FINAL

QUALITY ASSURANCE PROJECT PLAN

CHESAPEAKE BAY POINT-SOURCE DATA COLLECTION

Prepared for:

United States Environmental Protection Agency
Chesapeake Bay Program Office
410 Severn Avenue – Suite 112
Annapolis, MD 21403

Contract/WA/Grant No./Project Identifier: CB-97393901

Prepared by:

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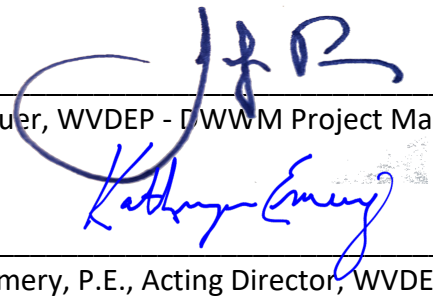
SECTION A – PROJECT MANAGEMENT

A.1 Title of Plan and Approval

Quality Assurance Project Plan
Chesapeake Bay Point-Source Data Collection

Prepared by:
WVDEP



_____ Date: 8/10/22
Jennifer Pauer, WVDEP - DWWM Project Manager

_____ Date: 08/11/22
Katheryn Emery, P.E., Acting Director, WVDEP – DWWM

_____ Date: _____
Lucinda Power, US EPA CB Project Manager

_____ Date: _____
Durga Ghosh, US EPA CBPO QA Officer

A.2 Table of Contents

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A.3 Distribution List

This document and all supporting materials will be submitted to the following individuals. Distribution format will be electronic copies.

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A.4 Project/Task Organization

Table A.1 Roles & Responsibilities

Individual(s) Assigned	Responsible for:	Authorized to:
Program Support – Environmental Resources Specialist Supervisor	· Compiles statewide DMR data for significant facilities using the Point Source Data Application · Ensures appropriate defaults for insignificant facilities are uploaded to the Point Source Data Application · QA of the DMR data, calculates nitrogen speciation based on CB guidance · Updates facility information · Reviews CSO, biosolid and spray irrigation information and adds to report · Reviews DMR QA work of team members · Submission of final report	· Report final point-source data
Watershed Assessment Branch/Watershed Improvement Branch/Permitting-Various	· Provides technical guidance as needed · Provides updated facility information	· N/A
Program Support – Environmental Resources Specialists	· Assist with compiling data for significant facilities using the Point Source Data Application and compiling default values for insignificant facilities · Obtains CSO, biosolid and spray irrigation information · Assists with QA of DMR data and facility research · Contacts facilities to obtain additional/corrected DMRs	· Assist in reporting final point-source data
DWWM EE Inspectors	· Inspects facilities to ensure correct sampling and reporting · Initiates Enforcement Actions to obtain compliance, if necessary	· Issue Enforcement Actions
US EPA – Chesapeake Bay Program Office	· Reviews final report and works with WVDEP staff to resolve any issues	· Approve final submission

Figure 1: DWWM - Program Support Group Organization Chart

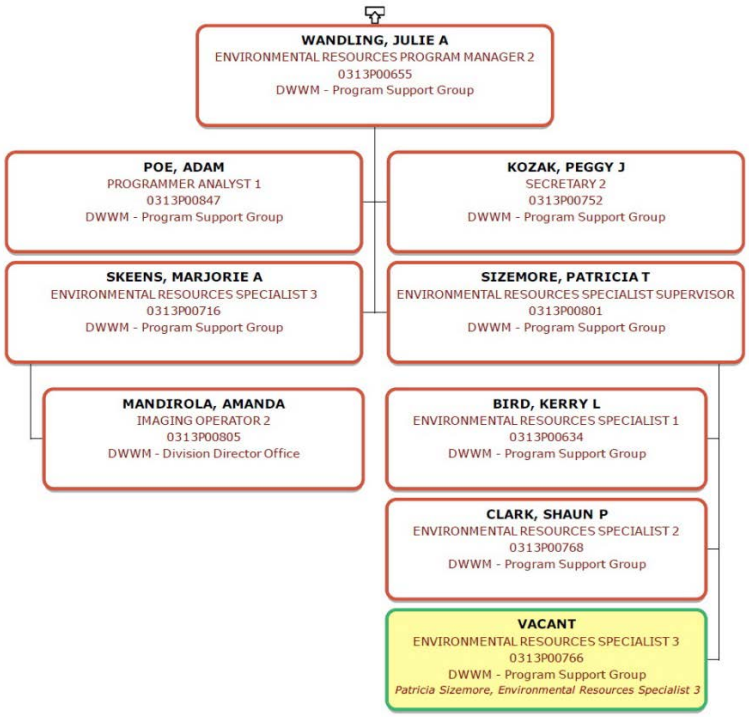


Figure 2: Watershed Assessment Branch/Total Maximum Daily Load Section Organization Chart

