Quality Assurance Project Plan

For

Maryland Urban Best Management Practices (BMP) Data

Prepared by:

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Prepared for:
U.S. Environmental Protection Agency (EPA) Chesapeake Bay Program Office (CBPO)
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Approvals Signature (required prior to project start):

_____ **Date:** 2/2/2017
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_____ **Date:** 2/2/17
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_____ **Date:** 2/3/17
Lee Currey/Acting WMA Director

_____ **Date:** _____
Holly Waldman, EPA CBPO Project Officer

_____ **Date:** _____
Rich Batiuk, EPA CBPO QA Officer

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1.0 PROJECT MANAGEMENT

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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

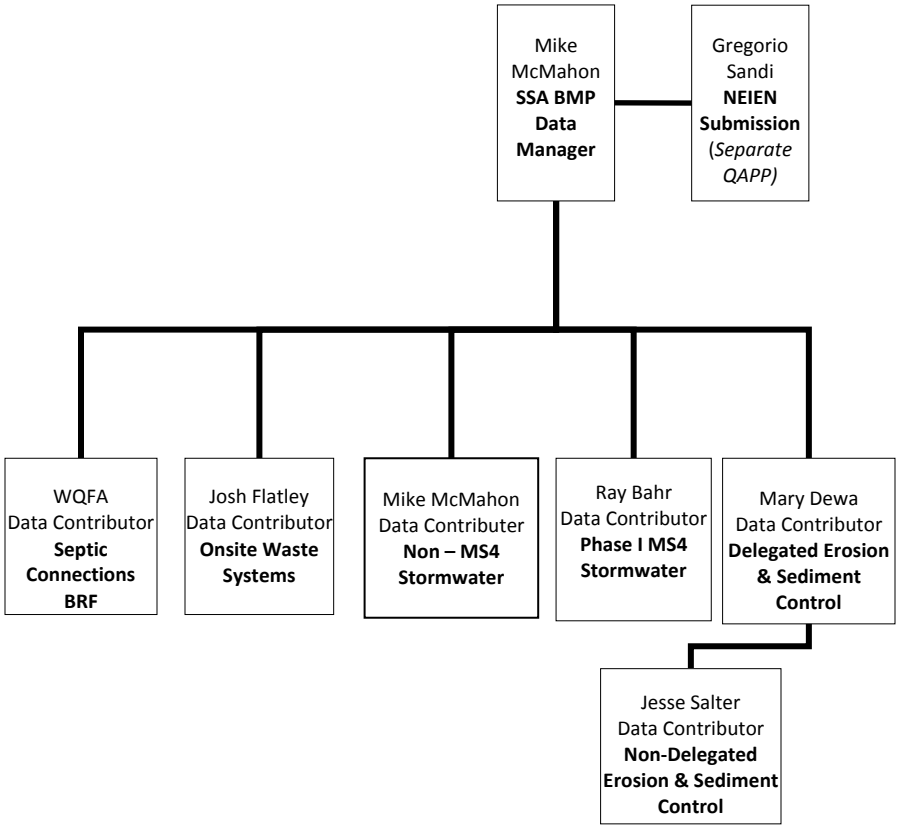
Data Reviewers will be responsible for the following activities:

- 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)

a. **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.

b. **Objective: Increase data reporting and data completeness.** Low bias occurs because of incomplete data and missing submissions.

c. **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.

d. **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).

e. **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)
- Inpsection/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.

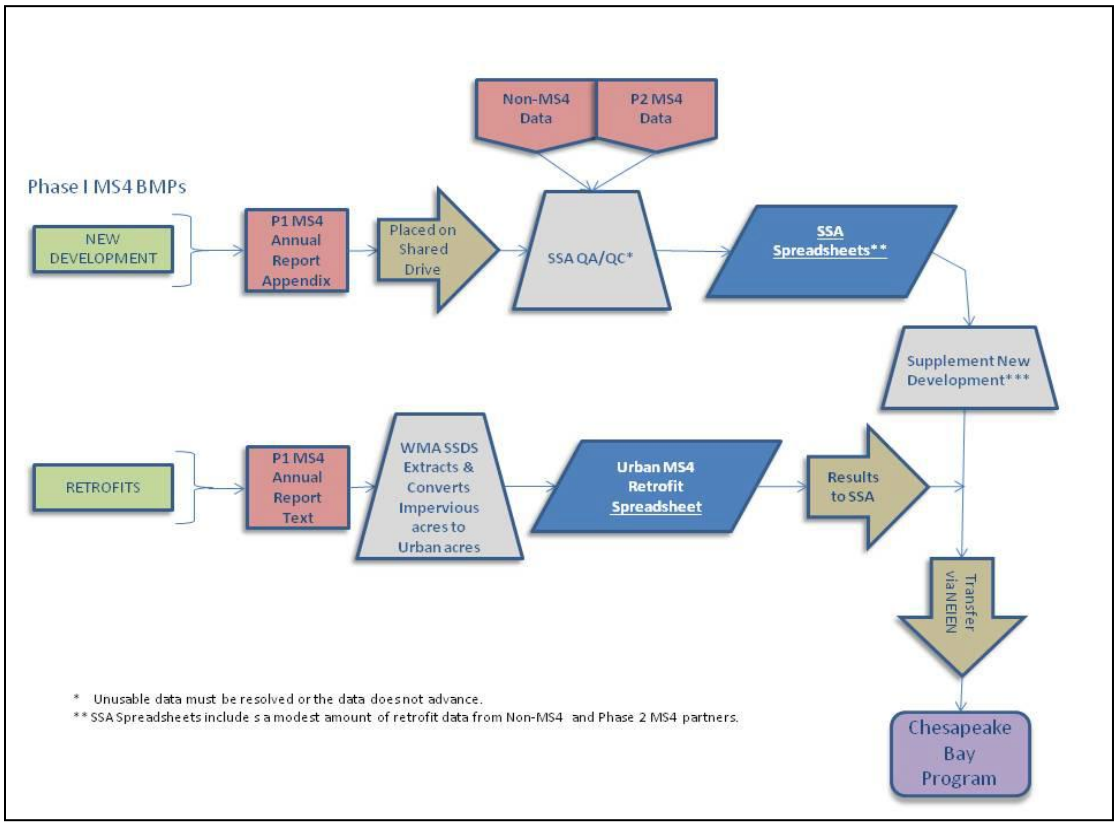


Figure 3. Future Stormwater BMP data flow.

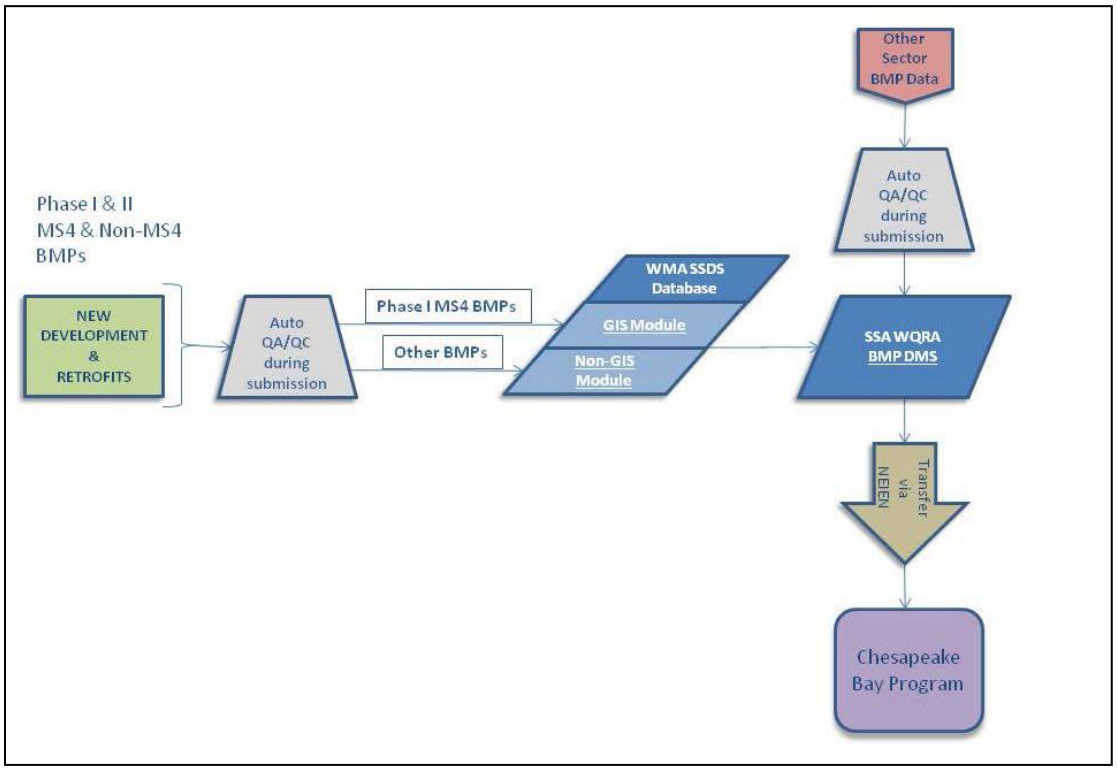


Figure 4. Erosion and sediment control reporting data flow.

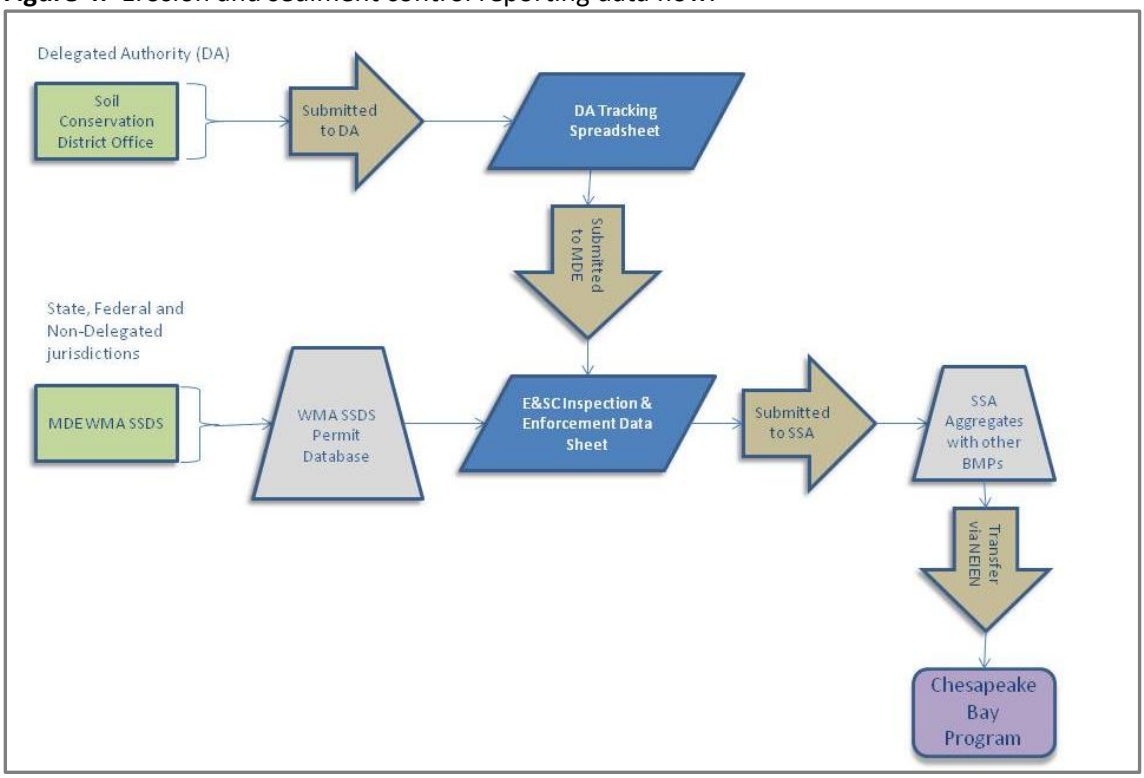
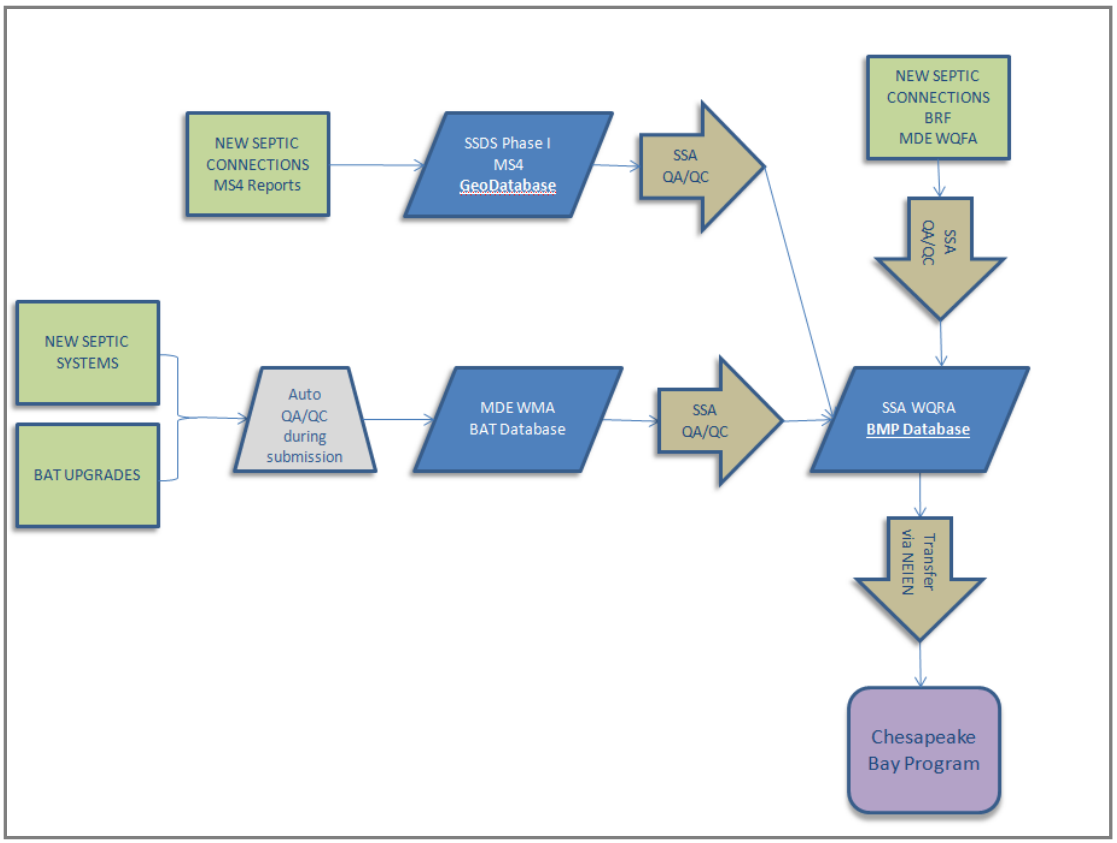


Figure5. Septic BMP data flow



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 stromwater 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-Bioretention	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 pervioius)	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

Maryland Department of the Environment

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4), Geodatabase Design and User's Guide

Prepared for:
Environment Protection Agency (EPA) Chesapeake Bay Restoration and Protection Funding (CBRAP)

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Maryland Department of the Environment
And
Theresa Foye
Maryland Environmental Service
Version 1.1
March 2015

Table of Contents

List of Acronyms and Abbreviations

ADC ®	Alexandria Drafting Company; American Digital Cartography Inc
BMP	Best Management Practice
BMPPOI	BMP Point of Investigation
EMC	Event Mean Concentration
EPA	US Environmental Protection Agency
ESRI	Environmental Systems Research Institute
FGDC	Federal Geographic Data Committee
GIS	Geographic Information System
GPS	Global Positioning System
HUC	Hydrologic Unit Code
IDDE	Illicit Discharge Detection and Elimination
MDE	Maryland Department of the Environment
MES	Maryland Environmental Service
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
QA\QC	Quality Assurance\Quality Control
SWM	Stormwater Management
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
WLA	Wasteload Allocation

1. Introduction

MDE's NPDES Stormwater Program Geodatabase

The Maryland Department of the Environment (MDE) in collaboration with the Maryland Environmental Service (MES) has developed a geodatabase for reporting data required in NPDES, MS4 permits. Local jurisdictions covered under these permits must implement programs to control stormwater pollution and improve water quality. The geodatabase establishes a consistent reporting structure for submitting local program data and showing compliance with permit requirements. A data intake tool has been created to allow ease of reporting so that MS4 jurisdictions can submit annual reports electronically and data can be aggregated into a statewide repository.

The database will support comprehensive geographic information system (GIS) analyses, which is useful in evaluating local stormwater program implementation. In addition, MDE can better organize the stormwater information submitted by MS4 permittees to assess progress toward statewide commitments to reach Chesapeake Bay restoration milestones. Figure 1 below provides an overview of the data reporting and assessment process.

This User's Guide is intended to provide an overview and understanding of how the geodatabase and the data intake tool will function. This includes an overall introduction to the geodatabase, details on the creation of unique identifiers, data collection standards, as well as detailed feature class and table descriptions.

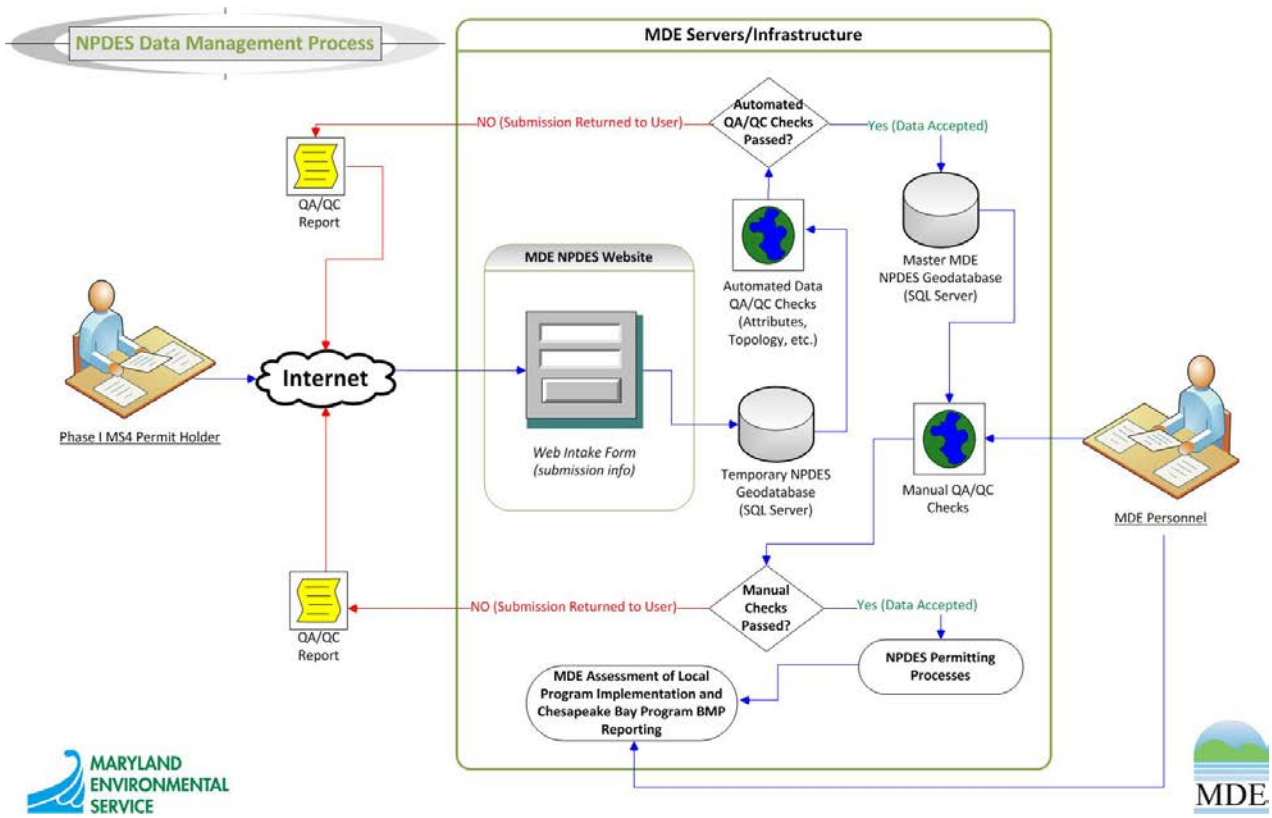


Figure I: Overview of NPDES Data Management Process

An Introduction to Database Terminology

The following is a brief overview of database terminology that will be used throughout this document.

The Geodatabase

A geodatabase is a database designed to store both tables (non-spatial data) and spatial data.

Like most modern databases, the structure of a geodatabase is relational; therefore, information is stored in a number of data types with relations between them. This structure is used to eliminate redundancy, creating a faster and more compact database.

There are three major data entities in a geodatabase: feature classes, tables and raster datasets. The NPDES geodatabase makes use of only feature classes and tables.

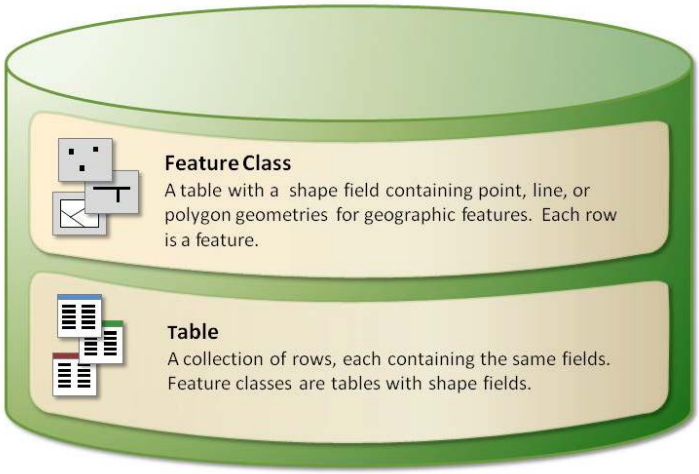


Figure II: Data elements used in a geodatabase; the MDE NPDES geodatabase uses Tables and Feature Classes

Figure III: Types of Feature Classes

A feature class within a geodatabase is used to store spatial data as well as tabular data about the feature. Tabular data is stored within the Attribute Table of a feature class. An Attribute Table may contain such information as collection date, geographic coordinates or inspection information.

A feature class can contain points, lines, polygons, or annotation; however, only one of these types is allowed in an individual feature class. A point feature class shows the location of items that are localized such as a septic system or a pipe outfall. A line feature class represents linear features such as streams or roads. A polygon feature class contains an area and is used for such things as property, watersheds and political areas. Annotation is text that is tied to a particular point on the surface of the earth.

In addition to feature classes, a geodatabase can contain standalone tables. Tables are non-spatial entities in a geodatabase that do not have any explicit spatial information. Tables are used in database programs such as Microsoft Access and are similar to the tables in a spreadsheet program such as Microsoft Excel.

Relationship classes are the elements that tie the feature classes and tables together. They are similar to joins in Microsoft Access. Each table or feature class can be related to multiple tables or feature classes. The relationship class references a field in a table or feature class to determine the relationship between them.

Database Keys

Primary Key, Foreign Key: A link must exist between two entities to create a relationship. This is accomplished through the use of keys. The primary key is a unique record number in the first, or origin, table or feature class. The foreign key is a record in the second destination table or feature class. There have to be matches between the contents of the foreign and primary keys; otherwise there can be no relationship between the tables/feature classes.

Cardinality: Once the relationship has been established by designating the foreign and primary keys, the cardinality must be established. Cardinality in the geodatabase takes the form of a one to one or one to many relationship.

A one to one relationship means that each record in the origin table/feature class will match only one record in the destination table/feature class.

A one to many relationship means that each record in the origin table/feature class will match one or more records in the destination table/feature class.

Domains: Data are often input in a variety of ways. To ensure consistency within a geodatabase and increase data integrity, it is a good practice to use domains when possible. The domain functions as a list of values from which to choose. Only legitimate values are shown, eliminating both duplicate values that are synonymous and values that are illegitimate.

2. Database Overview

The NPDES web intake tool and geodatabase are designed to work with data from multiple sources. These data will largely be submitted in geodatabase format; with supporting narrative files uploaded to the MDE NPDES web intake application.

Hardware and Software Requirements

Spatial

Spatial data will be submitted to the MDE NPDES web intake application in personal geodatabase format. Technical requirements for this application include:

1. ArcGIS Desktop 10.2 (ArcGIS Desktop Standard/ArcEditor or Advanced/ArcInfo)
2. Internet access

Non-Spatial

The web intake application allows non-spatial documents to be uploaded using the "upload attachment" function. A record of each uploaded document will be stored in the "Narrative File Table" within the geodatabase. More information regarding this workflow is provided later in this document.

Data Collection Standards

Data will be entered to the highest accuracy that is reasonable. A number of methods are acceptable for data capture. Locations can be ascertained through the use of heads-up (on-screen) digitizing. In an effort to limit individual variance in judgment, all digitizing must be made at a scale of 1:1,200.

Locations can also be determined through use of GPS survey equipment. GPS accuracy must be sub-meter. Lastly, as-built plans can be used to identify feature locations. Accuracy in this case is limited by the accuracy of the reference as-builts and varies from user to user.

Metadata Standards

In order to maintain proper records of the data input into the database, metadata for the database will be compiled in Federal Geographic Data Committee (FGDC) format. Information on this format is available on the Committee's website: http://www.fgdc.gov/. Specific implementation of this standard in ArcGIS can be found in ESRI's online help site:

http://resources.arcgis.com/en/help/main/10.2/index.html#//016w0000005s000000

Jurisdictions should focus on data collection and maintenance procedures, important dates, contact information and accuracy/precision. It is also important that the jurisdiction document how features were collected and at what scale.

Schema

The overall design of a geodatabase is commonly referred to as the schema. Appendix A provides a detailed overview of this database and table I provides details of the relationships within the geodatabase.

Database Elements Listing

The following is a list of each individual element of the database, including feature classes, tables, relationship classes and domains. More detailed descriptions of each element can be found in later sections of this document.

Feature Classes

The following is a list of feature classes to be captured as a part of this geodatabase:

- AltBMPLine (Line)
- AltBMPPoint (Point)
- AltBMPPoly (Polygon)
- BMPDrainageArea (Polygon)
- BMPPOI (Point)
- MonitoringDrainageArea (Polygon)
- MonitoringSite (Point)
- MunicipalFacilities (Point)
- Outfall (Point)
- OutfallDrainageArea (Polygon)
- QuarterlyGradingPermits (Point)
- RestBMP (Point)

Associated Tables

The following tables are to be populated as a part of this geodatabase:

- AltBMPLineInspections
- AltBmpPointInspections
- AltBMPPolyInspections
- BiologicalMonitoring
- BMP
- BMPInspections
- ChemicalApplication
- ChemicalMonitoring
- CountywideStormwaterWatershedAssessment
- ErosionSedimentControl
- FiscalAnalyses
- IDDE
- ImperviousSurface
- LocalConcern
- LocalStormwaterWatershedAssessment
- NarrativeFiles
- PermitInfo
- QuarterlyGradingPermit
- RespPersonnelCertInfo
- RestBMPInspections
- ShorelineManagementPractices
- StormwaterWatershedAssessment
- StrRestProtocols
- SWM

Domains

The following is a list of data domains that will be found in this database. Later sections identify which fields use which domains.

