

Federal Agency Progress Evaluation

Prepared for

Environmental Protection Agency, Chesapeake Bay Program Office

December 9, 2020

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| DRAFT  Federal Agency Progress Evaluation  Prepared for  Environmental Protection Agency, Chesapeake Bay Program Office  December 9, 2020 |
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| This is a draft and is not intended to be a final representation  of the work done or recommendations made by Brown and Caldwell.  It should not be relied upon; consult the final report. |

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List of Abbreviations

ARS Agricultural Research Service

BayFAST Bay Facility Assessment Scenario Tool

BC AH/BC Navy JV, LLC

BMP best management practice

CAST Chesapeake Assessment Scenario Tool

DoD Department of Defense

DEP Department of Environmental Protection

DEQ Department of Environmental Quality

DOEE Department of Energy and the Environment

EPA Environmental Protection Agency

FFTAT Federal Facilities Target Action Team

FPG federal planning goal

GSA General Services Administration

MD Maryland

MDE Maryland Department of the Environment

MS4 **municipal separate storm sewer system**

NASA National Aeronautics and Space Administration

NCR National Capital Region

NEIEN National Environmental Information Exchange Network

NPS National Park Service

NY New York

PA Pennsylvania

Report *Federal Agency Progress Evaluation*

TMDL total maximum daily load

TN total nitrogen

TP total phosphorus

TSS total suspended solids

US United States

USFS United States Forest Service

US FWS United States Fish and Wildlife Service

VA Virginia

WIP Watershed Implementation Plan

WV West Virginia

# 

Introduction

Federal agencies own or maintain almost 2.3 million acres in the Chesapeake Bay watershed, including 112,000 acres of developed land. Cumulatively, federally owned land is equal to 5.7 percent of the watershed land area, which makes the federal community an important stakeholder to the Chesapeake Bay total maximum daily load (TMDL). Since 2010, federal agencies have been partners in the restoration of the Chesapeake Bay through the implementation of two‑year milestones, the Federal Facilities Workgroup and Federal Office Directors, and the reporting of practices that support the Bay restoration. Like the Chesapeake Bay jurisdictions, federal agencies are expected to contribute to the reduction of pollutant loads of total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS) to the Chesapeake Bay. The jurisdictions define the expected equitable load reductions or final loads to be achieved by federal agencies with input from the Environmental Protection Agency (EPA), who is charged to oversee the Chesapeake Bay TMDL and restoration program, and the federal community.

The EPA Chesapeake Bay Program Office contracted AH/BC Navy JV, LLC (BC) to assess the progress of each federal agency toward their goals utilizing the results of the Chesapeake Assessment Scenario Tool (CAST) 2019 Progress scenario and comparing those loads to the federal planning goals (FPGs) defined for each jurisdiction. This effort includes a comparison of the best management practices (BMPs) currently credited to federal agencies in CAST and the agency’s record of implemented BMPs to assess the accuracy and completeness of the federal BMP record reported by the jurisdictions. The purpose of this exercise is to define the baseline (2019) for federal BMP implementation as documented in CAST, evaluate FPGs defined by jurisdictions and EPA through 2025, assess the accuracy of federal BMP information reported from the jurisdictions to CAST, and provide recommendations and next steps to EPA and the Federal Facilities Workgroup.

## Background

A number of federal agencies operate within the Chesapeake Bay watershed. Some, like the United States (US) Army Corps of Engineers, the United States Geological Survey, and the US Postal Service, own a limited land area. Others, like the Department of Defense (DoD) and the US Forest Service (USFS), control significant amounts of land. Recognizing the increased influence of the largest federal landholders to improve water quality in the Chesapeake Bay, CAST allows users to assess the progress of eight federal agencies: the Agricultural Research Service (ARS), DoD, General Services Administration (GSA), National Aeronautics and Space Administration (NASA), National Park Service (NPS), Smithsonian Institution, US Fish and Wildlife Service (US FWS), and USFS. These federal agencies own and operate facilities in six jurisdictions (Maryland, New York, Pennsylvania, Virginia, Washington, D.C., and West Virginia). There is no federal presence in Delaware; therefore, it is excluded from this analysis. The other federal agencies in the watershed are consolidated in CAST as “Other Federal Land” and are not evaluated as a part of this effort. Table 1‑1 includes a summary of the land assigned by jurisdiction to the eight named federal agencies in the 2019 Progress scenario from CAST-2019.