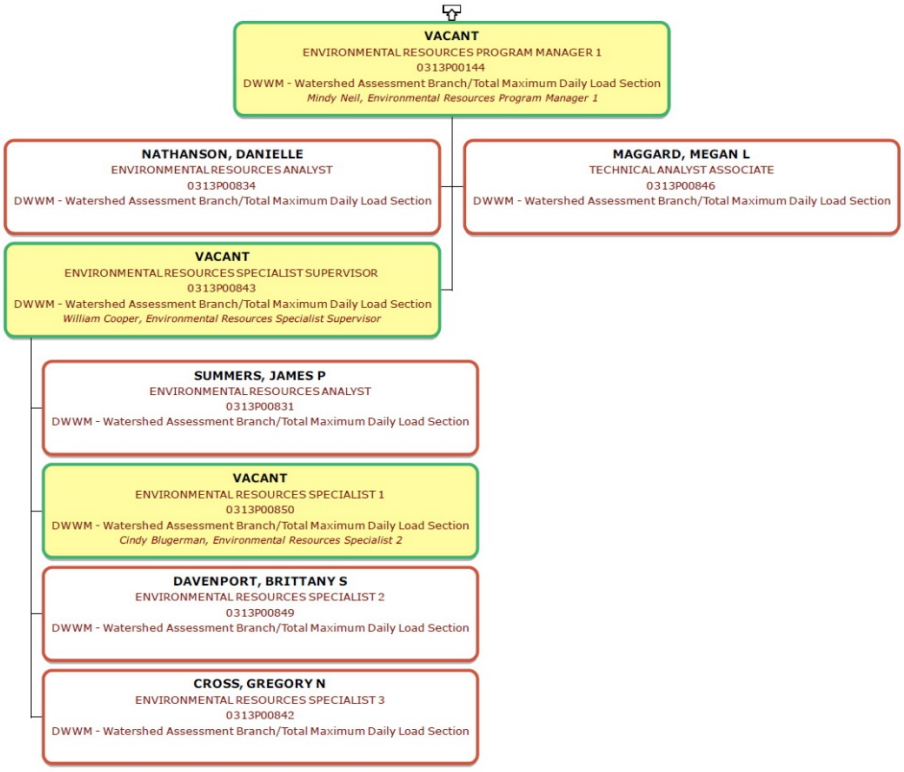
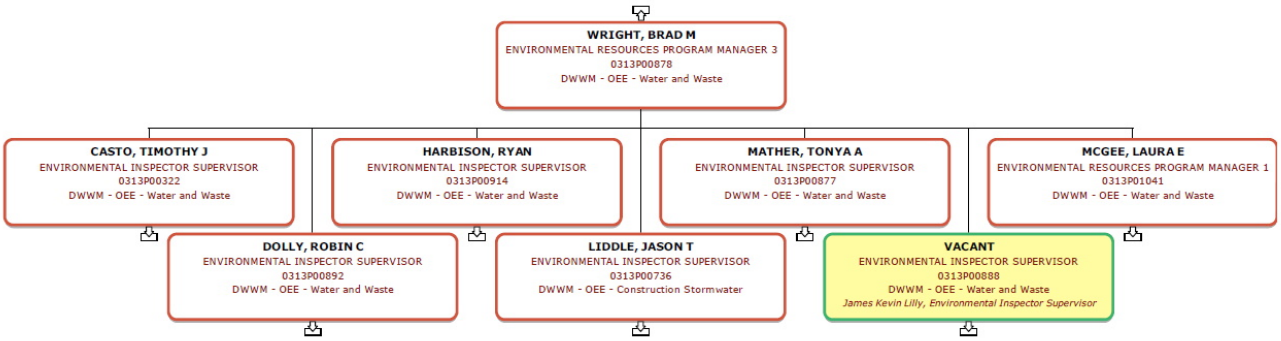