- dALTBMPLine
- dAltBMPPoint
- dAltBMPPoly
- dBayPollutant
- dBMPClass
- dBMPStatus
- dBMPType
- dBoolean
- dCBSegShed
- dChemCat
- dClarity
- dColor
- dConPurpose
- dDeposits
- dDocType
- dErosion
- dFacType
- dFloatables
- dFlowValue
- dHUC12digit
- dIDDEProtocol
- dIDDEStatus
- dJurisdiction
- dImpStatus
- dMD8Digit
- dMDPLandUse
- dNutrValue
- dOdor
- dOn_OffSite
- dOutfallMaterial
- dOutfallType
- dPassFail
- dPollutant
- dPrefix
- dQrtInsp
- dQuality
- dQuarter
- drBMPType
- dShrProtocol
- dSource
- dState
- dStationLoc
- dStationType
- dStormBaseflow
- dStrProtocol
- dStructCond
- dSWPPPlan
- dVegCond

Relationship Classes

The table below illustrates the relationships that exist between features and tables within the database.

Relationship Name	Details	Type
rAltBMPLine_AltBMPLineInspections	AltBMPLine (F) to AltBMPLineInspections (T)	One to Many
rAltBMPLine_ShorelineManagementPractices	AltBMPLine (F) to ShorelineManagementPractices (T)	One to Many
rAltBMPLine_StrRestProtocols	AltBMPLine (F) to StrRestProtocols (T)	One to Many
rAltBMPPoint_AltBMPPointInspections	AltBMPPoint (F) to AltBMPPointInspections (T)	One to Many
rAltBMPPoly_AltBMPPolyInspections	AltBMPPoly (F) to AltBMPPolyInspections (T)	One to Many
rBMP_BMPInspections	BMP (T) to BMPInspections (T)	One to Many
rBMPDrainageArea_BMP	BMPDrainageArea (F) to BMP (T)	One to One
rBMPDrainageArea_RestBMP	BMPDrainageArea (F) to RestBMP (F)	One to One
rBMPPOI_BMP	BMPPOI (F) to BMP (T)	One to Many
rBMPPOI_BMPDrainageArea	BMPPOI (F) to BMPDrainageArea (F)	One to One
rChemMonitoring_LocalConcern	ChemicalMonitoring (T) to LocalConcern (T)	One to Many
rMonitoringSite_BiologicalMonitoring	MonitoringSite (F) to BiologicalMonitoring (T)	One to Many
rMonitoringSite_ChemicalMonitoring	MonitoringSite (F) to ChemicalMonitoring (T)	One to Many
rMonitoringSite_MonitoringDrainageArea	MonitoringSite (F) to MonitoringDrainageArea (F)	One to One
rMonitoringSite_NarrativeFiles	MonitoringSite (F) to NarrativeFiles (T)	One to Many
rOutfall_IDDE	Outfall (F) to IDDE (T)	One to Many
rOutfall_OutfallDrainageArea	Outfall (F) to OutfallDrainageArea (F)	One to One
rPermitInfo_AltBMPLine	PermitInfo (T) to AltBMPLine (F)	One to Many
rPermitInfo_AltBMPLineInspections	PermitInfo (T) to AltBMPLineInspections (T)	One to Many
rPermitInfo_AltBMPPoint	PermitInfo (T) to AltBMPPoint (F)	One to Many
rPermitInfo_AltBMPPointInspections	PermitInfo (T) to AltBMPPointInspections (T)	One to Many
rPermitInfo_AltBMPPoly	PermitInfo (T) to AltBMPPoly (F)	One to Many
rPermitInfo_AltBMPPolyInspections	PermitInfo (T) to AltBMPPolyInspections (T)	One to Many
rPermitInfo_BiologicalMonitoring	PermitInfo (T) to BiologicalMonitoring (T)	One to Many
rPermitInfo_BMP	PermitInfo (T) to BMP (T)	One to Many
rPermitInfo_BMPDrainageArea	PermitInfo (T) to BMPDrainageArea (F)	One to Many
rPermitInfo_BMPInspections	PermitInfo (T) to BMPInspections (T)	One to Many
rPermitInfo_BMPPOI	PermitInfo (T) to BMPPOI (F)	One to Many
rPermitInfo_ChemicalApplication	PermitInfo (T) to ChemicalApplication (T)	One to Many
rPermitInfo_ChemicalMonitoring	PermitInfo (T) to ChemicalMonitoring (T)	One to Many
rPermitInfo_CountywideStormwaterWatershedAssessment	PermitInfo (T) to CountywideStormwaterWatershedAssessment (T)	One to Many
rPermitInfo_ErosionSedimentControl	PermitInfo (T) to ErosionSedimentControl (T)	One to Many
rPermitInfo_FiscalAnalyses	PermitInfo (T) to FiscalAnalyses (T)	One to Many
rPermitInfo_IDDE	PermitInfo (T) to IDDE (T)	One to Many
rPermitInfo_ImperviousSurface	PermitInfo (T) to ImperviousSurface (T)	One to Many

Relationship Name	Details	Type
rPermitInfo_LocalConcern	PermitInfo (T) to LocalConcern (T)	One to Many
rPermitInfo_LocalStormwaterWatershedAssessment	PermitInfo (T) to LocalStormwaterWatershedAssessment (T)	One to Many
rPermitInfo_MonitoringDrainageArea	PermitInfo (T) to MonitoringDrainageArea (F)	One to Many
rPermitInfo_MonitoringSite	PermitInfo (T) to MonitoringSite (F)	One to Many
rPermitInfo_MunicipalFacilities	Permitinfo (T) to MunicipalFacilities (F)	One to Many
rPermitInfo_NarrativeFiles	PermitInfo (T) to NarrativeFiles (T)	One to Many
rPermitInfo_Outfall	PermitInfo (T) to Outfall (F)	One to Many
rPermitInfo_OutfallDrainageArea	PermitInfo (T) to OutfallDraingeArea (F)	One to Many
rPermitInfo_QuartGradingPmtInfo	PermitInfo (T) to QuarterlyGradingPmtInfo (T)	One to Many
rPermitInfo_RespPersonnelCertInfo	PermitInfo (T) to RespPersonnelCertInfo (T)	One to Many
rPermitInfo_RestBMP	PermitInfo (T) to RestBMP (F)	One to Many
rPermitInfo_RestBMPInspections	PermitInfo (T) to RestBMPInspections (T)	One to Many
rPermitInfo_ShorelineManagementPractices	PermitInfo (T) to ShorelineManagementPractices (T)	One to Many
rPermitInfo_StrRestProtocol	PermitInfo (T) to StrRestProtocols (T)	One to Many
rPermitInfo_SWM	PermitInfo (T) to SWM (T)	One to Many

Table I Relationship Classes

Note:

1. (F) = Feature Class
2. (T) = Table

Attributes

Attributes are a part of all tables and feature classes. Common fields are shown in the table below:

Name	Type	Size	Mandatory	Domain	Description
OBJECTID	Text				Object Identifier
SHAPE	Text				Feature Geometry

Table II Common Attributes

- OBJECTID: Unique identifier automatically generated by the system.
- SHAPE: Geometry of the feature whether point, line, or polygon.

Feature classes contain the OBJECTID and SHAPE fields; Tables will only contain the OBJECTID field.

Unique ID Field

Additionally, to maintain data integrity, all tables and feature classes contain unique record fields.

These are populated using the method shown below:

2 digit jurisdiction code + 2 digit year + 3 digit identifying code + 6 digit sequential number.

Example: BMP Drainage Area

Jurisdiction: Anne Arundel County — AA

\+

Year feature/record was captured: 2013 — 13

\+

Identifying Code: BDA (BMP Drainage Area) — BDA

\+

Record number: 1 — 000001

=AA13BDA000001

An identifying code for each table and feature class can be found in Section 4 of this document.

3. Spatial Reference

The spatial reference information is used to make all collected data conform to Maryland standards. In this way, data can be overlaid and compared to data from other sources or basemaps with minimal distortion. The geodatabase design will store feature coordinates as Maryland State Plane NAD 83 meters.

Published specifications for the projection are as follows:

Horizontal Coordinate System

Projected Coordinate System Name:	NAD_1983_StatePlane_Maryland_FIPS_1900
Projection:	Lambert Conformal_Conic
False_Easting:	400000.000000
False_Northing:	0.0
Central_Meridian:	-77.00
Standard Parallel:	38.30
Standard Parallel:	39.45
Latitude_of_Origin:	37.67
Linear Unit:	Meter (1.0)
Geographic Coordinate System Name:	GCS_North_America_1983
Angular Unit:	Degree (0.0174532925199433)
Prime Meridian:	Greenwich (0.0)
Datum:	D_North_American_1983
Spheroid:	GRS_1980
Semimajor Axis:	6378137.00
Semiminor Axis:	6356752.314140356
Inverse Flattening:	298.257222101

Tolerance

The standard for the XY Tolerance will be 0.0001 meter. The XY Tolerance reflects the accuracy of the coordinate data. The tolerance value is the minimum distance between coordinates. In this case, if two coordinates are within 0.001 meter of each other, they are interpreted as being at the same location.

Resolution

The standard for the XY Resolution will be 0.0001 meters. The resolution represents the detail, or precision, in which a feature class depicts the location and shape of geographic features. It is the minimum distance that separates x-values and y-values.

ADC Mapbook Coordinates

ADC® map books have often been used by field staff to determine position. Because the coordinates may be not be precise enough and because there have been two coordinate systems used over the years, Maryland State Plane coordinates are the only type used in the database.

4. Feature Classes and Tables

All tables and feature classes are listed in detail below. The tables and feature classes are listed in the order that is best suitable for populating the geodatabase. Each table listed below has a field that indicates whether it is mandatory. An “M” value indicates that the field is mandatory (and therefore

must be populated in the geodatabase), an “O” value indicates that the field is optional (not required) and a “C” value indicates that the field is conditional, and it might not be applicable depending on another field value within the table. More information on conditional fields will be provided with each feature class description.

It is important to note, an OBJECTID field is present in all feature classes and tables; however, it is not shown in the tables below. The same applies to SHAPE, SHAPE_Length and SHAPE_Area. These fields are important to the geometry of the feature classes, but warrant no detailed description.

Permit Administration

PermitInfo

Type: Associated Table

Description: This table contains specific information about the permit number, effective dates and contacts involved with local permit administration.

Identifying Code: PER

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
PERMIT_NUM	Text	11	M		MDE permit number
FEDERAL_NUM	Text	10	M		10 digit federal permit number
JURISDICTION	Text	5	M	dJurisdiction	Jurisdiction
EFFECTIVE_DATE	Date	8	M		Permit effective date
EXPIRATION_DATE	Date	8	M		Permit expiration date
SWMP_TRAINING	Short Integer	3	M		Number of jurisdiction personnel trained regarding the MS4 stormwater management program
LAST_TRAIN_DATE	Date	8	M		Date of last pollution prevention training
CONTACT_NAME	Text	50	M		Contact name (First, Last)
CONTACT_TITLE	Text	50	O		Contact title, job title (director, manager etc.)
AGENCY_NAME	Text	50	M		Jurisdiction Agency
ADDRESS	Text	75	M		Jurisdiction Address
CITY	Text	50	M		Jurisdiction City
STATE	Text	2	M	dState	Jurisdiction State
ZIP	Text	5	M		Jurisdiction Zip Code
PHONE	Text	10	M		Contact phone number 10 digits, no dashes (numbers only)
HOTLINE	Text	10	O		Hotline for reporting illicit discharge. Phone number 10 digits, no dashes (numbers only)
IDDE_PROGRAM_CREDIT	Text	1	M	dBoolean	
IDDE Credit TN	Double	10	C		Total nitrogen (lb/year) claimed under IDDE program credit; Conditional if IDDE_PROGRAM_CREDIT = “Yes”
IDDE Credit TN	Double	10	C		Total phosphorus (lb/year) claimed under IDDE program credit; Conditional if IDDE_PROGRAM_CREDIT = “Yes”
WEB_ADDRESS	Text	100	O		Jurisdiction's web address where reports are posted
EMAIL	Text	50	M		Contact email address
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
GEN_COMMENTS	Text	255	O		General comments

Table 1: PermitInfo

Note:

1. If applying for the IDDE Advanced Nutrient Discovery Program Credit guidance on qualification and reporting requirements refer to the Chesapeake Bay Program Final Expert Panel Report on Removal Rates for the Elimination of Discovered Nutrient Discharges from Grey Infrastructure found at: http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2014/11/GREY-INFRASTRUCTURE-Expert-Panel-Report_FINAL_LONG.pdf
2. Jurisdictions can apply for an Advanced Program Credit for each watershed within which the program is implemented. Jurisdictions may not receive both the Advanced Program Credit and credit for individual eliminated discharges within the same watershed. If a jurisdiction applies for the Advanced Program Credit, it must provide a narrative detailing the calculations used to claim total nitrogen and total phosphorus reduced. Jurisdictions may not receive both the Program Credit and credit for individual discharges eliminated.
3. Permit Number is a repeated field throughout the database. This allows a relationship between the PermitInfo table and many of the feature classes and tables throughout the geodatabase to be established. To minimize repetitive data entry, the permit number should be given a default value in the properties of each table and feature class where applicable. Table and feature class properties are accessed by right clicking on the item in ArcCatalog and selecting “Properties”. Once the default value is assigned, every new row added to a table or feature class will be set to this default value.

Set Default Value

Link: http://resources.arcgis.com/en/help/

Under ArcGIS 10.2 Help select Desktop and in the search box type “Assign Default Value”

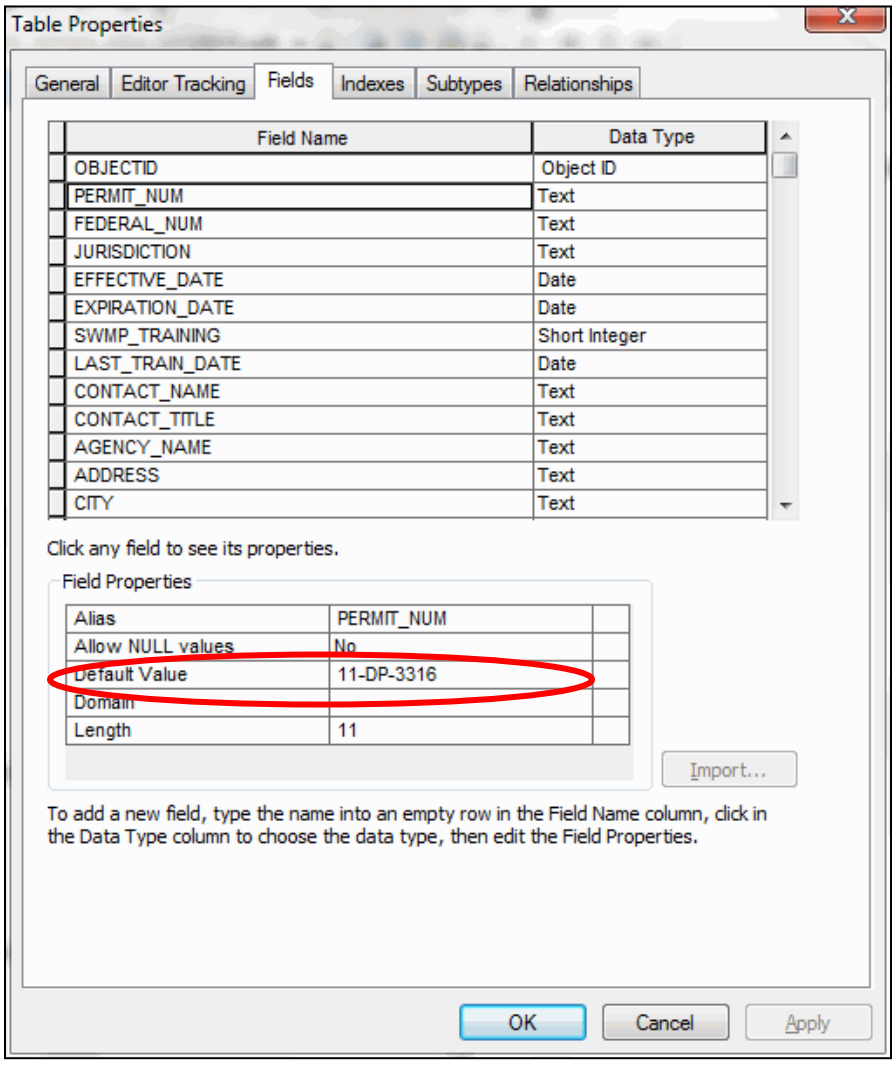


Table 2 Set Default Value

Source Identification

Outfall

Type: Point

Description: This feature class shows a specific geographical point for each stormwater outfall identified in accordance with the permit.

Identifying Code: OUT

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
MDE_OUTFALL_ID	Text	13	M		MDE primary ID (Unique table ID)
LOCAL_OUTFALL_ID	Text	20	O		Alias if jurisdiction has outfall ID
MD_NORTH	Double	8	M		Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	Double	8	M		Maryland grid coordinate (NAD 83 meters) Easting
DIM_OUTFALL	Double	8	M		Outfall dimensions (inches)
HT_OUTFALL	Double	8	M		Height of outfall (inches)
WT_OUTFALL	Double	8	M		Width of outfall (inches)
TYPE_OUTFL	Text	3	M	dOutfallType	Outfall type (e.g., culvert, headwall, etc.)
TYPE_MATL	Text	5	M	dOutfallMaterial	Outfall material type (e.g., RCP, CMP, PVC)
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit code
LAND_USE	Short Integer	3	M	dMDPLandUse	Predominant land use
LU_COUNTY	Text	25	O		County unique land use (predominant)
OUT_YEAR	Text	4	M		Year constructed (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 3: Outfall

OutfallDrainageArea

Type: Polygon

Description: This feature class shows the area draining to a particular outfall feature via overland flow, swale or underground storm drain pipe.

Identifying Code: ODA

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
MDE_OUTFALL_DRAIN_ID	Text	13	M		MDE primary ID (Unique table ID)
MDE_OUTFALL_ID	Text	13	M		MDE primary ID (Unique table ID) should match MDE_OUTFALL_ID value in Outfall featureclass
OUTFALL_DRAIN_AREA	Double	15	M		Drainage area (acres) to outfall; limit to two significant digits
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 4: OutfallDrainageArea

BMPPOI

Type: Point

Description: This feature class shows a specific geographical point indicating each BMP's point of investigation (see "The BMP Point of Investigation" guidance document, Appendix B) and includes information associated with watershed, drainage area, and BMP construction.

Identifying Code: POI

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
BMPPOI_ID	Text	13	M		MDE primary ID (Unique table ID)
MD_NORTH	Double	8	M		Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	Double	8	M		Maryland grid coordinate (NAD 83 meters) Easting
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit code
LAND_USE	Short Integer	3	M	dMDPLandUse	Predominant land use
LU_COUNTY	Text	25	O		County unique land use (predominant)
IMP_ACRES	Double	6	M		BMP impervious drainage area (acres)
APPR_DATE	Date/Time	8	M		Permit approval date for structure
BUILT_DATE	Date/Time	8	M		Construction completion date
LAST_CHANGE	Date/Time	8	M		Date last change was made to this record
RCN_PRE	Short Integer	2	O		Runoff curve number before event
RCN_POST	Short Integer	2	O		Runoff curve number after event
RCN_WOODS	Short Integer	2	O		Runoff curve number, woods

PE_REQ	Double	8	M	PE required
PE_ADR	Double	8	M	PE addressed
Q_PRE	Double	4	O	Runoff before construction in inches
Q_POST	Double	4	O	Runoff after construction in inches
Q_WOODS	Double	4	O	Runoff, woods in inches
PERMIT_NUM	Text	11	M	MDE permit number
GEN_COMMENTS	Text	255	O	General comments

Table 5: BMPPOI

BMP

Type: Associated Table

Description: This table contains specific information about all of the BMPs for new development, and redevelopment BMP's including alternative BMP's that are required by the MS4 permit. Typically, a BMP is a structural or non-structural device designed to capture or treat stormwater runoff in order to mitigate flooding, reduce pollution, and provide other amenities.

Identifying Code: BMP

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
BMP_ID	Text	13	M		MDE primary ID (Unique table ID)
LOCAL_BMP_ID	Text	25	O		Local BMP identifier
BMP_DRAIN_ID	Text	13	M		MDE primary ID (Unique table ID)
BMPPOI_ID	Text	13	M		ID linking record to BMP POI feature class (foreign key)
BMP_DRAIN_AREA	Double	6	M		Drainage area (acres) to BMP
BMP_NAME	Text	50	M		Name of BMP
BMP_CLASS	Text	1	M	dBMPClass	BMP Class (E, S, A)
BMP_TYPE	Text	5	M	dBMPType	Type of BMP
BMP_STATUS	Text	10	M	dBMPStatus	Status of BMP (Active, Removed)
NUM_BMPS	Short Integer	2	M		Number of BMPs present
ADDRESS	Text	75	M		BMP Address
CITY	Text	50	M		BMP City
STATE	Text	2	M	dState	BMP State
ZIP	Text	5	M		BMP Zip Code
ON_OFF_SITE	Text	10	M	dOn_OffSite	On or off-site BMP
CON_PURPOSE	Text	4	M	dConPurpose	New development (NEWD), redevelopment (REDE)
BUILT_DATE	Date	8	M		As-built completion date (MM/DD/YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 6: BMP

BMPDrainageArea

Type: Polygon

Description: This feature class shows the area draining to a particular BMP by overland flow, swales or an underground storm drain system.

Identifying Code: BDA

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
BMP_DRAIN_ID	Text	13	M		MDE primary ID (Unique table ID)
BMPPOI_ID	Text	13	M		ID linking record to BMP POI feature class (foreign key)
BMP_DRAIN_AREA	Double	6	M		Drainage area (acres) to BMP
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 7: BMPDrainageArea

ImperviousSurface

Type: Associated Table

Description: This feature summarizes the impervious surface area of the jurisdiction. "Impervious area" means any surface that does not allow stormwater to infiltrate into the ground.

Identifying Code: IMP

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
IMPERV_ID	Text	13	M		MDE primary ID (Unique table ID)
IMP_ACRES	Double	8	M		Total impervious acres within the jurisdiction
BASELINE_ACRES	Double	8	M		Uncontrolled baseline impervious acres established at the beginning of the permit term. Should remain constant throughout the life of the permit term
CONTROLLED_ACRES	Double	8	M		Total controlled impervious acres for the baseline year within the jurisdiction
PLANNED_ACRES	Double	8	M		Total acres of impervious areas planned for restoration activities within the jurisdiction
UNDER_DESIGN	Double	8	M		Total number of projects in design phase
UNDER_CONST	Double	8	M		Total number of projects currently under construction
COMPLETED	Double	8	M		Total number of completed projects for the reporting year
RESTORED_ACRES	Double	8	M		Total acres of restored impervious areas within the jurisdiction during current permit term
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 8: ImperviousSurface

MonitoringSite

Type: Point

Description: This feature class shows a specific geographical point for each outfall and instream monitoring site established by a local jurisdiction for assessment of controls.

Identifying Code: MSI

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
MON_STATION_ID	Text	13	M		MDE primary ID (Unique table ID)
LOCAL_STATION_ID	Text	20	O		Jurisdiction's station ID
STATION_TYPE	Text	4	M	dStationType	Station type (Bio, Chem, Phys)
STATION_LOC	Text	3	C	dStationLoc	Station location: outfall or instream
MD_NORTH	Double	8	M		Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	Double	8	M		Maryland grid coordinate (NAD 83 meters) Easting
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit code
LAND_USE	Short Integer	3	M	dMDPLandUse	Predominant land use
LU_COUNTY	Text	25	O		County unique land use (predominant)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 9: MonitoringSite

MonitoringDrainageArea

Type: Polygon

Description: This feature class maps the area draining to the established outfall and instream monitoring sites.

Identifying Code: MDA

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
MON_DRAIN_ID	Text	13	M		MDE primary ID (Unique table ID)
MON_STATION_ID	Text	13	M		Foreign key linking to monitoring site
MON_DRAIN_AREA	Double	6	M		Drainage area (acres) to monitoring station
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 10: MonitoringDrainageArea

AltBMPLine

Type: Line

Description: This feature class maps a specific geographical line indicating the location of certain linear alternative BMPs, i.e., stream restoration, shoreline stabilization, and outfall stabilization (see Appendix C: Alternative BMPs Geodatabase Guidance). In addition to these data, narrative stream restoration analysis shall be uploaded and included in the narrative table.

Identifying Code: ALN

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
ALTBMP_LN_ID	Text	13	M		MDE primary ID (Unique table ID)
BMP_DRAIN_AREA	Double	6	M		Drainage area (acres) to ALTBMPLine
BMP_CLASS	Text	1	M	dBMPClass	Primary BMP Classifcation (i.e., Alternative BMP, ESD, Structural BMP)
ALTBMP_TYPE	Text	5	M	dAltBMPLine	AltBMP Type i.e., Stream Restoration, Outfall Stabilization and Shoreline Stabilization
PROJECT_NAME	Text	25	M		Name of project
PROJECT_DESC	Text	75	M		Brief description of project
PROJECT_ADDRESS	Text	75	O		AltBMPLine Project Address if applicable
PROJECT_CITY	Text	50	M		AltBMPLine BMP City
PROJECT_STATE	Text	2	M	dState	AltBMPLine BMP State
PROJECT_ZIP	Text	5	M		AltBMPLine BMP Zip Code
PERCENT_IMPERVIOUS	Double	6	C		Watershed percent imperviousness
EQU_IMP_ACR	Double	6	M		Equivalent impervious acres treated by project
MAX_DUR_CREDIT	Short Integer	2	M		Maximum duration of credit (years)
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit code

LAND_USE	Short Integer	3	M	dMDPLandUse	Predominant land use
LU_COUNTY	Text	25	O		County unique land use (predominant)
INSTALL_DATE	Date	8	M		AltBMP completion date as MM/DD/YYYY
US_DRAIN_AREA	Double	6	C		Upstream drainage to AltBMP (acres)
LENGTH_REST	Double	8	M		Length of shoreline stabilized
TSS_LOAD	Double	12	C		Watershed TSS load before restoration (lbs/year)
TP_LOAD	Double	12	C		Watershed TP load before restoration (lbs/year)
TN_LOAD	Double	12	C		Watershed TN load before restoration (lbs/year)
TSS_REDUCTION	Double	12	C		TSS load reduction (lbs/year) after restoration (including all protocols used for stream restoration)
TP_REDUCTION	Double	12	C		TP load reduction (lbs/year) after restoration (including all protocols used for stream restoration)
TN_REDUCTION	Double	12	C		TN load reduction (lbs/year) after restoration (including all protocols used for stream restoration)
VEGETATION_REST	Double	6	C		Acreage of planting incorporated into a vegetated shoreline stabilization project
PROJECTED_IMPL_YR	Text	4	M		Projected year of project (construction) completion (YYYY)
IMPL_STATUS	Text	2	M	dIS_Status	Project Status (Planning, Under Construction, Complete)
IMPL_COMP_YR	Text	4	C		Year of completed Project (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 11: AltBMPLine

StrRestProtocols

Type: Associated Table

Description: This table contains information regarding the various protocols used for a specific stream restoration project. Each protocol used on a project will be detailed as one record in the referenced table below and linked to the appropriate project.