Although CAST calculates nutrient and sediment loads from six source sectors (Agriculture, Atmosphere, Developed, Natural, Septic, and Wastewater), federal agencies are only assigned loads in the Developed and Natural source sectors. In practice, federal agencies may also impact other source sectors, such as Agriculture, Septic, and Wastewater, but due to limitations in available data and scale of implementation, the Chesapeake Bay Program elected not to assign these source sectors to federal agencies. Federal agencies also do not have loads assigned for the Construction and Harvested Forest load source groups in the Developed and Natural source sectors, respectively. For the Agriculture and Wastewater sectors and the Construction and Harvested Forest load source groups, BMP implementation and loads are tracked by the jurisdictions.

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| Table 1‑1. Federal Agency Land in the Chesapeake Bay Watershed (Acres) | | | | | | |
| Agency | Maryland | New York | Pennsylvania | Virginia | Washington, D.C. | West Virginia |
| ARS | 6,317 | - | - | - | 420 | - |
| DoD | 72,392 | 2,812 | 84,517 | 205,463 | 1,655 | 10,006 |
| GSA | 1,787 | 0.6 | 4 | 188 | 509 | 7 |
| NASA | 1,229 | - | - | 516 | - | - |
| NPS | 44,836 | - | 14,446 | 287,100 | 8,152 | 3,763 |
| Smithsonian | 789 | - | - | 2,901 | 147 | - |
| US FWS | 28,399 | - | 164 | 24,971 | - | 626 |
| USFS | - | - | - | 1,195,138 | - | 267,280 |
| TOTAL | 155,749 | 2,813 | 99,131 | 1,716,277 | 10,883 | 281,682 |

## Report Organization

This 2019 Federal Agency Progress Evaluation (Report) includes four sections.

* Following this introduction (Section 1), Section 2 reviews the federal agency data and results from the 2019 Progress scenario, including the scenario’s BMP input deck, resulting loads, and a comparison with BMP data provided by the federal agencies.
* Section 3 will review potential FPGs for federal agencies from the EPA Default Method, the Phase III Watershed Implementation Plans (WIPs), and the CAST scenario of BMP inputs for 2025 (WIP 3 Final scenario) and compare the equity and level of effort associated with each source.
* Section 4 will include conclusions and next steps for federal agencies, jurisdictions, and EPA.

2019 Progress Evaluation

The 2019 Progress scenario in CAST-2019 was used to assess the progress of federal agencies through June 30, 2019. The Loads report within CAST was used to determine the TN, TP, and TSS loads assigned to each of the eight federal landholders with a defined agency code by Chesapeake Bay jurisdiction, and the BMP Input report was used to determine the number of BMPs assigned to each agency code by jurisdiction. In addition, the BMPs Submitted versus Credited report was utilized to determine the credited implementation of BMPs by BMP type. In the summer of 2020, each federal agency was asked to provide a copy of their full historical record or the most recent annual progress submission for comparison with the 2019 Progress scenario BMP information and to provide feedback on the BMP dataset currently assigned in CAST.

The results of this task are intended to inform the baseline for comparison with the FPGs (in Section 3) to determine the remaining effort required by federal agencies to achieve their 2025 targets. To assess the quality of the baseline, this section will also compare the 2019 Progress scenario inputs against the historical BMP record provided by the federal agencies. The purpose of this assessment is only to compare the number of BMPs in each dataset, not to determine the crediting status of individual BMPs tracked by the federal agencies.

## CAST BMP Input Overview

The Chesapeake Bay jurisdictions are a key intermediary between federal facilities and CAST. BMPs implemented for water quality improvement are reported by the federal community to the jurisdictions, who then report the information to the National Environmental Information Exchange Network (NEIEN). Data from NEIEN is used to track annual progress in CAST, which models the nutrient and sediment loads across the watershed and those that reach the Bay. While this approach creates a standardized structure for tracking progress by jurisdiction, each transfer of data from one repository to the next introduces the possibility of changes. The jurisdictions and federal agencies have dual responsibilities: to ensure that the reported data includes sufficient information to be successfully credited and to ensure the reported data is accurately transferred to the next node. This section will review the reporting and crediting of federal BMPs from the federal agency through CAST.