Figure 3: DWWM – OEE – Water and Waste Organization Chart - Supervisors



A.5 Problem Definition/Background

West Virginia's point-source data collection focuses on collecting data from permitted industrial and municipal facilities along the Chesapeake Bay watershed. The data is collected through each facility's submission of Discharge Monitoring Reports (DMRs) as required by their permit. DMRs are reports that provide analytical results of chemicals and nutrients being discharged by NPDES permitted facilities (point sources) into the waterways of West Virginia. The data undergoes rigorous quality assurance checks before being uploaded into WVDEP's Environmental Resources Information System (ERIS) and uploaded into US EPA's Integrated Compliance Information System (ICIS).

Additionally, Combined Sewer Overflows (CSOs) are present in the collection systems of four West Virginia Publicly Owned Treatment Works in the Potomac Basin and represented in the Chesapeake Bay Watershed Model. The Chesapeake Bay TMDL provides individual CSO wasteload allocations based upon 85% reduction of the loads represented in the Phase 5.3.2 model 2010NoAction scenario. Because of the episodic nature of overflows and lack of flow monitoring capability, measurement of actual CSO loadings is not practical. Under national and state CSO control policies, facilities are implementing long-term plans to ensure that CSOs do not cause or contribute to any violation of water quality standards. Interim goals of 85% CSO reduction and/or controls that result in less than six overflows per year are being pursued.

Biosolids data is collected through sewage sludge management reports from four municipal facilities that use land application and spray irrigation data for one municipal facility is collected from DMR applications.

Annually, the data is compiled into a report to be used by the US EPA's Chesapeake Bay Program Office in Chesapeake Bay Watershed Model to assess reductions in nitrogen, phosphorus and sediment loadings to Chesapeake Bay and its tidal tributaries. Since the nature of this project relies on data collected and reported from outside sources, there are unique challenges to ensuring complete and accurate data. A quality assurance project plan to address the procedure for obtaining thorough, correct data was needed to ensure consistency from year to year.

A.6 Project/Task Description

Discharge samples are collected and analyzed by the permitted facilities or authorized contracted laboratories, which are certified pursuant to 47 CSR 32, Environmental Laboratories Certification and Standard of Performance. The results are reported on DMRs to WVDEP utilizing the procedures outlined in WVDEP's Electronic Discharge Monitoring Reporting (eDMR) User's Guide (see Attachment 1).

The point source data is then compiled in accordance with the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2) guidelines. This includes various nitrogen and phosphorus species, as well as total suspended solids and dissolved oxygen. The data collected for this project is from significant facilities with a design flow of 0.4 MGD or greater in the Chesapeake Bay watershed, and each annual report covers discharges occurring between the previous July through June period. The data from the DMRs is verified by WVDEP Program Support staff who contact the facility, if necessary, to correct erroneous data.

Program Support staff will seek technical assistance from groups such as Watershed Assessment Branch, Watershed Improvement Branch and Permitting as needed to provide default values for insignificant facilities in the watershed using the default approach referenced on page 16 of West Virginia's Phase III Watershed Implementation Plan (WIP). No wasteload allocations are provided for new or expanded discharges from sewage treatment facilities of any size. All such discharges must offset 100% of new loadings and WV/NPDES permits must include enforceable provisions to implement offsets. insignificant municipal facilities may secure offsets by improved treatment of existing discharges and/or by assimilation of existing onsite systems and other existing wastewater treatment systems for which wasteload allocations have been provided. New or expanded municipal discharges of any size will require regulation under an individual WV/NPDES permit to implement offset provisions. Data tracking and verification protocols for expanded insignificant facilities will be identical to those described for existing significant facilities i.e. expanded non-significant facilities will be required to self-monitor nutrient concentrations and measure flow and report on DMRs.

When all quality checks are complete, the data sets for significant facilities are created and edited, if needed, in the Point Source Data Application while data sets for insignificants are created in the Point Source Application, exported to Excel where it is edited and finalized, and then uploaded to the Point Source Application. CSOs, biosolid and spray irrigation data are compiled, formatted in Excel spreadsheets and submitted to US EPA's Chesapeake Bay Program Office by the deadline specified in the Chesapeake Bay Regulatory and Accountability Grant (typically November 30th). Refer to the West Virginia Plan for Verification and Validation of Nutrient Reduction Strategies (Attachment 3) for more information.