Identifying Code: SRP

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
SRP_ID	Text	13	M		MDE primary ID (Unique table ID)
ALTBMP_LN_ID	Text	13	M		Foreign key linking to AltBMPLine featureclass (i.e., Stream Restoration project)
PROTOCOL	Text	3	M	dStrProtocol	Protocol used for stream restoration, i.e., P1. P2. P3 or IR
TSS_REDUCTION	Double	10	C		TSS load reduction (lbs/year) for P1, P2, and/or P3 and IR
TP_REDUCTION	Double	10	C		TP load reduction (lbs/year); applies only to P2
TN_REDUCTION	Double	10	C		TN load reduction (lbs/year); applies only to P2
TSS_RED_EFF	Double	3	C		TSS loading rate reduction efficiency (percent) for P1 and P3
TP_RED_EFF	Double	3	C		TP loading rate reduction efficiency (percent) for P1 and P3
TN_RED_EFF	Double	3	C		TN loading rate reduction efficiency (percent) for P1 and P3
PRELENGTH_LT	Double	10	C		The left side pre-restoration stream length (feet) connected to the floodplain where bank height ratio is 1.0 or less; applies only to P2
PRELENGTH_RT	Double	10	C		The right side pre-restoration stream length (feet) connected to the floodplain where bank height ratio is 1.0 or less; applies only to P2
PREWIDTH_LT	Double	10	C		The left side pre-restoration stream width (feet) taken from the thalweg to the edge of connected side of stream, as indicated by a bank height ratio of 1.0 or less; applies only to P2
PREWIDTH_RT	Double	10	C		The right side pre-restoration stream width (feet) taken from the thalweg to the edge of connected side of stream, as indicated by a bank height ratio of 1.0 or less; applies only to P2
POSTLENGTH_LT	Double	10	C		The left side post restoration stream length (feet) connected to the floodplain where bank height ratio is 1.0 or less; applies only to P2

POSTLENGTH_RT	Double	10	C	The right side post restoration stream length (feet) connected to the floodplain where bank height ratio is 1.0 or less; applies only to P2
POSTWIDTH_LT	Double	10	C	The left side post restoration stream width (feet) taken from the thalweg to the edge of connected side of stream, as indicated by a bank height ratio of 1.0 or less; applies only to P2
POSTWIDTH_RT	Double	10	C	The right side post restoration stream width (feet) taken from the thalweg to the edge of connected side of stream, as indicated by a bank height ratio of 1.0 or less; applies only to P2
FP_WETLAND_AR	Double	6	C	Area (acres) of floodplain/wetland connected to stream channel
REPORTING_YEAR	Text	4	M	State fiscal year (YYYY)
PERMIT_NUM	Text	11	M	MDE permit number
GEN_COMMENTS	Text	255	O	General comments

Table 12: StrRestProtocols

ShorelineManagementPractices

Type: Associated Table

Description: This table contains information regarding the various protocols used for a specific shoreline management practices. Each protocol used on a project will be detailed as one record in the referenced table below and linked to the appropriate project in the AltBMPLine feature class.

Identifying Code: SHR

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
SHR_ID	Text	13	M		MDE primary ID (Unique table ID)
ALTBMP_LN_ID	Text	13	M		Foreign key linking to AltBMPLine feature class (i.e., Shoreline Restoration project)
PROTOCOL	Text	3	M	dShrProtocol	Protocol used for shoreline restoration, (i.e., P1, P2, P3 and P4)
TSS_REDUCTION	Double	10	C		TSS load reduction (lbs/year) is required if P1, P3, or P5 is selected
TP_REDUCTION	Double	10	C		TP load reduction (lbs/year) is required if P1, P3, P4, or P5 is selected
TN_REDUCTION	Double	10	C		TN load reduction (lbs/year) is required if P1, P2, P4 or P5 is selected
ACRES_REVEG	Double	6	C		Acres of revegetation are required if P2, P3, or P4 is selected; limit to two significant digits
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 13: ShorelineManagementPractices

AltBMPPoint

Type: Point

Description: This feature class maps a specific geographical point indicating the location of certain alternative BMPs, e.g., Septic Systems, Septic System Improvements (see Appendix C: Alternative BMPs Geodatabase Guidance).

Identifying Code: APT

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
ALTBMP_PT_ID	Text	13	M		MDE primary ID (Unique table ID)
BMP_CLASS	Text	1	M	dBMPClass	Primary BMP classification (i.e., Alternative BMP, ESD, Structural BMP)
ALTBMP_TYPE	Text	5	M	dAltBMPPoint	Alternative BMP Type (i.e., Septic Pumping, Septic Denitrification and Septic Connections to Waste Water Treatment Plant (WWTP))
PROJECT_NAME	Text	25	M		Name of project
PROJECT_DESC	Text	75	M		Brief description of project
PROJECT_ADDRESS	Text	75	O		AltBMPPoint Project Address if applicable
PROJECT_CITY	Text	50	M		AltBMPPoint BMP City
PROJECT_STATE	Text	2	M	dState	AltBMPPoint BMP State
PROJECT_ZIP	Text	5	M		AltBMPPoint BMP Zip Code
TN_REDUCTION	Double	12	O		TN load reduction (lbs/year)
EQU_IMP_ACR	Double	6	M		Equivalent impervious acres treated; limit to two significant digits
INSTALL_DATE	Date	8	M		BMP completion date
IMPL_COST	Short Integer	12	M		Projected or actual cost as applicable
PROJECTED_IMPL_YR	Text	4	M		Projected year of project (construction) completion (YYYY)

IMPL_STATUS	Text	2	M	dIS_Status	Project Status (i.e., Planning, Under Construction, Complete)
IMPL_COMP_YR	Text	4	C		Year of completed Project (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 14: AltBMPPoint

AltBMPPoly

Type: Polygon

Description: This feature class maps a specific geographical area indicating the location of certain alternative BMPs, e.g., street sweeping and tree planting (see Appendix C: Alternative BMPs Geodatabase Guidance).

Identifying Code: APY

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
ALTBMP_PY_ID	Text	13	M		MDE primary ID (Unique table ID)
BMP_CLASS	Text	1	M	dBMPClass	Primary BMP Classification (i.e., Alternative BMP, ESD, Structural BMP)
ALTBMP_TYPE	Text	5	M	dAltBMPPoly	AltBMP Type
PROJECT_NAME	Text	25	M		Name of project
PROJECT_DESC	Text	75	M		Brief description of project
PROJECT_ADDRESS	Text	75	O		AltBMPPoly Project Address if applicable
PROJECT_CITY	Text	50	M		AltBMPPoly BMP City
PROJECT_STATE	Text	2	M	dState	AltBMPPoly BMP State
PROJECT_ZIP	Text	5	M		AltBMPPoly BMP Zip Code
TSS_REDUCTION	Double	12	C		TSS load reduction (lbs/year); limit to two significant digits
TP_REDUCTION	Double	12	C		TP load reduction (lbs/year); limit to two significant digits
TN_REDUCTION	Double	12	C		TS load reduction (lbs/year); limit to two significant digits
EQU_IMP_ACR	Double	6	M		Equivalent impervious acres treated; limit to two significant digits
ACRES	Double	6	C		Acres swept as a part of street sweeping; limit to two significant digits

LBS_REMOVED	Double	12	C		Pounds of material removed as a part of street sweeping or inlet cleaning; limit to two significant digits
TIMES_SWEPT	Short Integer	2	C		Number of times per year this area is swept; limit to two significant digits
ACRES_PLANTED	Short Integer	6	C		Acres of trees planted; limit to two significant digits
IMP_ACR_ELIM	Double	6	C		Acres of imperviousness removed; limit to two significant digits
PERMIT_NUM	Text	11	M		11 digit MDE permit number
IMPL_COST	Short Integer	12	M		Projected or actual cost as applicable
PROJECTED_IMPL_YR	Text	4	M		Projected year of project (construction) completion (YYYY)
IMPL_STATUS	Text	2	M	dIS_Status	Project Status (Planning, Under Construction, Complete)
IMPL_COMP_YR	Text	4	C		Year of completed Project (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 15: AltBMPPoly

Note:

1. For Street Sweeping projects, either POUNDS_REMOVED must be populated or the ACRES field must be populated.
2. If the ACRES field is populated (instead of the POUNDS_REMOVED field), then TIMES_SWEPT must be populated. This area must be swept 25 times per year to receive Chesapeake Bay Program credits.
3. ACRES_PLANTED is required for any Tree Planting or Reforestation project.

RestBMP

Type: Point

Description: This feature class shows a specific geographical area indicating a new restoration BMP or conversion of an existing BMP or redevelopment project.

Identifying Code: RST

Feature Class Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
REST_BMP_ID	Text	13	M		MDE primary ID (Unique table ID)
BMP_DRAIN_ID	Text	13	M		Foreign key linking to BMPDrainageArea Feature Class
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit code
PROJECT_NAME	Text	25	M		Name of project
PROJECT_DESC	Text	75	M		Brief description of project
PROJECT_ADDRESS	Text	75	O		Restoration Project Address if applicable
PROJECT_CITY	Text	50	M		Restoration BMP City
PROJECT_STATE	Text	2	M	dState	Restoration BMP State
PROJECT_ZIP	Text	5	M		Restoration BMP Zip Code
CON_PURPOSE	Text	4	M	dConPurpose	New restoration projects, conversion of existing BMPs and redevelopment projects
CONVERTED_FROM	Text	5	C	dBMPType	If conversion of existing BMP then prior BMP Type is required
REST_TBMP_TYPE	Text	5	M	drBMPType	Type of Restoration BMP
BMP_CLASS	Text	1	M	dBMPClass	Primary BMP classification (i.e., ESD, Structural BMP)
NUM_BMP	Short Integer	2	M		Number of Restoration BMP's present
IMP_ACRES	Double	6	M		BMP impervious drainage area (acres)

TSS_REDUCTION	Double	12	O		TSS load reduction (lbs/year); limit to 2 significant digits
TP_REDUCTION	Double	12	O		TP load reduction (lbs/year); limit to 2 significant digits
TN_REDUCTION	Double	12	O		TS load reduction (lbs/year); limit to 2 significant digits
APPR_DATE	Date/Time	8	O		Permit approval date for structure; (MM/DD/YYYY)
BUILT_DATE	Date/Time	8	M		Construction completion date; (MM/DD/YYYY)
LAST_CHANGE	Date/Time	8	M		Date last change was made to this record; (MM/DD/YYYY)
RCN_PRE	Short Integer	2	O		Runoff curve number before event
RCN_POST	Short Integer	2	O		Runoff curve number after event
RCN_WOODS	Short Integer	2	O		Runoff curve number, woods
PE_REQ	Double	8	M		PE required for restoration is 1"
PE_ADR	Double	8	M		PE addressed
Q_PRE	Double	4	O		Runoff before construction in inches
Q_POST	Double	4	O		Runoff after construction in inches
IMPL_COST	Short Integer	12	M		Projected or actual cost as applicable
PROJECTED_IMPL_YR	Text	4	M		Projected year of project (construction) completion (YYYY)
IMPL_STATUS	Text	2	M	dIS_Status	Project Status (Planning, Under Construction, Complete)
IMPL_COMP_YR	Text	4	C		Year of completed Project (YYYY)
Q_WOODS	Double	4	O		Runoff, woods in inches
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 16: RestBMP

Management Programs

SWM

Type: Associated Table

Description: This table details Stormwater Management Program information necessary for the State's triennial review of local program implementation.

Identifying Code: SWM

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
SWM_ID	Text	13	M		MDE primary ID (Unique table ID)
PLAN_CON	Short Integer	3	M		Number of plan concepts
PLAN_DEV	Short Integer	3	M		Number of plan site development(s)
PLAN_FINAL	Short Integer	3	M		Number of plan final approval
PLAN_REDEV	Short Integer	3	M		Number of plan redevelopment
PLAN_EXPT	Short Integer	3	M		Number of plan exemptions
WAIV_REQ	Short Integer	3	M		Number of waiver quality requested
WAIV_GRT	Short Integer	3	M		Number of waiver quality granted
WAIV_REQ_QT	Short Integer	3	M		Number of waiver quantity requested
WAIV_GRT_QT	Short Integer	3	M		Number of waiver quantity granted
COMB_REQ	Short Integer	3	M		Number of combined waiver requests
COMB_GRT	Short Integer	3	M		Number of combined waivers granted
TOTAL_REQ	Short Integer	3	M		Number of total waivers requested
TOTAL_GRT	Short Integer	3	M		Number of total waivers granted
CON_INSPEC	Short Integer	3	M		Number of construction inspections
CON_VIOS	Short Integer	3	M		Number of construction violations
MAIN_INIT	Short Integer	3	M		Number of initial maintenance inspections
MAIN_FLW	Short Integer	3	M		Number of maintenance follow ups
MAIN_ENF	Short Integer	3	M		Number of maintenance enforcements

MAIN_VIO	Short Integer	3	M		Number of maintenance violations
MOD_ADMIN	Text	1	M	dBoolean	Were there modifications to county administrative procedures. If Y is selected narrative file must be submitted.
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General Comments

Table 17: SWM

BMPInspections

Type: Associated Table

Description: This table contains inspection, maintenance, and verification records for each BMP. This is for post-construction inspections only.

Identifying Code: BIN

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
BMP_INSP_ID	Text	13	M		MDE primary ID (Unique table ID)
BMP_ID	Text	13	M		Unique MDE BMP ID (foreign key linking to BMP table)
BMP_STATUS	Text	1	M	dPassFail	BMP status (i.e., Pass/Fail)
LAST_INSP_DATE	Date/Time	8	M		Last inspection date (MM/DD/YYYY)
MAIN_DATE	Date/Time	8	C		Last date maintenance was performed (MM/DD/YYYY), Conditional if maintenance was previously performed.
REINSP_STATUS	Text	1	M	dPassFail	Re-inspection status (i.e., Pass/Fail)
REINSP_DATE	Date/Time	8	M		Next planned inspection date (MM/DD/YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 18: BMP Inspections

AltBMPLineInspections

Type: Associated Table

Description: This table contains inspection, maintenance and verification records for linear alternative BMPs, i.e., stream restoration, shoreline erosion, and outfall stabilization. This is for post-construction inspections only.

Identifying Code: LIN

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
ALTBMP_LN_INSP_ID	Text	13	M		MDE primary ID (Unique table ID)
ALTBMP_LN_ID	Text	13	M		Unique MDE BMP ID (foreign key linking to BMP table)
ALTBMP_STATUS	Text	1	M	dPassFail	BMP status (i.e., Pass/Fail)
LAST_INSP_DATE	Date/Time	8	M		Last inspection date (MM/DD/YYYY)
MAIN_DATE	Date/Time	8	C		Last date maintenance was performed (MM/DD/YYYY), Conditional if maintenance was previously performed.
REINSP_STATUS	Text	1	M	dPassFail	Re-inspection status (i.e., Pass/Fail)
REINSP_DATE	Date/Time	8	M		Next planned inspection date (MM/DD/YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 19: AltBMPLineInspections

AltBMPPointInspections

Type: Associated Table

Description: This table contains inspection, maintenance and verification records for point alternative BMPs, e.g., septic systems and septic system improvements. This is for post-construction inspections only.

Identifying Code: PIN

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
ALTBMP_PT_INSP_ID	Text	13	M		MDE primary ID (Unique table ID)
ALTBMP_PT_ID	Text	13	M		Unique MDE BMP ID (foreign key linking to BMP table)
BMP_STATUS	Text	1	M	dPassFail	BMP status (i.e., Pass/Fail)
LAST_INSP_DATE	Date/Time	8	M		Last inspection date (MM/DD/YYYY)
MAIN_DATE	Date/Time	8	C		Last date maintenance was performed (MM/DD/YYYY), Conditional if maintenance was previously performed.
REINSP_STATUS	Text	1	M	dPassFail	Re-inspection status (i.e., Pass/Fail)
REINSP_DATE	Date/Time	8	M		Next planned inspection date (MM/DD/YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 20: AltBMPointInspections

AltBMPPolyInspections

Type: Associated Table

Description: This table contains inspection, maintenance and verification records for alternative BMPs, e.g., street sweeping and tree planting. This is for post-construction inspections only.

Identifying Code: YIN

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
ALTBMP_PY_INSP_ID	Text	13	M		MDE primary ID (Unique table ID)
ALTBMP_PY_ID	Text	13	M		Unique MDE BMP ID (foreign key linking to BMP table)
ALTBMP_STATUS	Text	1	M	dPassFail	BMP status (i.e., Pass/Fail)
LAST_INSP_DATE	Date/Time	8	M		Last inspection date (MM/DD/YYYY)
MAIN_DATE	Date/Time	8	C		Last date maintenance was performed (MM/DD/YYYY), Conditional if maintenance was previously performed.
REINSP_STATUS	Text	1	M	dPassFail	Re-inspection status (i.e., Pass/Fail)
REINSP_DATE	Date/Time	8	M		Next planned inspection date (MM/DD/YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 21: AltBMPolyInspections

RestBMPInspections

Type: Associated Table

Description: This table contains inspection, maintenance and verification records for a new restoration BMP or conversion of an existing BMP or redevelopment project. This is for post-construction inspections only.

Identifying Code: RIN

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
REST_BMP_INSP_ID	Text	13	M		MDE primary ID (Unique table ID)
REST_BMP_ID	Text	13	M		Unique MDE BMP ID (foreign key linking to BMP table)
BMP_STATUS	Text	1	M	dPassFail	BMP status (i.e., Pass/Fail)
LAST_INSP_DATE	Date/Time	8	M		Last inspection date (MM/DD/YYYY)
MAIN_DATE	Date/Time	8	C		Last date maintenance was performed (MM/DD/YYYY), Conditional if maintenance was previously performed.
REINSP_STATUS	Text	1	M	dPassFail	Re-inspection status (i.e., Pass/Fail)
REINSP_DATE	Date/Time	8	M		Next planned inspection date (MM/DD/YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 22: RestBMPInspections

ErosionSedimentControl

Type: Associated Table

Description: This table contains local Erosion and Sediment Control Program implementation information including data necessary for conducting the State's review of delegated enforcement activity.

Identifying Code: ESC

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
ESC_ID	Text	13	M		MDE primary ID (Unique table ID)
CONTACT	Text	50	M		Name of local contact for ESC program (first, last)
PHONE	Text	10	M		Phone number of individual, 10 digits, no dashes (numbers only)
FAX	Text	10	O		Fax number of individual, 10 digits, no dashes (numbers only)
EMAIL	Text	50	M		Email of individual
PERMITS_ISSUED	Short Integer	3	M		Total number of grading permits issued this permit year
PERMITS_ACTIVE	Short Integer	3	M		Estimate of active permits (overall)
DIST_ACTIVE	Short Integer	4	M		Disturbed area for active permits (acres)
OTHER_ISSUED	Short Integer	4	M		Total number of other approvals issued this year (e.g., Standard Plans)
OTHER_ACTIVE	Short Integer	4	M		Estimated number of active permits for other approvals
DIST_ACTIVE_OTH	Short Integer	4	M		Disturbed area for active permits other (acres)
NUM_INSPECTORS	Short Integer	2	M		Total number of sediment control inspectors
NUM_SUPERVISORS	Short Integer	2	M		Total number of supervisors
NUM_INSPECTIONS	Short Integer	2	M		Total number of sediment control inspections performed
STOP_WRK_ORDERS	Short Integer	3	M		Total number of stop work orders issued
NUM_FINES_COL	Short Integer	3	M		Total number of fines or securities collected
AMNT_FINES_COL	Double	10	M		Total amount of fines or securities collected
NUM_VIOS	Short Integer	3	M		Total number of violations
NUM_CRT_CASES	Short Integer	3	M		Total number of court cases
COMP_REC	Short Integer	3	M		Total number of sediment control complaints received

REPORTING_YEAR	Text	4	M	State fiscal year (YYYY)
PERMIT_NUM	Text	11	M	MDE permit number
GEN_COMMENTS	Text	255	O	General comments

Table 23: ErosionSedimentControl

QuarterlyGradingPermits

Type: Point

Description: This feature class maps a specific geographical point for each local government grading permit approval associated with construction sites greater than one acre.

Identifying Code: QGP

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
QGP_ID	Text	13	M		MDE primary ID (Unique table ID); foreign key linking to QuaterlyGradingPermitInfo
MD_NORTH	Double	8	M		Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	Double	8	M		Maryland grid coordinate (NAD 83 meters) Easting
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 24: QuarterlyGradingPermits

QuarterlyGradingPmtInfo

Type: Associated Table

Description: This table contains information concerning local grading permits for construction sites greater than one acre.

Identifying Code: QPI

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
QPI_ID	Text	13	M		MDE primary ID (Unique table ID)
QGP_ID	Text	13	M		Foreign key linking to QuarterlyGradingPermit feature class
SITE_NAME	Text	100	M		Construction site name
SITE_OWNER	Text	100	M		Construction site owner (first, last) or company name
SITE_ADDRESS	Text	75	O		Site Street Address
SITE_CITY	Text	50	M		Site City
SITE_STATE	Text	2	M	dState	Site State
SITE_ZIP	Text	5	M		Site Zip Code
SITE_LOCATION	Text	50	O		Description of site location if no street address available
OWNER_ADDRESS	Text	75	M		Owner Street Address
OWNER_CITY	Text	50	M		Owner City
OWNER_STATE	Text	2	M	dState	Owner State
OWNER_ZIP	Text	5	M		Owner Zip Code
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit Code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit Code
DIST_AREA	Double	8	M		Disturbed area of site (acres)
GRAD_PERMIT	Text	50	M		Local grading permit number
APPR_DATE	Date/Time	8	M		Grading permit approval date (MM/DD/YYYY)
LAND_USE_BF	Short Integer	4	M	dMDPLandUse	Predominant land use before grading
LU_COUNTY_BF	Text	25	O		County unique land use before grading
LAND_USE_AF	Short Integer	3	M	dMDPLandUse	Predominant land use after grading
LU_COUNTY_AF	Text	25	O		County unique land use after grading
CGP_NUM	Text	10	O		Construction general permit number
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
QUARTER	Text	2	M	dQuarter	Reporting quarter,(i.e., first, second, third, fourth)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 25: QuarterlyGradingPmtInfo

RespPersonnelCertInfo

Type: Associated Table

Description: This table records all persons certified under the State's program for erosion and sediment control training.

Identifying Code: RPC

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
RPC_ID	Text	13	M		MDE primary ID (Unique table ID)
PREFIX	Text	5	O	dPrefix	Name prefix (Mr., Mrs., Ms., etc.)
FIRSTNAME	Text	50	O		First name
LASTNAME	Text	50	O		Last name
ADDRESS	Text	75	O		Street Address
CITY	Text	50	O		City
STATE	Text	2	O	dState	State
ZIP	Text	5	O		Zip Code
CERT_DATE	Date/Time	8	O		Date of certification (MM/DD/YYYY)
PHONE	Text	10	O		Phone number: 10 digits, no dashes (numbers only)
CERT_NUM	Text	20	O		Certification number as provided by MDE
COMPANY	Text	50	O		Employer
INSTRUCTOR	Text	50	O		Instructor's last name
REPORTING_YEAR	Text	4	O		State fiscal year (YYYY)
PERMIT_NUM	Text	11	O		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 26: RespPersonnelCertInformation

IDDE

Type: Associated Table

Description: This table contains all data associated with screening outfalls as part of a jurisdiction's illicit discharge detection and elimination program. Data include outfall conditions, observed dry weather flows, and chemical testing of discharges for pollutant source indicators such as chlorine, detergents and phenol. Additionally, inspection, follow-up and resolution of illicit discharges are documented in this table.

