction Monitoring Reports submitted to MDE.

MDE Roles and Responsibilities

Stormwater

Currently, all stormwater data submitted to MDE SSDS are reviewed for permit compliance. That data is shared with SSA staff, which performs an independent validation process. SSA staff reviews MS4 and non-MS4 data to ensure that it conforms to the minimum data requirements established by the Chesapeake Bay Program Partnership and NEIEN data schema. If data do not conform to the minimum data requirements, it is sent back to the data provider to correct and is not included in the submission to EPA.

MDE SSDS has developed a geodatabase to more efficiently collect and organize the information submitted in annual reporting. The geodatabase will provide reporting structure for submitting local program data and showing compliance with permit requirements. A data web intake portal is being built into the system to provide quality control as the data are entered into the database. Validation tools built into the data collection system will provide much of the validation that is currently occurring in MDE SSA.

E&SC

Maryland State Law ([COMAR Title 26.17.02](#)) requires all localities in Maryland to report the construction, inspection and maintenance of all stormwater BMPs to the MDE Sediment Stormwater and Dam Safety (SSDS) Program; therefore, SSDS is the primary recipient of stormwater and E&SC data within MDE. Data are submitted to MDE in a variety of formats including electronic database transfer, spreadsheets and physical paper formats. SSDS staff consolidates the information provided by delegated authorities and State compliance programs into a statewide inspection and enforcement data table. The table is provided to MDE Science Services Administration's (SSA) Water Quality Restoration and Accountability (WQRA) Program for further processing and inclusion in progress scenarios via NEIEN. Non-MS4 data are currently sent to SSA for compilation.

Septic Systems

MDE has instituted an online reporting system that is required by law ([COMAR 26.04.02.07](#)) to be used by all septic system service providers. Service providers are required by law to report through this system within one month of all installation and maintenance activities they perform.

All septic connections to WWTPs currently reported are paid for by the Bay Restoration Fund. These projects are subject to contractual reporting guidelines and are legally bound to provide accurate information in order to receive payment. The State will accept practices not paid for by BRF primarily through the annual MS4 reports.

1.6 - Project/Task Description and Schedule

The Maryland Department of the Environment (MDE) has developed standard operating procedures (SOPs) for evaluating each major element of its urban BMP tracking and reporting programs.

Multiple non-time specific projects involving BMP data are covered under the scope of this QAPP to describe information processing conducted by MDE. This project acquires data from multiple local jurisdictions, federal and state agencies. These data are ultimately supplied to the CBPO via MDE SSA where the CBPO Scenario Builder tool distributes them geographically for entry into the watershed model.

Annual reports for Phase I and Phase II MS4 jurisdictions are due on the anniversary of permit issuance. Currently, each jurisdiction has its own schedule. Each annual submission is archived once it has been successfully transferred and confirmed as processed by the SSDS.

Non-MS4 data can come at any time and is usually reported at various times throughout the year depending on the amount of new data to report.

Erosion and sediment control data is submitted quarterly from the delegated jurisdictions and compiled annually by MDE.

Septic upgrade data is continually updated per COMAR as BAT systems replace traditional septic systems in the state. Septic connections from the BRF are usually reported annually when WQFA fiscal reports are provided.

1.7 - Quality Objectives and Criteria for Acceptance of Data

The information collected under this Project will be used to evaluate the progress of Maryland's urban BMP implementation on a state fiscal year basis. A system of performance criteria has been established to ensure that these data are of appropriate quality and that they are suitable for use in meeting MS4 permit requirements and as key input files to the CBP's Watershed Model used to guide environmental managers in their assessment of the impacts of nutrient and sediment control activities on loads, and ultimately the water quality of the Chesapeake Bay and its tributaries.

The information is collected under the following conditions to ensure that the resulting data support their intended use:

- Data are understood to undergo QA/QC at the submitting agency and through the SSDS geodatabase tool
- Consistent reporting and data verification are employed
- To be considered valid, a BMP record must have a minimum set of data associated with implementation and performance, must meet design specifications and performance criteria and in the future, must meet BMP verification protocols to be phased in by 2018.
- Data are also reviewed using Best Professional Judgement (BPJ) to ensure that the reported area treated does not exceed the functional performance of a particular BMP.