The number of BMPs assigned to each federal agency in the 2019 Progress scenario, as pulled in July 2020, is summarized by jurisdiction in Table 2-1. Red-filled cells indicate that the agency has land in the jurisdiction but no BMPs that were credited in state year 2019. Cross-hatched cells indicate that the agency does not have land in the jurisdiction, based on federal land use data in CAST.

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| Table 2‑1. BMP Count in 2019 Progress Scenario by Agency & Jurisdiction | | | | | | |
| Agency/State | MD | NY | PA | VA | DC | WV |
| ARS |  |  |  |  |  |  |
| DoD | 1406 | 1 | 302 | 50 | 125 |  |
| GSA | 15 |  |  |  | 68 |  |
| NASA | 29 |  |  | 3 |  |  |
| NPS |  |  |  |  | 26 |  |
| Smithsonian |  |  |  |  | 22 |  |
| US FWS | 21 |  | 5 | 1 |  |  |
| USFS |  |  |  |  |  |  |

A detailed discussion of the results for each agency is included in the subsequent sub-sections.

## ARS

ARS controls 6,317 acres in Maryland and 420 acres in Washington, D.C. Of that area, 1,526 acres and 156 acres are developed in Maryland and Washington, D.C., respectively. Therefore, most of the land owned by ARS is assigned to the Natural source sector.

### BMP Implementation

The 2019 Progress scenario does not include BMPs from ARS. Recent changes in staff at ARS have led to some loss of institutional knowledge. Bill Howl with the United States Department of Agriculture indicated that there are about 50 BMPs to report at ARS facilities. In 2021, EPA will work with ARS to assist with their BMP reporting. Given the agency’s focus on agriculture, it is possible that some of the 50 BMPs are agricultural practices that will not be credited to the federal agency in CAST.

### Pollutant Loads

Table 2-2 summarizes the 2019 Progress loads of TN, and TP, and TSS for ARS by state basin. These loads do not include load reductions from BMPs that may be located at ARS facilities.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑2. ARS 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| DC Potomac River Basin | 1,408 | 120 | 181,357 | 1,328 | 106 | 101,191 |
| MD Patuxent River Basin | 260 | 35 | 37,515 | 109 | 25 | 14,695 |
| MD Potomac River Basin | 24,180 | 3,656 | 5,986,377 | 19,762 | 3,754 | 5,064,072 |

## DoD

DoD owns 72,392 acres in Maryland, 2,812 acres in New York, 84,517 acres in Pennsylvania, 205,463 acres in Virginia, 1,655 acres in Washington, D.C., and 10,006 acres in West Virginia. Of the almost 377,000 acres owned by DoD across the Chesapeake Bay watershed, 72,341 acres are developed. Therefore, DoD controls the most developed land among the federal agencies in the Chesapeake Bay watershed.

### BMP Implementation

#### BMP Inputs

The DoD agency code is assigned to 1,884 BMPs in the 2019 Progress scenario BMP input deck. However, the DoD maintains a database of over 3,800 BMPs that were reported to the jurisdictions for the 2019 progress year. Of the 3,858 BMPs, about 3,400 were expected to be credited, meaning that there is no known reason the BMP record would be excluded from the 2019 Progress scenario. Known reasons would include expired annual BMPs, ineligible BMP types, BMPs with a failed inspection and no corrective maintenance, or BMPs without required information like a drainage area or extent. This list is based on BC’s experience with jurisdiction reporting requirements and the NEIEN error reports. The number of BMPs eligible for credit is an estimate only; for more information, federal agency or facility staff should coordinate directly with the appropriate jurisdiction contact or review the NEIEN error reports to determine if and why some BMPs are not credited.

