

Quality Assurance Project Plan

For

Reporting Maryland Nonpoint Source BMP Data via NEIEN For 2014 Progress Scenarios

Chesapeake Bay Regulatory and Accountability Program Grant (CB97394601)
Objective 16, WIP Accountability Framework Implementation & Refinement

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Prepared for:

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Jim George, MDE QA Manager

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Lucinda Power, EPA CBPO Project 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, Science Services Administration (SSA), with general administrative oversight by senior SSA staff. The following individuals will be involved with project management:

MDE Project Manager – Gregorio Sandi will be responsible for overall project management.

Mr. Sandi will oversee obligations for completing all work assigned; maintaining communications with the associated data providers to ensure that assigned tasks are completed in a timely manner and meet CBP requirements including:

- Conduct outreach with internal/external stakeholders
- Maintain official, approved Quality Assurance Project Plan(QAPP)
- Develop amended QAPP
- Process the data
- Provide the data to the Chesapeake Bay Program in XML format

MDE QA Manager – Jim George will be responsible for reviewing and approving the QAPP.

MDE Grant Manager – Paul Emmart will maintain communication with the U.S. Environmental Protection Agency (EPA) for issues related to overall grant management and the budget and immediate supervision of the Project Manager.

Additional personnel involved in project implementation are listed in Table 1, and shown as an organization chart in Figure 1. Figure 2, NEIEN Data Flow, shows their connection to BMP types and sector-specific QAPPs.

The BMPs reported by each partner and data contributor, and their contact information are listed in Table 2 of Appendix A, Maryland’s NEIEN XML Generation and Submission to the Chesapeake Bay Program.

Table 1: Project Implementation Personnel

Individual	Role in Project	Organizational Affiliation
Greg Sandi	Project Manager	Maryland Dept of Environment
Alisha Mulkey	Data Contributor	Maryland Dept of Agriculture
Elaine Dietz	Data Contributor	Maryland Dept of Environment
Denise Clearwater	Data Contributor	Maryland Dept of Environment
New Hire 2014	Data Contributor	Maryland Dept of Natural Resources
Marya Levelev	Data Contributor	Maryland Dept of Environment
Sekhoane Rathebe	Data Contributor	Maryland Dept of Environment
Jesse Salter	Data Contributor	Maryland Dept of Environment
Mary Dewa	Data Contributor	Maryland Dept of Environment
Josh Flatley	Data Contributor	Maryland Dept of Environment
Federal Facilities – Sekhoane Rathebe	Data Contributor	Maryland Department of the Environment
Kristen Fleming	Data Contributor	Maryland Dept of Natural Resources
Raymond Bahr	Partner	Maryland Dept of Environment
Jason Keppler	Partner	Maryland Dept of Agriculture
Anne Hairston- Strang	Partner	Maryland Dept of Natural Resources
Jay Prager	Partner	Maryland Dept of Environment
Robin Pellicano	Partner	Maryland Dept of Environment

Data Contributors will be responsible for the following activities:

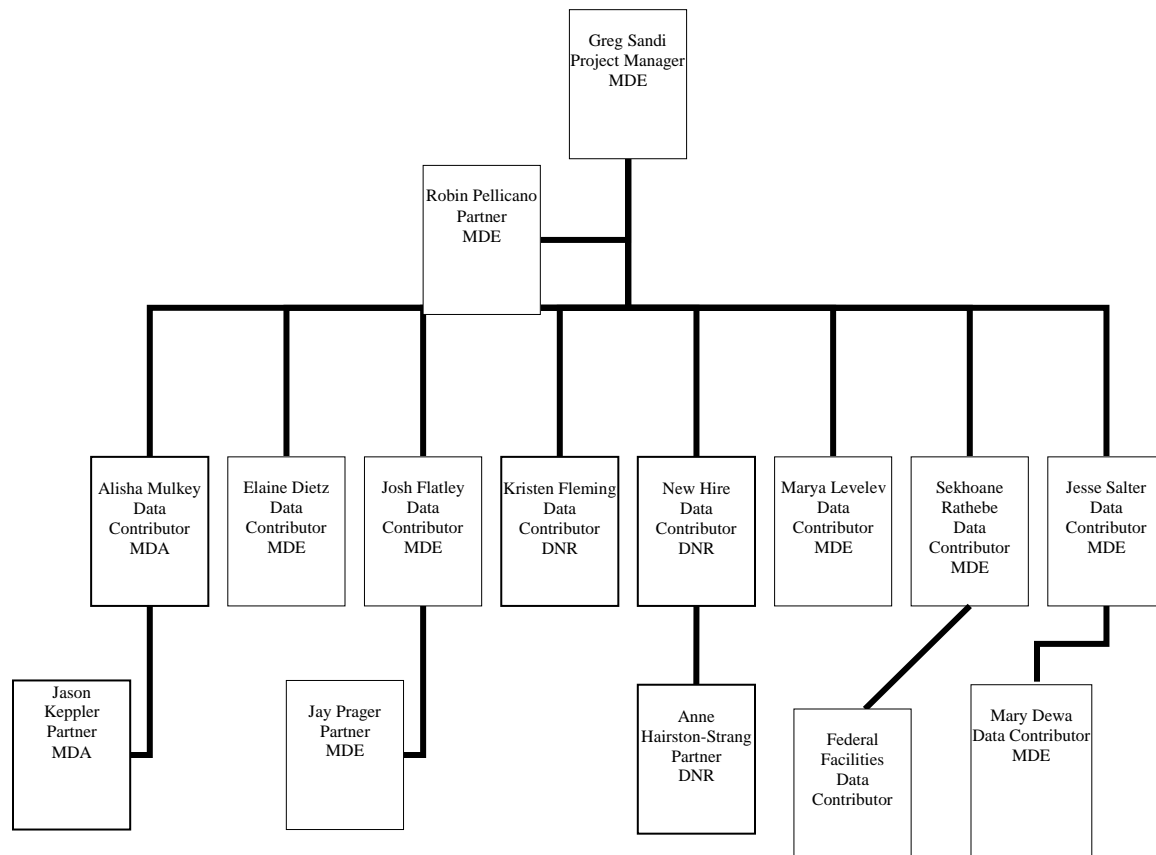
- Provide BMP data in templates
- Provide MDE with BMP data that has been verified, validated and compiled according to the procedures cited in this, or sector specific QAPP documents
- Provide updates and corrections to data as needed

Partners will be responsible for the following activities:

- Documenting and implementing a sector-specific QAPP for data provided to MDE
- Providing assistance when questions arise
- Assuring that the reported BMP data has been verified, validated and compiled according to the procedures cited in their QAPP document

Providing updates and corrections to data as needed

Figure 1: Project Organizational Chart



1.5 - Problem Definition/Background

MDE provides Best Management Practice (BMP) implementation data on an annual basis for the Chesapeake Bay Program Office (CBPO) assessments of Maryland's progress towards reducing nitrogen, phosphorus and sediment loads to the Chesapeake Bay and its tidal tributaries. BMP data represent Maryland's pollution control efforts to reduce these loads, which are translated to annual loading estimates via the CBP Watershed Model (WSM). The purpose of this QAPP is to document procedures used annually to process and submit nonpoint source BMP data, received from multiple entities, via the National Environmental Information Exchange Network (NEIEN) to the CBPO for the previous state fiscal year.

Multiple federal, state and local agencies are involved in tracking and reporting BMP practices. Three state agencies are responsible for the collection and accuracy of the BMP data. MDE WMA is responsible for reporting urban and wetland BMPs, and is developing separate QAPPs for the collection and reporting of those practices. MDA is responsible for all agricultural BMPs and has a stand-alone QAPP describing their procedures. MDNR is responsible for forestry BMPs and has an approved QAPP describing their procedures.

MDE Science Services Administration (SSA) has been collecting and submitting annual implementation of BMPs to the CBPO since 2005. Known as the "Annual Progress Submission," these data were historically provided in a spreadsheet format transmitted via electronic mail to the CBPO. However, for annual progress year 2010 the CBPO required submittals via a web service called the National Environmental Information Exchange Network (NEIEN).

This change in reporting methodology presented a great challenge for those partners submitting information to the CBP. Maryland has a fairly mature progress reporting system; however, refinements to the Bay watershed model and these new reporting requirements revealed the need to refine this system further. During the first year of using NEIEN as a data conduit, it was a challenging learning process leading to many delays and inaccurate information however Maryland was able to create a system of data processing and transmission via NEIEN.

Each year the process has improved data processing efficiency and data quality. However, the data requested by CBPO and the process by which Maryland submits data is still evolving to become more inclusive of additional data sources and increase the efficiency of collection, conversion and transmission of Maryland's annual progress submission.

In 2014, MDE SSA received two Chesapeake Bay Regulatory and Accountability Program (CBRAP) grants that will support the BMP data management system used to process and submit data to CBPO via NEIEN. One grant supports the initiation of a data management system. The other grant is to identify and incorporate data elements associated with nutrient trading. The three components of this initiative are the identification of data needs, the design and development of a database system and the establishment of a communications plan. The communications plan will formalize coordination with partners and data contributors including the documentation of their standard operating procedures.

It is envisioned, that a future annual progress reporting system will enable MDE to increase the automation of receiving, maintaining, analyzing and reporting data. Effectively reducing inefficiencies and potential errors associated with manually processing the information. This is a critical issue in view

of heightened expectations associated with the Chesapeake Bay TMDL implementation accountability and increasing complexity associated with BMP implementation and maintenance verification and potential market-based crediting of reductions across pollution source sectors.

MDE Roles and Responsibilities with regard to NEIEN

NEIEN is a partnership between the Bay jurisdictions and the CBPO for the secure, real time exchange of BMP implementation information. The Network uses extensible markup language (XML), web services for geo-location, and common data standards to transmit data from the jurisdictions to the CBPO. Existing data management systems are able to remain in place and through the Network, data is transferred based on strict formatting methods, or a schema. The schema in use contains fields such as jurisdiction, data source, contact information, name of practice, practice components, unique ID for practices, location, unit of measure, quantity, status, and funding source.