Accuracy and Completeness Objectives (Qualitative)

- Objective: Timely annual reporting.** Both low bias and high bias occur, on an annual basis, due to the lag time and subsequent catch-up in reporting. Low bias for a given year can occur when data are not submitted on time. High bias can occur when old data are reported in a later year. In the long term, these types of biases cancel out; however, they degrade the accuracy of annual progress results reflected in a high degree of annual variance. Overcoming this will necessitate addressing a variety of factors including inadequate inventory management, MS4 reporting dates that are inconsistent with annual progress data submission, and lack of resources.
- Objective: Increase data reporting and data completeness.** Low bias occurs because of incomplete data and missing submissions.
- Objective: Increase data reporting of geolocation data for stormwater controls on new development:** Low bias is anticipated to occur for stormwater controls on new development due to EPA requiring Lat/Long coordinates for individual BMPs. This is a special case of the previous objective; however, it is of sufficient significance to warrant highlighting.
- Objective: Ensure grant making entities promote local BMP reporting by the sectors receiving pollution reduction credit.** To avoid double-counting of BMPs by both a grant making entity and the recipient of the grant, it is general Maryland policy that the recipient of the grant is responsible for reporting, potentially via another party like a local government. Unless this policy is implemented via effective communications, this could result in underreporting (low bias).
- Objective: Improve verification of BMP installation and maintenance information.** As part of the CBPO's BMP Verification Framework, Maryland has documented its procedures for this objective in Sections 5, 6.2, and 6.3 of the State's BMP Verification Protocols.

1.8 - Special Training Requirements/Certification

Stormwater

Training for entering data into the stormwater geodatabase is provided in the form of a user's manual. There is no "certification" required to enter data; however, the person entering data receives detailed instruction on how to use the database and enter data properly from MDE SSDS staff. In Maryland, county staff are sophisticated enough to understand and report in this manner and therefore do not require certification. The user manual is attached as Appendix A.

E&SC

Training and certification requirements for E&SC are in [COMAR 26.17.01.06](#). Online Training for inspectors can be found at: [Responsible Personnel Certification](#) (RPC).

Septic Systems

Only a person who has completed a course of study approved by MDE for the installation of BAT, and who has a certification of qualification for installing BAT systems from the manufacturer can report this data.

Training for entering data into the septic BAT database is provided in the form of a user's manual. There is no "certification" required to enter data; however, the person entering data receives detailed instruction on how to use the database and enter data properly from MDE Bay Restoration Fund program personnel.

1.9 - Documents and Records

- 1) Data provided to MDE are a part of long-standing reporting system, dating back to the 1990s, which has evolved over time. See Maryland's [Best Management Practice Verification Protocols](#) (MDE 2016).
- 2) MDE retains compiled BMP data sets for a given progress year for at least 5 years in an electronic format. Any manipulations to previous progress submissions will be kept 5 years from the date of their last manipulation.

MDE generates and maintains a variety of records in the Baltimore headquarters:

- A User Manual (Appendix B) for the new stormwater geodatabase documents the data requirements, database structure, and data collection standards.
- A User Manual (Appendix C) for the BRF BAT database documents the data requirements, database structure, and data collection standards.
- Documentation associated with funded projects is maintained in the Baltimore office. These documents include grantee's Funding Proposals (Applications, Project Area and Watershed Identification, Scope of Work, Schedule of Activities and Projected Budget) and Management Measures status on each Project and Summary Table Reports.
- Records are stored on internal computer networks which are backed-up on a daily basis and are stored at another location.
- Senior management has the responsibility for assurance that the personnel have the most current version of this QAPP and any project-specific QAPP developed by grantees.

2.0 DATA SOURCES AND ACQUISITION

This project's purpose is to accept and maintain data to allow collation and transmission of information gathered by Maryland's local jurisdictions, state agencies and federal partners. The tracking system produced will not generate data but receive and maintain that which is submitted to MDE for the CBP annual progress modeling scenario.

2.1 - Data Acquisition

All data that are needed and used for this project will come from non-direct sources. Local jurisdictions and Federal partners provide spreadsheets that contain numeric data to state agencies. There are requirements to report numeric data, but also to supply narrative information in the form of electronic mail discussion. The numeric data will be used as a basis for the annual submission under this project.