Identifying Code: IDD

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
IDDE_ID	Text	13	M		MDE primary ID (Unique table ID)
MDE_OUTFALL_ID	Text	13	M		MDE foreign key linking to outfall.
LOCAL_OUTFALL_ID	Text	20	O		Alias if local jurisdiction has an ID number for Outfall
SCREEN_DATE	Date	8	M		Field screening date (MM/DD/YYYY)
TEST_NUM	Short Integer	2	M		Initial screening (1), follow-up test(2), 3rd test (3), etc. Used for reinspection of a problem. Test numbers continue within and across years.
LAST_RAIN	Date	8	M		Date of last rain > 0.10 inches (MM/DD/YYYY)
SCREEN_TIME	Text	8	M		Field screening time (TT:TT am/pm)
OBSERV_FLOW	Text	1	M	dBoolean	Was flow observed? (i.e., Yes/No)
CFS_FLOW	Double	10	C		Flow rate in cubic feet per second (CFS), limit to hundreths, Conditional if OBSERV_FLOW = "Yes" then CFS_FLOW should be > 0. If OBSERV_FLOW = "No", CFS Flow should be NULL; limit to 2 significant digits
WATER_TEMP	Double	3	C		Water temperature (Fahrenheit), Conditional if OBSERV_FLOW = "Yes"; limit to 2 significant digits,
AIR_TEMP	Double	3	M		Air Temperature (Fahrenheit); limit to 2 significant digits,
CHEM_TEST	Text	1	M	dBoolean	Was chemical test performed? (i.e., Yes/No)
pH	Double	4	C		pH meter reading, Conditional if OBSERV_FLOW = "Yes"; limit to 2 significant digits,
PHENOL	Double	8	C		Phenol in milligrams per liter (mg/L), Conditional if OBSERV_FLOW = "Yes"; limit to 2 significant digits,
CHLORINE	Double	8	C		Chlorine in milligrams per liter (mg/L), Conditional if OBSERV_FLOW = "Yes"; limit to 2 significant digits,
DETERGENTS	Double	8	C		Detergents in milligrams per liter (mg/L), Conditional if OBSERV_FLOW = "Yes"; limit to 2 significant digits
COPPER	Double	8	C		Copper in milligrams per liter (mg/L), Conditional if OBSERV_FLOW = "Yes" ; limit to 2 significant digits
ALGAEGROW	Text	1	M	dBoolean	Was algae growth observed? (i.e., Yes/No)
ODOR	Text	3	M	dOdor	Type of odor
COLOR	Text	3	C	dColor	Discharge color, Conditional if OBSERV_FLOW = "Yes"

CLARITY	Text	3	C	dClarity	Discharge clarity, Conditional if OBSERV_FLOW = "Yes"
FLOATABLES	Text	3	C	dFloatables	Floatables present in discharge, Conditional if OBSERV_FLOW = "Yes"
DEPOSITS	Text	3	M	dDeposits	Deposits in outfall area
VEG_COND	Text	3	M	dVegCond	Vegetative condition in outfall area
STRUCT_COND	Text	3	M	dStructCond	Structural condition of outfall
EROSION	Text	1	M	dErosion	Erosion in outfall area
COMPLA_NUM	Text	1	M	dBoolean	Is screening complaint driven? (i.e., Yes/No)
DISCHARGE_SOURCE	Text	3	C	dSource	What was the source of the discharge? Conditional if OBSERV_FLOW = “Yes”, If dSource = "N", "U" or "OTH", explanation required in general comments
ILLICIT_Q	Text	1	C	dBoolean	Was the discharge illicit? (i.e., yes/no); Conditional if OBSERV_FLOW = "Yes"; if “No”, Explanation required in general comments
ILLICIT_ELIM	Text	1	C	dIDDEStatus	What is the status of the illicit discharge? Conditional if ILLICIT_Q = “Yes”
YEAR_ELIM	Text	4	C		Year illicit discharge was eliminated (YYYY); Conditional if ILLICIT_ELIM = E
ILLICIT_CREDIT	Text	1	C	dBoolean	Is the jurisdiction requesting Chesapeake Bay Program nutrient reduction credits (i.e., Yes/No); Conditional if ILLICIT_ELIM = E. If “Yes”, a narrative file with calculations is required. Credit to be available under Version 6.0 of the Watershed Model
IDDE_PROTOCOL	Text	7	C	dIDDEProtocol	Protocol used to estimate nutrient reduction credits for detecting and eliminating illcit discharges. Conditional if ILLICIT_CREDIT = "Yes"
CB_SEG_SHED	Text	8	C	dCBSegShed	Chesapeake Bay river basin segment where the illicit discharge was eliminated. Conditional if ILLICIT_CREDIT = "Yes"
FLOW_VOL	Double	8	C		Illicit discharge flow volume in gallons per day (gpd); Conditional if ILLICIT_CREDIT = “Yes”
FLOW_VALUE	Text	1	C	dFlowValue	Was the flow value based on an estimate or direct measurement? Conditional if ILLICIT_CREDIT = “Yes” (Data check-estimates cannot be used for Source codes E or D)
FLOW_DURATION	Double	8	C		Illicit discharge duration in days per year; Conditional if ILLICIT_CREDIT = “Yes”; data check-cannot be greater than 365
PRE_TN	Double	10	C		Total nitrogen concentration pre-elimination of discharge (mg/L); Conditional if ILLICIT_CREDIT = “Yes”
POST _TN	Double	10	C		Total nitrogen concentration post-elimination of discharge (mg/L); Conditional if ILLICIT_CREDIT = “Yes”

TN_VALUE	Text	1	C	dNutrValue	Was total nitrogen concentration based on a default value or a field measurement? Conditional if ILLICIT_CREDIT = "Yes" (Data check-defaults cannot be used for Source codes V, F, or O)
PRE _TP	Double	10	C		Total phosphorus concentration pre-elimination of discharge (mg/L); Conditional if ILLICIT_CREDIT = "Yes"
POST _TP	Double	10	C		Total phosphorus concentration post-elimination of discharge (mg/L); Conditional if ILLICIT_CREDIT = "Yes"
TP_VALUE	Text	1	C	dNutrValue	Was total phosphorus concentration based on a default value or a field measurement? Conditional if ILLICIT_CREDIT = "Yes" (Data check-defaults cannot be used for Source codes V, F, or O)
TN_REDUCTION	Double	10	C		Total nitrogen reduction (lbs/year); Conditional if ILLICIT_CREDIT = "Yes"
TP_REDUCTION	Double	10	C		Total phosphorus reduction (lbs/year); Conditional if ILLICIT_CREDIT = "Yes"
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 27: IDDE

Note:

1. If "Other" is selected for any field, please provide additional information in the GEN_COMMENT field.
2. If claiming nutrient reduction credits for the elimination of individual illicit discharges, guidance on calculations and reporting requirements can be found in the Chesapeake Bay Program Final Expert Panel Report on Removal Rates for the Elimination of Discovered Nutrient Discharges from Grey Infrastructure found at: http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2014/11/GREY-INFRASTRUCTURE-Expert-Panel-Report_FINAL_LONG.pdf

MunicipalFacilities

Type: Point

Description: This feature class maps a specific geographical point and contains information about industrial facilities managed for stormwater.

Identifying Code: MUN

Feature Class Attributes

The following schema will be used to capture features:

Name	Type	Size	Mandatory	Domain	Description
MUNI_FACILITIES_ID	Text	13	M		MDE primary ID (Unique table ID)
MD_NORTH	Double	8	M		Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST	Double	8	M		Maryland grid coordinate (NAD 83 meters) Easting
FACILITY_NAME	Text	50	M		Name of facility
FACILITY_TYPE	Text	20	M	dFacType	Type of facility
GP_NUM	Text	9	M		Maryland industrial General Permit number
NOI_NUM	Text	9	M		Unique NOI registration number
QRT_INSP	Text	3	M	dQrtInsp	Have all quarterly inspections been conducted? (i.e., Yes/No/No Exposure Certificate); if "Yes", a narrative file should be uploaded; if "No", provide explanation in general comments
LAST_INSP_DATE	Date/Time	8	M		Date of last quarterly visual inspection (MM/DD/YYYY)
QUARTER	Text	6	C	dQuarter	Which quarter (i.e., First, Second, Third, Fourth)
SWPPP	Text	3	M	dSWPPPlan	Stormwater Pollution Prevention Plan (SWPPP) present? (i.e., Yes/No/No Exposure Certification); if "Yes" a narrative file should be uploaded

SWPPP_TRAINING	Short Integer	3	M		Number of personnel trained regarding the facility SWPPP
ANNUAL_REVIEW	Text	1	M	dBoolean	Has an annual comprehensive review been performed; if "Yes" a narrative file should be uploaded
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 28: MunicipalFacilities

ChemicalApplication

Type: Associated Table

Description: This table contains information about the type of chemicals and quantities a county or municipality uses in maintaining public right-of-way and property.

Identifying Code: CAP

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
CHEM_APPL_ID	Text	13	M		MDE primary ID (Unique table ID)
CHEM_CAT	Text	5	M	dChemCat	Category of chemical
CHEM_NAME	Text	50	M		Chemical applied (e.g., nitrogen, phosphorus, copper)
CHEM_AM_CUR	Double	8	M		Chemical amount current fiscal year (lbs)
CHEM_AM_PR	Double	8	M		Chemical amount prior fiscal year (lbs)
CHEM_PER_CH	Double	7	M		Chemical percent change (may be positive or negative)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENT	Text	255	O		General comments

Table 29: ChemicalApplication

Restoration Plans and Total Maximum Daily Loads

CountywideStormwaterWatershedAssessment

Type: Associated Table

Description: This table details pollutant load reductions associated with County-wide restoration implementation plans at the MD 8 digit HUC or the USGS 12 digit HUC and can be aggregated to show progress towards meeting Bay TMDLs, WLAs; percent reductions; and modeling information necessary for MS4 compliance. To determine TMDL_SHED_ID refer to MDE's TMDL Data Center web page at: http://wlat.mde.state.md.us/.

Identifying Code: CSW

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
CSW_ID	Text	13	M		MDE primary ID (Unique table ID)
WATERSHED8DGT	Text	8	M	dMD8digit	Maryland 8 digit hydrologic unit code
WATERSHED12DGT	Text	12	O	dHUC12digit	USGS 12 digit hydrologic unit code (if 12 digit is used by County for modeling then specify watershed code)
TMDL_SHED_ID	Text	5	O		MDE unique identifier for the TMDL watershed (data source:MDE TMDL data center)
POLLUTANT	Text	5	M	dBayPollutant	TN, TP or TSS
MODEL_SOURCE	Text	50	M		Model used by county to determine pollutant loads
BASELINE_LOAD	Double	8	M		County modeled pollutant load for Bay TMDL baseline year (County Watershed Models); limit to two significant digits
TARGET_LOAD	Double	8	M		County estimated target load calculated using baseline load and percent reduction (County Watershed Models); limit to two significant digits
PERMIT_LOAD	Double	8	M		County modeled pollutant load for the year the county MS4 permit was made effective (County Watershed Models); limit to two significant digits
CURRENT_LOAD	Double	8	M		County modeled pollutant load for the current annual reporting year (County Watershed Models); limit to two significant digits
TARGET_YEAR	Text	4	M		Year target load will be attained (YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 30: CountywideStormwaterWatershedAssessmentLocalStormwaterWatershedAssessment

LocalStormwaterWatershedAssessment

Type: Associated Table

Description: This table details pollutant load reductions associated with EPA approved local TMDLs, WLAs; percent reductions; and modeling information necessary for MS4 compliance. To determine TMDL_SHED_ID refer to MDE's TMDL Data Center web page at http://wlat.mde.state.md.us/.

Identifying Code: LSW

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
LSW_ID	Text	13	M		MDE primary ID (Unique table ID)
TMDL_SHED_ID	Text	5	M		MDE unique identifier for the TMDL watershed (data source:MDE TMDL data center)
POLLUTANT	Text	5	M	dPollutant	TMDL pollutant
PERCENT_REDUCTION	Double	6	M		Stormwater Wasteload Allocation (SW-WLA) required percent reduction for the TMDL (data source:MDE TMDL data center)
BASELINE_YEAR	Text	4	M		Year associated with modeled baseline load in the TMDL (data source:MDE TMDL data center), (YYYY)
MODEL_SOURCE	Text	50	M		Model used by county to determine pollutant loads
BASELINE_LOAD	Double	10	M		County modeled pollutant load for TMDL baseline year (County Watershed Models); limit to two significant digits
TARGET_LOAD	Double	10	M		County estimated target load calculated using baseline load and percent reduction (County Watershed Models); limit to two significant digits
PERMIT_LOAD	Double	10	M		County modeled pollutant load for the year the county MS4 permit was made effective (County Watershed Models); limit to two significant digits
CURRENT_LOAD	Double	10	M		County modeled pollutant load for the current annual reporting year (County Watershed Models); limit to two significant digits
TARGET_YEAR	Text	4	M		Year target load will be attained (YYYY)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 31: LocalStormwaterWatershedAssessment

Assessment of Controls

ChemicalMonitoring

Type: Associated Table

Description: This table contains information about the chemical monitoring and event mean concentrations (EMCs) of stormwater discharges from MS4 established outfall and in-stream monitoring locations.

Identifying Code: CHE

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
CHEM_MON_ID	Text	13	M		MDE primary ID (Unique table ID)
MON_STATION_ID	Text	13	M		Foreign key linking to monitoring site feature class
LOCAL_STATION_ID	Text	20	O		Local ID value
MD_OUTFALL_ID	Text	13	C		MDE outfall ID; applies only if OUT_INSTREAM selection is outfall
LOCAL_OUTFALL_ID	Text	20	O		Alias if jurisdiction has outfall ID
EVENT_DATE	Date	8	M		Date of storm event (MM/DD/YYYY)
EVENT_TIME	Text	8	M		Time monitoring begins (HH:MM am/pm)
STORM_BASEFLOW	Text	10	M	dStormBaseFlow	Storm or base flow sample
DEPTH	Double	8	C		Depth of rain (inches); applies only to storm sample
DURATION	Double	8	C		Duration of event (HH:MM); applies only to storm sample
INTENSITY	Double	8	C		Intensity = depth/duration
TOTAL_STORM_FLOW_VOL	Double	8	C		Total storm flow volume (gallons); applies only to storm sample
WATER_TEMP	Double	8	M		Flow weighted average of water temperature (°F)
pH	Double	8	M		Flow weighted average of pH
BOD_dt	Double	8	M		Biological oxygen demand detection limit used in analysis
BOD_EMC0	Double	8	M		EMC for biological oxygen demand (mg/L) using (0)
BOD_EMC_dt	Double	8	M		EMC for biological oxygen demand (mg/L) using (dt)
TKN_dt	Double	8	M		Total Kjeldahl nitrogen detection limit used in analysis

TKN_EMC0	Double	8	M		EMC for total Kjeldahl nitrogen (mg/L) using (0)
TKN_EMC_dt	Double	8	M		EMC for total Kjeldahl nitrogen (mg/L) using (dt)
NITRATE_NITRITE_dt	Double	8	M		Nitrate + nitrite detection limit used in analysis
NITRATE_NITRITE_EMC0	Double	8	M		Enter EMC for nitrate + nitrite (mg/L) using (0)
NITRATE_NITRITE_EMC_dt	Double	8	M		Enter EMC for nitrate + nitrite (mg/L) using (dt)
TOTAL_PHOSPHORUS_dt	Double	8	M		Total phosphorus detection limit used in analysis
TOTAL_PHOSPHORUS_EMC0	Double	8	M		Enter EMC for total phosphorus (mg/L) using (0)
TOTAL_PHOSPHORUSEMC_dt	Double	8	M		Enter EMC for total phosphorus (mg/L) using (dt)
TSS_dt	Double	8	M		Total suspended solids detection limit used in analysis
TSS_EMC0	Double	8	M		EMC for total suspended solids (mg/L) using (0)
TSS_EMC_dt	Double	8	M		EMC for total suspended solids (mg/L) using (dt)
TOTAL_COPPER_dt	Double	8	M		Total copper detection limit used in analysis
TOTAL_COPPER_EMC0	Double	8	M		Enter EMC for total copper (ug/L) using (0)
TOTAL_COPPER_EMC_dt	Double	8	M		Enter EMC for total copper (ug/L) using (dt)
TOTAL_LEAD_dt	Double	8	M		Total lead detection limit used in analysis
TOTAL_LEAD_EMC0	Double	8	M		Enter EMC for total lead (ug/L) using (0)
TOTAL_LEAD_EMC_dt	Double	8	M		Enter EMC for total lead (ug/L) using (dt)
TOTAL_ZINC_dt	Double	8	M		Total zinc detection limit used in analysis
TOTAL_ZINC_EMC0	Double	8	M		Enter EMC for total zinc (ug/L) using (0)
TOTAL_ZINC_EMC_dt	Double	8	M		Enter EMC for total zinc (ug/L) using (dt)
HARDNESS_dt	Double	8	M		Record detection limit used in analysis
HARDNESS_EMC0	Double	8	M		Enter EMC for hardness (ug/L) using (0)
HARDNESS_EMC_dt	Double	8	M		Enter EMC for hardness (ug/L) using (dt)
TPH_dt	Double	8	M		Total petroleum hydrocarbons detection limit used in analysis
TPH_EMC0	Double	8	M		EMC for total petroleum hydrocarbons (mg/L) using (0)
TPH_EMC_dt	Double	8	M		EMC for total petroleum hydrocarbons (mg/L) using (dt)
ENTEROCOCCI_dt	Double	8	C		Record detection limit used in analysis; applies if ECOLI_dt is null

ENTEROCOCCI_EMC0	Double	8	C	EMC for enterococci (MPN/100ml) using (0); applies if ECOLI_EMC0 is null
ENTEROCOCCI_EMC_dt	Double	8	C	EMC for enterococci (MPN/100ml) using (dt); applies if ECOLI_EMC is null
ECOLI_dt	Double	8	C	Record detection limit used in analysis; applies if ENTEROCOCCI_dt is null
ECOLI_EMC0	Double	8	C	EMC for E. Coli (MPN/100ml) using (0); applies if ENTEROCOCCI_EMC0 is null
ECOLI_EMC_dt	Double	8	C	EMC for E. Coli (MPN/100ml) using (dt); applies if ENTEROCOCCI_EMC is null
REPORTING_YEAR	Text	4	M	State fiscal year (YYYY)
PERMIT_NUM	Text	11	M	MDE permit number
GEN_COMMENTS	Text	255	O	General comments

Table 32: ChemicalMonitoring

Note:

1. EMC (0) = Flow weighted averages for three discrete samples representative of a storm using zero (0) for any discrete samples recorded less than the detection limit.
2. EMC (dt) = Flow weighted averages for three discrete samples representative of a storm using the detection limit value (dt) for any discrete samples recorded less than the detection limit.

LocalConcern

Type: Associated Table

Description: This table allows local jurisdictions to monitor additional chemical parameters of local concern as part of a long-term monitoring program.

Identifying Code: LOC

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
LOCAL_CONCERN_ID	Text	13	O		MDE primary ID (Unique table ID)
CHEM_MON_ID	Text	13	O		Foreign key linking to ChemicalMonitoring table
LOCAL_CONCERN	Text	50	O		Chemical/material being tested for
LOCAL_CONCERN_dt	Double	8	C		Detection limit used in analysis in mg/L
LOCAL_CONCERN_EMC0	Double	8	C		Enter EMC in mg/L using 0
LOCAL_CONCERN_EMC_dt	Double	8	C		Enter EMC in mg/L using dt
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 33: LocalConcern

Note:

1. EMC (0) = Flow weighted averages for three discrete samples representative of a storm using zero (0) for any discrete samples recorded less than the detection limit.
2. EMC (dt) = Flow weighted averages for three discrete samples representative of a storm using the detection limit value (dt) for any discrete samples recorded less than the detection limit.

Biological Monitoring

Type: Associated Table

Description: This table contains the records of biological samples used to assess the overall health of a stream.

Identifying Code: BIO

Table Attributes

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
BIO_MON_ID	Text	13	M		MDE primary ID (Unique table ID)
MON_STATION_ID	Text	13	M		Foreign key linking to monitoring site feature class
EVENT_DATE	Date	8	M		Sampling date (MM/DD/YYYY)
EVENT_TIME	Text	8	M		Sampling time (HH:MM am/pm)
BIBI	Double	8	M		Benthic index of biological indicators
FIBI	Double	8	M		Fish index of biological indicators
QUAL_DESCRIP	Long Integer	1	M	dQuality	Qualitative description of sample, (i.e., excellent, good, fair, poor)
EMBEDDEDNESS	Double	8	M		Rapid bioassessment protocol score for embededdness
EPIFAUNAL	Double	8	M		Rapid bioassessment protocol score for epifaunal
HABITAT	Double	8	M		Rapid bioassessment protocol score for habitat
HABITAT_DESCRIP	Long Integer	1	M	dQuality	Description of habitat, (i.e., excellent, good, fair, poor)
REPORTING_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 34: BiologicalMonitoring

Program Funding

FiscalAnalyses

Type: Associated Table

Description: The fiscal analyses table documents calculations of costs (in millions) for each program.

Identifying Code: FIS

Table Attributes:

The following schema will be used to capture data:

Name	Type	Size	Mandatory	Domain	Description
FISCAL_ID	Text	13	M		MDE primary ID (Unique table ID)
OP_BUDGET	Double	8	M		Total operational budget for next fiscal year; limit to two significant digits
OP_COST	Double	8	M		Total operational cost for current fiscal year; limit to two significant digits
CAP_BUDGET	Double	8	M		Total capital budget for next fiscal year; limit to two significant digits
CAP_COST	Double	8	M		Total capital cost for current fiscal year; limit to two significant digits
WPR_FUNDS	Double	8	M		Total watershed protection and restoration funds generated for current fiscal year
SWM_COST	Double	8	O		Total annual cost for stormwater management program; limit to two significant digits
EROS_SED_CON	Double	8	O		Total annual cost for erosion and sediment control; limit to two significant digits
ILLICIT_DET_ELIM	Double	8	O		Total annual cost for illicit detection/elimination; limit to two significant digits
TRASH_ELIM	Double	8	O		Total annual cost for trash elimination; limit to two significant digits
PROP_MANAGEMENT	Double	8	O		Total annual cost for property management; limit to two significant digits
INLET_CLEAN	Double	8	O		Total annual cost for inlet cleaning; limit to two significant digits
STRT_SWEEP	Double	8	O		Total annual cost for street sweeping; limit to two significant digits
RD_MAINT_OTHER	Double	8	O		Total annual cost for road maintenance – other; limit to two significant digits

PUB_EDUCATION	Double	8	O	Total annual cost for public education; limit to two significant digits
WATERSHED_ASSESS	Double	8	O	Total annual cost for watershed assessment; limit to two significant digits
WATERSHED_RESTOR	Double	8	O	Total annual cost for watershed restoration; limit to two significant digits
CHEM_MON_ASSESS	Double	8	O	Total annual cost for chemical monitoring and assessment; limit to two significant digits
BIO_MON_ASSESS	Double	8	O	Total annual cost for biological monitoring and assessment; limit to two significant digits
PHYS_STRM_ASSESS	Double	8	O	Total annual cost for physical assessment; limit to two significant digits
MANUAL_MON	Double	8	O	Total annual cost for design manual monitoring; limit to two significant digits
TMDL_ASSESS	Double	8	O	Total annual cost for TMDL assessment; limit to two significant digits
TOTAL_NPDES_COST	Double	8	O	Total annual costs for NPDES program; limit to two significant digits
REPORTING_YEAR	Text	4	M	State fiscal year (YYYY)
PERMIT_NUM	Text	11	M	MDE permit number
GEN_COMMENTS	Text	255	O	General comments

Table 35: FiscalAnalyses

NarrativeFiles

Type: Associated Table

The narrative files table contains documents, charts and reports related to the MS4 annual reports that do not easily fit into a traditional database structure. Documents that are uploaded to MDE will be referenced in this table. Each document attached as a part of the submittal must have its own record added to this table.

Identifying Code: NAR

Table Attributes

The following schema will be used to capture associated attached files:

Name	Type	Size	Mandatory	Domain	Description
MDE_DOC_NAME_ID	Text	13	M		MDE primary ID (Unique table ID)
MON_STATION_ID	Text	13	M		Foreign key linking to monitoring site feature class
DOC_NAME	Text	50	M		Full document title
DOC_TYPE	Text	5	M	dDocType	Type of document/file being submitted
DOC_DESCRIPTION	Text	255	M		Description of document being submitted
PERMIT_YEAR	Text	4	M		State fiscal year (YYYY)
PERMIT_NUM	Text	11	M		MDE permit number
GEN_COMMENTS	Text	255	O		General comments

Table 36: NarrativeFiles

Note:

1. A document description must be provided if a DOC_TYPE of “Other” is selected.

Domains

The purpose of a domain is to constrain the value that can be placed in a field. The constraints serve to standardize the data and make entering the data more straightforward. When a domain is assigned to a field, the user is given a drop down list to select from and the field is populated. The selected value is then stored in the database using a coded value. Only an acceptable code can be input into the database.

dAltBMPLine

Domain Description	Code	Code Description
Alternative BMP Type	OUT	Outfall Stabilization
	SHST	Shoreline Stabilization
	STRE	Stream Restoration

dAltBMPPoint

Domain Description	Code	Code Description
Alternative BMP Type	SEPC	Septic Connections to WWTP
	SEPD	Septic Denitrification
	SEPP	Septic Pumping

dAltBMPPoly

Domain Description	Code	Code Description
Alternative BMP Type	CBC	Catch Basin Cleaning
	IMPF	Impervious Surface Elimination (to forest)
	IMPP	Impervious Surface Elimination (to pervious)
	MSS	Mechanical Street Sweeping
	FPU	Planting Trees or Forestation on Previous Urban
	VSS	Regenerative/Vacuum Street Sweeping
	SDV	Storm Drain Vacuuming

dBayPollutant

Domain Description	Code	Code Description
Alternative BMP Type	TN	Total Nitrogen
	TP	Total Phosphorus
	TSS	Total Suspended Solids

dBMPClass

Domain Description	Code	Code Description
Class of BMP	A	Alternative BMP
	E	ESD
	S	Structural BMP

dBMPStatus

Domain Description	Code	Code Description
Status of BMP	ACT	Active
	PROP	Proposed
	REM	Removed

dBMPType

Domain Description	Code	Code Description
Type of BMP	AGRE	Green Roof - Extensive
	AGRI	Green Roof - Intensive
	APRP	Permeable Pavements
	ARTF	Reinforced Turf
	BRCT	Bio-Reactor Carbon Filter
	DID	Disconnection of Illicit Discharges
	EDU	Education
	FBIO	Bioretention
	FORG	Organic Filter (Peat Filter)
	FPER	Perimeter (Sand) Filter
	FPRES	Floodplain Restoration
	FSND	Sand Filter
	FUND	Underground Filter
	IBAS	Infiltration Basin
	ITRN	Infiltration Trench
	MENF	Enhanced Filters
	MIBR	Infiltration Berms
	MIDW	Dry Well
	MILS	Landscape infiltration
	MMBR	Micro-Bioretention
	MRNG	Rain Gardens
	MRWH	Rainwater Harvesting
	MSGW	Submerged Gravel Wetlands
	MSWB	Bio-Swale
	MSWG	Grass Swale
	MSWW	Wet Swale
	NDNR	Disconnection of Non-Rooftop Runoff
	NDRR	Disconnection of Rooftop Runoff

Domain Description	Code	Code Description
	NSCA	Sheetflow to Conservation Areas
	ODSW	Dry Swale
	PET	Pet Waste Management
	PMED	Micropool Extended Detention Pond
	PMPS	Multiple Pond System
	PPKT	Pocket Pond
	PWED	Extended Detention Structure, Wet
	PWET	Retention Pond (Wet Pond)
	RBS	River Bank Stabilization
	SPSC	Step Pool Storm Conveyance
	SUB	Sub-Soiling
	TRA	Trash Removal
	WEDW	Extended Detention - Wetland
	WPKT	Pocket Wetland
	WPWS	Wet Pond - Wetland
	WSHW	Shallow Marsh
	XDED	Extended Detention Structure, Dry
	XDPD	Detention Structure (Dry Pond)
	XFLD	Flood Management Area
	XOGS	Oil Grit separator
	OTH	Other

dBoolean

Domain Description	Code	Code Description
Yes or No	N	No
	Y	Yes

dCBSegShed

Domain Description	Code	Code Description
Chesapeake Bay Segment Shed	ANATF_DC	Anacostia River Tidal Fresh DC
	ANATF_MD	Anacostia River Tidal Fresh Maryland
	BACOH	Back River Oligohaline
	BIGMH	Big Annemessex River Mesohaline
	BOHOH	Bohemia River Oligohaline
	BSHOH	Bush River Oligohaline
	C&DOH_DE	C&D Canal Oligohaline Delaware
	C&DOH_MD	C&D Canal Oligohaline Maryland
	CB1TF	Northern Chesapeake Bay Tidal Fresh
	CB2OH	Northern Chesapeake Bay Oligohaline
	CB3MH	Upper Chesapeake Bay Mesohaline
	CB4MH	Middle Chesapeake Bay Mesohaline
	CB5MH_MD	Lower Chesapeake Bay Mesohaline Maryland
	CHOMH1	Choptank River Mesohaline mouth 1