A.7 Quality Objectives & Criteria

1) Accuracy Objectives (Qualitative)
    a. Compare expected numbers vs. actual counts using prior years' numbers
    b. Ensure there is no double counting of discharge data (ex. internal outlets or facility counted as a significant & non-significant)
    c. Ensure facility online/offline statuses are updated on the report

2) Completeness Objectives
    a. Ensure all DMRs for the annual reporting period are sent to WVDEP by July 25th
    b. Contact facility to obtain missing DMR data and have it sent in no later than September 30th

A.8 Special Training/Certification

n/a

A.9 Documents and Records

This QAPP is saved in a shared folder and accessible by all WVDEP staff that work on the annual point-source progress report. It is updated as programmatic requirements or process changes occur.

Data for significant and insignificant facilities that have been finalized via the Point Source Data Application are exported into Excel spreadsheets for WVDEP's records. They are saved in a shared folder available to WVDEP Program Support staff since they are responsible for its creation and completion. CSO, biosolids and spray irrigation data are ultimately submitted by email in spreadsheet format to the Chesapeake Bay Program Office. This data is also saved in a shared folder available to WVDEP Program Support staff. Any modifications to the spreadsheets are automatically backed up, with a date included in the file name to easily keep track.

All of the versions for a report year are kept in a folder with the year number. The yearly folders are kept in one overall Chesapeake Bay Point Source folder, along with reference information including the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2). The data will be kept indefinitely.

SECTION B – DATA GENERATION & ACQUISITION

B.1 Sampling Process Design (Experimental Design)

n/a

B.2 Sampling Methods

n/a

B.3 Sampling Handling & Custody

n/a

B.4 Analytical Methods

n/a

B.5 Quality Control

n/a

B.6 Instrument/Equipment Testing, Inspection, and Maintenance

n/a

B.7 Instrument/Equipment Calibration and Frequency

n/a

B.8 Inspection/Acceptance of Supplies & Consumables

n/a

B.9 Data Acquisition Requirements for Non-Direct Measurements

Point-source data is obtained through the compilation of electronic DMRs submitted to WVDEP through the Electronic Submission System (ESS). The data must undergo electronic validations in order to be deemed acceptable, where it is then scrutinized by WVDEP staff. Limitations of the data include human error by the facility when entering the data that may not be caught during review if it still falls within the expected values. Additionally, sampling errors could occur that result in inaccurate measurements.

B.10 Data Management

DMR data is required to be kept on file by the facility for at least three years following the date of the report. However, WVDEP's ESS keeps electronic DMRs in the system indefinitely that can be retrieved anytime for verification purposes.

The ERIS database is used to house the DMR data at the state level. From ERIS, the data is fed into ICIS and the Point Source Data Application extracts the available data from ICIS to be verified and expanded upon. The Point Source Data Application is required to select and create the final format for significant and insignificant facilities to be used by US EPA as outlined in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2).

SECTION C – ASSESSMENT AND OVERSIGHT

C.1 Assessments and Response Actions

1. Perform routine surveillance of DMR data completeness through monthly Entry Rate reports to ensure data is obtained and downloaded in a timely manner. A success is considered a 95% or greater Entry Rate in the month following the DMR due date, with missing DMRs obtained afterwards through facility contact. Serious cases will be referred to enforcement staff to take appropriate enforcement actions to obtain compliance, if necessary.