Stormwater (Figures 2 & 3):

Data for stormwater BMPs in Phase I MS4 jurisdictions are reported to and tracked by MDE WMA Sediment, Stormwater and Dam Safety Program. Currently data for BMPs on non-MS4 development are reported via an electronic spreadsheet compiled by MDE SSA staff. In the future all stormwater BMPs will be reported to and tracked by SSDS and then provided to SSA for submission to EPA.

Note: The field names in Appendix B will include required elements of the stormwater performance standards which are listed below.

Includes stormwater performance standards (SWPS) reporting

- Year Implemented
- State Abbreviation
- BMP Name
- Spatial attributes
- Amount (acres treated or disturbed)
- Unit (acres)
- Impervious acres (SWPS)
- Runoff storage volume (SWPS)
- Project type (SWPS)
- Previous BMP(if project type is converted retrofit)
- Inspection/Maintenance dates

Project types are:

- New Development
- Re-Development
- New Retrofit
- Converted Retrofit
- Enhanced Retrofit
- Restored Retrofit

Erosion and Sediment Control (Figure 4):

The E&SC data provided to MDE SSA for inclusion in the NEIEN submission has traditionally been a summary spreadsheet indicating an estimated number grading permits, and another estimation of actual disturbed acres. These numbers are based on a 2-year running averages of disturbed acres.

There are difficulties in determining the geographic distribution of disturbed acres for jurisdictions that have not accepted delegated authority to manage an E&SC program. This remains an opportunity for improving the data.

MDE is revising its reporting methodology to use aerial imagery to inform its assessment of actual construction acres and then applying an annual compliance rate to those acres disturbed based on rates reported by delegated jurisdictions and MDE inspections.

Until the new aerial methodology is accepted, the calculated numbers of disturbed acres under construction permits are estimated for each county prior to the progress run so that the pre-BMP land use can be adjusted. The numbers of acres of ESC in each county reported to NEIEN, are an adjustment of those disturbed acres by the compliance rate.

Septic Systems (Figure 5):

Septic upgrade data is primarily provided to MDE SSA by MDE's WMA based on reporting to MDE through a cost reimbursement process associated with Maryland's Bay Restoration Fund (BRF). Additional Septic BAT upgrade BMP data is supplied in the annual reports of several Phase I MS4 permittees.

Data on the connection of septic systems to waste water treatment plans is primarily provided to MDE SSA by MDE's Office of Budget and Financing, Water Quality Financing Administration. This avenue captures connections funded by the State. MDE SSA has provided a spreadsheet to local jurisdictions to report septic connections that are funded locally. Additional Septic connection BMP data is supplied in the annual reports of several Phase I MS4 permittees.

Current and future stormwater, E&SC and Septic BMP data flows are shown in the associated figures below.

Figure 2. Current Stormwater BMP data flow.