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| --- | --- | --- | --- |
| Table 2‑3. Number of DoD BMPs Credited in 2019 Progress vs. DoD BMP Records | | | |
| Jurisdiction | BMPs in 2019 Progress | Estimate of BMPs Eligible for Credit | Data Rating b |
| Maryland | 1,406 | 1,664 | Medium |
| New York | 1 | 1 | High |
| Pennsylvania | 302 | 288 | High |
| Virginia | 50 | 1,374 | Low |
| Washington, D.C. | 125 | 71 | Low |
| West Virginia | 0 | 7 | Low |
| 1. Data ratings for Maryland, Pennsylvania, Washington, D.C., and Virginia are provided by the agency. The agency did not rate the data in New York or West Virginia. | | | |

Table 2-3 summarizes the number of BMPs credited in the 2019 Progress scenario, the number of BMPs estimated to be eligible for credit, and the agency’s data quality rating. The following observations note potential concerns about the BMP record in CAST compared to the agency’s BMP record:

Maryland. As stated above, the Maryland Department of the Environment (MDE) omitted some records in the 2019 Progress reporting due to an error in their data management system. According to the DoD BMP Crediting Report for Maryland, this impacted at least 300 DoD BMPs. For this reason, DoD indicated that the data record in Maryland has Medium completeness and accuracy.

Virginia. DoD reported over 1,300 BMPs to the Department of Environmental Quality (DEQ) BMP Warehouse. However, only 50 BMPs are credited in the 2019 Progress scenario. For this reason, DoD indicated that the data record in Virginia has Low completeness and accuracy.

Washington, D.C. DoD annually reports all implemented BMPs in Washington, D.C. to the District Department of Energy and the Environment (DOEE). However, DOEE reports to CAST from its own internal record system built from approved plan sets. DoD and DOEE have not successfully reconciled the two datasets to confirm the status of individual BMPs. For this reason, the agency rates the quality of the data in Washington, D.C. as Low.

West Virginia. DoD BMPs have not been credited in West Virginia.

#### Credited BMPs

Table 2-4 includes a summary of the BMP types that were credited for only a portion of the amount submitted. In most cases, a lack of credit for BMP implementation is due to excess, meaning that the submitted BMP amount exceeds the amount of available land to apply the BMP type at the scale it was reported in CAST. In the case of the Forest Harvesting Practices BMP reported in Pennsylvania, the BMP is not credited because federal agencies are not assigned land under the Harvested Forest load source group.

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| Table 2‑4. DoD BMPs Submitted versus Credited Summary | | | | | | |
| Jurisdiction | Unit | BMP | Total Amount Submitted | Total Amount Credited | Percent Credited (%) |
| Maryland | Acres Treated | Stormwater Performance Standard- Stormwater Treatment | 2,445.90 | 2,416.2 | 98.8 |
| New York | Acres Treated | Bioretention/raingardens -  A/B soils, underdrain | 2.0 | 0.9 | 46.7 |
| New York | Acres Treated | Infiltration Practices w/ Sand, Veg. -  A/B soils, no underdrain | 16.2 | 7.6 | 46.7 |
| Pennsylvania | Acres | Forest Harvesting Practices | 700.0 | 0 | 0 |
| Pennsylvania | Acres Treated | Infiltration Practices w/ Sand, Veg. -  A/B soils, no underdrain | 831.7 | 33.3 | 4.0 |
| Pennsylvania | Acres Treated | Wet Ponds and Wetlands | 23,911.10 | 2,922.4 | 12.2 |
| Pennsylvania | Acres Treated | Filtering Practices | 1.0 | 0.3 | 31.2 |
| Pennsylvania | Acres Treated | Stormwater Performance Standard- Stormwater Treatment | 319 | 129.8 | 40.7 |
| Pennsylvania | Acres Treated | Stormwater Performance Standard- Runoff Reduction | 354.8 | 297.3 | 83.8 |
| Pennsylvania | Acres Treated | Bioretention/raingardens -  C/D soils, underdrain | 0.3 | 0.3 | 87.6 |
| Pennsylvania | Acres Treated | Vegetated Open Channels -  A/B soils, no underdrain | 1.8 | 1.6 | 87.7 |
| Pennsylvania | Acres Treated | Dry Extended Detention Ponds | 47.0 | 41.3 | 88.0 |
| Pennsylvania | Acres Treated | Bioretention/raingardens -  A/B soils, underdrain | 6.7 | 6.1 | 90.8 |
| Pennsylvania | Acres Treated | Dry Detention Ponds and Hydrodynamic Structures | 1,946.2 | 1,803.3 | 92.7 |
| Virginia | Acres | Nutrient Management Plan | 1,138.0 | 691.3 | 60.7 |
| Virginia | Acres Treated | Permeable Pavement w/ Sand, Veg. -  A/B soils, no underdrain | 0.1 | 0.1 | 92.9 |
| Virginia | Acres Treated | Bioretention/raingardens -  A/B soils, underdrain | 10.8 | 10.3 | 95.9 |