MDE SSA has served as Maryland's NEIEN submission conduit since its inception in the 2010 CBPO annual progress submission. Because MDE is the host of the State's NEIEN node, and the lead on Maryland's Chesapeake Bay TMDL and Watershed Implementation Plan (WIP), it was logical to use SSA as a conduit for reporting information via NEIEN.

Every year, SSA sends out several requests to partner agencies and WIP contacts, with timelines, for submitting BMP data to use in the annual progress submission. The data are currently submitted from other units within MDE, MDA and DNR via electronic mail in MS Excel spreadsheets to MDE SSA's NEIEN Project Manager, currently Gregorio Sandi.

Once SSA receives the BMP data from its partners, it conducts several formatting tests to ensure the information provided is complete and consistent with NEIEN submission formats. An additional limited QA/QC is conducted to check for duplicates, unusual levels of BMP reporting relative to expected levels, make sure dates are within reporting range, look for outliers that do not conform to practice types and ensure BMP names are consistent with existing CBPO values. If non-conforming data are identified, SSA reports results back to its partners for further modification within the constraints of the data reporting schedule. Aside from these checks, the data are assumed to have acceptable levels of quality assurance and quality control (QA/QC) performed by the data provider¹.

SSA then processes the data into a single dataset with a consistent format that conforms to the NEIEN schema as documented in Maryland's NEIEN XML Generation and Submission to the Chesapeake Bay Program (Appendix A). The NEIEN XML data is then transmitted to the password protected CBPO NEIEN node via a NEIEN node client software. The NEIEN submission is acknowledged by CBPO via transmittal to MDE SSA of a summary of the individual BMPs processed by its Scenario Builder tool. MDE then has the opportunity to review and update the NEIEN submission prior to it being finalized.

¹ MDE SSA staff provide QA/QC services for septic system upgrade and some stormwater BMP data; however, these services function outside of the NEIEN data processing scope documented in this QAPP.

1.6 - Project/Task Description and Schedule

BMP submissions are to be aggregated by state fiscal year, July 1st of year A to June 30th of year B (e.g. First submission was for the period July 1st, 2009 to June 30th, 2010). Each submission may include only BMPs from this time range, or revisions to past progress years that have utilized NEIEN. As of 2014, each successive annual submission is added to the submission from previous years. Each annual submission is archived once it has been successfully transferred and confirmed as processed by the CBP.

Multiple non-site or time-specific projects involving BMP data analysis activities are covered under the scope of this QAPP to describe information processing conducted by SSA. This project acquires data from multiple local jurisdictions, federal and state agencies.

In Maryland, BMPs are routinely tracked at several levels of government. Locally, BMPs are tracked through Soil Conservation Districts (Agriculture), County/Municipal Governments (Stormwater Management Facilities) as well as Federal installations (DOD facilities, National Institute of Standards and Technology (NIST), General Services Agency (GSA), etc.). Using Maryland's Data Exchange template (Appendix B) and historic BMP reporting guidance supplied by MDE (Appendix C), these agencies report their BMPs to their respective source sector State agency who then submits the data to SSA.

Agricultural BMPs are reported to the Maryland Department of Agriculture. Stormwater controls are reported to the Maryland Department of Environment. Forestry related practices are reported to the Maryland Department of Natural Resources. Since all agencies operate under the guidelines of sector specific QAPPs, it is assumed that at each of these levels there has been adequate Quality Assurance or Quality Control of the information about the BMPs. Refer to the QAPPs for Agriculture, 319 (h) stormwater and Forestry for greater detail on QA/QC procedures.

The individual agency information is then summarized into spreadsheets and sent to the Maryland Department of Environment. BMPs, in general, are reported in one of three levels of geographic scale. Agricultural BMPs are generally reported in a summary table by county. Forestry BMPs are generally reported by county. Stormwater Facilities on new development are reported using spatial coordinates. MDE takes the tables of information and consolidates them. This data is then converted to XML and sent to the Chesapeake Bay Program Office (CBPO) via NEIEN where the CBPO Scenario Builder tool distributes them geographically for entry into the watershed model.

Table 1: Annual Submission Schedule

<u>Milestones/Tasks</u>	<u>Completion Date</u>
1. Send out BMP Data Request Letter	August 1
2. Begin consolidating data from available sources	September
3. Data due to MDE	September 30
4. Integrate new data/send notice of deficiencies	October - November
5. Send notice to tardy data suppliers	November 1
6. Send NEIEN submission to CBP	December 1
7. Refine submission as needed	December – February (as needed)
8. Finalize annual progress run	February (following year)

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 BMP implementation on a state fiscal year basis. A system of performance criteria has been established to ensure that this data is of appropriate quality and that it is suitable for use 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 supports its intended use:

- Data is understood to undergo QA/QC at the submitting agency
- Consistent reporting and data verification is employed
- To be considered valid, a BMP must have an associated implementation (completion) date, must meet design specifications and performance criteria and in the future, must meet BMP verification protocols to be phased in by 2018.

As stated previously all data acquired for this project is understood to have been verified for all factors by the submitting entity. Quality objectives, tracking and verification procedures for Agriculture and Forestry BMPs are described in the respective QAPP. Quality objectives and acceptance criteria for reporting MDE regulated practices, i.e., stormwater, erosion control, septic and wetlands, are described in their respective QAPP.

1) Accuracy and Completeness Objectives (Qualitative)

- a. **Objective: Timely annual reporting.** Both low bias and high Bias occurs, 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 is not submitted on time. High bias can occur when old data is reported in a later year². 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 under reporting (low bias).
- e. **Objective: Improve verification of BMP installation and maintenance information.** Although Maryland has many procedures in place to verify the proper installation and maintenance of BMPs, a consolidated documentation of these procedures remains outstanding. As part of the CBPO's BMP Verification Framework, Maryland will document BMP verification procedures by July 2015 and phase in those procedures fully by 2018.

² The CBPO does not re-run past annual progress evaluations for the public record. As a consequence, annual model results do not reflect actual annual progress supported by the most current data.

1.8 - Special Training Requirements/Certification

Some specialized training is required to successfully complete this project. Familiarity with this QAPP and Maryland's NEIEN XML Generation and Submission to the Chesapeake Bay Program," the NEIEN SOP (**Appendix A**), is required. Any training (MDE internal or external) is documented and these records are maintained in the Baltimore office. As future training or retraining needs are identified, Program staff will address them appropriately.

Alternate MDE staff users will need to be trained regarding the XML conversion and NEIEN submission system. Materials for staff training (Appendix A) and experience will be gained throughout the testing and troubleshooting process, as well as individual training of staff to complete this process. Periodic update of the SOPs will need to occur in order to maintain the NEIEN submission process. As improvements are made to the data collection and submission process, this QAPP will be modified to reflect any changes to the training needs for successful NEIEN submission.

1.9 - Documents and Records

- 1) Data provided to MDE is a part of long-standing reporting system, dating back to the 1990s, which has evolved over time. The most recent documentation of the reporting system is reflected in Section 6 of Maryland's Phase I WIP completed in December 2010.³ Maryland intends to update this information as part of documenting the State's BMP Verification Program in July 2015 at which time the operating procedures for each data contributor will also be updated to include details on their data/records retention policies.
- 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.

The Program generates and maintains a variety of records in the Baltimore headquarters.

- Standard Operating Procedures – SOPs for the NEIEN submission will be maintained at the Baltimore office. The project manager overseeing BMP data acquisition activities shall periodically review these SOPs.
- 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.

³ Maryland's Phase I Watershed Implementation Plan (WIP), December, 2010.
http://www.mde.state.md.us/programs/Water/TMDL/Documents/www.mde.state.md.us/assets/document/MD_Phase_I_Plan_12_03_2010_Submitted_Final.pdf

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. (See Figure 2) 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. Most of our partners will submit the information required using Maryland's Data Exchange Template (**Appendix B**) to MDE SSA.

BMPs currently supplied to SSA include:

Septic:

Septic upgrade data is currently 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).

Data on the connection of septic systems to waste water treatment plans is 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.

Forestry:

Forestry practices in the urban setting, such as urban riparian buffers and tree plantings that may be credited towards stormwater restoration, are generally provided to MDE SSA through stormwater management reporting avenues described below.

Forestry practices in the agricultural setting, such as riparian buffers and wind breaks, are reported to MDE SSA by the Maryland Department of Agriculture per the agricultural reporting avenues described below.

Forestry practices on State lands are reported to MDE SSA by the Maryland Department of Natural Resources, which has an approved QAPP from EPA to track and report those BMPs. (MD Dept. Nat. Res., June, 2011)

Forest Practices associated with forest harvesting are reported to MDE SSA by the Maryland Department of Natural Resources, which has an approved QAPP from EPA to track and report those BMPs.

Agriculture:

Agricultural Practices are provided to MDE SSA from the Maryland Department of Agriculture, which has an approved QAPP from EPA to track and report those BMPs. (MD Dept. Ag., March, 2012)

Stormwater:

Currently data is reported to the MDE SSA NEIEN Project Manager through two avenues:

Data for stormwater restoration BMPs on old developed land with little or no stormwater controls in Phase I MS4 jurisdictions, are reported by MDE WMA Sediment, Stormwater and Dam Safety Program.

Data for BMPs on new development are reported via an electronic spreadsheet compiled by MDE SSA staff. This data is managed according to an existing QAPP developed pursuant to a 319(h) grant project. (MD Dept. Env., May 2011)

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

Stormwater Performance Standards

- Year Implemented
- State Abbreviation
- BMPShortName
- Segment
- Landuse Group (either Urban or UrbanWithCSS)
- Amount (acres treated or disturbed)
- Unit (acres)
- Impervious acres
- Runoff storage volume –Appendix B says RNC
- Project type
- Previous BMP(if project type is converted retrofit)

Project types are:

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

Erosion and Sediment Control (E&SC):

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.

Another opportunity for improving data is reconciling the amount of disturbed acres reported through MDE's E&SC summary spreadsheet with the amount of disturbed acres in the model. Generally, this spreadsheet reports three times the amount of disturbed acres than are in the model for any given year.