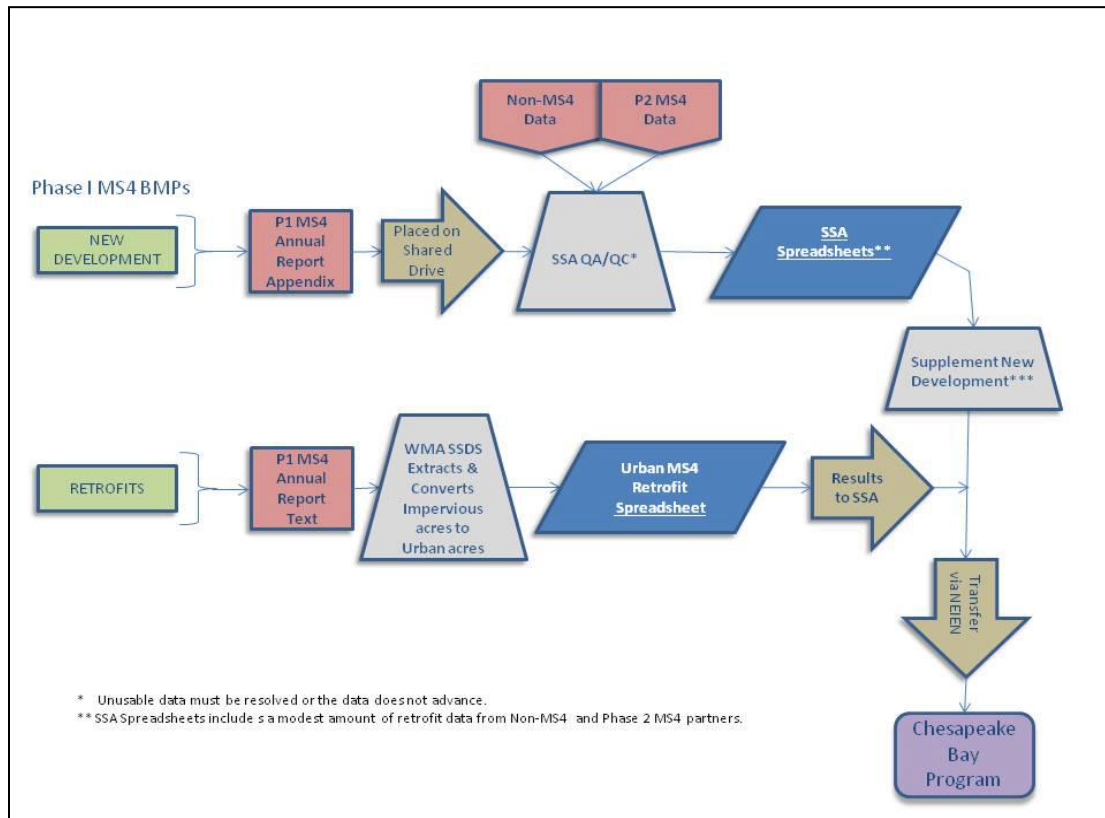


Figure 3. Future Stormwater BMP data flow.

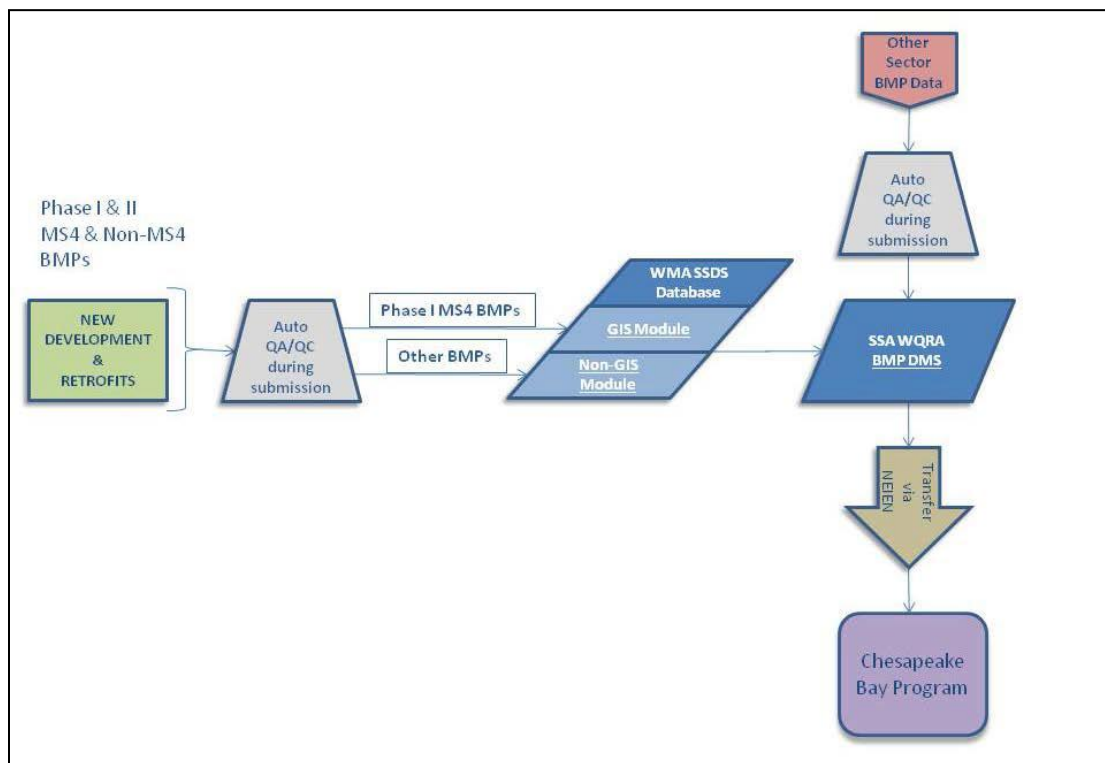


Figure 4. Erosion and sediment control reporting data flow.