### Pollutant Loads

Table 2-5 summarizes the 2019 Progress loads of TN, TP, and TSS for DoD by state basin. As a result of uncredited BMPs excluded from the 2019 Progress scenario in Maryland, Virginia, and West Virginia, as well as unresolved issues between DoD and DOEE in Washington, D.C., the loads in these jurisdictions are higher than if those BMPs were properly credited and attributed to DoD.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 2‑5. DoD 2019 Progress Loads (lbs/year) | | | | | | | |
| Jurisdiction | EOS | | | EOT | | | |
| TN | TP | TSS | | TN | TP | TSS |
| DC Potomac River Basin | 12,183 | 964 | 1,793,313 | | 11,662 | 1,052 | 1,986,229 |
| MD Eastern Shore of Chesapeake Bay | 10,572 | 710 | 48,817 | | 19,225 | 6,851 | 30,030,580 |
| MD Patuxent River Basin | 80,045 | 7,914 | 10,377,115 | | 77,807 | 15,261 | 45,796,378 |
| MD Potomac River Basin | 117,583 | 12,227 | 27,966,624 | | 125,769 | 32,244 | 128,785,173 |
| MD Susquehanna River Basin | 1,044 | 56 | 178,199 | | 982 | 43 | 61,513 |
| MD Western Shore of Chesapeake Bay | 138,515 | 19,696 | 25,559,392 | | 171,888 | 55,031 | 209,851,307 |
| NY Susquehanna River Basin | 17,229 | 2,142 | 3,501,038 | | 7,651 | 819 | 853,797 |
| PA Potomac River Basin | 43,839 | 5,263 | 11,384,829 | | 38,169 | 3,490 | 5,948,541 |
| PA Susquehanna River Basin | 402,429 | 32,568 | 56,308,266 | | 267,523 | 10,855 | 9,626,087 |
| VA Eastern Shore of Chesapeake Bay | 87 | 10 | 11,124 | | 78 | 7 | 1,494 |
| VA James River Basin | 204,246 | 21,392 | 18,264,383 | | 195,151 | 32,975 | 86,327,296 |
| VA Potomac River Basin | 233,446 | 43,462 | 83,101,680 | | 171,662 | 34,770 | 65,866,057 |
| VA Rappahannock River Basin | 116,246 | 15,187 | 30,712,816 | | 83,935 | 7,691 | 2,891,342 |
| VA York River Basin | 148,729 | 17,289 | 27,974,837 | | 87,285 | 13,117 | 33,070,925 |

## GSA

GSA owns land located in Maryland (1,787 acres, 58 percent developed), Washington, D.C. (518 acres, 98 percent developed), and Virginia (300 acres, 73 percent developed). A small amount of land is in West Virginia (6.9 acres, 99 percent developed), Pennsylvania (4.4 acres, 99.7 percent developed), and New York (0.6 acres, 99.9 percent developed).

### BMP Implementation

#### BMP Inputs

Only 83 BMPs are assigned to GSA in the 2019 Progress scenario with 15 reported BMPs in Maryland and 68 reported BMPs in Washington, D.C. The GSA National Capital Region (NCR), which includes GSA facilities in the Washington, D.C. metropolitan area, provided BMP records from the Suitland and White Oak facilities in Maryland. GSA Region 3 did not provide BMP information for GSA facilities in parts of Maryland, Pennsylvania, Virginia, and West Virginia to assess the completeness of the BMP record in those states. Table 2-6 includes the number of BMPs credited to GSA in the 2019 Progress scenario and the estimated number of BMPs that were eligible for credit. The agency did not provide a rating of the overall data quality.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2‑6. Number of GSA BMPs Credited in 2019 Progress vs. GSA BMP Records | | | |
| Jurisdiction | BMPs in 2019 Progress | Estimate of BMPs Eligible for Credit | Data Rating |
| Maryland | 15 | 61 | N/A |
| New York | 0 | Unknown | Unknown |
| Pennsylvania | 0 | Unknown | Unknown |
| Virginia | 0 | Unknown | Unknown |
| Washington, D.C. | 68 | Unknown | Unknown |
| West Virginia | 0 | Unknown | Unknown |