Domain Description	Code	Code Description
	CHOMH2	Choptank River Mesohaline 2
	CHOOH	Choptank River Oligohaline
	CHOTF	Upper Choptank River Tidal Fresh
	CHSMH	Lower Chester River Mesohaline
	CHSOH	Middle Chester River Oligohaline
	CHSTF	Upper Chester River Tidal Fresh
	EASMH	Eastern Bay Mesohaline
	ELKOH	Elk River Oligohaline
	FSBMH	Fishing Bay Mesohaline
	GUNOH	Gunpowder River Oligohaline
	HNGMH	Honga River Mesohaline
	LCHMH	Little Choptank River Mesohaline
	MAGMH	Magothy River Mesohaline
	MANMH	Manokin River Mesohaline
	MATTF	Mattawoman Creek Tidal Fresh
	MIDOH	Middle River Oligohaline
	NANMH	Lower Nanticoke River Mesohaline
	NANOH	Upper Nanticoke River Oligohaline
	NANTF_MD	Upper Nanticoke River Tidal Fresh Maryland
	NANTF_DE	Upper Nanticoke River Tidal Fresh Delaware
	NORTF	North East River Tidal Fresh
	PATMH	Patapsco River Mesohaline
	PAXMH	Lower Patuxent River Mesohaline
	PAXOH	Middle Patuxent River Oligohaline
	PAXTF	Upper Patuxent River Tidal Fresh
	PISTF	Piscataway Creek tidal Fresh
	POCMH_MD	Lower Pocomoke River Mesohaline Maryland
	POCOH_MD	Middle Pocomoke River Oligohaline Maryland
	POCOH_VA	Middle Pocomoke River Oligohaline Virginia
	POCTF	Upper Pocomoke River Tidal Fresh
	POTMH_MD	Lower Potomac River Mesohaline Maryland
	POTOH1_MD	Lower Potomac River Oligohaline Maryland
	POTOH2_MD	Port Tobacco River Oligohaline Maryland
	POTOH3_MD	Nanjemoy Creek Oligohaline Maryland
	POTTF_DC	Upper Potomac River Tidal Fresh DC
	POTTF_MD	Upper Potomac River Tidal Fresh Maryland
	RHDMH	Rhode River Mesohaline
	SASOH	Sassafras River Oligohaline
	SEVMH	Severn River Mesohaline
	SOUMH	South River Mesohaline
	TANMH_MD	Tangier Sound Mesohaline Maryland
	WBRTF	Western Branch Patuxent River Tidal Fresh
	WICMH	Wicomico River Mesohaline
	WSTMH	West River Mesohaline

dChemCat

Domain Description	Code	Code Description
Chemical Category	DEICE	Deicing
	FERT	Fertilizer
	HERB	Herbicide
	PEST	Pesticide

dClarity

Domain Description	Code	Code Description
Discharge Clarity	C	Clear
	CD	Cloudy
	OP	Opaque
	OTH	Other

dColor

Domain Description	Code	Code Description
Color of Discharge	B	Brown
	C	Clear
	G	Gray
	GR	Green
	R	Red
	Y	Yellow
	OTH	Other

dConPurpose

Domain Description	Code	Code Description
Purpose of Construction	CONV	Conversion of Existing BMP
	NEWD	New Restoration Project
	REDE	Redevelopment Project

dDeposits

Domain Description	Code	Code Description
Deposits in Outfall Area	OL	Oil
	N	None
	S	Sediment
	OTH	Other

dDocType

Domain Description	Code	Code Description
Type of Documents and Files that Have Been Submitted	AOC	Assessment of Controls e.g., stream assessment reports, hydrologic and or hydraulic analysis, monitoring modification, stream restoration analysis
	LEG	Legal Authority
	LFR	Litter and Floatables Report
	MP	Management Programs e.g., SWM plan modification details, report on problems and modifications in implementing ESD to the MEP
	ORG	Permit Administration e.g., Organizational chart
	PED	Public Education e.g., public education efforts summary
	PMM	Property Management and Maintenance e.g., pollution prevention plan report, street sweeping description, catch basin cleaning description, alternate maintenance program narrative.
	REAPP	Reapplication for NPDES Permit
	RESTP	Restoration Plans and TMDL e.g., watershed assessments, restoration plans, restoration plan public comments, impervious surface area assessment, TMDL assessment report with tables
	SID	Source Identification e.g., watershed restoration plans, restoration plan public comments
	TLR	Trash and Litter Report
	OTH	Other Document

dErosion

Domain Description	Code	Code Description
Erosion in Outfall Area	M	Moderate
	N	None
	S	Severe

dFacType

Domain Description	Code	Code Description
Type of Facility	Category i	Category i - Industry subject to Federal effluent standards
	Category ii	Category ii - Heavy Manufacturing
	Category iii	Category iii - Mineral Industry
	Category iv	Category iv - Hazardous Waste
	Category v	Category v - Landfills
	Category vi	Category vi - Recycling/Salvage
	Category vii	Category vii - Steam Electric Plants
	Category viii	Category viii - Transportation
	Category ix	Category ix - Treatment Works
	Category x	Category x - Construction
	Category xi	Category xi - Light Industry

dFloatables

Domain Description	Code	Code Description
Type of Floatable	N	None
	OS	Oil Sheen
	SE	Sewage
	T	Trash
	OTH	Other

dFlowValue

Domain Description	Code	Code Description
The Type of Value Used to Calculate Flow Volume	E	Estimate (calculations used to estimate flow must be included in the narrative file)
	M	Direct measurement

dHUC12digit

Domain Description	Code	Code Description
USGS 12 Digit Hydrologic Unit Code	Please see geodatabase for full list of 12 digit watersheds	

dIDDEProtocol

Domain Description	Code	Code Description
IDDE Protocol	IDDEP1	IDDE Protocol 1
	IDDEP2	IDDE Protocol 2
	IDDEP3	IDDE Protocol 3

dIDDEStatus

Domain Description	Code	Code Description
Status of the Illicit Discharge	E	Eliminated
	C	In process of correction
	I	Source under investigation

dImpStatus

Domain Description	Code	Code Description
Project Status	C	Complete
	P	Planning
	UC	Under Construction

dJurisdiction

Domain Description	Code	Code Description
Jurisdiction	AA	Anne Arundel County
	AL	Allegany County
	BA	Baltimore County
	BC	Baltimore City
	CA	Caroline County
	CE	Cecil County

Domain Description	Code	Code Description
	CH	Charles County
	CR	Carroll County
	CV	Calvert County
	DO	Dorchester County
	FR	Frederick County
	GA	Garrett County
	HA	Harford County
	HO	Howard County
	KE	Kent County
	MDSHA	Maryland State Highway Administration
	MO	Montgomery County
	PG	Prince George's County
	QA	Queen Anne's County
	SM	St. Mary's County
	SO	Somerset County
	TA	Talbot County
	WA	Washington County
	WI	Wicomico County
	WO	Worcester County

dMD8Digit

Domain Description	Code	Code Description
Maryland 8 Digit Hydrologic Unit Code	02130705	Aberdeen Proving Ground
	02140205	Anacostia River
	02140502	Antietam Creek
	02130102	Assawoman Bay
	02130703	Atkisson Reservoir
	02130101	Atlantic Ocean
	02130604	Back Creek
	02130901	Back River
	02130903	Baltimore Harbor
	02130207	Big Annemessex River
	02130606	Big Elk Creek
	02130803	Bird River
	02130902	Bodkin Creek
	02130602	Bohemia River
	02140104	Breton Bay
	02131108	Brighton Dam
	02120205	Broad Creek
	02130701	Bush River
	02130704	Bynum Run
	02140207	Cabin John Creek
	05020204	Casselman River
	02140305	Catoctin Creek
	02130106	Chincoteague Bay
	02130607	Christina River
	02050301	Conewago Creek
	02140504	Conococheague Creek
	02120204	Conowingo Dam Susq R

Domain Description	Code	Code Description
	02130507	Corsica River
	05020203	Deep Creek Lake
	02120202	Deer Creek
	02130204	Dividing Creek
	02140304	Double Pipe Creek
	02130501	Eastern Bay
	02141002	Evitts Creek
	02140511	Fifteen Mile Creek
	02130307	Fishing Bay
	02130609	Furnace Bay
	02141004	Georges Creek
	02140107	Gilbert Swamp
	02130801	Gunpowder River
	02130905	Gwynns Falls
	02130401	Honga River
	02130103	Isle of Wight Bay
	02130904	Jones Falls
	02130511	Kent Island Bay
	02130504	Kent Narrows
	02120201	L Susquehanna River
	02130506	Langford Creek
	02130907	Liberty Reservoir
	02140506	Licking Creek
	02130402	Little Choptank
	02140505	Little Conococheague
	02130605	Little Elk Creek
	02130804	Little Gunpowder Falls
	02131105	Little Patuxent River
	02140509	Little Tonoloway Creek
	05020202	Little Youghiogheny R
	02130805	Loch Raven Reservoir
	02139998	Lower Chesapeake Bay
	02130505	Lower Chester River
	02130403	Lower Choptank
	02130601	Lower Elk River
	02130804	Little Gunpowder Falls
	02131105	Little Patuxent River
	02140509	Little Tonoloway Creek
	05020202	Little Youghiogheny R
	02130805	Loch Raven Reservoir
	02139998	Lower Chesapeake Bay
	02130505	Lower Chester River
	02130403	Lower Choptank
	02130601	Lower Elk River
	02130802	Lower Gunpowder Falls
	02140302	Lower Monocacy River
	02130202	Lower Pocomoke River
	02130301	Lower Wicomico River
	02130702	Lower Winters Run
	02131001	Magothy River
	02130208	Manokin River

Domain Description	Code	Code Description
	02140503	Marsh Run
	02130306	Marshyhope Creek
	02140111	Mattawoman Creek
	02139997	Middle Chesapeake Bay
	02130509	Middle Chester River
	02131106	Middle Patuxent River
	02130807	Middle River - Browns
	02130502	Miles River
	02130302	Monie Bay
	02140110	Nanjemoy Creek
	02130305	Nanticoke River
	02130205	Nassawango Creek
	02130105	Newport Bay
	02130608	Northeast River
	02120203	Octoraro Creek
	02140204	Oxon Creek
	02130906	Patapsco River L N Br
	02131101	Patuxent River lower
	02131102	Patuxent River middle
	02131104	Patuxent River upper
	02140203	Piscataway Creek
	02130201	Pocomoke Sound
	02140109	Port Tobacco River
	02140508	Potomac River AL Cnty
	02140301	Potomac River FR Cnty
	02141001	Potomac River L N Branch
	02140101	Potomac River L tidal
	02140102	Potomac River M tidal
	02140202	Potomac River MO Cnty
	02141005	Potomac River U N Branch
	02140201	Potomac River U tidal
	02140501	Potomac River WA Cnty
	02130806	Prettyboy Reservoir
	02140206	Rock Creek
	02131107	Rocky Gorge Dam
	02130908	S Branch Patapsco
	02130610	Sassafras River
	02141006	Savage River
	02140208	Seneca Creek
	02131002	Severn River
	02140510	Sideling Hill Creek
	02130104	Sinepuxent Bay
	02131003	South River
	02130508	Southeast Creek
	02140105	St. Clements Bay
	02140103	St. Mary's River
	02130611	Stillpond-Fairlee
	02130706	Swan Creek
	02130206	Tangier Sound
	02140507	Tonoloway Creek
	02140512	Town Creek

Domain Description	Code	Code Description
	02130308	Transquaking River
	02130405	Tuckahoe Creek
	02139996	Upper Chesapeake Bay
	02130510	Upper Chester River
	02130404	Upper Choptank
	02130603	Upper Elk River
	02140303	Upper Monocacy River
	02130203	Upper Pocomoke River
	02131005	West Chesapeake Bay
	02131004	West River
	02131103	Western Branch
	02130303	Wicomico Creek
	02140106	Wicomico River
	02130304	Wicomico River Head
	02141003	Wills Creek
	02130503	Wye River
	05020201	Youghiogheny River
	02140108	Zekiah Swamp

dMDPLandUse

Domain Description	Code	Code Description
Predominant Land Use	242	Agricultural Building
	20	Agriculture
	72	Bare Exposed Rock
	73	Bare Ground
	70	Barren Land
	71	Beaches
	44	Brush
	14	Commercial
	21	Cropland
	41	Deciduous Forest
	42	Evergreen Forest
	17	Extractive
	24	Feeding Operations
	241	Feeding Operations (except commercial fishing areas)
	40	Forest
	13	High Density Residential
	15	Industrial
	16	Institutional
	191	Large Lot Subdivision (Agriculture)
	192	Large Lot Subdivision (Forest)
	11	Low Density Residential
	12	Medium Density Residential
	43	Mixed Forest
	18	Open Urban Land
	23	Orchards/Vineyards/Horticulture
	22	Pasture
	25	Row and Garden Crops
	80	Transportation
	10	Urban Built-up

Domain Description	Code	Code Description
	50	Water
	60	Wetlands

dNutrValue

Domain Description	Code	Code Description
The Type of Value Used for Nutrient Concentrations	D	Default (estimate) approved by the Chesapeake Bay Program
	M	Direct measurement

dOdor

Domain Description	Code	Code Description
Type of Odor	G	Gas
	N	None
	OL	Oil
	RS	Rancid-Sour
	SE	Sewage
	S	Sulfur
	OTH	Other

dOn_OffSite

Domain Description	Code	Code Description
On or off site BMP	ON	On Site
	OFF	Off Site

dOutfallMaterial

Domain Description	Code	Code Description
Outfall Material Type	ASRP	Aluminum Spiral Rib Pipe
	ACCMP	Asphalt Coated Corrugated Metal Pipe
	BCCMP	Bituminous Coated Corrugated Metal Pipe
	CIP	Cast Iron Pipe
	CONC	Concrete
	CMP	Corrugated Metal Pipe
	HDPE	High Density Polyethylene
	PVC	Polyvinyl Chloride (PVC) Pipe
	RCP	Reinforced Concrete Pipe
	STR	Stream
	SPP	Structural Plate Pipe
	TCP	Terracotta Pipe
	UNK	Unknown
	VC	Vitrified Clay
	OTH	Other

dOutfallType

Domain Description	Code	Code Description
Outfall Type	CV	Culvert
	ES	Endsection
	EW	Endwall
	HW	Headwall
	IN	Inlet
	MH	Manhole
	PP	Projecting Pipe
	OTH	Other

dPassFail

Domain Description	Code	Code Description
BMP Status	F	Fail
	P	Pass

dPollutant

Domain Description	Code	Code Description
TMDL Pollutant	AL	Aluminum – lbs/yr
	NH	Ammonia (Total)– lbs/yr
	AS	Arsenic
	BOD	Biochemical Oxygen Demand – lbs/yr
	CD	Cadmium
	UNK	Cause Unknown
	CHDN	Chlordane –µg/L
	CLRD	Chlorides
	CPF	Chlorpyrifos
	CR	Chromium (Total)
	CU	Copper
	CN	Cyanide
	DFT	Debris/Floatables/Trash
	E	Enterococcus – Billion MPN/Day
	ECOLI	Escherichia coli
	FC	Fecal Coliform – Billion Counts/Day
	HEP	Heptachlor Epoxide
	FE	Iron – lbs/yr
	PB	Lead
	MN	Manganese
	HG	Mercury – grams/yr
	NI	Nickel
	N	Nitrogen (Total) – lbs/yr
	NA	Not Applicable
	OL	Oil spill - PAHs
	PCB	PCB – grams/yr
	PH	pH
	P	Phosphorus (Total)
	PCB	Polychlorinated Biphenyls – lbs/yr
	SED	Sedimentation/Siltation
	SE	Selenium
	AG	Silver
	SULF	Sulfates – lbs/yr

Domain Description	Code	Code Description
	TEMP	Temperature, Water
	TSS	Total Suspended Solids (TSS) – tons/yr
	TOX	Toxics
	ZN	Zinc
	OTH	Other

dPrefix

Domain Description	Code	Code Description
Prefix	DR	Dr.
	MR	Mr.
	MRS	Mrs.
	MS	Ms.
	OTH	Other

dQrtInsp

Domain Description	Code	Code Description
Inspections Conducted	Y	Yes
	N	No
	EX	Exempt

dQuality

Domain Description	Code	Code Description
Qualitative Description of Sample or Habitat	1	Excellent
	2	Good
	3	Fair
	4	Poor

dQuarter

Domain Description	Code	Code Description
Quarter of the Year	Q1	Quarter 1
	Q2	Quarter 2
	Q3	Quarter 3
	Q4	Quarter 4

dShrProtocol

Domain Description	Code	Code Description
Protocol of Shoreline Restoration	P1	Protocol 1
	P2	Protocol 2
	P3	Protocol 3
	P4	Protocol 4
	IR	Interim Rate

dSource

Domain Description	Code	Code Description
Source of the Illicit Discharge	L	Laundry Washwater (residential or commercial)
	V	Commercial and Mobile Vehicle Washing
	F	Floor Drains
	C	Sanitary Direct Connection
	E	Sewer Pipe Exfiltration
	D	Drinking Water Transmission Loss
	S	Dry Weather Sanitary Sewer Overflows
	O	Other Illicit Discharge – Explanation required in general comments
	N	Non-illicit Discharge (e.g., firefighting activities) – Explanation required in general comments
	U	Unknown – Explanation required in general comments

dState

Domain Description	Code	Code Description
State	AL	Alabama
	AK	Alaska
	AZ	Arizona
	AR	Arkansas
	CA	California
	CO	Colorado
	CT	Connecticut
	DE	Delaware
	FL	Florida
	GA	Georgia
	HI	Hawaii
	ID	Idaho
	IL	Illinois
	IN	Indiana
	IA	Iowa
	KS	Kansas
	KY	Kentucky
	LA	Louisiana
	ME	Maine
	MD	Maryland
	MA	Massachusetts
	MI	Michigan
	MN	Minnesota
	MS	Mississippi
	MO	Missouri
	MT	Montana
	NE	Nebraska
	NV	Nevada
	NH	New Hampshire
	NJ	New Jersey
	NM	New Mexico
	NY	New York
	NC	North Carolina
	ND	North Dakota

Domain Description	Code	Code Description
	OH	Ohio
	OK	Oklahoma
	OR	Oregon
	PA	Pennsylvania
	RI	Rhode Island
	SC	South Carolina
	SD	South Dakota
	TN	Tennessee
	TX	Texas
	UT	Utah
	VT	Vermont
	VA	Virginia
	WA	Washington
	WV	West Virginia
	WI	Wisconsin
	WY	Wyoming
	DC	Washington DC

dStationLoc

Domain Description	Code	Code Description
Station Location	IN	Instream
	OUT	Outfall
	OTH	Other

dStationType

Domain Description	Code	Code Description
Station Type	BIO	Biological
	CHEM	Chemical
	PHYS	Physical

dStormBaseflow

Domain Description	Code	Code Description
Is Sample Storm or Base Flow	BF	Base Flow
	S	Storm

dStrProtocol

Domain Description	Code	Code Description
Protocol of Stream Restoration	P1	Protocol 1
	P2	Protocol 2
	P3	Protocol 3
	P4	Protocol 4
	IR	Interim Rate

dStructCond

Domain Description	Code	Code Description
Structural Condition of Outfall	CC	Concrete Cracking
	SP	Concrete Spalling
	N	Normal
	OTH	Other

dSWPPPlan

Domain Description	Code	Code Description
Stormwater Pollution Prevention Plan	N	No
	NEC	No Exposure Certification
	Y	Yes

dVegCond

Domain Description	Code	Code Description
Vegetative Condition of Outfall	EG	Excessive Growth
	IG	Inhibited Growth
	N	Normal
	OTH	Other

Appendix A: Geodatabase Schema
(This is attached separately as an excel spreadsheet)

Appendix B: The BMP Point of Investigation

Feature Classes for New Development and Restoration BMPs

Description

The **BMP Point of Investigation** (BMPPOI) and **Restoration BMPs** (RestBMP) are feature classes that designate a specific geographical point. These feature classes contain information about the stormwater management practice or practices used for new development and redevelopment (BMPPOI) and restoration (RestBMP) within the drainage or study area to that point. Where redevelopment projects are used to address both regulatory and restoration requirements, both feature classes should be completed. The information contained in these feature classes is used for determining the effects of stormwater management practices on local hydrology and assessing regulatory compliance and/or local restoration efforts.

The point of investigation (POI) used for either feature class represents a single stormwater management practice or a system of stormwater management practices within a specified drainage area. For individual practices with larger drainage areas, like ponds and wetlands, the POI is the discharge point, or outfall, from the individual practice. For smaller scale practices (e.g., filtering systems) and newer environmental site design (ESD) systems, the POI is represented by the outfall from the drainage area containing these practices. Drainage areas with nested BMPs are also considered as a system of practices that have just one outfall. A further explanation for each of these cases and a **Frequently Asked Questions** section are provided below.

Case 1: Single BMPs

Large-scale structural BMPs may be used to address new development stormwater management or MS4 restoration requirements. Typically, the location of the POI in these situations is the outfall from the BMP. Where this practice was used for new development, the related attribute table will include important information about the drainage area to the practice including its size and characteristics (e.g., land use, impervious area). Practice specific information will include design criteria (e.g., the rainfall depth and amount of runoff captured and treated), construction date, and current maintenance status. This information demonstrates compliance with both State and local stormwater management requirements.

When these larger structural BMPs are constructed and/or modified to meet MS4 restoration requirements, the location of the POI is also the outfall from the practice. In these cases, the related attribute table will identify the practice as an MS4 restoration project. The practice specific information then is used to determine the appropriate impervious area credit. A full list of structural BMPs is shown in Table 1 below for reference.

TABLE 1. STRUCTURAL BMPs*

Ponds	Wetlands	Infiltration	Filtering Systems	Open Channel Systems
Micropool Extended Detention Pond	Shallow Wetland	Infiltration Trench	Surface Sand Filter	Dry Swale
Wet Pond	ED Shallow Wetland	Infiltration Basin	Underground Sand Filter	Wet Swale
Wet Extended Detention Pond	Pond/Wetland System		Perimeter Sand Filter	
Multiple Pond System	Pocket Wetland		Organic Sand Filter	
Pocket Pond			Pocket Sand Filter	
			Bioretention	

*See Chapter 3 of the *2000 Maryland Stormwater Design Manual* (MDE, 2000 & 2009) for detailed descriptions

Case 2: Multiple Practices

Multiple small-scale BMPs and/or design techniques (e.g., environmental site design, or "ESD") often are combined together to provide stormwater management for a specific drainage area. Where this occurs, the location of the POI should be the outfall from that drainage area. The related attribute table will contain information about the drainage area like its size and characteristics (e.g., land use, impervious area). This includes design criteria (e.g., the rainfall depth and amount of runoff captured and treated) that demonstrate compliance with stormwater management requirements for the drainage area. The table also identifies the types and numbers of the individual practices within that drainage area. The list of ESD practices is shown in Table 2 below.

Multiple BMPs can be implemented over a broad area to meet MS4 restoration requirements where there is no existing management. Where this occurs, there are two options for submitting information. When the BMPs are larger in scale and/or there are a small number of BMPs that are far apart, it may be easier to identify each BMP with its own POI. When this option is used, the attribute table(s) should include all pertinent information including land use, impervious area, design criteria, and practice status needed to determine impervious area credits.

A second option considers the BMPs as a system of practices providing stormwater treatment. This option should be used where there are a large number of smaller scale practices (e.g., rain gardens, micro-bioretention) that are more uniformly distributed throughout an area. This is similar to using multiple practices for new development. Again, the POI should be the outfall from the drainage area containing the group of practices. The collection of practices can be used in aggregate to determine the rainfall depth managed at the selected outfall. As additional practices are implemented within the selected drainage area, the information contained in the feature class and attribute tables will need to be revised to receive appropriate MS4 impervious area credit.

TABLE 2. ESD TECHNIQUES & PRACTICES*

Alternative Surfaces	Non-Structural Practices	Micro-Scale Practices	
Green Roof	Disconnection of Rooftop Runoff	Rainwater Harvesting	Submerged Gravel Wetlands
Permeable Pavement	Disconnection of Non-Rooftop Runoff	Landscape Infiltration	Infiltration Berms
Reinforced Turf	Sheetflow to Conservation Areas	Dry Wells	Micro-Bioretention
		Rain Gardens	Swales
		Enhanced Filters	

*See Chapter 5 of the *2000 Maryland Stormwater Design Manual* (MDE, 2000 & 2009) for detailed descriptions

Case 3: A Larger BMP (e.g., Regional Pond) with Nested BMPs (Structural and/or ESD Practices)

This situation occurs where there is a larger BMP located in the lower end of a drainage area and there are several smaller scale practices distributed throughout that drainage area. Because there is a large-scale BMP at the lower end, this case is similar to the single BMP described in Case 1 above. The location of the POI should be the outfall from the larger BMP. The related attribute table will include important information about the drainage area to this POI including its size and characteristics (e.g., land use, impervious area). The table also identifies the types and numbers of the nested practices (whether structural or ESD practices), and any BMP-specific information for these practices. The cumulative effects of the individual practices are factored into the larger practice's performance to determine any applicable restoration credits. Any additional BMPs that are implemented within the drainage area as part of MS4 restoration requirements will need to be added to the related attribute table. Additionally, a new rainfall depth will need to be calculated for the larger BMP in order to receive additional impervious area credit.

Frequently Asked Questions

<u>Question 1:</u> *My County has installed numerous rain barrels and rain gardens in the Clear Skies subdivision, which already has a wet pond that accepts runoff from the entire drainage area. How should I submit these new small practices for credit?*

Answer: There should already be a BMP point feature associated with the wet pond. The location of the point feature remains unchanged; however, the related attribute table should be modified to indicate the presence of the newly installed rain barrels and rain gardens. In addition, the rainfall depth captured and treated by the rain barrels and rain gardens should be added to the existing rainfall depth being managed by the wet pond for additional impervious area and Chesapeake Bay Program efficiency credit.

<u>Question 2:</u> *My city has approved a new development project that effectively uses sheetflow to conservation areas and there is no concentrated discharge or outfall point. Where shall I locate my BMP point feature?*

Answer: As a part of new development (per MDE regulations) there is a downstream point where regulatory compliance was demonstrated during the plan approval process. This point will be your POI.

<u>Question 3:</u> My jurisdiction is encouraging homeowners to implement rain gardens that are going in above existing BMP drainage areas, and in neighborhoods built before the 1980's where there is no stormwater management. Can I just submit all of these rain gardens as one lump sum?

Answer: Rain gardens that are in older areas where there is currently no stormwater management may be submitted practice by practice for credit. However, as the watershed becomes more managed, it may make sense to pick a downstream outfall and treat all of the rain gardens as a system of practices with one discharge point, as described under **Case 2: ESD to the MEP Practices**. If the rain gardens are being implemented above an existing stormwater management facility, then they will need to be aggregated into a system of BMPs with the existing structure's outfall representing the BMP point feature, otherwise the newly implemented practices may be double-counting impervious acres treated. The level of management for this downstream BMP, however, may be adjusted to receive greater impervious area or Chesapeake Bay Program pollutant removal efficiency credit.