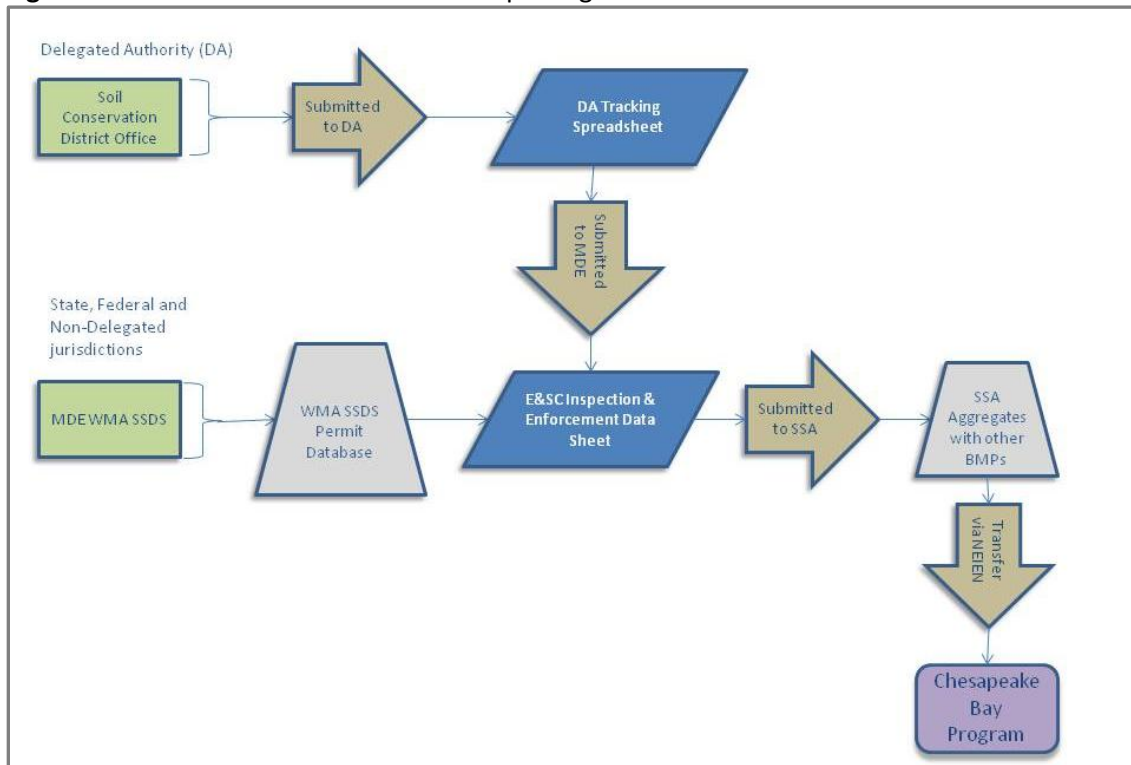
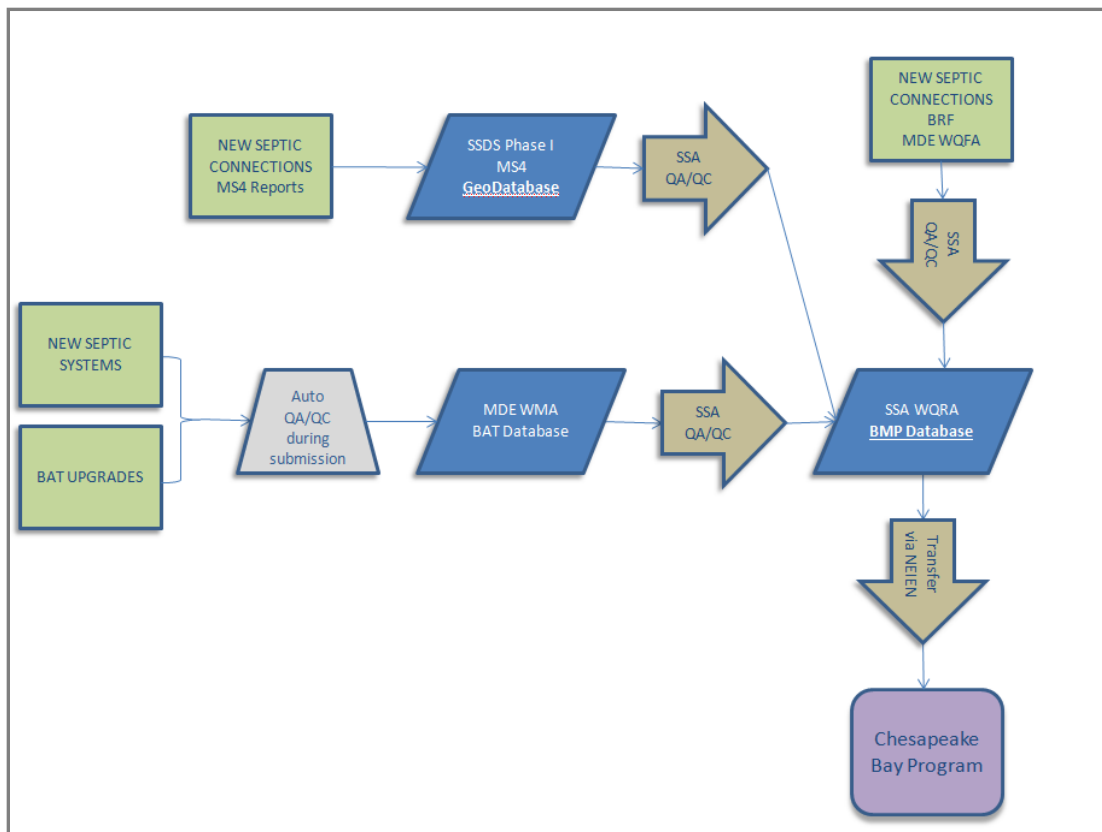