Maryland. GSA NCR reported 70 BMPs to MDE for 2019 Progress. A review of BMP data provided by GSA NCR indicated that 53 BMPs at the White Oak laboratory were reported in 2019, and 17 BMPs were reported at the Suitland facility in 2019. Of those BMPs, four BMPs do not have drainage area information, and five BMPs reported in 2019 include a failed inspection with no corrective maintenance. Based on correspondence between EPA and GSA staff, BMP implementation and maintenance is an ongoing concern, and some BMPs that have failed inspections need to be removed. Despite this concern, the 2019 Progress scenario appears to significantly undercount the number of BMPs at GSA facilities in Maryland.

In addition, GSA recognizes that its reported historical record does not represent all BMPs located at its facilities. GSA NCR indicates that BMP maintenance and repair is complete or scheduled for 200 BMPs at the region’s main campuses and 100 BMPs at smaller facilities. In FY2021, GSA plans to conduct a technical study at the Saint Elizabeth facility to locate BMPs on the site. Other assessments are also planned through the end of FY2021 to report BMPs identified through the technical studies.

Washington, D.C. Because no BMP record was provided for GSA in Washington, D.C., the accuracy and completeness of the dataset compared to the agency’s internal records cannot be assessed.

#### Credited BMPs

All BMPs that are included in the CAST 2019 Progress scenario for GSA are fully credited.

### Pollutant Loads

Table 2-7 summarizes the 2019 Progress loads of TN, and TP, and TSS for GSA by state basin. Based on the results in Table 2-6, the loads in Maryland do not reflect GSA’s eligible BMPs; therefore, the 2019 Progress loads overestimate the pollutant loads from the agency’s land.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑7. GSA 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| DC Potomac River Basin | 1,946 | 130 | 207,580 | 1,908 | 124 | 162,451 |
| MD Eastern Shore of Chesapeake Bay | 11 | 0.3 | 174 | 10 | 0.3 | 53 |
| MD Patuxent River Basin | 101 | 7 | 8,791 | 85 | 5 | 3,021 |
| MD Potomac River Basin | 5,500 | 574 | 1,283,539 | 4,641 | 528 | 1,140,794 |
| MD Western Shore of Chesapeake Bay | 8,161 | 531 | 781,796 | 6,525 | 380 | 322,155 |
| NY Susquehanna River Basin | 9 | 0.4 | 2,021 | 5 | 0.1 | 427 |
| PA Potomac River Basin | 0.5 | 0.03 | 41 | 0.5 | 0.02 | 21 |
| PA Susquehanna River Basin | 35 | 1.5 | 7,356 | 23 | 0.5 | 1,502 |
| VA James River Basin | 121 | 11 | 15,009 | 105 | 9 | 9,646 |
| VA Potomac River Basin | 1,526 | 146 | 225,337 | 1,143 | 98 | 63,623 |

## NASA

NASA owns 1,229 acres in Maryland and 516 acres in Virginia. In Maryland, 386 acres (31 percent) are assigned to the Developed source sector, and in Virginia, 327 acres (63 percent) are in the Developed sector.

### BMP Implementation

#### BMP Inputs

The Virginia BMP record from the NASA Langley Research Center in Virginia includes 33 BMPs. Of these, four BMPs are expired annual practices (e.g. storm drain cleaning, street cleaning) or practices not credited to federal agencies (e.g. erosion and sediment control). Therefore, it is expected that 29 BMPs would be eligible for credit. However, only three BMPs are credited to NASA in Virginia. Table 2-8 includes the number of BMPs credited in the 2019 Progress scenario, the estimated number of BMPs that were eligible for credit, and the data quality rating provided by the agency.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2‑8. Number of NASA BMPs Credited in 2019 Progress vs. NASA BMP Records | | | |
| Jurisdiction | BMPs in 2019 Progress | Estimate of BMPs Eligible for Credit | Data Rating |
| Maryland | 29 | 29 | Medium |
| Virginia | 3 | 29 | Low |

Maryland. NASA has reported 30 BMPs at the Goddard Space Flight Center in Maryland. One BMP does not have drainage area information and is marked for removal, so only 29 practices would be expected to be credited in Maryland. However, NASA staff indicated that the drainage area information of some BMPs in CAST does not match what was reported to MDE. For this reason, the data quality is rated by the agency as Medium.