Faced with this deficiency in data, MD devised a percent compliance rate of reporting based on acres inspected and violations over a ten year period. Adding a 2% margin of safety to be conservative, it is estimated that 91% of E&SC acres in MD are in compliance. This 91% is applied to pre-BMP LU estimates from the model and reported by county.

One potential fix MDE may use to revise the way it reports E&SC controls for progress 2015 is by going to individual Soil Conservation Districts and trying to determine the actual number of disturbed acres by county. This solution, as others, depends on personnel and budget availability to achieve success.

Wetlands:

This is tracked by MDE WMA through their permitting process, however all Ag wetlands are reported by MDA.

Data not included in NEIEN

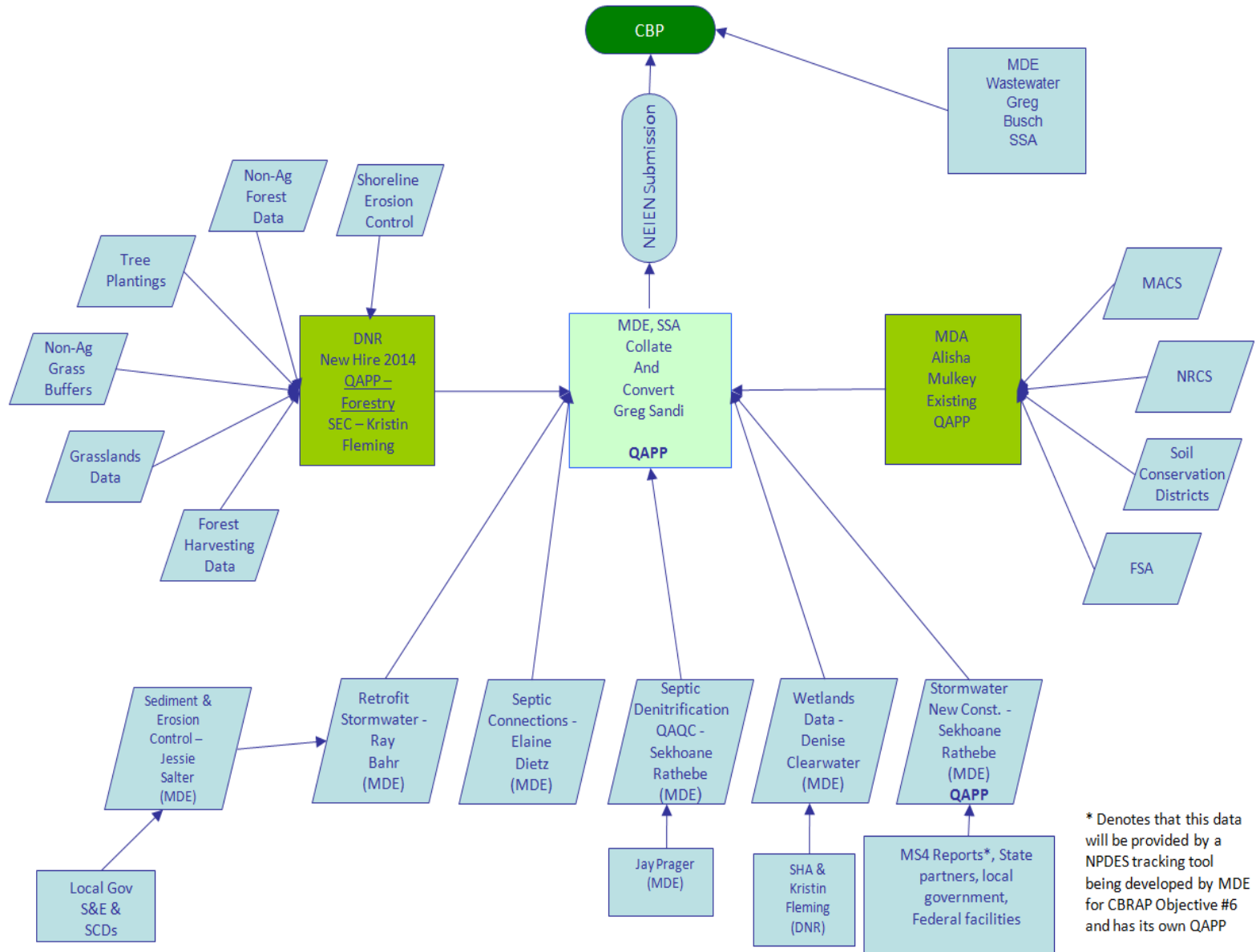
Point Sources:

These practices are not tracked or reported through NEIEN and therefore not included in this document.

Homeowner BMPs:

The collection of urban/suburban BMPs installed by homeowners is still being developed. This information is to be collected by local governments and submitted to MDE via standard reporting avenues. It is anticipated that these will be phased into progress submissions gradually as data collection programs expand throughout the state.

Figure 2. NEIEN Data Flow



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.

MDE SSA receives information in the form of Microsoft Excel Spreadsheets. The data from the partner spreadsheets are reviewed for duplicates, built dates, potential outliers, and missing data fields. Once the QA/QC is complete, the data within in these sheets is sorted by "Built Date". All data from the current progress year is extracted from these spreadsheets and combined into a separate Excel file in preparation for the conversion to XML. This data is then converted and submitted according to Appendix A.

Data within the partner spreadsheets that falls within previous NEIEN progress reporting years is compared to the data from previous submissions to identify any new records for those years. If new records are found, a review is conducted to determine the number of records and amount of acres covered by the new submission. Depending upon the size of the previous submission, and the number of new records, MDE SSA removes all submissions from a previous progress year for a given data provider and replaces them with the newest information provided. The revised progress submissions are uploaded into NEIEN along with the most recent progress submission for pollutant load reduction credit.

As an example: Anne Arundel County (AACo) provided updates for 2010-2013 BMP progress, MDE SSA removed all BMPs from for AACo in 2010 – 2013 and replaced them with the new information. The revised progress years were resubmitted to NEIEN independent of the 2014 progress year data as separate files.

This process is repeated annually for all data providers in order to provide the most current inventory of MD BMPs without introducing the possibility for duplication of practices in previous submissions.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Data Validation Methods

The project manager, currently Gregorio Sandi, is responsible for validation checks of both internal and external data. Validation is independent from those staff responsible for data collection and entry.

Methods for data validation include the following procedures:

Internally provided data -	Completeness reviews for required fields Valid date ranges Locational accuracy checks (on-site and GIS checks) Checks for double counting (e.g., BMP unique values) BMP records with “not built” or “waivers” are omitted
Externally provided data -	Completeness reviews for required fields Valid date ranges Locational data checks (on-site and GIS checks) BMP records with “not built” or “waivers” are omitted County/Municipality office visits planned for 2015

3.2 Assessment and Response Actions

SSA's Project Manager, currently Gregorio Sandi, 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

3.3 Reports to Management

Annual reports for CBRAP will be updated for the assessment of Objective #16. This objective is funded by EPA and the scope of work is approved by EPA annually. The project is titled “Accountability

Framework” and is intended to provide a process for Maryland data to be transferred to CBPO via the NEIEN system accurately and in a timely manner.

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 is formatted in a manner consistent with NEIEN requirements
- Data was successfully transmitted to the CBP via NEIEN and is stored on the CBP production node

References

Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated - Guidance for NPDES Stormwater Permits, Aug. 2014.

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- Chapter 3, *Performance Criteria for Urban BMP Design*
- Chapter 5, *Environmental Site Design (May 2009)*

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Agriculture Best Management Practices (BMP) Implementation Reporting Procedures, Quality Assurance Project Plan, Maryland Department of Agriculture, Revised 3/22/12.

Procedures for Reporting Forest-related Practices for the Chesapeake Bay Watershed Model, Maryland Department of Natural Resources Forest Service, June 2011.

Urban Best Management Practices Database, Quality Assurance Project Plan, Maryland Department of the Environment, Technical and Regulatory Services Administration, May 24, 2011.

Quality Assurance Project Plan for Stormwater Management Program Enhancements to Improve Data Tracking and Regulatory Compliance, Maryland Department of the Environment, Water Management Administration, March 30, 2012.

Appendix A

Maryland's NEIEN XML Generation and Submission to the Chesapeake Bay Program

Created by Gregorio Sandi
March 23, 2011

Updated: 7/16/14

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Section 1: Background

Maryland’s Best Management Practice (BMP) submission to the Chesapeake Bay Program (CBP) is coordinated through Maryland Department of the Environment’s (MDE) Water Quality Protection and Restoration (WQPR) program. The WQPR program sends out notifications to the BMP submission partners, which consist of individuals within MDE, Maryland Department of Natural Resources (DNR) and the Maryland Department of Agriculture (MDA) for data regarding BMPs. Once partners provide the data, it is MDE’s responsibility to aggregate, format and transfer data to CBP.

1.1 – BMP Submission Timetable

Annual BMP submissions to CBP will be due on December 31st of each subsequent year. The data call will follow this generic template:

Table 1. Rough timeline for data collection and submission

Timeframe	Actions
October (1st or 2nd week)	Send out the initial notification to all partners regarding BMP submission deadlines. Set the end of November or a date in early December as the final deadline. Provide a copy of the Data Exchange Template (DET)
October (3rd or 4th week)	Follow up with partners to remind them of the submission process and provide another copy of the DET.
November (once a week)	Follow up with partners to see if they need assistance or any questions answered. Remind them of the December deadline
December (first week)	Get all the submissions ready and begin data formatting process
December - remaining	Continue formatting for XML generation, get updates from partners and verify submissions with partners prior to conversion into XML. Generate XML and submit to CBPs test and production nodes.

1.2 – Data Range and Sources

BMP submissions will be aggregated by state fiscal year, June 30th of year A to July 1st of year B (i.e. First submission was June 30th, 2009 to July 1st, 2010). Each submission will include only BMPs from this time range. Moving forward, each successive annual submission will be added to the submission from this year. Each annual submission will need to be archived once it has been successfully transferred and confirmed as processed by the CBP.