Figure 5. Septic BMP data flow



BMPs currently supplied to MDE include:

See Appendix A for list of stormwater and septic BMPs

The one BMP not included in Appendix A:
Erosion & Sediment Control

2.3 - Data Management

This project is a data management process. Data to be included within the data tracking system originates from municipalities, counties, Federal facilities and state agencies. Data storage and security as well as hardware and software requirements, will be modified as the process evolves.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Data Validation Methods

Stormwater

Reviews to assess annual report data submitted by the MS4 permittees are coordinated by both MDE SSDS and SSA. Permit review staff from SSDS review for data requirements to meet permit conditions and SSA review data for model accreditation. When the new geodatabase is fully functional with its proposed validations, it is anticipated that the process will become automated.

Some of the data validations for EPA submission include:

- Completeness reviews for required fields
- Valid date ranges
- Checks for double counting (e.g., BMP unique values)
- BMP records with “not built” or “waivers” are omitted
- Locational data checks (GIS checks)
- Outliers (e.g. BMPs with large treatment areas)
- Valid Inspection/maintenance dates
- CB Partnership non-approved BMPs are omitted

Erosion and Sediment Control (E&SC):

The validation for E&SC is done by both delegated jurisdictions and MDE Water Management Administration (WMA) based on who is responsible for regulating these practices. The data is generated through a permitting process and therefore must meet minimum reporting requirements, with accurate information, so that violations are not issued or projects

Some of the data validations for EPA submission include:

- Review of disturbed acres (GIS)
- Annual compliance rate assessment

Septic Systems

Most septic BAT data are currently collected via the internet using a web portal and an individual log-in supplied only to authorized data providers. The forms used in the web portal will contain required information that must be accurate in order to receive reimbursement from the BRF. The invoicing serves as a validation of the data. A similar process, without the web portal, is required for septic connections being reimbursed by the BRF and reported to EPA.

Septic BMPs submitted by MS4 permittees undergo the same validation as the stormwater BMPs and are cross checked with practices reported by the BRF BAT database.

Some of the data validations for EPA submission include:

- Location (street address)
- Septic BAT technology
- Installation/Maintenance date
- Treatment Plant connected to (for connections only)
- Date of pumpout

3.2 Assessment and Response Actions

MDE will conduct an internal systems evaluation annually after each Annual Progress assessment has been completed and provided to the QA manager. Any anomalies will be addressed and corrected, if necessary, and provided to the QA manager. Any recommendations or changes will be reflected in future versions of this QAPP document.