Virginia. NASA provided a record of 33 BMP for 2019 Progress, which included 6 progress BMPs. The historical record includes two expired annual BMPs (storm drain and street cleaning) and two erosion and sediment control practices that would be credited in 2019 Progress. Therefore, 29 BMPs would be expected to have received credit, assuming that the data was entered in the appropriate template and reported to DEQ. However, only three BMPs are credited to NASA in the 2019 Progress scenario; therefore, the data quality for NASA in Virginia is rated by the agency as Low.

#### Credited BMPs

Table 2-9 includes a summary of the BMP types that were credited for only a portion of the amount submitted. In most cases, a lack of credit for BMP implementation is due to excess, meaning that the submitted BMP amount exceeds the amount of available land for the BMP at the scale it was reported in CAST.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑9. NASA BMPs Submitted versus Credited Summary | | | | | | |
| Jurisdiction | Unit | BMP | Total Amount Submitted | Total Amount Credited | Percent Credited (%) |
| Maryland | Acres Treated | Dry Detention Ponds and Hydrodynamic Structures | 10.3 | 5.2 | 50 |
| Maryland | Acres Treated | Wet Ponds and Wetlands | 513.2 | 277.1 | 54 |
| Maryland | Acres Treated | Stormwater Performance Standard- Stormwater Treatment | 75.6 | 61.7 | 82 |

### Pollutant Loads

Table 2-10 summarizes the 2019 Progress loads of TN, TP, and TSS for NASA by state basin. Based on the results in Table 2-8, the modeled loads in Maryland generally capture the implementation of NASA BMPs, though not all BMPs included in the 2019 Progress scenario are fully credited (Table 2‑9). In Virginia, the implementation of NASA BMPs is not captured in the 2019 Progress scenario loads; therefore, loads in the VA York River Basin are biased higher.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑10. NASA 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| MD Patuxent River Basin | 1,144 | 88 | 89,012 | 461 | 62 | 35,007 |
| MD Potomac River Basin | 3,391 | 337 | 617,728 | 2,771 | 348 | 523,830 |
| VA York River Basin | 5,034 | 483 | 447,950 | 4,096 | 376 | 347,197 |

## NPS

NPS owns over 358,000 acres across the Chesapeake Bay watershed, including 44,836 acres in Maryland, 14,446 acres in Pennsylvania, 287,100 acres in Virginia, 8,152 acres in Washington, D.C., and 3,763 acres in West Virginia. Of that land, only 16,475 acres are Developed, meaning that the majority of NPS land is part of the Natural source sector. NPS controls only 3,755 acres of developed land in Maryland (8 percent), 1,307 acres in Pennsylvania (9 percent), 7,717 acres in Virginia (3 percent), 3,217 acres in Washington, D.C. (40 percent), and 472 acres in West Virginia (13 percent).

### BMP Implementation

#### Credited BMPs

The 2019 Progress scenario included 26 NPS BMPs in Washington, D.C. Table 2-11 includes the number of BMPs credited in the 2019 Progress scenario, the estimated number of NPS BMPs that were eligible for credit, and the data quality rating assigned by the federal agency.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2‑11. Number of NPS BMPs Credited in 2019 Progress vs. NPS BMP Records | | | |
| Jurisdiction | BMPs in 2019 Progress | Estimate of BMPs Eligible for Credit | Data Rating |
| Maryland | 0 | 0 | Low |
| Pennsylvania | 0 | 0 | Low |
| Virginia | 0 | 5 | Low |
| Washington, D.C. | 26 | 52 | Low |
| West Virginia | 0 | 0 | Low |

The NPS provided a spreadsheet with BMPs in Washington, D.C., Maryland, Virginia, and West Virginia with which to assess the 2019 Progress scenario inputs. The agency rated the BMP data in the 2019 Progress scenario as Low.

Maryland. The NPS tracks 28 BMPs in Maryland, including agricultural and septic BMPs, which would not be credited to federal agencies. The other BMPs in the record are missing required information; the most common omissions are the installation date of the BMP, the BMP drainage area or extent, and the latitude and longitude coordinates. Therefore, these practices are not expected to have been credited in the 2019 Progress scenario.