Table 2. Contact List for 2010 submission

Sector	BMP	BMP Type	Contact Name	Agency	email
Urban	Erosion & Sediment Control	ST	Jesse Salter	MDE	Jesse.Salter@maryland.gov
	Dry Detention Ponds & Hydrodynamic Structures	ST	Sekhoane Rathebe	MDE	Sekhoane.Rathebe@maryland.gov
	Dry Extended Detention Ponds	ST	Sekhoane Rathebe	MDE	
	Filtering Practices	ST	Sekhoane Rathebe	MDE	
	Infiltration Practices	ST	Sekhoane Rathebe	MDE	
	Wet Ponds & Wetlands	ST	Sekhoane Rathebe	MDE	

Sector	BMP	BMP Type	Contact Name	Agency	email
	Street Sweeping and Catch Basin Inserts		Not Reported 2010		
	Stream Restoration		Not Reported 2010		
	Septic Connections	ST	Elaine Dietz	MDE	Elaine.Dietz@maryland.gov
	Septic Denitrification	ST	Sekhoane Rathebe	MDE	
	Riparian Forest Buffers - Urban	FED	Anne Hairston-Strang	DNR	Only temporary, new hire for 2014
	Streambank Restoration	ST	Alisha Mulkey	MDA	
	Tree Planting	ST	Anne Hairston-Strang	DNR	Only temporary, new hire for 2014
		ST	Kristen Fleming	DNR	Kfleming@dnr.state.md.us
	Urban Nutrient Management	ST	Alisha Mulkey	MDA	
Agriculture	Animal Mortality Facility	FED	Alisha Mulkey	MDA	Alisha.Mulkey@maryland.gov
	Conservation Cover	FED	Alisha Mulkey	MDA	
	Conservation Plans/SCWQP	ST	Alisha Mulkey	MDA	
	Conservation Tillage	ST	Alisha Mulkey	MDA	
	Cover Crops	ST	Alisha Mulkey	MDA	
	Cover Crops - State Land	ST	Alisha Mulkey	DNR	
	Critical Area Planting	FED	Alisha Mulkey	MDA	
	Cropland Irrigation Management	ST	Alisha Mulkey	MDA	
	Dairy Manure Incorporation	ST	Alisha Mulkey	MDA	
	Dead Bird Composting Facility	ST	Alisha Mulkey	MDA	
	Fencing	ST	Alisha Mulkey	MDA	
	Field Border	FED	Alisha Mulkey	MDA	
	Filter Strip	FED	Alisha Mulkey	MDA	
	Grassed Waterway	FED	Alisha Mulkey	MDA	
	Horse Pasture Management	ST	Alisha Mulkey	MDA	
	Manure Transport w/Destination	ST	Alisha Mulkey	MDA	
	Manure Transport w/out Destination	ST	Alisha Mulkey	MDA	
	Nutrient Management	ST	Alisha Mulkey	MDA	
	Poultry Manure Incorporation	ST	Alisha Mulkey	MDA	
	Poultry Phytase	ST	Alisha Mulkey	MDA	
Riparian Forest Buffer	FED	Alisha Mulkey	MDA		
Riparian Herbaceous Cover	FED	Alisha Mulkey	MDA		
Roof Runoff Structure	FED	Alisha Mulkey	MDA		

Sector	BMP	BMP Type	Alisha Mulkey	Agency	email
	Shoreline Erosion Control	ST	Alisha Mulkey	MDA	
	Spring Development	FED	Alisha Mulkey	MDA	
	Stream Crossing	FED	Alisha Mulkey	MDA	
	Vegetative Environmental Buffer	ST	Alisha Mulkey	MDA	
	Waste Storage Structure	ST	Alisha Mulkey	MDA	
	Water Control Structure	ST	Alisha Mulkey	MDA	
	Watering Facility	FED	Alisha Mulkey	MDA	
	Wetland Creation	FED	Denise Clearwater	MDE	Denise.Clearwater@maryland.gov
	Wetland Restoration	FED	Denise Clearwater	MDE	
		FED	Alisha Mulkey	MDA	
Forest	Forest Conservation	ST	Anne Hairston-Strang	DNR	
	Forest Harvesting Practices	ST	Anne Hairston-Strang	DNR	

Section 2: Data Collection and NEIEN Formatting

The National Environmental Information Exchange Network (NEIEN) framework for submission of BMPs to CBP was implemented in late 2010 and early 2011. This process includes strict protocols for data formatting to submit BMP information from various jurisdictions via the internet into a communication node managed by CBP. Data on that node is downloaded and input into Scenario Builder.

2.1 Data Exchange Template

As part of the NEIEN submission process, a DET was created to provide data uniformity for easier entry into scenario builder. A copy of the original DET can be downloaded from <http://webservices.chesapeakebay.net/schemas/> and includes all potential fields that can be accepted for transfer to the node. WQPR has modified the DET into 3 separate smaller DET formats which include only the required and conditionally required fields from the larger document. The NEIEN DETs will also contain important information such as field length, type and specific values such as the number of decimal places allowed in the entry.

2.2 Data Formatting

As data comes in, there will be some editing needed to make sure it able to integrate with the NEIEN exchange and Scenario Builder conversions. Appendix A of the Data flow document is constantly being updated to accommodate some of the different data types, but ultimately the BMP names and measurement data in excel and MS Access should directly mirror a row in this table located here: L:\WQPR Program\CBP_Information\BMP Implementation\2014\Support Docs\ NEIEN NPS BMP CBP Data Flow_AppendixA.8.26_11262013.xlsx *

* This file is updated annually and this SOP will need to be updated to supply the newest appendix

If there are any questions concerning data format of BMPs as well as other pertinent information, please refer to the previous year's submission. The initial data is gathered in an excel spreadsheet format for ease of manipulation. It will later be transferred to MS Access for conversion into XML.

In general the Structural BMPs and conservation practices are all stored on one worksheet, with separate worksheets for conservation plans, cover crops, manure transport with destination and manure transport without destination. This is done in order to manage XML file size, but also because formatting the Manure Transport requires additional rows of data that is not needed by the others. In addition, a "Contact" worksheet will need to be created to include in the XML. Please refer to the 2010 submission spreadsheet referenced above for more guidance on formatting and worksheet set up.

2.3 Access Database Creation

In order to allow the Altova software to generate XML, it is necessary to transfer the data into MS Access. To do this, open MS Access 2003 and create a new database. On the toolbar, select "File" and scroll down to "Get External Data" and select "Import." Follow the wizard and repeat the process for each worksheet.

Section 3: XML Generation

3.1 - Software

MDE personnel evaluated many different options for XML generation software and found that Altova MapForce and XMLSpy were the most user friendly options for generating well formed XMLs. The key to this was the possession of a driver that was compatible with these systems allowing easy interaction between the Altova software and Microsoft programs. This software is found at www.altova.com and is packaged in the XML Mission Kit for XML Developers.

3.2 - Schema

A schema is a template which will allow us to format the BMP data into a form that is acceptable to the NEIEN framework and will be recognized as it goes through the communication points, or nodes. There are multiple schemas used for the NEIEN submission that are connected to each other using external reference to the correlating schemas. In the figure below, it demonstrates how to modify the schema provided by the Bay Program to reference other external schemas.

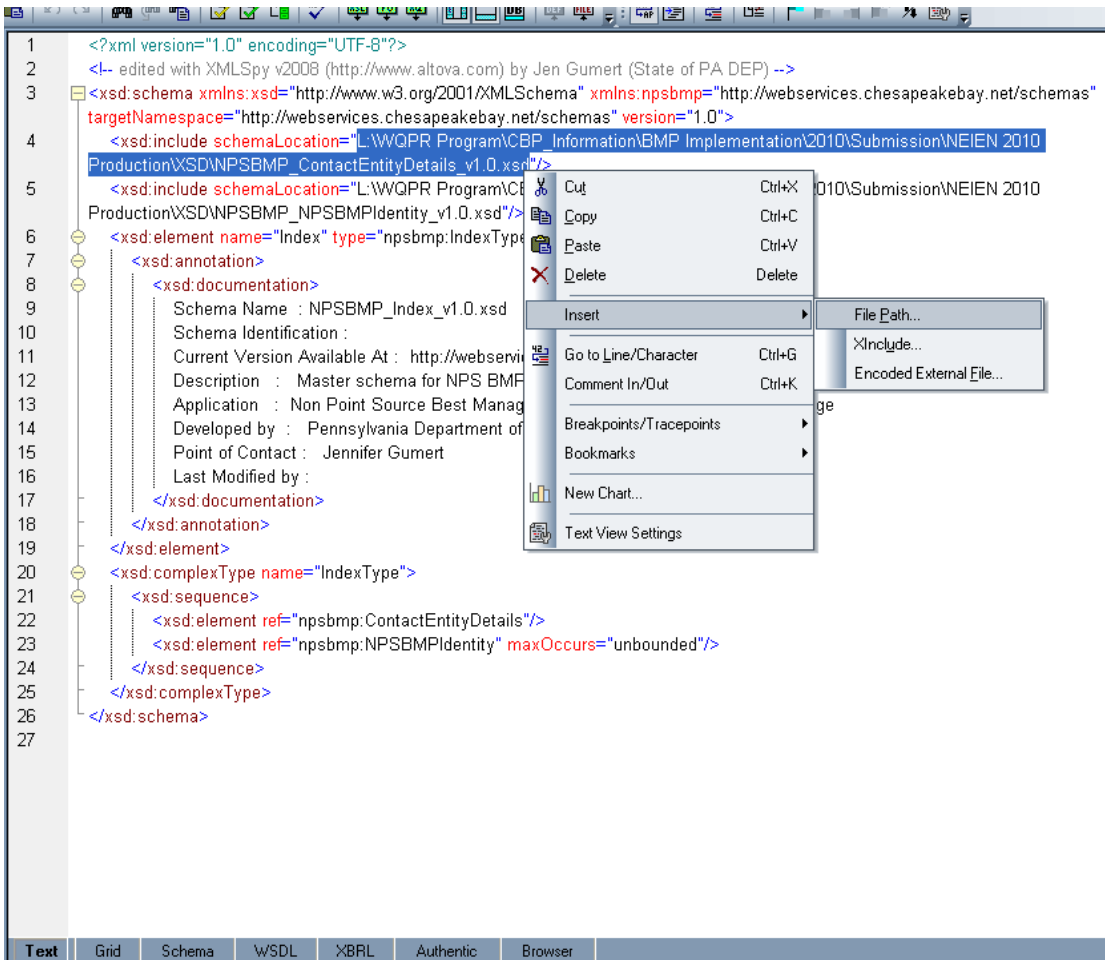


Figure 1. Editing the NPSBMP_Index_v1.0.xsd file using XML Spy

In this example, the original schema referenced the other schema file “NPSBMP_ContactEntityDetails_v1.0.xsd” to provide the format for data relating to that structure. In order to make the changes highlighted in blue, you can either manually edit this reference by typing in a file path, or highlight the area you want to change and right click on it. Then select Insert and File Path... This will bring up a window where you can search for the other schema file. This process must be repeated through all the subsequent schemas containing references.