Senior staff holds the primary responsibility for ensuring that the problems identified through the evaluations are responded to and corrected in a timely fashion. If any problems are identified from the audits discussed above, various measures are taken.

- Communicating with authorities in the reporting agencies and those jurisdictions that provide information to MD state agencies. This is done via telephone, e-mail, webinar outreach or personal visits with the purpose of filling in the data gaps. Visits are undertaken either when requested by data suppliers, or the missing important data items are too numerous. During the visits communication and review of data deficiencies are conducted in order to obtain the following:
 - i) missing data from key reporting fields which prevent BMP transmission to CBPO;
 - ii) the specific name of the structure type if it is not specified in the original data report
 - iii) communicate what data needs to be reported to receive credit under the new Stormwater Performance Standards
 - iv) Collecting data needed for verification purposes

3.3 Reports to Management

Stormwater

The State maintains all urban stormwater BMP data in an interactive GIS platform know as [StormwaterPrint](#). Here management and the public will have access to available BMP data. MS4 annual report evaluations are maintained on file.

Erosion and Sediment Control

Evaluation of the MDE program is provided as part of an annual [enforcement and compliance report](#) describing numerous regulatory programs at MDE.

Septic Systems

Section 1605.2 of Chapter 9 of the Environment Article requires that beginning January 2006, and every year thereafter, the Bay Restoration Fund (BRF) Advisory Committee must provide an update to the Governor and the General Assembly on the implementation of the BRF program, and report on its findings and recommendations. This includes BRF-funded BAT and septic to sewer connections.

4.0 DATA REVIEW AND USABILITY

Upon completion of the BMP data analysis, the file will be reviewed by a qualified member of the staff to determine if the data meets the objectives of the QAPP. The following activities will be performed:

- Data reflects increase in BMP implementation
- Data reflects the feasible implementation of the BMP; does not reflect implementation beyond the possible
- Data contains all applicable fields required by CBP
- Data contains accurate information
- Data is compliant with reporting requirements.

Data will be subject to further reviews and evaluations for reporting the State's annual progress as outlined in the QAPP for compiling NEIEN reporting.

5.0 ADDITIONAL RESOURCES

The State maintains numerous guidance documents for how to manage and report urban stormwater BMPs to MDE. These include design specifications, data format and guidelines for receiving credit toward MS4 permits. The list below is a subset of that guidance that provides regulatory oversight of urban BMP implementation:

MDE 2014. Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated. Guidance for National Pollutant Discharge Elimination System Stormwater Permits.

<http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/NPDES%20MS4%20Guidance%20August%2018%202014.pdf>

MDE 2011. "2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control" Dec. 2011

<http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/SoilErosionandSedimentControl/Documents/2011%20MD%20Standard%20and%20Specifications%20for%20Soil%20Erosion%20and%20Sediment%20Control.pdf>

MDE 2004. Sediment Control Guidelines for State and Federal Projects (1990) (revised 2004)

<http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/www.mde.state.md.us/assets/document/State%20Erosion%20Control%20Guidelines.pdf>

MDE 2010. "Stormwater Management Guidelines for State and Federal Projects", May 2010.

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Appendix A – List of urban water treatment practices