Appendix C: Alternative BMP Geodatabase Guidance

ALTERNATIVE BMPs

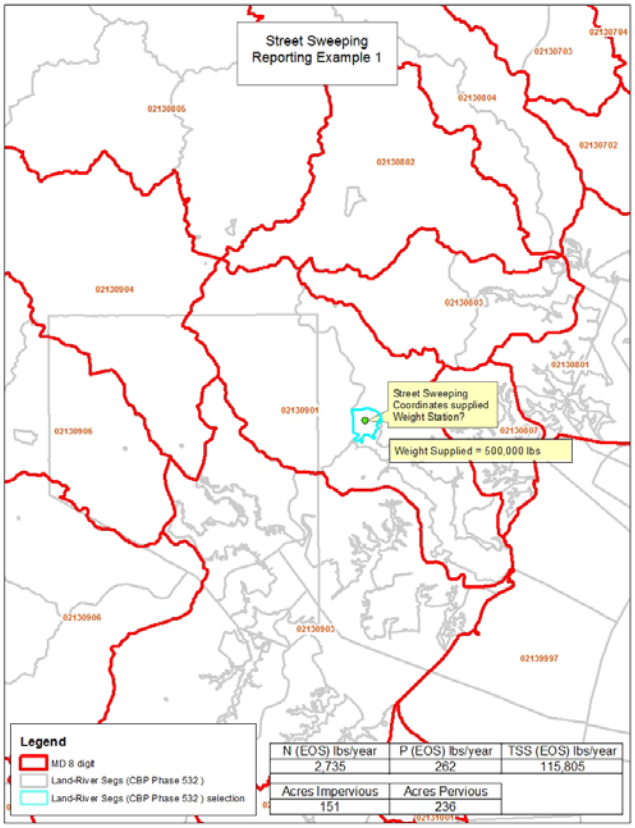
The National Pollutant Discharge Elimination System (NPDES) municipal separate sewer systems (MS4) permits require the restoration of a certain percentage of a jurisdiction's impervious surface area that has little or no stormwater management. The Maryland Department of the Environment (MDE) document "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated" (August 2014) provides a list of acceptable stormwater Best Management Practice (BMPs) for impervious area restoration. Also provided are additional practices known as *alternative BMPs* which do not have a clearly defined drainage area but may be used for water quality treatment. Examples of alternative BMPs include street sweeping, catch basin cleaning and storm drain vacuuming, tree planting and reforestation, stream restoration, shoreline stabilization, and septic system upgrades. MDE's User's Guide shows how these activities can be graphically represented in the MS4 geodatabase to ensure that maximum credit is received under the Chesapeake Bay Program (CBP) when alternative BMPs are used for restoration

A. Street Sweeping/Catch Basin Cleaning/Storm Drain Vacuuming

Street sweeping, catch basin cleaning, and storm drain vacuuming are routine maintenance activities performed on targeted infrastructure where high pollutant accumulation rates are observed. They may be implemented by local jurisdictions to reduce pollutants associated with roadways and parking lots. The pollutant load reductions achieved by these practices are reported as pounds (lbs) of material removed. In order to allocate credit to these activities, coordinates are randomly selected by MDE for the local jurisdiction at a point that the Chesapeake Bay Program (CBP) model can use. However, if a jurisdiction reports these activities using a large or county-wide geographic area, then unintended consequences such as loss of credit may occur. A few examples using street sweeping practices are provided below.

If a jurisdiction reports that for street sweeping activities, a total of 500,000 lbs of material was removed from the 8-digit watershed 02130901, then MDE will randomly select coordinates within the watershed 02130901 for submittal to the CBP model. In this example, the coordinates represented by the point fall in a small Land-River (L-R) segment (see figure 1). The CBP model may take that point and apply the reductions to that L-R segment only. In this case the L-R segment does not contribute as much material (nitrogen, phosphorous, sediment) on an annual basis as the amount of material collected through street sweeping. Any additional material, above the amount contributed by the L-R segment, will not be accepted by the CBP model.

Figure 1.



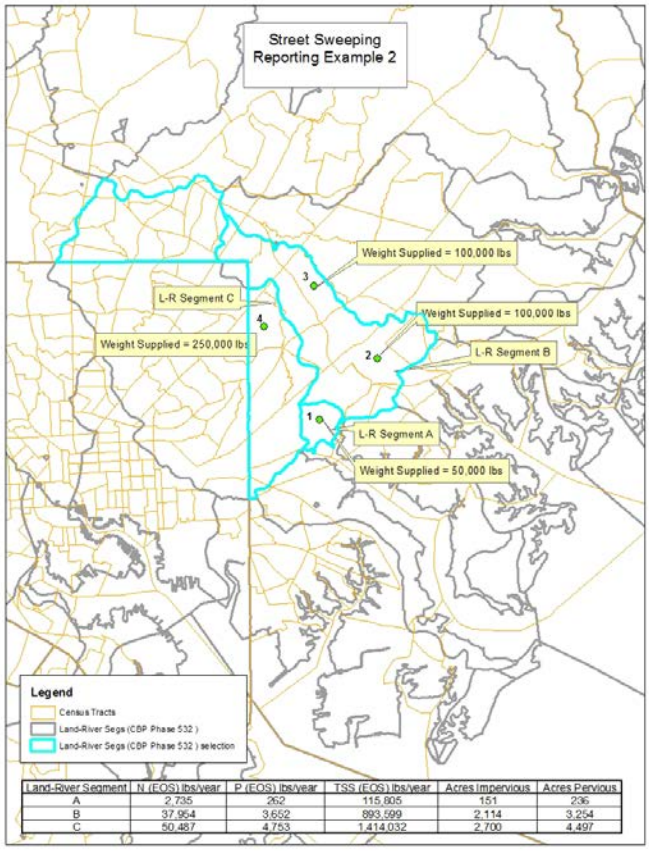
MDE is recommending that jurisdictions use the census block, tract, or a classification smaller than the 8-digit watershed when reporting these activities. This method will enable more locations to be placed across the jurisdiction and allow the CBP model to more appropriately assign reductions as demonstrated in the following example. A jurisdiction reports that street sweeping was conducted within four census tracts (see table 1) with the following pounds of removed material:

Table 1.

Census Tract	Pound of Material Removed
1	50,000
2	100,000
3	100,000
4	250,000
Total	500,000

A total of 500,000 lbs of material was removed across the jurisdiction for the reporting year. MDE will randomly select coordinates within each of the census tracts. In this example, the coordinates of the four randomly selected points fall in three different L-R segments (see figure 2). Point 1 falls in the small L-R segment again but in this case, because a much smaller geographic area is being used, only 50,000 lbs are reported for street sweeping activities. This is far less than the CBP estimates for runoff from this watershed, so the full 50,000 lbs reported will be credited. For the remaining street sweeping that is now being recorded using numerous smaller census tract areas, more appropriate points have been selected for accounting in the CBP model and the jurisdiction will receive more reduction credit.

Figure 2.



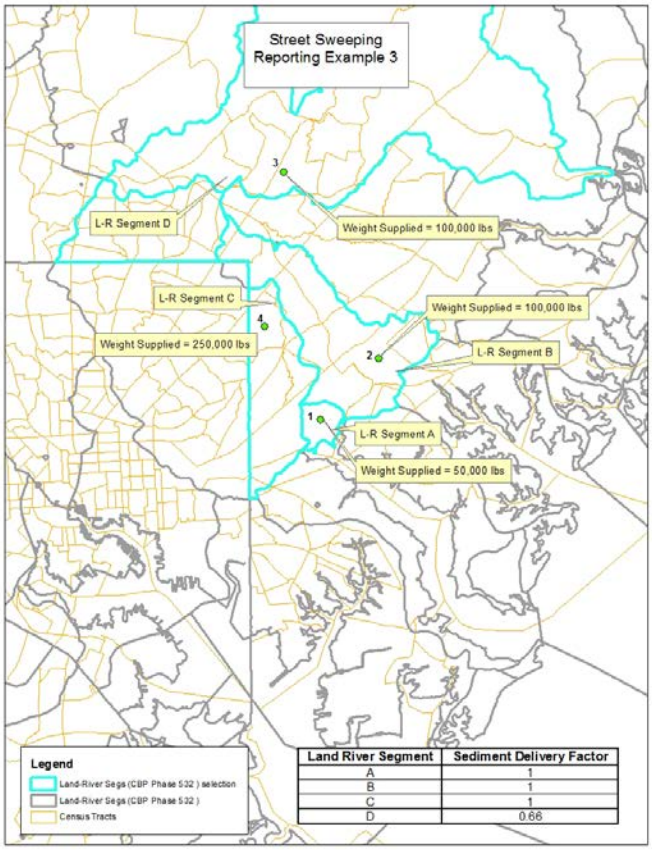
Land-River Segment	N (EOS) lbs/year	P (EOS) lbs/year	TSS (EOS) lbs/year	Acres Impervious	Acres Pervious
A	2,735	262	115,805	151	236
B	37,954	3,652	893,599	2,114	3,254
C	50,487	4,753	1,414,032	2,700	4,497

Delivery factors associated with the CBP model can also have profound effects on materials removed and credit accepted. For example, a jurisdiction reports that a total of 500,000 lbs of material was removed across the jurisdiction during the reporting year. If only one point is randomly selected (L-R segment D, see figure 3), the CBP model, using a delivery factor of 66% (see table 2) will reduce the credit for implementation by 34%. The jurisdiction will receive a material reduction of 330,000 lbs. Using census tracts for reporting, more points will be selected where the delivery factor is greater (1.0), and the jurisdiction will receive more credit for material reduction. In this scenario, the jurisdiction will receive credit for 415,000 lbs of material removed.

Table 2.

Land River Segment	Sediment Delivery Factor	Lbs removed	Lbs (DEL) credited
A	1.0	100,000	100,000
B	1.0	100,000	100,000
C	1.0	50,000	50,000
D	0.66	250,000	165,000
Total			415,000

Figure 3.



In all instances above, a jurisdiction will receive greater pollutant removal credit under the CBP model when smaller geographic areas are designated for street sweeping, catch basin cleaning, and storm drain vacuuming.

Listed below are additional alternative BMPs along with a brief CBP definition and how they should be represented graphically in MDE's MS4 geodatabase. [For specific definitions and documentation of impervious area credits, see MDE's guidance document "Accounting for Stormwater Wasteload

Allocations and Impervious Acres Treated."]. A summary table of all alternative BMPs and how they should be graphically represented can be found in Table 3.

B. Grass/Meadow and Forest Buffers

Buffers are protected areas that are adjacent to a stream or similar body of water. Grass/meadow buffers consist of infrequently-mown grass, meadow flora species, and intermittent trees while forest buffers consist predominately of trees with some shrubs and other vegetation. Whether grass/meadow or forest, buffer areas should be represented as a polygon feature class.

C. Tree Planting and Reforestation

Tree Planting and Reforestation involves the process of transplanting tree seedlings over an area. The project area should be represented as a polygon feature class.

D. Stream Restoration

Stream Restoration can be one or more of the following features: re-establishing a stable channel, reconnecting the stream with the floodplain, introducing habitat features such as step-pools, woody debris or riparian vegetation, and integrating structural approaches such as rock walls or riprap. The length of the stream restoration implementation should be represented as a line feature class.

E. Shoreline Stabilization

Shoreline Stabilization practices apply to the Chesapeake and Atlantic Coastal Bays as well as tidal rivers. Nonstructural practices include tidal marsh creation and beach nourishment while structural practices include stone revetments, breakwaters, or groins. The length of the shoreline stabilization activity should be represented as a line feature class.

F. Septic System Upgrades

Septic System upgrades include the implementation of pumping, enhanced denitrification technology or the removal of the system and reconnection of the waste stream to a wastewater treatment plant. The physical address at which the septic system is located should be represented as a point feature class.

G. Outfall Stabilization

Outfall Stabilization involes the stabilization or repair of localized areas of erosion below a storm drain outfall.

Alternate BMPs Representation in the Geodatabase

Table 3.

Practice Type	Code	GIS Feature Class
Mechanical Street Sweeping	MSS	Polygon
Regenerative/Vacuum Street Sweeping	VSS	Polygon
Catch Basin Cleaning	CBC	Polygon
Storm Drain Vacuuming	SDV	Polygon
Grass/Meadow Buffers	GMB	Polygon
Forest Buffers	FB	Polygon
Planting Trees or Forestation on Pervious Urban	FPU	Polygon
Stream Restoration	STRE	Line
Shoreline Stabilization	SHST	Line
Outfall Stabilization	OUT	Line
Septic Pumping	SEPP	Point (Address)
Septic Denitrification	SEPD	Point (Address)
Septic Connections to WWTP	SEPC	Point (Address)

Appendix C - MDE BRF BAT database users manual

BAT Database Operations

- This document provides a definition of county and vendor responsibilities as well as a guide for the proper use of the database. Please note, this database is only compatible with Internet Explorer. Do not use any other web servers as it may not save all of the work users have put forth.

Vendor Responsibilities:

Vendors are responsible for the initial entry of all BAT installations in the database. Including all funded systems and non funded sytems. Steps 1 through 14 detail how to properly add a BAT installation to the database. Installations must be entered into the database no later than 30 days after the install date.

Vendors that also perform service are required to update service contract information for every property to which they provide service. Vendors who do not perform this task in a satisfactory manner will be removed from the BRF program.

BAT Database Operations

County Responsibilities:

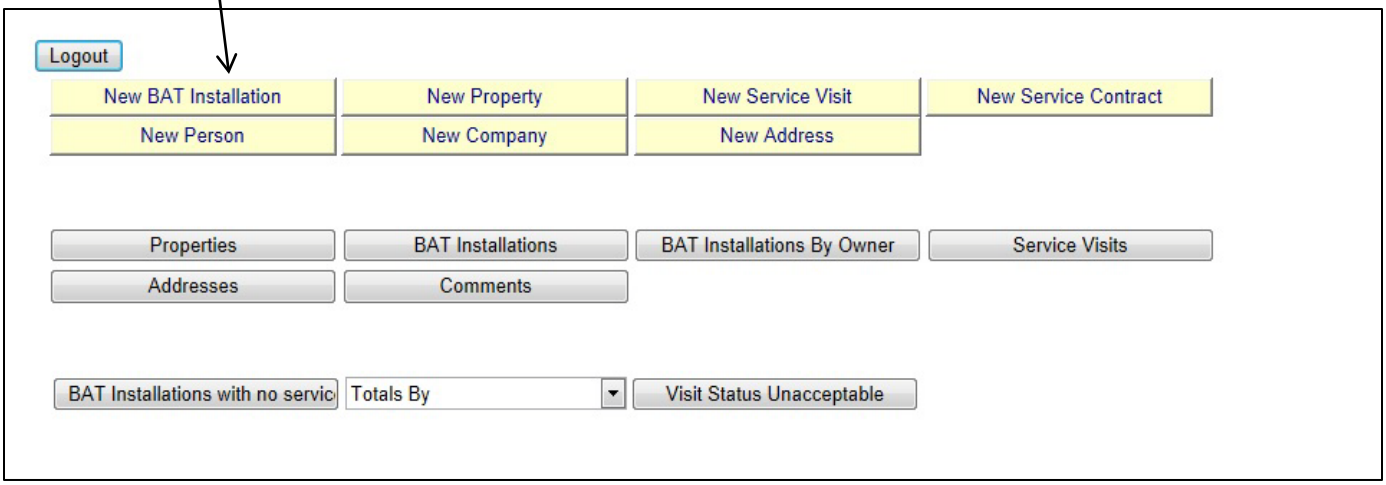
Counties are responsible for quality control checks of the installations that have been entered by the vendors. Counties are to ensure that the information listed is accurate. Counties must provide information on critical area and property owner name if this information was not known by the vendor at the time of entry.

Counties are responsible for entering any BRF-funded public sewer connections, following steps 1-14 , within 30 days of the construction completion date.

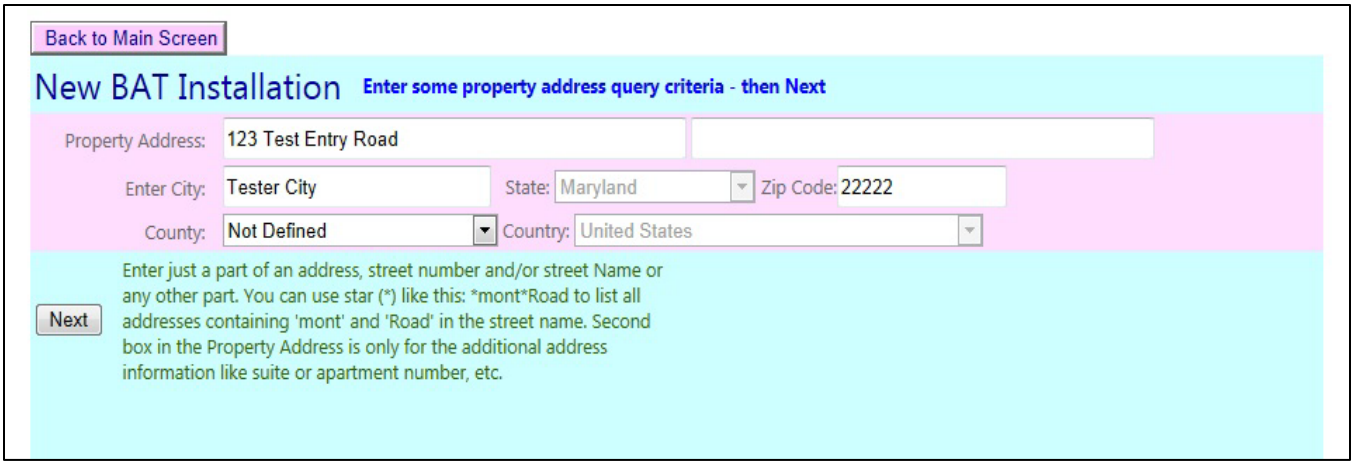
Counties must ensure that all information in the database is up to date and accurate. Counties have until the 5th of every month to ensure that the installations from the previous month are accurate. These quality control checks will take the place of the monthly reporting that was previously given to MDE. Any county that does not complete this task in a satisfactory manner will have HB12 funding withheld.

Section 1: Vendor Responsibilities
Steps 1-14
Entering a BAT Installation

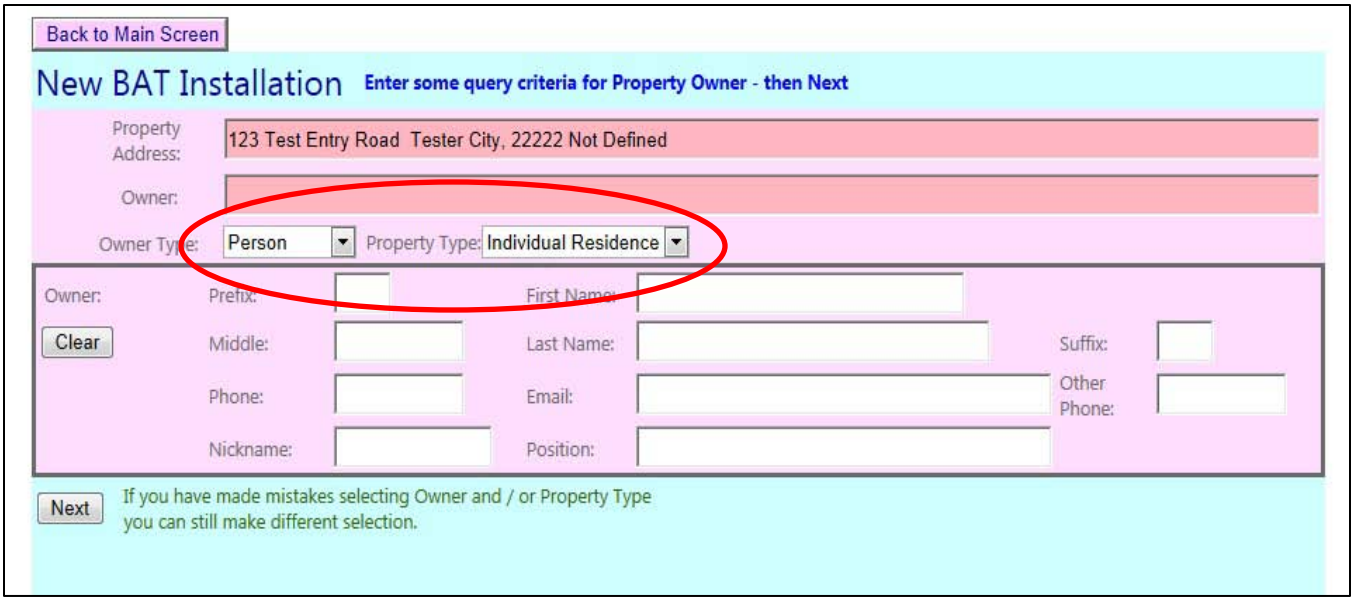
Step 1: The vendor creates the installation profile using the New BAT Installation module.



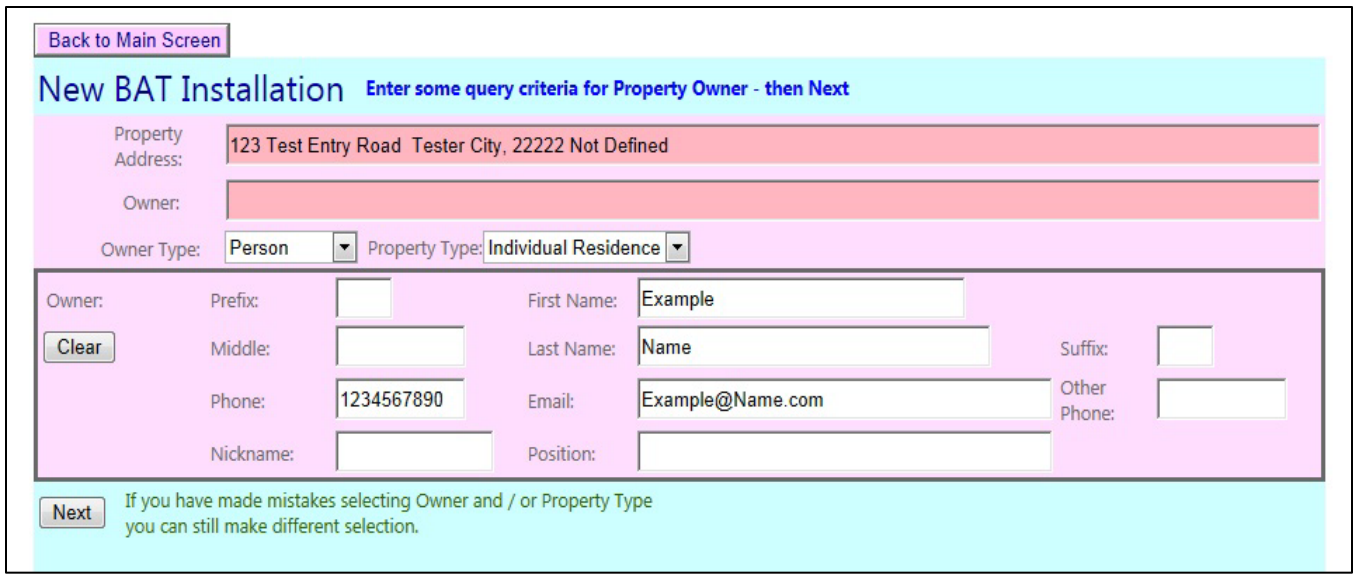
Step 2: Enter the property address, city, zip code, and county. Click Next . Please make sure to spell out words like Road, Street, Lane etc. when entering addresses.



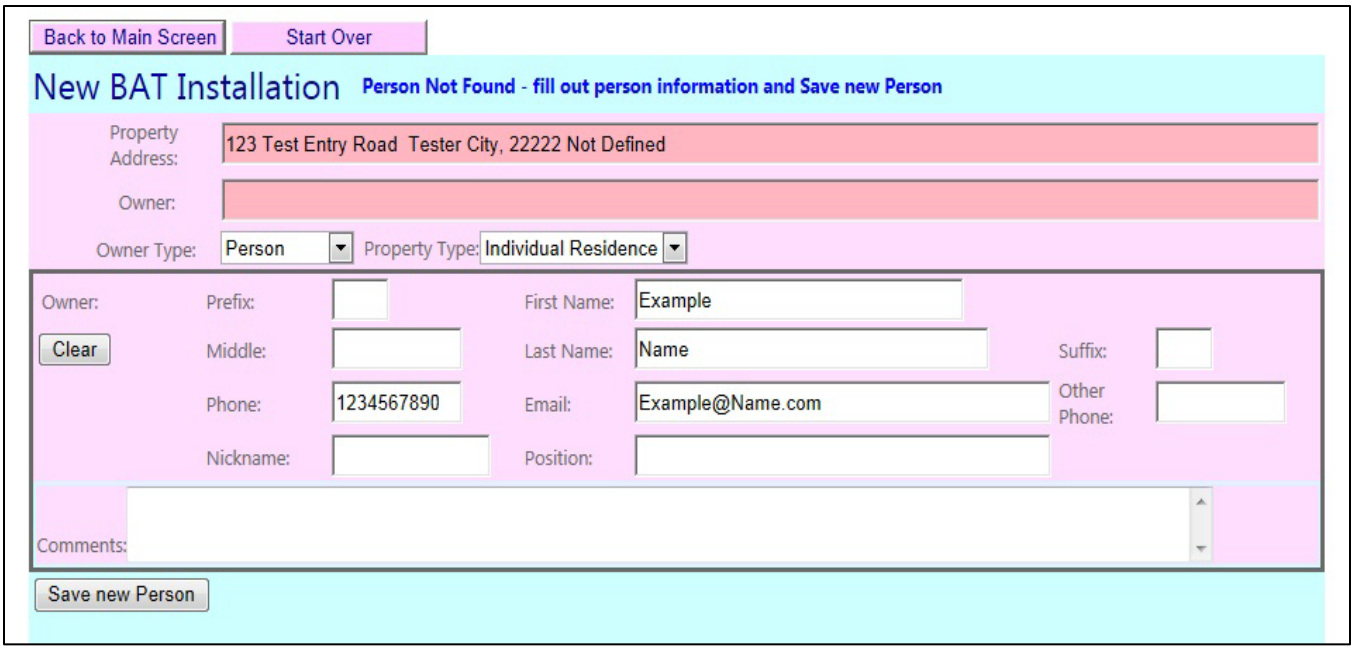
Step 4: Select the Owner Type and Property Type.



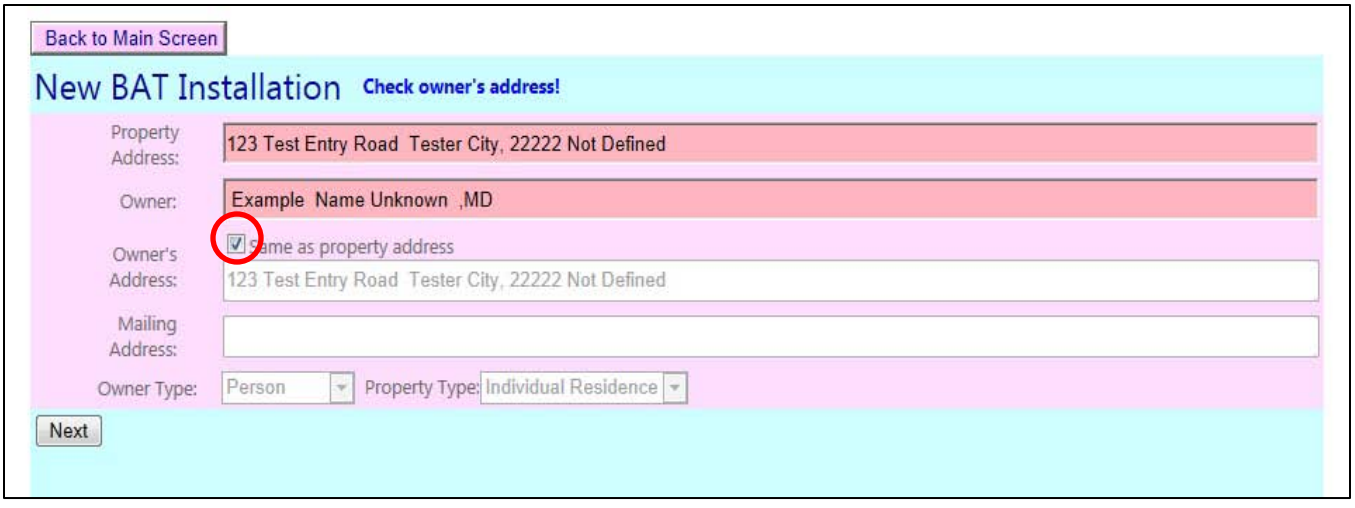
Step 5: Ensure that First Name and Last Name are entered and correct. Other information in this section is optional. Phone number is useful for future use.