Once the schema is complete, you must generate a sample XML file. To do this in XML Spy, make sure the root schema is open, in this case “NPSBMP_Index_v1.0.xsd.” Go to the “DTD/Schema” menu and select “Generate Sample XML File.” A window will pop up and in the bottom part there is a section which asks you to select a root. Scroll through the options to find “Index” and select that. Click OK and check the XML to make sure all pieces of the overall schema are included. (Hint: You’ll need to become familiar with the structure of the overall schema, which can be done by clicking on the Main Element Button.)

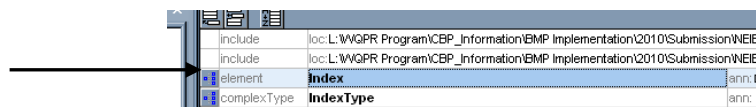


Figure 2. Showing Schema Structure

Save the verified XML file as something you’ll remember for the mapping process.

3.3 – Using MapForce to generate XML Files

Altova MapForce is used to apply the schema to a data set and produce an XML output file in the structure determined by the schema. When you open the program, a new empty mapping project is already open in the working window. To get started, either go to Insert in the main toolbar or click on the insert database icon on the lowest toolbar. A window will pop up asking for the type of database you want to connect to, select Microsoft Access and click Next. Browse to the location of your database and select it. Another Window will pop up asking which tables to bring into MapForce. To keep things simple, work with only the Contact table and one of the others (i.e. Structural_BMPs) and click OK.

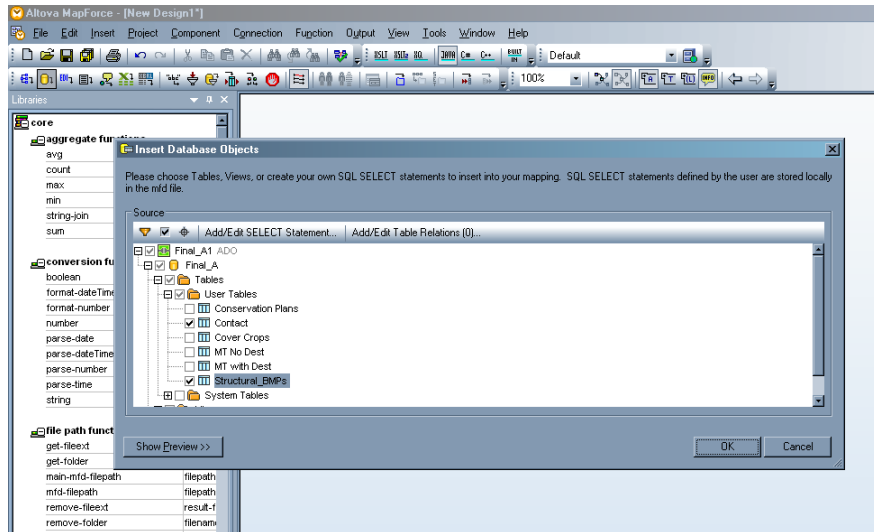


Figure 3. Selecting database tables to use in MapForce

The result is the two tables are displayed with expansion boxes to the left of them. Click on the expansion boxes to show the contents of each table and expand the view screen by clicking and dragging on the lower right corner.

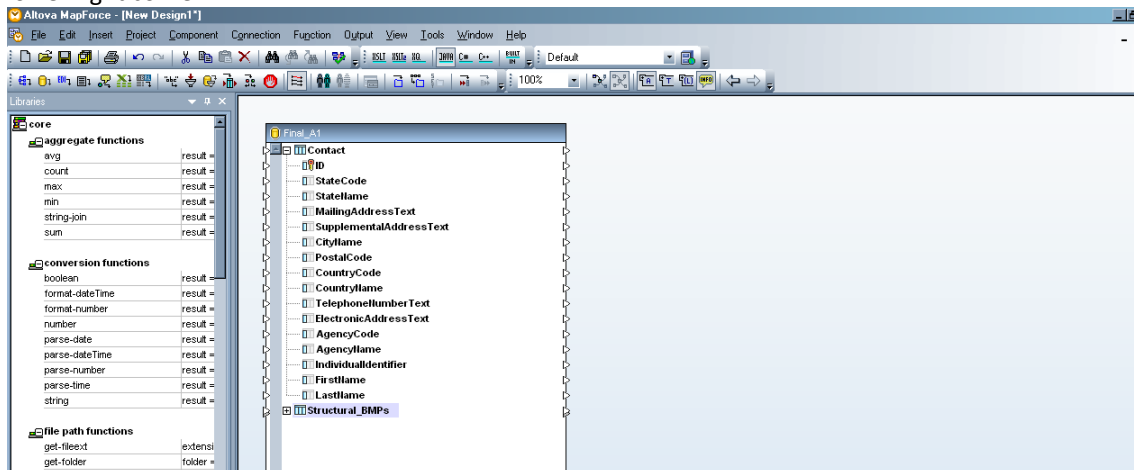


Figure 4. Tables with columns shown

Go back to Insert or click the Insert XML Schema/File icon on the lower toolbar and locate NPSBMP_Index_v1.0.xsd. A pop up will appear asking about providing a sample XML file for your schema. Click Browse and find the XML file you created with XML Spy in section 3.2. Apply and you may get an

error message in the bottom, but it will not affect the outcome. Another box should appear with the schema structure.

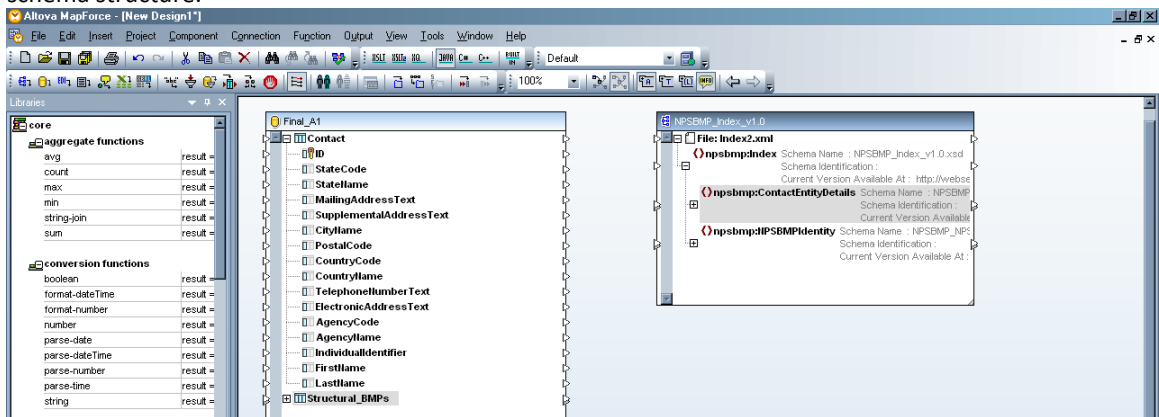


Figure 5. Database Tables and Schema

Expand the boxes associated with npsbmp:ContactEntityDetails and click on the lower right corner to expand the view. Begin matching the rows in the Contact table with the row in npsbmp:ContactEntityDetails section of the schema, starting after the "ID" field in Contact.