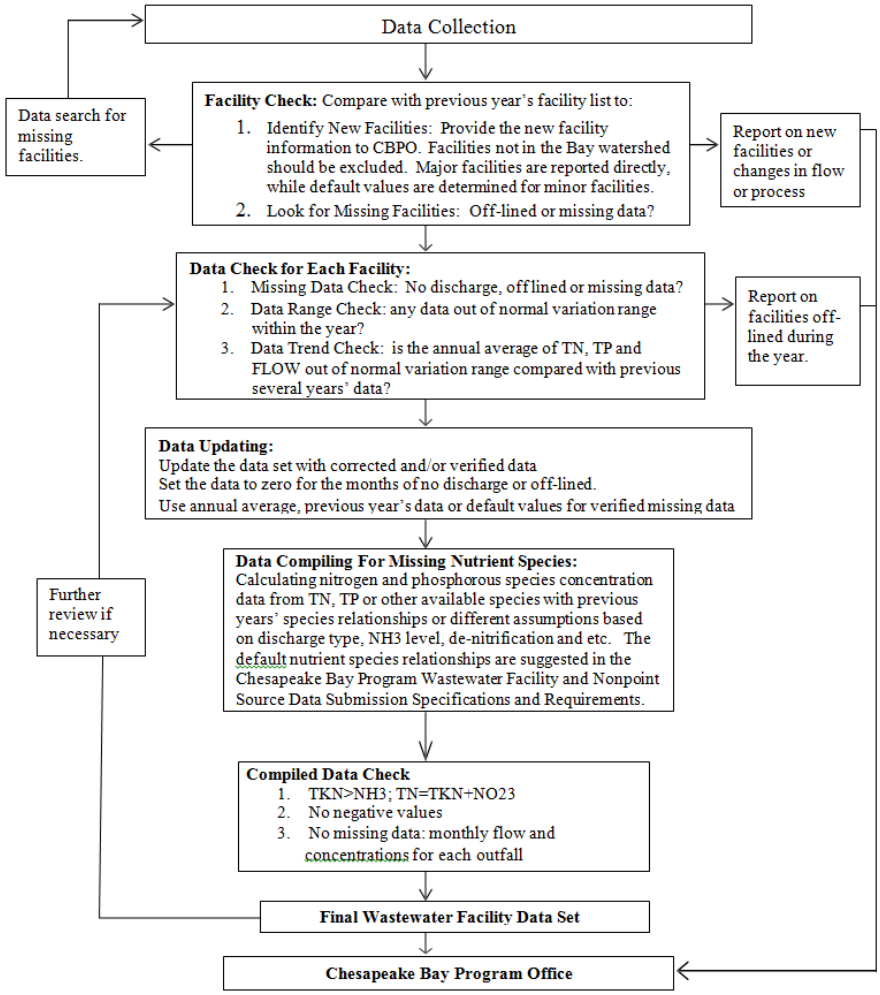
2. WVDEP participates in Chesapeake Bay meetings and conferences to discuss data collection efforts as they occur. Any data issues that arise are discussed until a solution is determined. If programmatic changes occur that impact data collection or verification, WVDEP will adjust data management and analysis methods as appropriate to meet Chesapeake Bay Program Office requirements. This QAPP will be revised to reflect any changes that occur.

3. Run quarterly Chesapeake Bay Trend Reports in ICIS for significant facilities and verify any anomalies resulting from the reports.

4. WVDEP Program Support staff creates a draft annual report in August and analyzes and evaluates data for accuracy and completeness as outlined by the Chesapeake Bay Phase 6 Community Watershed Model, the WVDEP Reporting Reference Manual (see Attachment 4), and in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2). First, the data is reviewed to determine if there is missing information from their DMRs. If so, the facility is contacted in order to obtain the information. If no analytical data is available for Nitrogen and Phosphorus derivatives, values are calculated using formulas specified in the guidance documents or by averaging the values reported in other months. The data is scrutinized by multiple staff members to ensure nothing is missed and is considered a success if all fields have been verified and have a value for the model. The data is then scrutinized to look for anomalies by comparing each reported value for the month to each other. Next, DEP staff calculates annual pounds from the monthly concentrations and compares the value to past years' values to observe any trends and ensure the value is within reason. Significant facilities are required to report annual loadings for Nitrogen and Phosphorus each year. Although WV/NPDES permit reporting time frames are not generally consistent with CBP Progress periods, reported annual loads are used for comparison purposes as another form of data verification. For new facilities, additional information has to be reported, including latitude and longitude and the date the facility began discharging. Once submitted, US EPA staff will notify WVDEP if data needs adjusted, and WVDEP will submit a corrected report if required.

5. WVDEP Laboratory Certification staff performs assessments of laboratories that collect and/or test water samples reported on DMRs. This is done through Technical Systems Audits that assess sampling and analytical quality control procedures, and can include onsite evaluations, equipment calibration, personnel qualification reviews, recordkeeping reviews, data validations and management reviews, and reviews of field and laboratory activity reports. See the WVDEP Quality Management Plan for additional information.

Figure 4: Wastewater Facility Nutrient Data Processing Diagram



C.2 Reports to Management

No standardized reports are sent to management during the process, but management often checks on the status of the project informally and problems are addressed or followed up on as needed.