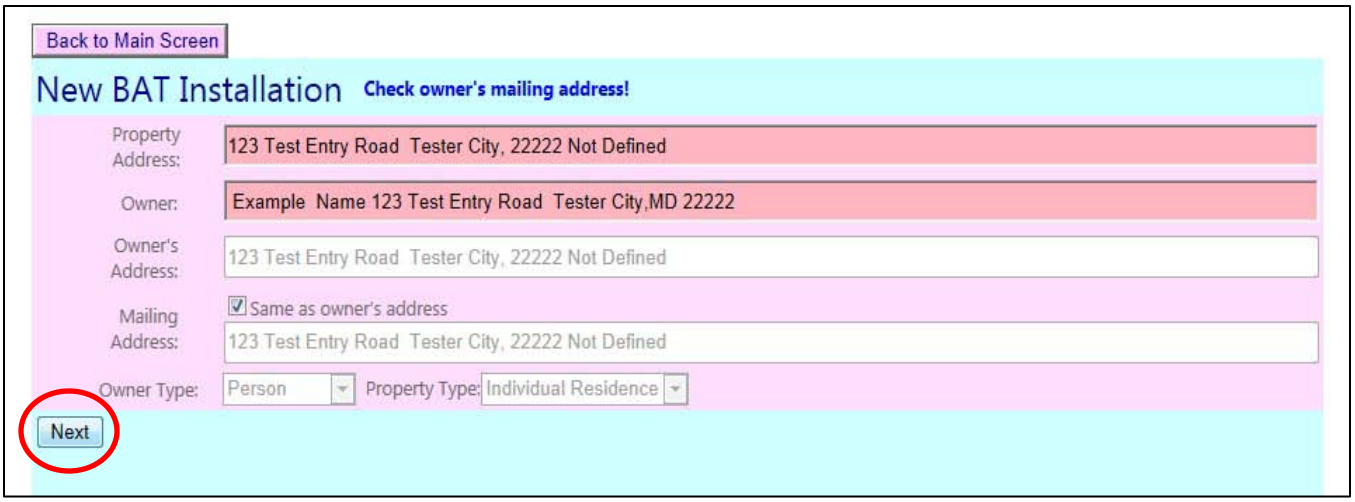
Step 6: Any Comments on Property owner can be entered here. For example, a secondary owner name. Click Save new Person



Step 7: If mailing address is different from the installation address, deselect ☑ Same as property address and enter the mailing address.



Step 8: If the mailing address is the same as the property address, simply click Next to auto-populate the mailing address field with the property address information. Click Next again to save.



Step 9: Optional information. Here you can add any address comments (gate code, call homeowner, BAT location, etc.) if you find them helpful. You can also enter Parcel ID info or site issues. Click Save Property when finished.

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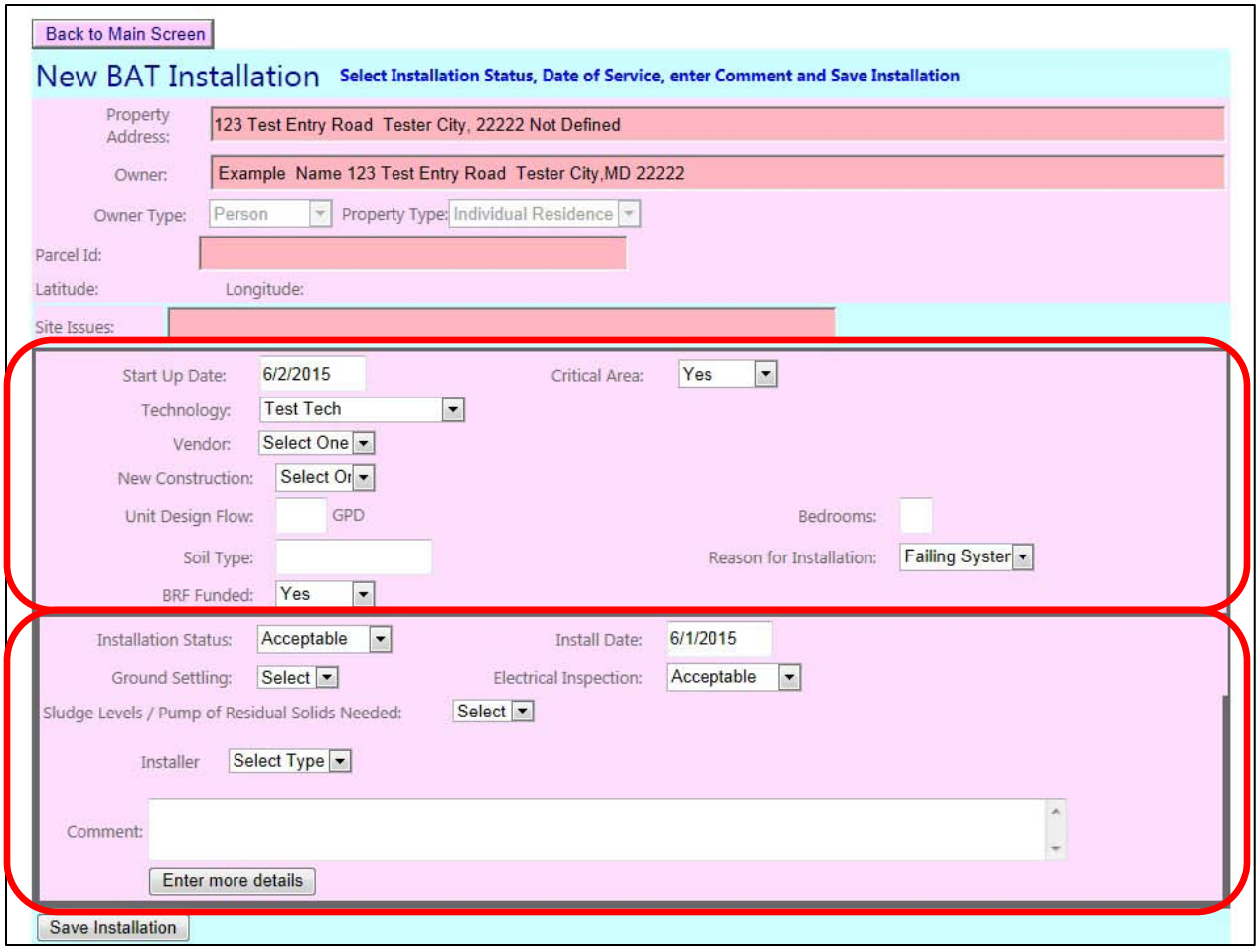
Step 10: Enter Start-Up date , Critical Area, and Technology type. If the system has not yet been started up, leave that field blank.

Step 11: Fill out New Construction, BRF Funded, And Reason for Installation. Add other information if available. Note: County users must also select Vendor.

Step 12: Select the Install Date and add any further comments or details you deem important. Select the Installer from the list.

Step 13. Ensure that all information is complete and accurate. Click Save Installation when complete.

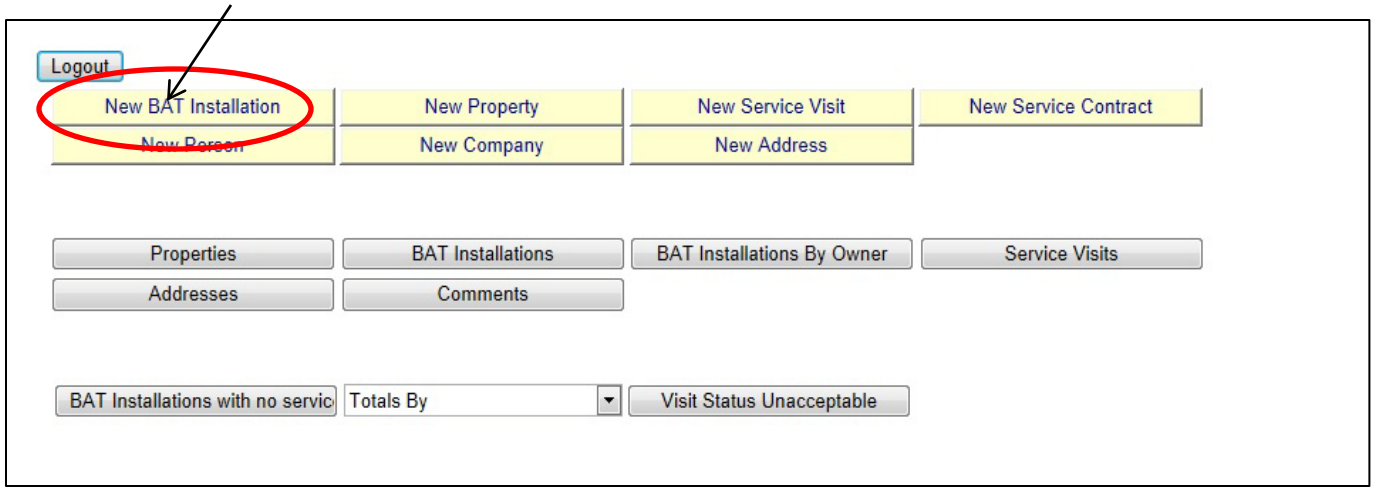


Step 14: You should see the text “Installation added successfully”. You will then be able to Enter Next Installation or return to the main screen.

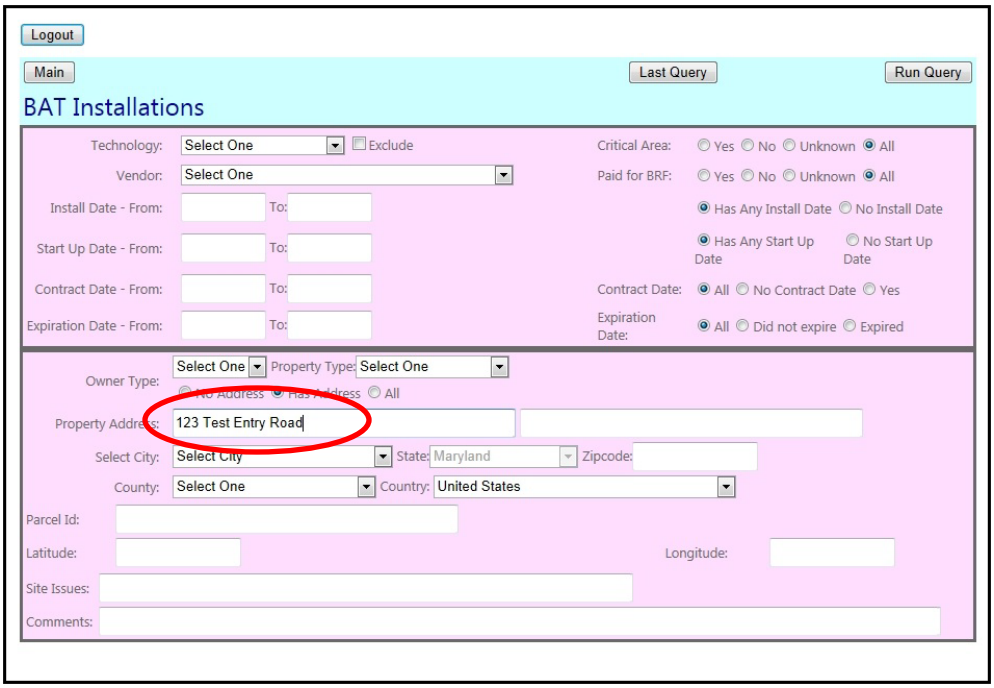
Section 2: County Responsibilities (Levels I, II, and III)

Counties are responsible for entering information that may not be available to vendors at the time of install. This information includes but is not limited to Critical Area, reason for Installation, BRF Funded, and homeowner name. Counties are also responsible for checking the installation details for accuracy.

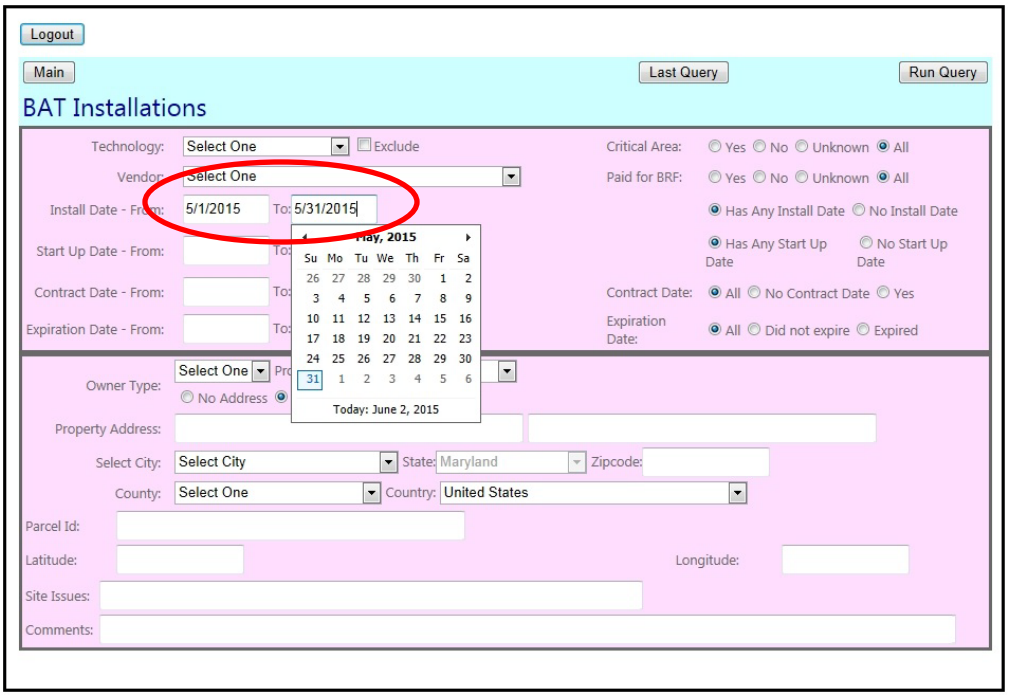
Step 1: Begin by clicking BAT Installations to run a query for the an individual installation or to query a monthly report.

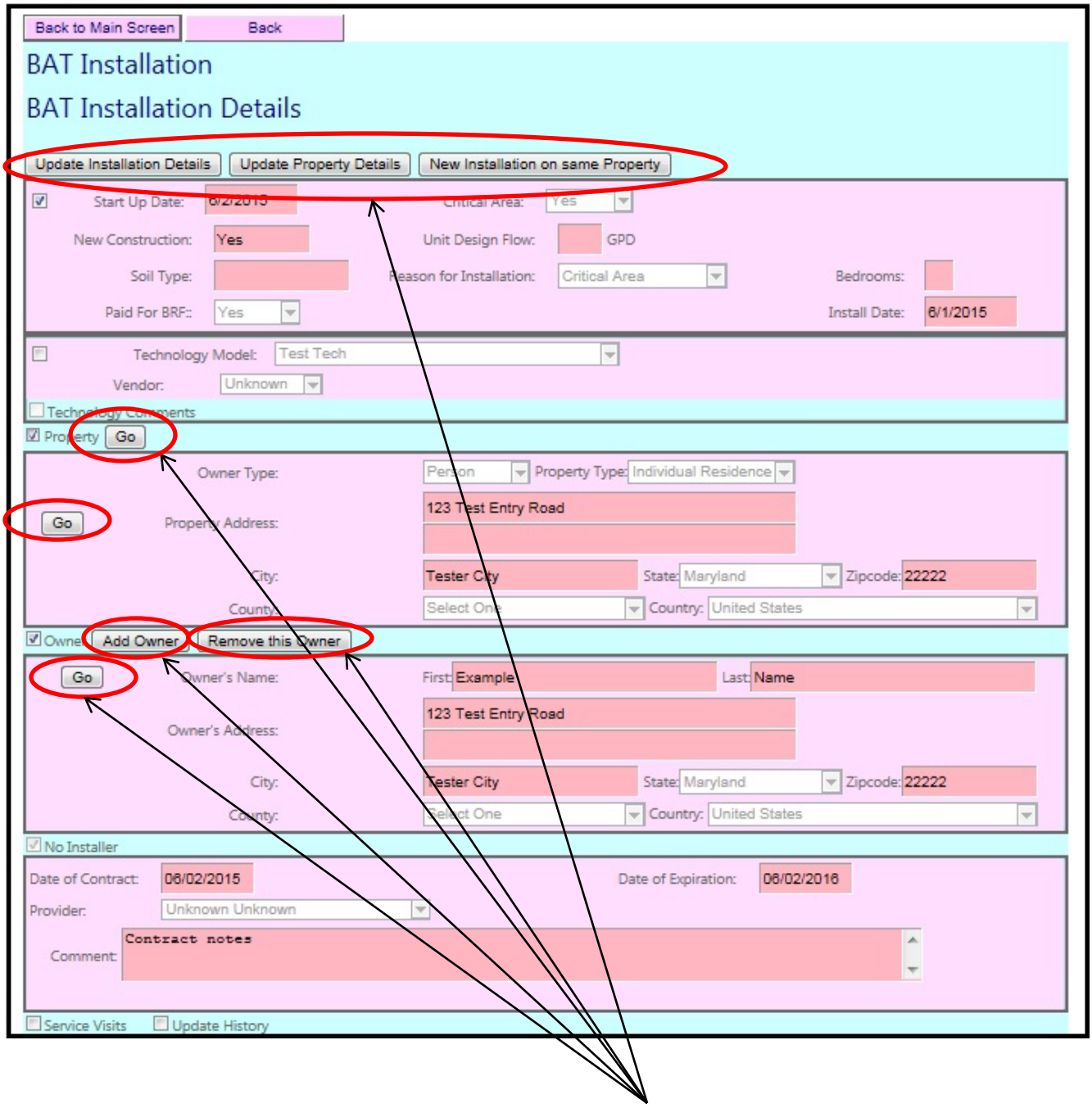


Step 2, Individual Installation: Enter search criteria- in this case, "123 Test Entry Road" and click Run Query



Step 2, Monthly report: For monthly reporting, query by install date, using the first and last dates of the previous month.



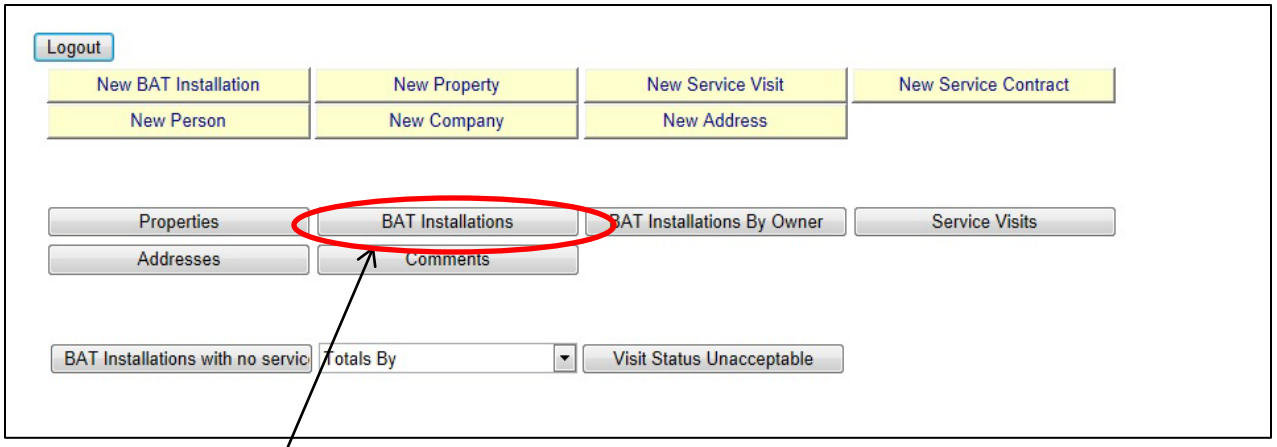


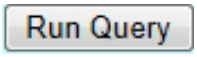
Step 3: Verify that all information for each of the previous month's installations is complete and correct. If any information needs to be added or changed, use the appropriate button for that task. For detailed instructions, refer to the "General Use" section of this guide.

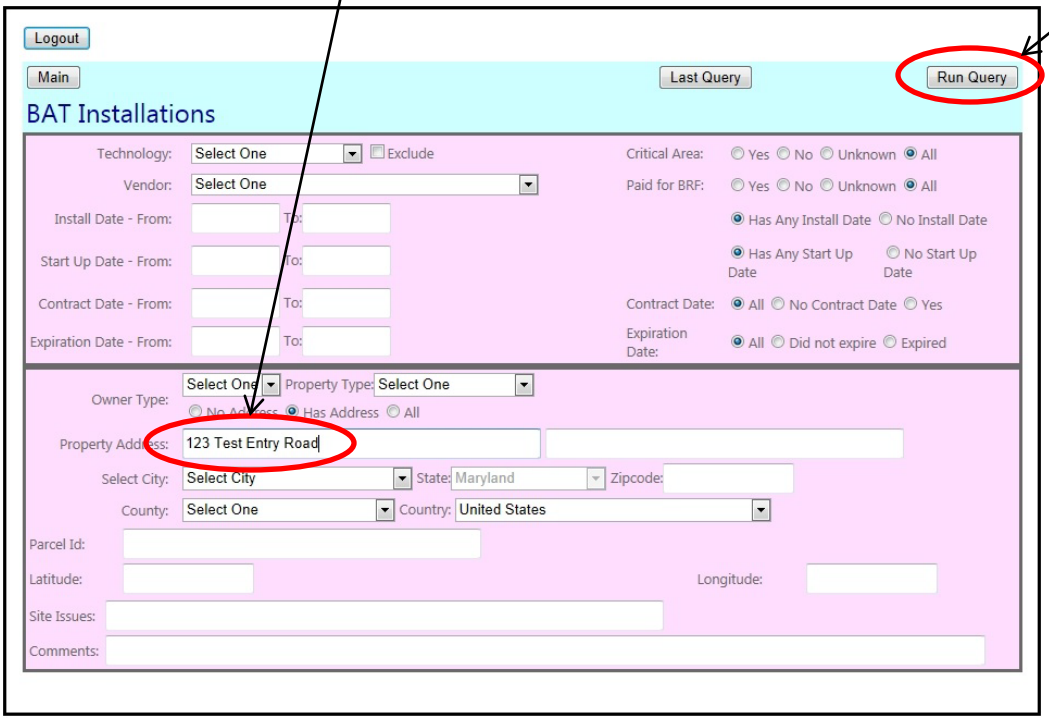
General Use

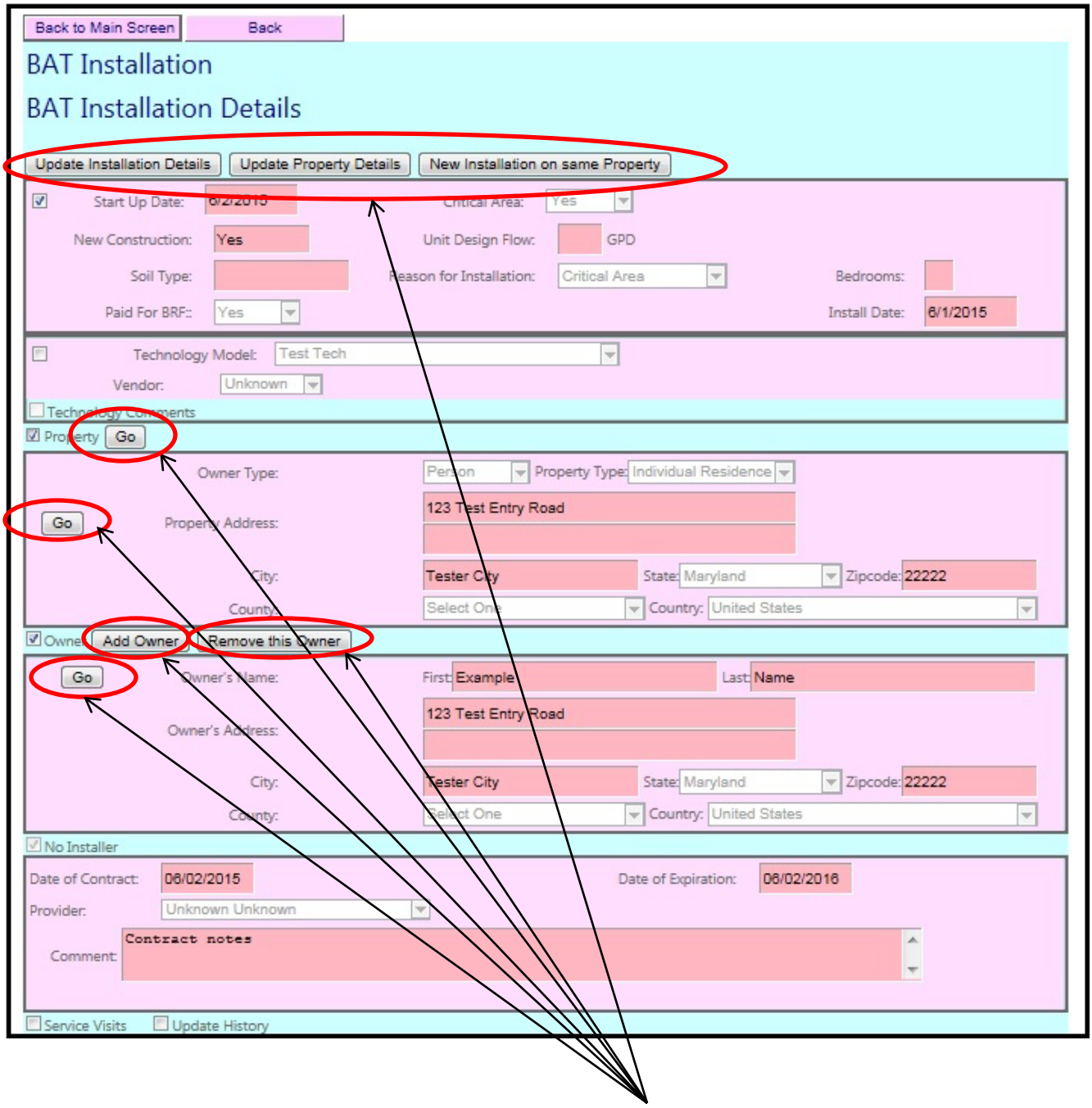
This section provides a general overview for tasks that may be performed by all database users.