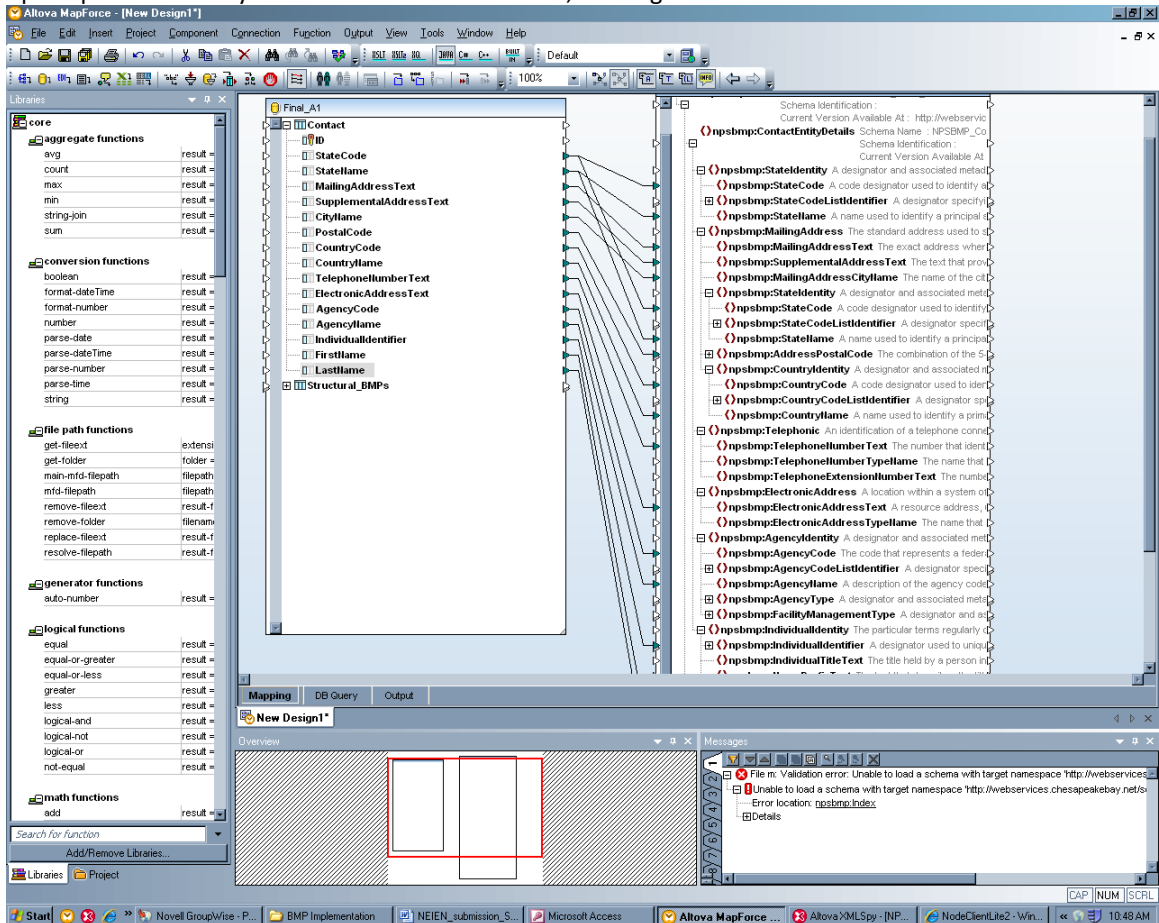


Figure 6. Mapping Fields to the Schema structure.

Notice that not all the data from Contact will fill the npsbmp:ContactEntityDetails Schema, this is because only the required elements are included with these tables and not all parts of the schema are required.

Repeat the process for the Structural_BMPs table and npsbmp:NPSBMPIdentity schema.
*****IMPORTANT: You must also connect the main root of the table Structural_BMPs to the main root of the npsbmp:NPSBMPIdentity schema.*****

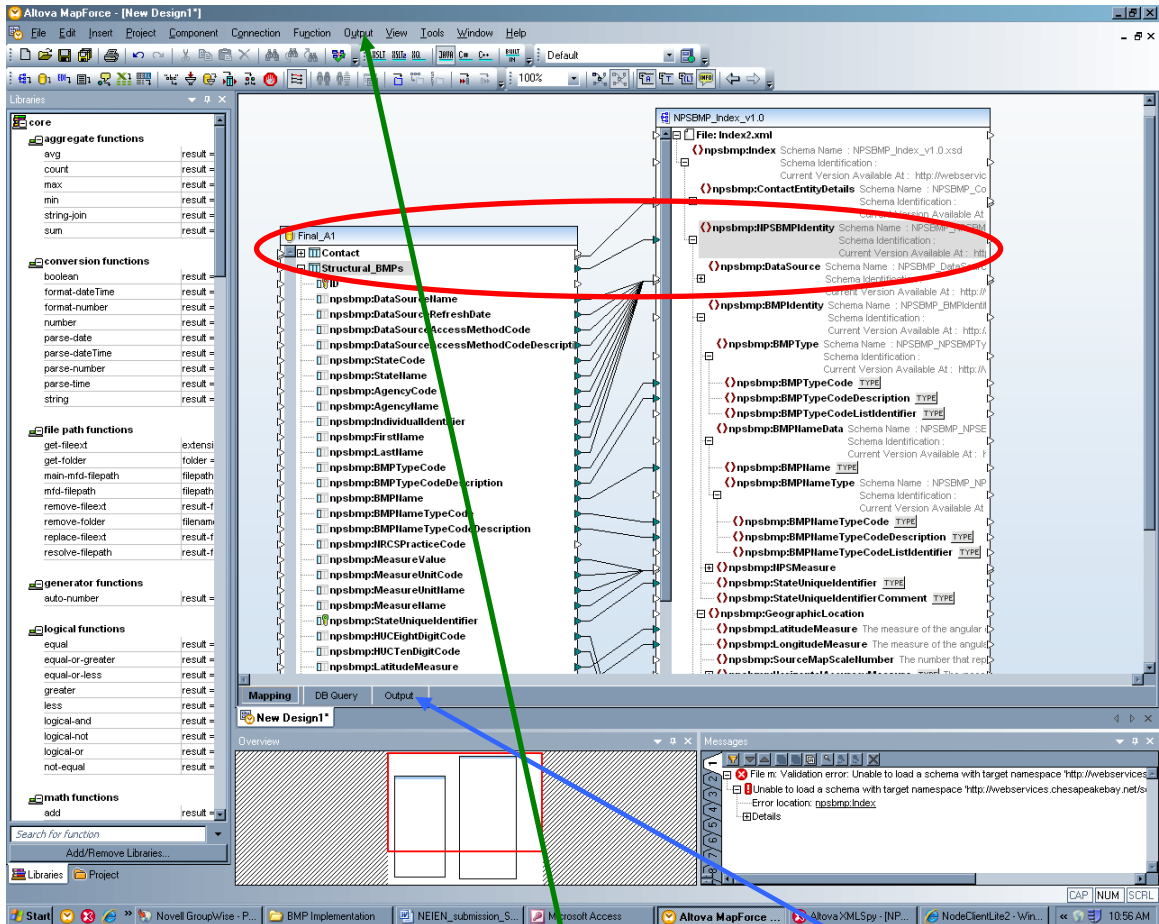


Figure 7. Mapping BMPs to the BMP Identification schema

Once done mapping all Table fields (except NRCS Practice Codes) you click on the lower **“Output”** tab to generate the XML file. Once the processing completes, it will show the output in the display box. Verify that it has created individual records and click on **“Output”** on the upper Menu bar, scroll down and select **“Save Output File.”**

3.3.A - Manure Transport

Manure Transport is another animal (no pun intended), it requires duplicating the NPS Measure part of the BMP Identification schema once for Manure Transport w/out Destination and twice for Manure Transport w/Destination. It also requires that you provide a blank field for the GeographicLocation tag so that it is accepted with a null value. If this sounds greek to you, ask for help or look at the previous Manure Transport Mappings included here:



Figure 8. Manure Transport with Destination Mapping

In the Figure above “npsbmp:NPSMeasure” is a parent value in the schema that will need to be duplicated once for Manure Transport without destination and twice for Manure Transport with destination. In the final XML, the (2) and (3) values assigned will disappear and not affect the submission. The first measure value will be the “County From”, the second will be “County To” and the final your Animal Type and amount of manure. (see excel data template)

3.4 – Adding the final Touches

Open up your new XML file with XMLSpy. There are several minor edits that need to be done to make it ready for the transfer through the node.

3.4.A – Adding a Header and Footer

NEIEN requires a specific header and footer to complete the transfer. The Header is included in 2010 XML files and can be copied to the new files and edited in XMLSpy. It must be placed between the “<?xml version” line and the “<Index” tag. See example below.

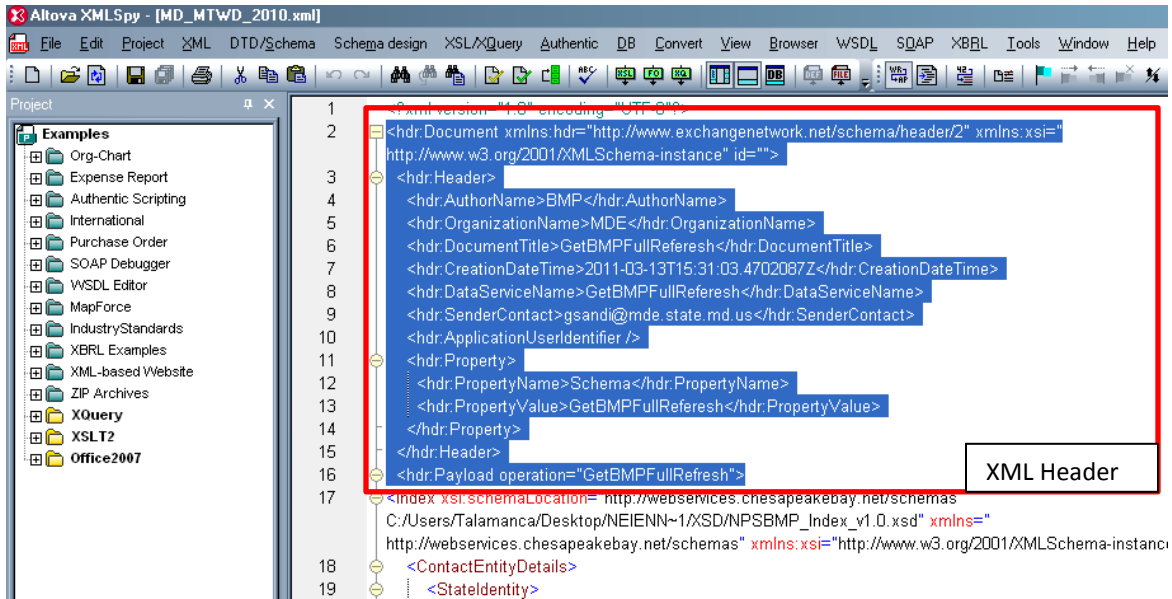


Figure 9. NEIEN Transfer Header

Once the Header is included, you'll need to add a footer as well and the way to do this is to scroll to the bottom of the XML document in XMLSpy and add the following tags after </Index>:

```

</hdr:Payload>
</hdr:Document>

```

3.4.B – Changing the Agency Code

The agency code in the ContactEntityDetails section of the XML document must be modified for each XML file being submitted. The current codes being used are:

- 24510_4 = Structural_BMPs
- 24510_5 = Conservation Plans
- 24510_6 = Cover Crops
- 24510_7 = Manure Transport w/out Destination
- 24510_8 = Manure Transport w/Destination

ONLY CHANGE THE AGENCY CODE FOR THE FIRST CONTACTENTITYDETAILS SECTION, LEAVE THE REST ALONE!! The Agency code in this section is used by the Node to replace existing documents and ID them if you have questions about what is on the node and active (most current). When you submit an XML with the same agency code in the initial ContactEntityDetails Section, the previous XML will still be on the CBP node, only listed as inactive (not current). Remember to use the same agency codes each year so that you replace the previous submissions with current ones!!