SECTION D – DATA VALIDATION AND USABILITY

D.1 Data Review, Verification, and Validation

DMR data can be rejected in ESS, ERIS or ICIS if it does not pass automated validations put in place to ensure accurate and complete data. Data is then reviewed by DEP staff members following instructions outlined in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2), including ways to calculate data not required by the DMRs. WVDEP looks for outlying values by comparing monthly data values, as well as compares the annual loads of nitrogen and phosphorus to the loads of previous years to ensure the variations are within reason. Any suspicious values are identified, and the facility is contacted in order to verify, obtaining laboratory reports when possible.

D.2 Verification and Validation Methods

One of the primary mechanisms for verifying compliance is the self-monitoring requirements included in the NPDES permits issued to significant facilities. Permits require regular and frequent submission of effluent analytical data to WVDEP to verify compliance with effluent limitations via monthly DMRs. Permits also contain procedures for facilities to calculate monthly loads by averaging nutrient results and coupling those with measured total monthly flow. Generally, 1/week nitrogen and phosphorus composite sampling and continuous flow measurement are required. These self-reported data are maintained in a database by WVDEP staff and are the intended basis for annual progress reporting. The eDMR system has numerous data validations built directly into the interface that prevent facilities from submitting certain types of erroneous data, such as detecting improper units or reporting frequencies. Facilities cannot submit their eDMR until the errors have been addressed, thus all data received should have a very high standard of completeness and accuracy prior to review by WVDEP Program Support staff.

Trained WVDEP Division of Water and Waste staff performs regular assessments of the data received from the facilities. During these reviews WVDEP staff looks for and attempts to rectify any anomalies in the data (ex. incorrect reporting units, incorrect load calculations, etc.). Prior to submitting the annual point-source progress report, WVDEP staff performs a QA/QC review in accordance with the recommended methods described in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements guidance document (Attachment 2) and will contact facility to rectify any issues.

Another quality assurance measure performed by WVDEP staff occurs when data is translated from the state database (ERIS) to US EPA's ICIS in batch, using the Central Data Exchange. Batch Transaction Summary Reports from ICIS are ran and checked by Program Support staff members to rectify any errors that occurred during translation. Additionally, Program Support staff completes the ICIS Quarterly Non-Compliance Reports (QNCRs). The QNCRs show DMR data that violates the permit limits and conditions as well as any facilities that failed to submit a scheduled eDMR during the quarter. Staff assesses the validity of the violations by comparing the DMR data provided by the facility against the data in ICIS and the requirements of their permit and contacts the facility to obtain corrected reports as needed.

Discharge Monitoring Report data is not tracked or reported for insignificant facilities. The self-monitoring required of insignificant facilities often includes infrequent instantaneous measurements without flow measurement and is insufficient to characterize annual loads. Because pollutant reductions are not expected from the insignificant facilities that existed when the TMDL was developed, verification is not directly applicable. In the TMDL, aggregate wasteload allocations were prescribed at the county level and were calculated by summing individual facility loads derived from default concentrations and design flow. West Virginia's inventory of insignificant facilities is well documented and includes even the smallest permitted facilities such as home aeration units. West Virginia's focus lies in tracking the universe of active non-significant dischargers and annually reporting loads from active facilities that are derived from the same default concentrations and design flows used to develop the wasteload allocations.

For CSO data, reporting is based upon broadly assessing the level of control that has been accomplished and continuing to report that level of control until the facility implements new substantive controls.

In addition to the self-monitoring and reporting mechanisms, WVDEP independently assesses/compels compliance with permits through inspections and the use of enforcement actions in response to noncompliance. The number, type, and frequency of inspections performed conform to the guidance provided by the USEPA's Compliance Monitoring Strategy (CMS). For Major facilities covered in this point-source data report, the inspection frequency is at least one comprehensive inspection every two years, or once every three years if using the Inspection Targeting Model and the facility is in compliance. Systematic escalation of enforcement is pursued to resolve noncompliant facilities in the shortest time possible. Each inspection covers numerous topics that directly impact the quality of DMR data received by WVDEP, including permit reporting requirements (including DMRs), flow measurements, laboratory certification, and sampling practices (see Attachment 5).