Adding or Editing Information to a BAT Installation



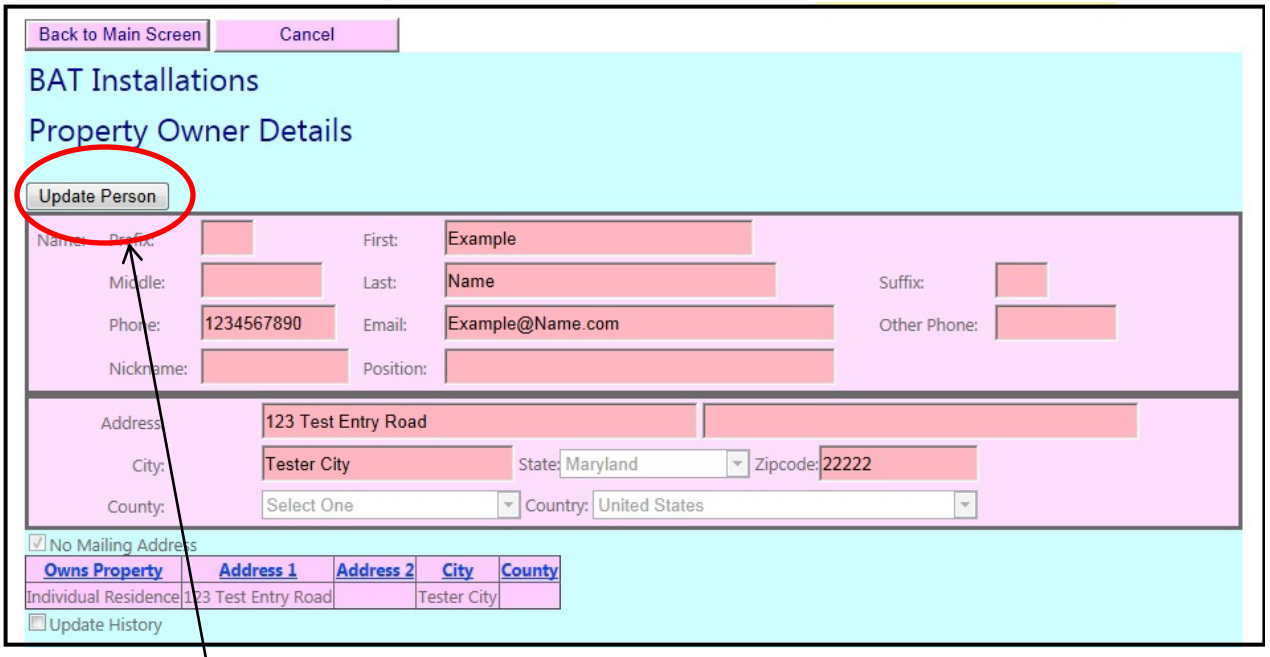
Step 1: Click  and run a query for the particular Property, in this case “123 Test Entry Road” (example only). Then click 



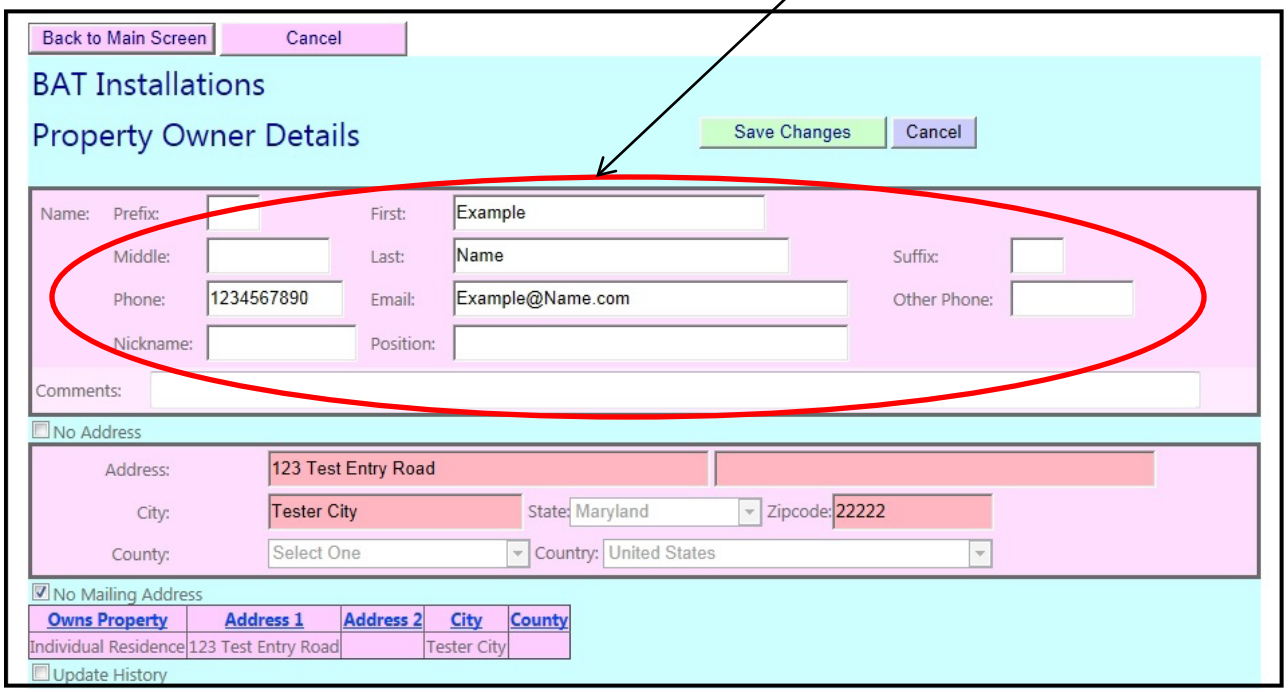


This is the “BAT Installation Details” page from which all editing and additions take place. To add or edit any of the above information, use the button corresponding to the section you wish to edit or change. See the following pages for examples.

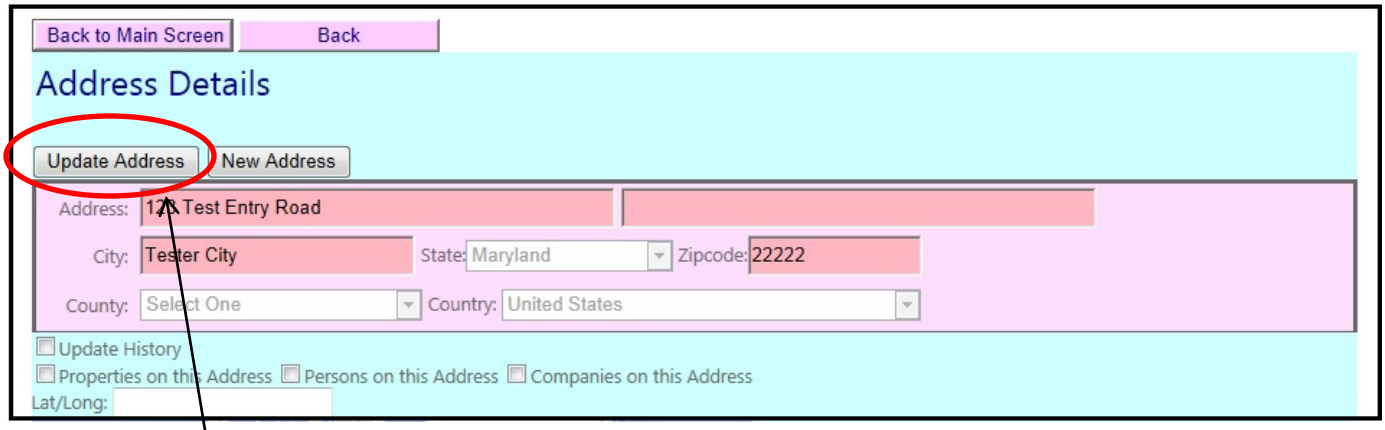
Updating Owner Information



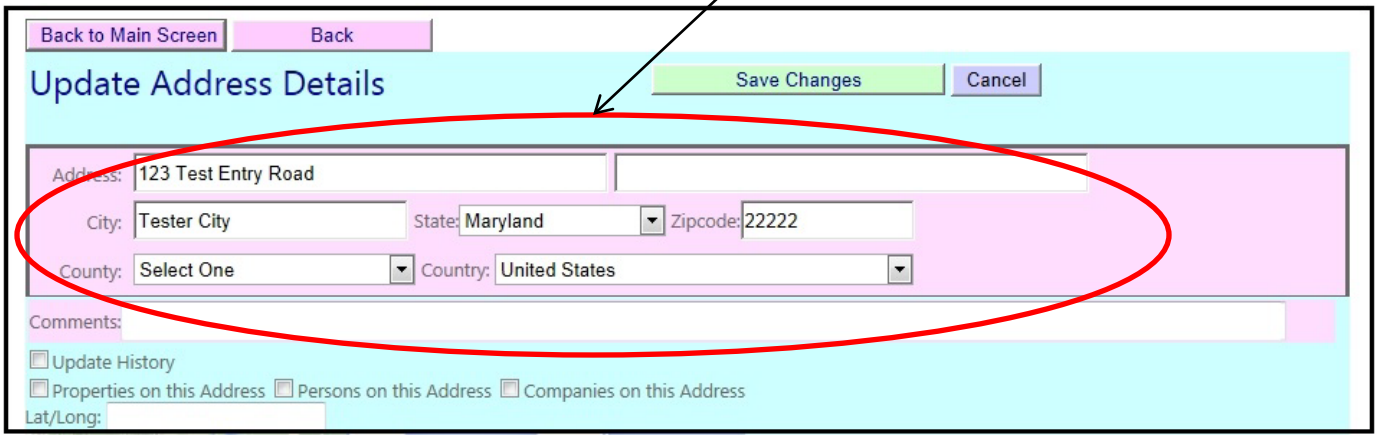
From the "BAT Installation Details" screen, click Go next to the words "Owner Name," then click Update Person Then, you will be able to edit any of the fields in this section. *Important* Click Save Changes when finished.



Updating Address Information

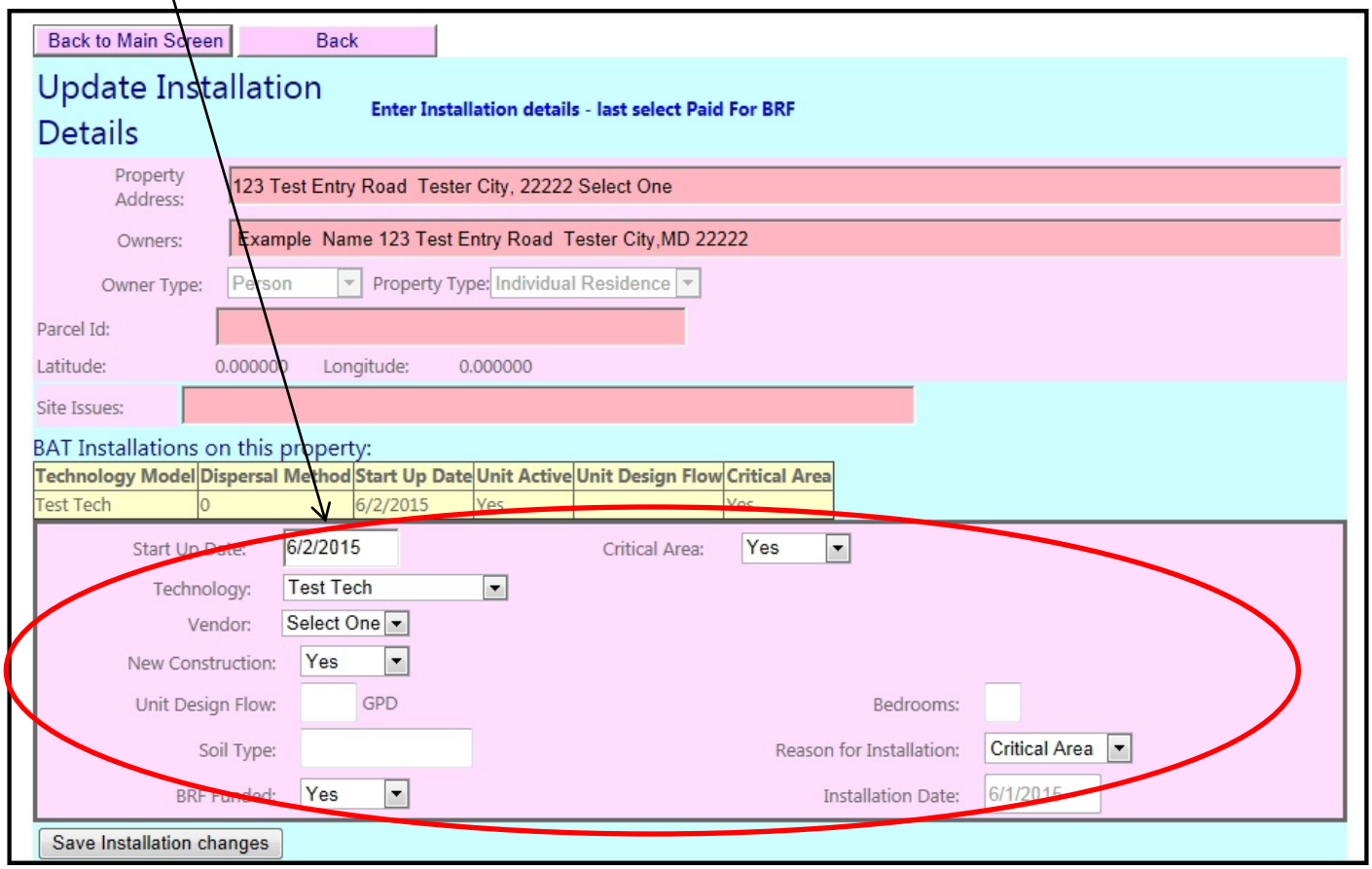


From the "BAT Installation Details" screen, click Go next to the words "Property Address," then click Update Address You will then be able to edit anything in this section. * Important* Click Save Changes when finished .

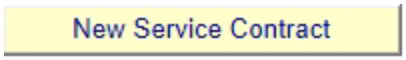


Updating Installation Information

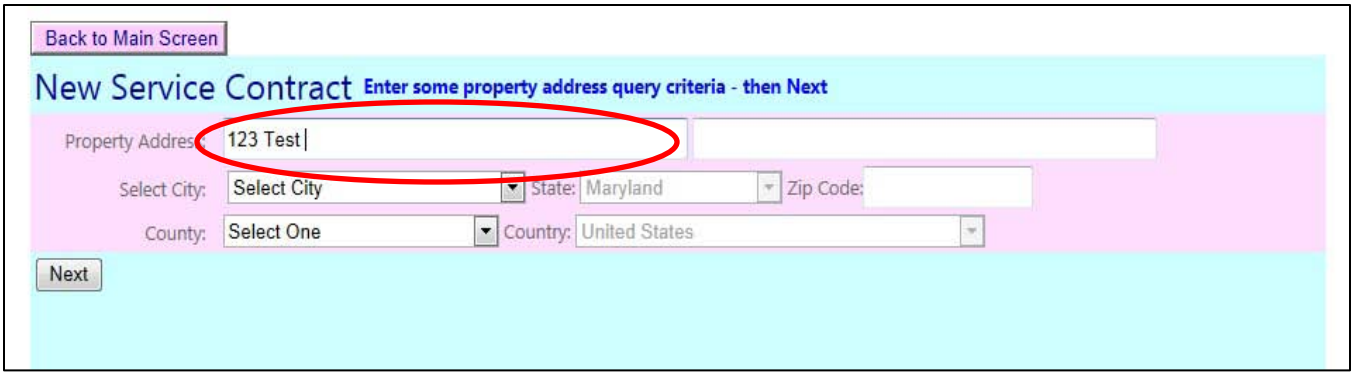
From the “BAT Installation Details” screen, click Update Installation Details Then you will be able to edit anything in this Section.* Important* Click Save Installation changes when finished .



Service Contracts

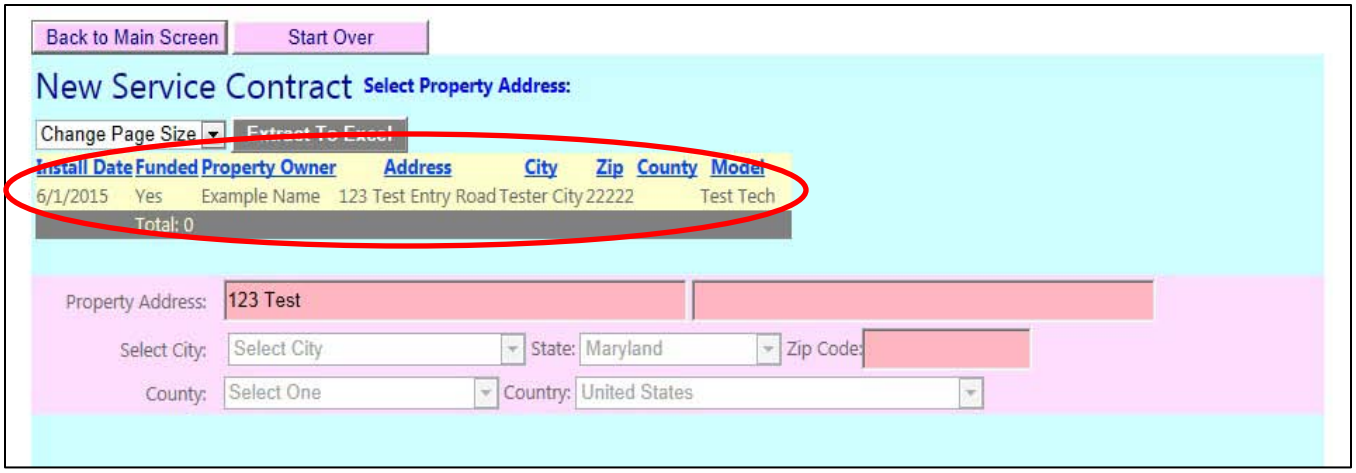
1. When you have a new service contract with a homeowner, you can enter the contract service dates into the database for compliance tracking. Click 

2. Begin by querying the address you want to add a contract on. You do not need to enter the entire address, simply enter the house number and the first name of the street name. For example, 123 Test.

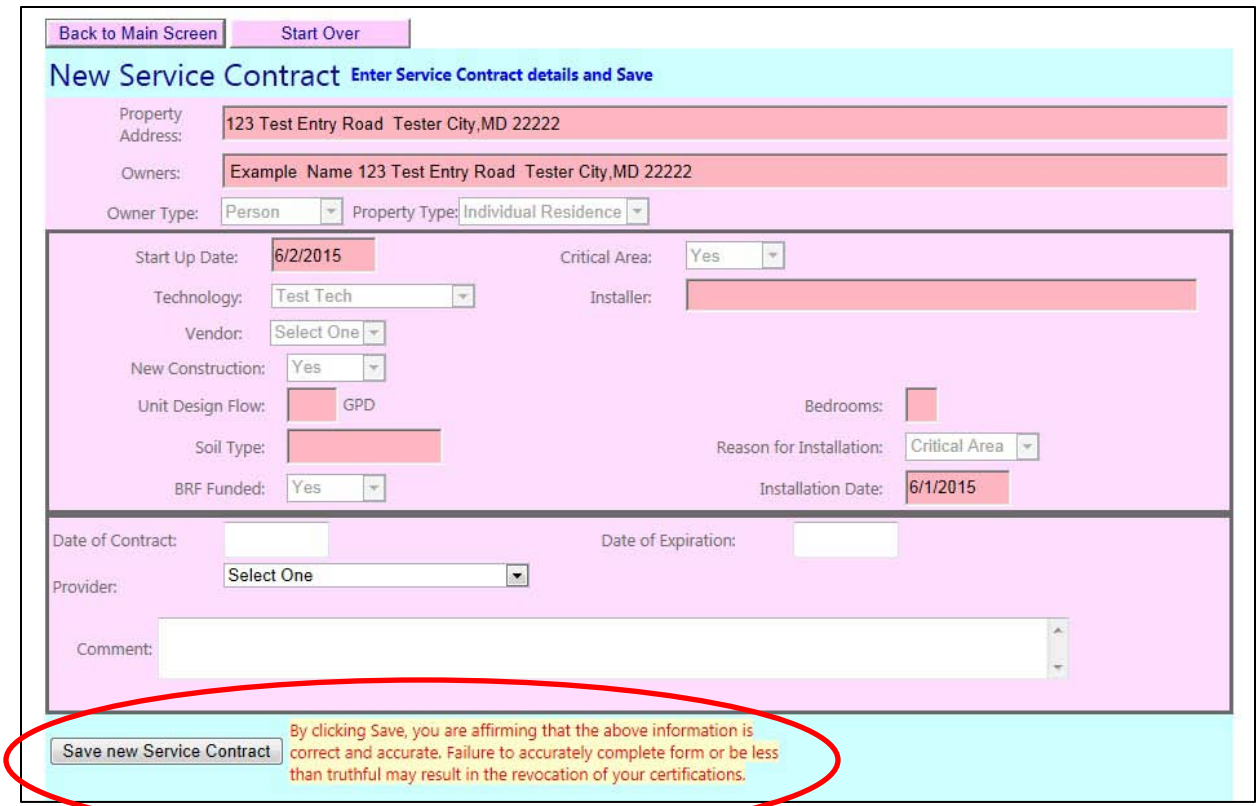


Service Contracts, continued

3. If the property exists in the database, it will show up in the results box above the address entry form. Click on the address to open the property's profile.

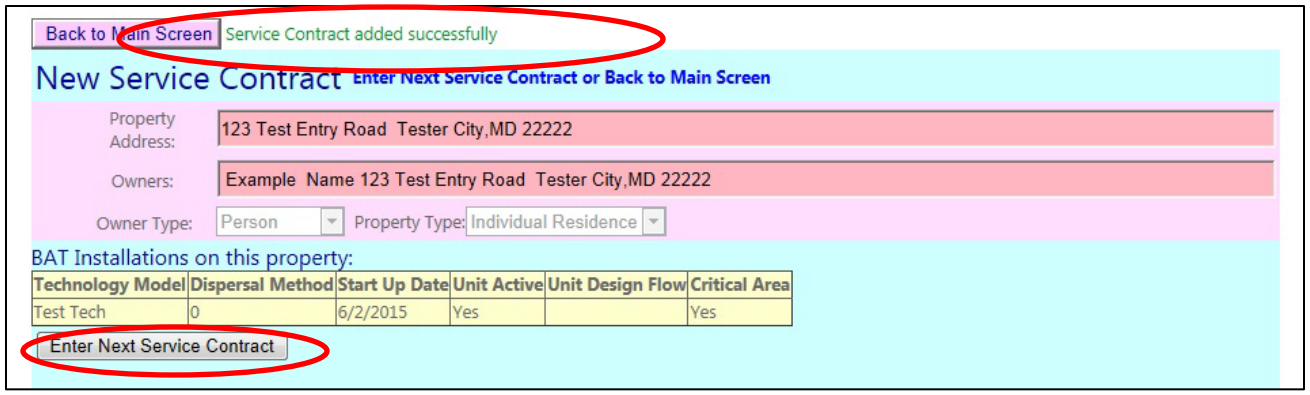


4. Once you're on the property's profile page, you can enter the contract's beginning and end dates, the service provider's name, and any additional comments you would like to track.
When finished, click Save new Service Contract

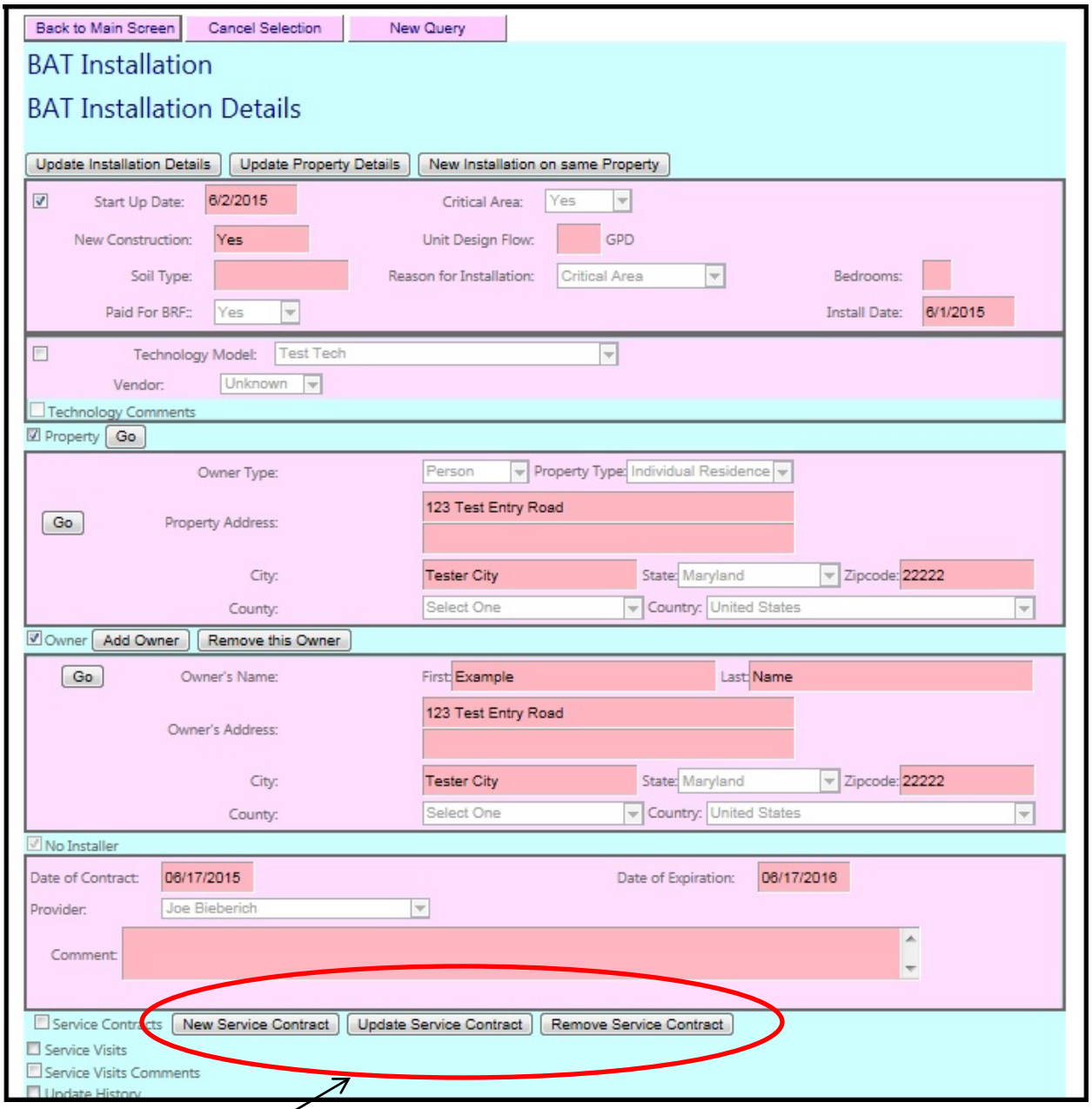


Service Contracts, continued

5. You will then see the text “Service Contract added successfully” at the top of the screen. From here you can click I Enter Next Service Contract if you have another entry to add or you can return to the main screen.



Service Contract, continued



Alternatively, you can add a new contract or update/remove a current contract using the appropriate button at the bottom of "BAT Installation Details" screen.

Running Queries

The gray buttons on the main screen represent the various query options. Below is a brief summary of their uses.

Properties: Allows you to search all properties, including those that do not have a BAT installed
BAT Installations: Allows you to search for all BAT systems using a variety of different search options
BAT Installations By Owner: Searches BAT installations by owner name
Service Visits: Allows you to search all past service visits
Addresses: Allows you to search all addresses
Comments: Searches all comments from BAT Installations and service visits
BAT Installations with no service: Shows all BAT systems that have not been serviced in the past 12 months
Totals By: Shortcut that provides numbers of BAT systems by county, vendor, and technology
Visit Status Unacceptable: Provides a list of installations that are deemed to be unacceptable for any given reason