Section 4: NODE Transmission

Transferring data to the node requires two things: User accounts w/ passwords for the test and production server, Windsor Node Client Lite 2 software. To get the Node account and passwords, call the Help Desk and ask for Harry Smith (or current node administrator) to provide you with credentials for the test and production servers. At the same time put in a request for installation of the NodeClientLite2 software available here: <http://www.windsorsolutions.biz/nodeclient/>

4.1 – Uploading Data

- 1- Start the Node Client software and click on Application.
- 2- Enter your username and password for the server you're attempting to log in to and save.
- 3- Select the path to the server you will be sending data to and place in the Endpoint box:

Production:

<https://neien.chesapeakebay.net/www/endpoint2/>

Test:

<http://entestnode.chesapeakebay.net/www/Endpoint2/ENService20.asmx>

We are using version 2.0 for our testing and submissions.

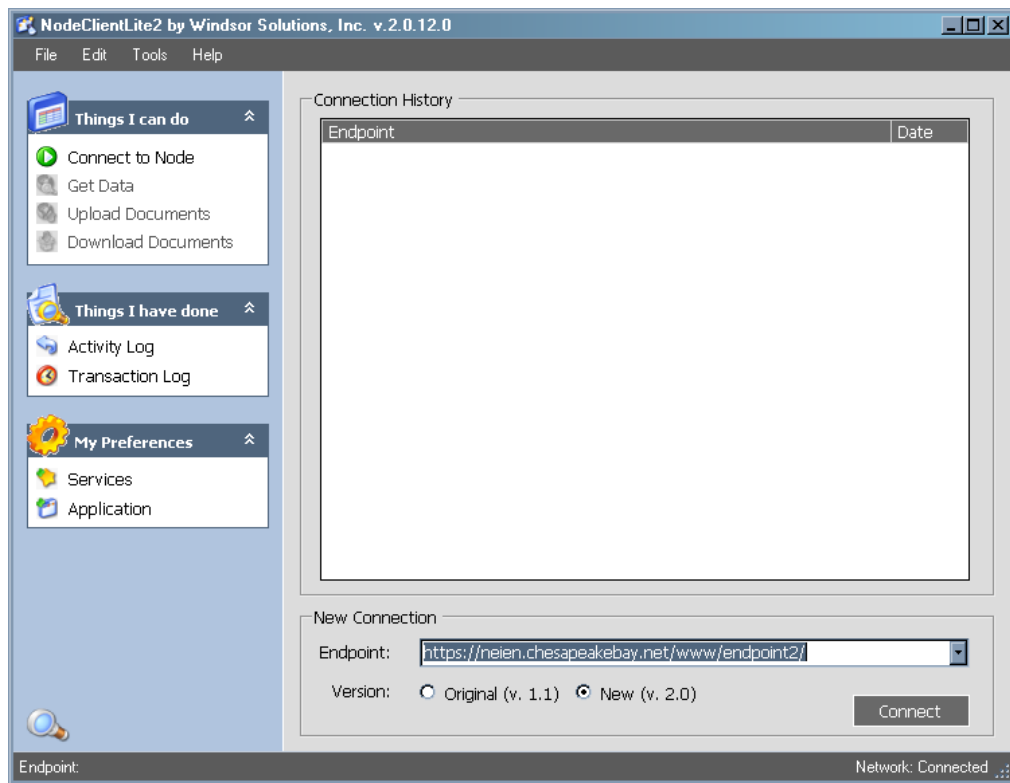


Figure 10. Logging onto the Node

- 4- Click on Upload Documents once you're connected. In the Data Flow: box, type "npsbmp" in either all caps or all lowercase.
 - 5- Click Add button and navigate to where you keep your file. (Note: There is a 20MB limit on file size, so if your file is larger than that, please zip the file first before submitting, the node will accept zip files. I zip everything over 10MB for faster upload times)
 - 6- Press submit and the software will process your request. It will display any error or success messages at this time.
- ** Note: You can submit files in batches, but it is a little more difficult to track after they're submitted this way.****
- 7- An email will be generated and sent to you with a transaction ID and either a success or failure message.

4.2 Getting Processing Reports

Processing reports give you a general idea of what might be wrong with your XML submission, sometimes they will stop at the first error and not detail everything wrong in the document. It is important to download these reports on every failed submission to determine where your errors lie.

Using the Node Client software, select Download Documents. Enter “npsbmp” in the Data Flow box. Insert the Transaction ID you received via email into the Service box and click on the Selected Directory link to change where you will download the file to. Click submit.

Go to the folder where you sent the file and open to view.

****Note - Errors may occur from time out on the node, if this happens restart the Node Client Software and try again.****

Maryland's Historical BMP Clean-up Guidance and Schedule

Background

In Maryland, Best Management Practices (BMPs) have been implemented to reduce the impacts of pollution from wastewater treatment plants (WWTPs), onsite sewage disposal systems (Septics) and stormwater runoff to help manage water quantity and water quality to all receiving waterbodies. BMPs have been implemented by citizens, local jurisdictions, federal and state partners in an effort to improve the water quality of local streams, rivers and the Chesapeake Bay.

Tracking the implementation of these practices and reporting them to the Chesapeake Bay Program (CBP) for entry into the Chesapeake Bay Watershed Model has historically been coordinated by the State, most recently by the Maryland Department of the Environment (MDE). The current BMP inventory has a variety of deficiencies, including BMPs that are omitted from the inventory, generic BMPs being reported rather than specific types, incorrect dates of implementation, incorrect BMP locations and incorrect areas treated by BMPs.

Purpose

The CBP has recently announced that a new version of the Chesapeake Bay Watershed Model will be developed by 2017. Consequently, we have an opportunity to ensure that the historical record of implementation is accurate to the best degree possible within the limited period of time given, that is, by May 29, 2015.

This guidance is intended to help clarify the information that will be necessary to the "Clean-up," lay out the process for doing that, and identify priorities given limited time and resources. The "Clean-up" is an opportunity to identify BMPs that were previously unreported, or in some way deficient, in order to receive proper credit for the pollutant load reductions associated with those practices. This improved inventory will also support the BMP verification process in the future, which includes BMP maintenance, to ensure the integrity of the Bay restoration process.

Scope

This guidance focuses primarily on BMPs for urban/suburban stormwater and septic systems. This guidance does not address several other data refinement opportunities that are part of the Bay model re-development. In particular, a separate process will guide the refinement of land use information and information about the numbers of septic systems. For questions about refined land use and septic system information for the new model, please contact Jeff.White@maryland.gov. The end results of this process will be used in the calibration of the new Chesapeake Bay Model being developed by CBP, as well as serve as a foundation for future Annual Progress reporting.

Timeline

The historical BMP Clean-up process will involve two steps. The first step will be a “test submittal,” through which we will help work out practical technical issues (June 30, 2014). The second step will be a “final submittal,” which will be the submittal that updates the State’s historical BMP inventory for the foreseeable future (May 29, 2015).

The first historical BMP inventory submittal is requested by **June 30, 2014** and should be provided electronically to Gregorio.Sandi@maryland.gov at MDE. This first submittal will be the test submittal and, to the extent possible, will be QA/QC’d by MDE for gaps. MDE will provide each jurisdiction a list of obvious data gaps, such as missing information. However, MDE will not QA/QC the actual content (e.g., coordinates, BMP type, date, drainage area); if any information is not correct (e.g., coordinates locate it in Asia or date is in the year 1901), it will not be flagged or corrected and will be omitted from submission to CBP. Reporting entities are welcome to provide their BMP inventory before this date in order to receive comments from the State.

The final date for submitting information to be used in the calibration of the new model is near the end of State **FY 2015 (May 29, 2015)**. Any information that is received by this date will be used to the extent possible but will not receive any QA/QC for submission gaps. If any information is received after this date, there is no guarantee that it will be used in the calibration of the new model.

Relation to Routine Annual BMP Reporting

To avoid confusion, this historical cleanup process is for updating the Chesapeake Bay model calibration and separate from the annual NPDES or CBP progress BMP reporting processes. The deadlines for annual NPDES reporting are established in the permits and CBP progress BMP reporting to MDE remains to be September 30. However, if MDE does not receive a submittal in September, your June 30 submittal information will serve as your routine annual submittal unless MDE is informed in writing to Gregorio.Sandi@maryland.gov.

Guidance

I. General

The model calibration period has not yet been determined so we are encouraging local partners to provide all BMPs with their appropriate installation or enhancement year. After the calibration is completed in 2015-16, any BMPs discovered that were implemented either prior to or during the calibration period will not be credited in the model (until it is re-calibrated at some future date). This is because their effect will be attributed to what is observed in the calibration water quality data; including reduction credit for them would be considered double-counting.

The BMP inventory should include dates of implementation so that the calibration process can reflect the effect of those BMPs over that time period¹. If the implementation date of a BMP is not known, then an estimated date of implementation will suffice.

II. Urban Stormwater

1. Priorities: Given that reporting entities have limited time and capacity, it is important that you prioritize efforts to clean up historical BMP inventories.
 - a. **BMP Types:** The Bay Model only accepts certain practices with regard to urban pollutant management (**Figure 1**). Focus initially on historical BMPs that are approved for use in the Bay model, or BMPs that will likely be approved in the near future. See *BMPs Under Review by Bay Program*: http://stat.chesapeakebay.net/?q=node/130&quicktabs_10=3.
 - b. **Stormwater BMPs on new development:** EPA indicates that Maryland will receive credit for stormwater control BMPs implemented as part of the development process up to SFY 2010². Consequently, a priority of the historical BMP cleanup is to report all BMPs installed on new development in SFY 2010 through present (July 2009 forward)³.
 - c. **Retrofits:** It is important to distinguish and report all BMPs installed as a retrofit as far back in history as possible. Their importance is critical in that they provide reductions to pre-existing loads that are part of meeting Maryland's Bay restoration targets.
2. Converting existing BMPs to enhanced or restored retrofits⁴:
 - a. Provide enough detail to determine which practice is being enhanced, replaced or restored so that the historical record reflects this.
 - i. Unique ID's for each BMP will help
 - b. Avoid double-counting of retrofits and original practice
 - i. Replacing original practice with retrofit
 - ii. Creating a conversion table which has all retrofits and their type (e.g., no treatment, or dry to wet pond conversion)
 - iii. Need to provide the dates of the original BMPs installation, as well as the conversion date

¹ The same concept applies to land use and the numbers of septic systems, although that information is beyond the scope of this guidance.