For CSOs and traditional municipal and industrial wastewater treatment works, many controls have already been put in place. For future constructions, the Clean Water State Revolving Fund ensures proper design and installation of new and upgraded systems as required by state auditing procedures in accordance with 40 CFR 35.31. See the table below for a schedule of completed and planned treatment upgrades for significant facilities. For CSOs, a Long-Term Control Plan is developed as a requirement of their NPDES permit that ensures post-construction self-monitoring. Inspections are completed by the WVDEP Environmental Enforcement branch as described above.

Table 1. Significant Facility Upgrade Status (updated 10/1/2021)

Significant Facilities Upgrade Status			
WV/NPDES Permit No.	**Permittee**	**Upgrade "Substantially Complete" Status/Schedule Date**	**Comment**
WV0106038	MOOREFIELD-HARDY COUNTY WASTEWATER AUTHORITY	complete	consolidates and treats previous Town of Moorefield WV0020150 and two significant industrial facilities
WV0020699	ROMNEY	complete	
WV0021792	PETERSBURG	complete	
WV0022349	CHARLES TOWN	complete	Charles Town Willow Springs wastewater treatment plant (WV0086452) tied into Charles Town (WV0022349) Outlet 001 6/14/2017.
WV0023167	MARTINSBURG	complete	
WV0024392	KEYSER	complete	
WV0024775	SHEPHERDSTOWN	complete	
WV0027707	WARM SPRINGS PSD - BS	compliant	no near-term upgrade planned
WV0105988	FRANKFORT PSD	complete	previously Fort Ashby WV0041521
WV0082759	BCPSSD - O/H	complete	
WV0082759	BCPSSD - Inwood	complete	
WV0082759	BCPSSD - Baker Heights	complete	
WV0082759	BCPSSD - North End	complete	
WV0005495	PILGRIM'S PRIDE CORPORATION	complete	Included in Moorefield-Hardy County Wastewater Authority
WV0047236	PILGRIM'S PRIDE CORPORATION	complete	Included in Moorefield-Hardy County Wastewater Authority
WV0005649	USDOI - Leetown	noncompliant	no near-term upgrade planned
WV0111821	WVDNR - Reeds Creek	compliant	no near-term upgrade planned
WV0112500	WVDNR- Spring Run	compliant	no near-term upgrade planned
WV0116149	CONSERVATION FUND	compliant	no near-term upgrade planned

With respect to onsite systems, BMP tracking for nonpoint sources is covered under the WV QAPP for BMP Collection.

Table 2. Wastewater sector verification strategy from the West Virginia Plan for Verification and Validation of Nutrient Reduction Strategies

Program Component	Program Elements	Wastewater treatment plant data verification
i. BMP Verification	1. What was the driver for BMP installation?	Permit
	2. How many BMPs will be inspected?	For all significant facilities, DMR self-monitoring submissions are reviewed and field inspections are performed
	3. How is inspection frequency and location determined?	DMRs and CSO reports are reviewed upon receipt and comprehensively at annual progress submission intervals; Inspection frequency in accordance with USEPA Compliance Monitoring Strategy
	4. How often are BMPs/groups of BMPs inspected?	Inspection frequency in accordance with USEPA Compliance Monitoring Strategy
	5. What is the method of inspection?	DMR review, database review and field inspections
	6. Who will conduct the inspection and is he/she certified/trained?	WVDEP trained permit and enforcement staff
	7. What needs to be recorded for each inspection?	See attached inspection form (Attachment 5)
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	Yes.
	9. How is collected data recorded?	DMR data is submitted through an online form and maintained in a database. Online form guidance is included in Attachment 1. Permittees currently submit hard copy CSO reports.
	10. At what resolution are results reported to EPA and/or the public?	Site-level
ii. BMP Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	Only active facilities are reported; permit database allows activity tracking
	12. What is the method used to validate state's ability to collect and report correct data?	Annual review of data collected for all facilities.
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	All DMR data is submitted by the permittee under a statement certifying that the data is true and accurate. Analytical laboratories must also be certified to perform permit self-monitoring analyses
	14. Who conducts data validation?	WVDEP
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	Effluent limitations, self-monitoring and reporting under NPDES permit requirements that are consistent with the TMDL wasteload allocations.
	16. Who collects BMP effectiveness data?	WVDEP

D.3 Reconciliation with User Requirements

The final report should always be submitted in such a way to be completely in line with User Requirements since it is formatted, compiled, analyzed and calculated as outlined by the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2).