MDE BMP Code	MDE BMP Name	CBPO BMP Name	CBPO Stormwater Performance
ESD Practices			
Alternative Surfaces (A)			If all data elements exist, these BMPs will be reported as Stormwater Performance
EAGRE	Green Roof - Extensive	Green Roofs	Runoff Reduction
EAGRI	Green Roof -Intensive	Green Roofs	Runoff Reduction
EAPRP	Permeable Pavements	Permeable Pavement	Runoff Reduction
EARTF	Reinforced Turf	Green Parking Lot	Runoff Reduction
Nonstructural Techniques (N)			
ENDRR	Disconnection of Rooftop Runoff	Disconnection of Rooftop Runoff	Runoff Reduction
ENDNR	Disconnection of Non-Rooftop Runoff	Still under panel review	Runoff Reduction
ENSCA	Sheetflow to Conservation Areas	Vegetated Treatment Area	Runoff Reduction
Micro-Scale Practices (M)			
EMRWH	Rainwater Harvesting	Cisterns & Rain Barrels	Runoff Reduction
EMSGW	Submerged Gravel Wetlands	Wet Ponds & Wetlands	Stormwater Treatment
EMILS	Landscape Infiltration	Infiltration Practices	Runoff Reduction
EMIBR	Infiltration Berms	Infiltration Practices	Runoff Reduction
EMIDW	Dry Wells	Dry Well	Runoff Reduction
EMMBR	Micro-Bioretenion	Bioretention	Runoff Reduction
EMRNG	Rain Gardens	Rain Garden	Runoff Reduction
EMSWG	Grass Swale	Dry Swale	Runoff Reduction
EMSWW	Wet Swale	Vegetated Open Channels	Stormwater Treatment
EMSWB	Bio-Swale	Bioswale	Runoff Reduction
EMENF	Enhanced Filters	Filtering Practices	Stormwater Treatment
Structural BMPs			
Ponds (P)			
SPWED	Extended Detention Structure, Wet	Wet Extended Detention	
SPWET	Retention Pond (Wet Pond)	Wet Pond	Stormwater Treatment

SPMPS	Multiple Pond System	Wet Pond	Stormwater Treatment
SPPKT	Pocket Pond	Wet Pond	Stormwater Treatment
SPMED	Micropool Extended Detention Pond	Micropool Extended Detention	Stormwater Treatment
Wetlands (W)			
SWSHW	Shallow Marsh	Wet Ponds & Wetlands	Stormwater Treatment
SWEDW	ED - Wetland	Wet Ponds & Wetlands	Stormwater Treatment
SWPWS	Wet Pond - Wetland	Wet Ponds & Wetlands	Stormwater Treatment
SWPKT	Pocket Wetland	Wet Ponds & Wetlands	Stormwater Treatment
Infiltration (I)			
SIBAS	Infiltration Basin	Infiltration Practices	Runoff Reduction
SITRN	Infiltration Trench	Infiltration Practices	Runoff Reduction
Filtering Systems (F)			
SFBIO	Bioretention	Bioretention	Runoff Reduction
SFSND	Sand Filter	Filtering Practices	Stormwater Treatment
SFUND	Underground Filter	Filtering Practices	Stormwater Treatment
SFPER	Perimeter (Sand) Filter	Filtering Practices	Stormwater Treatment
SFORG	Organic Filter (Peat Filter)	Filtering Practices	Stormwater Treatment
Open Channels (O)			
SODSW	Dry Swale	Dry Swale	Runoff Reduction
SOWSW	Wet Swale	Vegetated Open Channels	Stormwater Treatment
Other Practices (X)			
SXDPD	Detention Structure (Dry Pond)	Dry Detention Ponds & Hydrodynamic Structures	
SXDED	Extended Detention Structure, Dry	Dry Extended Detention Ponds	
SXFLD	Flood Management Area	Dry Detention Ponds & Hydrodynamic Structures	
SCOGS	Oil Grit Separator	Dry Detention Ponds & Hydrodynamic Structures	
SXOTH	Other	Not Reported	
MDE Approved Alternative BMP Classifications			
AMSS	Mechanical Street Sweeping	Street Sweeping	

AVSS	Regenerative/Vacuum Street Sweeping	Street Sweeping	
AIMPP	Impervious Surface Elimination (to pervious)	Reduction of Impervious Surface	Runoff Reduction
AIMPF	Impervious Surface Elimination (to Forest)	Not Reported	
AFPU	Planting Trees or Forestation on Pervious Urban	Tree Planting	
ACBC	Catch Basin Cleaning	Not Reported	
ASDV	Storm Drain Vacuuming	Not Reported	
ASTRE	Stream Restoration	Stream Restoration Urban	
AOUT	Outfall Stabilization	Outfall Stabilization	
ASPSC	Regenerative Step Pool Conveyance	Regenerative Stormwater Conveyance	Runoff Reduction
ASHST	Shoreline Management	Urban Shoreline Management	
ASEPP	Septic Pumping	Septic Tank Pumpout	
ASEPD	Septic Denitrification	Septic Denitrification	
ASEPC	Septic Connection to WWTP	Septic Connections	

Appendix B - MDE SSDS Geodatabase users manual

Appendix C - MDE BRF BAT database users manual