² Maryland's State stormwater law required BMP implementation on new development going back to roughly 1985. EPA gives Maryland credit for these BMPs via a framework called "BMPs by era" in which it is presumed these BMPs were implemented on land developed during that era.

³ Aside from the historical BMP Clean-up process, it is vital that reporting entities provide BMP implementation on new development in the future. That's because EPA has indicated that, starting in 2010, it no longer allows the State to presume new development includes stormwater management.

⁴ Enhanced BMPs utilize the original stormwater treatment mechanism, but improve removal by increasing storage volume or hydraulic residence time. Restored BMPs apply to major maintenance upgrades to existing BMPs that have either failed or lost their original stormwater treatment capacity.

III. Septic Systems

1. Non-BRF funded septic upgrades: The State tracking program is focused on upgrades enabled by the Bay Restoration Fund (BRF). Reporting entities are encouraged to report upgrades that are non-BRF funded.
2. Septic Connections: Currently the only tracking of connections is those connections that were paid for through state funding sources. Reporting entities are encouraged to report any treatment plant connections not funded with state assistance.

IV. Suggested Methods for Gathering Information on unknown or unreported BMPs.

These are only a few suggestions for how a local jurisdiction might be able to acquire a more robust data set:

1. Aerial photography could provide snapshots in time to determine installation dates of stormwater BMPs
2. Using development dates, reporting entities could determine the types of BMPs used during construction to identify practices
3. Inspection records from conservation districts and MS4 permittees could be analyzed
4. Historic septic denitrification and removal (connections) data could be gathered through inspection/maintenance records
5. Notice of Construction Completion (NOCC) forms in paper format should be entered into the database. Again, focus on development in 2010 and forward as the first priority.
6. Additionally, MDE's Stormwater and Sediment program has developed new classifications of BMPs for reporting to MDE and CBP (forthcoming).

V. Process for Providing Historical BMP Clean-up Information

1. The response to this call for a "clean-up" should include all known BMPs in a spreadsheet format. An example of what a submission should look like is provided in **Appendix A**.
2. Many reporting entities have provided MDE with BMP database(s). However some databases do not have all of the required elements (see below). Therefore, it is in the interest of every jurisdiction to ensure that datasets previously supplied to MDE are reviewed and resubmission of the data coordinated with MDE.
3. See "Timeline" above.
4. Data should be provided electronically to Gregorio.Sandi@maryland.gov at MDE. Questions about the process should also be directed to Gregorio Sandi.

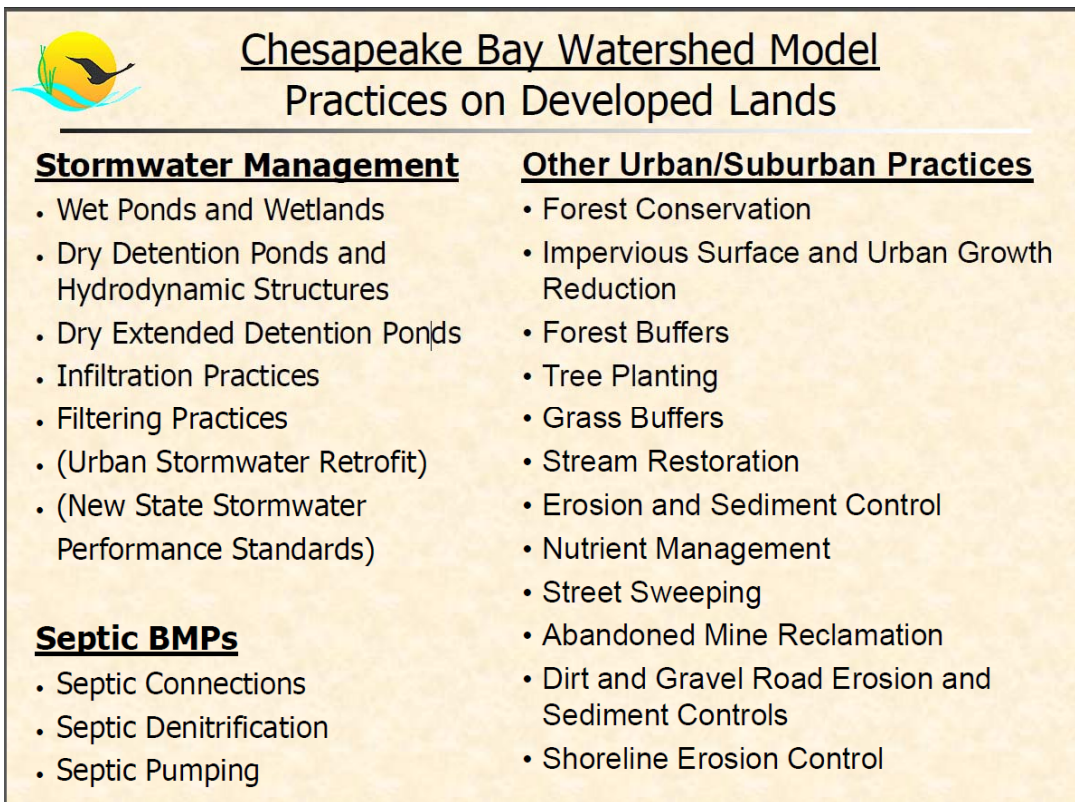


Figure 1: CBP approved urban practices

VI. MDE recognizes that a significant number of BMPs installed in both the urban and agricultural sectors are not being credited in the Bay Model (e.g., Homeowner installed BMPs, or BMPs without cost share funding on farms). These BMPs will become important as we work with EPA to incorporate those into the model, but for now are less of a priority.

VII. Agricultural Sector BMP Clean-up Process

In Maryland, the Agricultural sector should focus on geographic areas and BMPs currently being “cut-off” in Scenario Builder. By investigating a particular BMP or area, other anomalies with other BMPs and areas may surface. Another avenue of inspection may be to improve the land use within the model to more accurately reflect what is on the ground outside the model. This analysis should be conducted by the State.

Reporting requirements for the Historical BMP Cleanup

Table 1 shows the required elements for the Clean-up. It’s important to note that there is not the requirement to report using the new CBP approved [Water Quality Performance Standards for New Development or retrofits](#). However, it is recommended that if such information is available then it be provided. In the future, Phase I and Phase

II MS4 jurisdictions will be required to report those elements (Impervious area treated, Rainfall Depth treated).

Table 1 also identifies data elements that are currently not required, but will be requested in the future. Maintenance information is not mandatory in the current data solicitation because it is not certain how that information will be incorporated into reporting to CBP; however, if you have inspection or maintenance information, it is requested that you please provide it.

Future Guidance on Reporting

There will be guidance issued from MDE Water Management Administration later this year regarding reporting Environmental Site Design to the Maximum Extent Practicable (ESD to MEP) BMPs as well as a new set of BMP codes for reporting to MDE in the future. In the interim, please use the previously established BMP codes and methodologies in reporting BMPs to MDE.

Table 1: Elements needed to receive credit in the Bay Model
 (Table comes from MS4 reporting guidelines.) * Denotes Required Field

Field Name	Description
CONTACT_ENTITY*	Entity reporting BMPs
CONTACT_NAME*	Contact Name
CONTACT_TITLE	Contact title, job title (director of xyz)
ADDRESS	Contact address
CITY	Contact city
ZIP	Contact zip code
PHONE*	Contact phone number 10 digits, no dashes (numbers only)
EMAIL*	Contact email address
BMP_ID*	Unique table ID number
STRU_ID*	Structural identifier
STRU_NAME*	Name of Structure
STRU_TYPE*	BMP Structure Type (BMP, Non-structural BMP, ESD Practice or Water Quality Improvement Project)
BMP_TYPE*	Type of BMP structure
MD_NORTH*	Maryland grid coordinate (NAD 83 meters) Northing
MD_EAST*	Maryland grid coordinate (NAD 83 meters) Easting
ADDRESS	Structure address
CITY	Structure city
ZIP	Structure zip
ON_OFF_SITE	On or off-site structure
CON_PURPOSE*	New development (NEWD), redevelopment (REDE), New restoration project (NRP) or restoration of existing facility (REF)
PRIOR_BMP	Use if new BMP is a conversion retrofit of previous BMP
LINEAR_FT	Linear feet of a stream restoration project
POUNDS_COLLECTED	Pounds of Trash Collected
IMP_ACRES*	Equivalent impervious acres treated
URBAN_ACRES*	Total Urban acres treated (Use this cell for pervious and impervious acres)
RAINFALL	The amount of rainfall this practice is designed to capture (needed for water quality performance standards only)
BUILT_DATE*	Construction Completion Date
REPORTING_DATE*	Date BMP Initially entered into database
REPORTING_YEAR	State Fiscal Reporting year
BMP_STATUS	BMP status (pass/fail)
INSP_DATE	Most recent inspection date
MAIN_DATE	Last date maintenance was performed
REINSP_STATUS	Re-inspection status (pass/fail)
REINSP_DATE	Re-inspection date if needed

QA/QC

Reporting entities should QA/QC the data before submittal. In past reporting, extensive data clean-up was necessary to meet either the requirements or correct obvious errors. The clean-up included: providing coordinates when an address is given; updating an address (e.g., when only vague information is given such as “Hamilton Gardens” or “Wayland Corner”); correcting coordinates; correcting area treated (e.g., wrong input of 2010 instead of 20.10); or trying to correct the date (e.g., formatting created dates in the year 1901 instead of 2001). These types of errors will be flagged to the extent possible by MDE; however, it is not the State’s responsibility to ensure the accuracy of the data.