Virginia. The BMP record provided by NPS includes 34 BMPs in Virginia. The list includes some ineligible BMP types (stream fencing, land retirement, and septic system pumping), and many of the remaining practices are missing required information, such as the BMP installation date. Five BMPs appear to include sufficient information to be successfully reported, but the spreadsheet indicates that they have not been reported to DEQ. Therefore, these practices are not expected to be included in the 2019 Progress scenario.

Washington, D.C. NPS tracks 62 BMPs in Washington, D.C., including 26 records sourced from DOEE data. The data is formatted similar to the DOEE reporting template, and ten practices are missing data about the BMPs’ drainage areas. Otherwise, most BMPs appear to include the required information. Of the 62 records, 42 are labeled as reported to DOEE. However, only 26 BMPs are included in the 2019 Progress scenario.

West Virginia. There are six BMPs listed in West Virginia. One BMP is a Stormwater Pollution Prevention and Groundwater Protection Plan, which is not an eligible BMP type. The remaining BMPs are missing required data, including the date installed and the drainage area information for the BMP. Therefore, these practices are not expected to be included in the 2019 Progress scenario.

### Pollutant Loads

Table 2-12 summarizes the 2019 Progress loads of TN, TP, and TSS for NPS by state basin. Because it appears that some NPS BMPs are not credited in Virginia and Washington, D.C., the loads in those jurisdictions are higher than if the BMPs were included. In Maryland, Pennsylvania, and West Virginia, the loads in Table 2-12 reflect the BMPs expected to be credited but not the number of BMPs actually implemented at NPS facilities in those jurisdictions.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑12. NPS 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| DC Potomac River Basin | 37,733 | 4,405 | 9,814,949 | 35,843 | 4,676 | 10,374,039 |
| MD Patuxent River Basin | 2,903 | 250 | 479,744 | 2,180 | 204 | 113,693 |
| MD Potomac River Basin | 121,367 | 13,855 | 27,205,073 | 116,981 | 19,666 | 66,313,459 |
| MD Western Shore of Chesapeake Bay | 971 | 73 | 94,709 | 704 | 134 | 422,133 |
| PA Potomac River Basin | 27,708 | 5,495 | 6,354,348 | 17,796 | 3,305 | 2,661,045 |
| PA Susquehanna River Basin | 22,572 | 1,565 | 3,127,523 | 14,129 | 592 | 510,621 |
| VA James River Basin | 108,239 | 15,558 | 37,974,540 | 54,901 | 8,199 | 17,889,952 |
| VA Potomac River Basin | 249,300 | 35,222 | 81,369,722 | 184,220 | 36,402 | 101,174,531 |
| VA Rappahannock River Basin | 126,018 | 17,820 | 38,514,656 | 72,876 | 13,232 | 29,474,712 |
| VA York River Basin | 53,314 | 11,385 | 16,465,862 | 27,212 | 6,475 | 10,282,049 |

## Smithsonian Institution

The Smithsonian Institution owns 789 acres in Maryland, including 142 developed acres; 2,901 acres in Virginia, including 159 developed acres, and 147 acres in Washington, D.C., including 147 developed acres.

### BMP Implementation

The 2019 Progress scenario does not include BMPs from the Smithsonian Institution. Despite attempts to contact the agency, BC and EPA were not able to verify if the 2019 Progress scenario accurately reflects the number of BMPs that ought to be credited to the agency.

### Pollutant Loads

Table 2-13 summarizes the 2019 Progress loads of TN, TP, and TSS for the Smithsonian Institution by state basin.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑13. Smithsonian Institution 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| DC Potomac River Basin | 344 | 87 | 171,004 | 282 | 59 | 70,749 |
| MD Potomac River Basin | 603 | 61 | 113,050 | 531 | 50 | 50,288 |
| MD Western Shore of Chesapeake Bay | 2,172 | 316 | 549,303 | 2,209 | 451 | 1,293,957 |
| VA Potomac River Basin | 5,435 | 716 | 1,871,243 | 4,908 | 524 | 1,164,672 |

## US FWS

The US FWS owns land in Maryland (28,399 acres), Pennsylvania (164 acres), Virginia (24,971 acres), and West Virginia (626 acres). The acres of developed land by state are 1,302 acres in Maryland (5 percent), 23 acres in Pennsylvania (14 percent), 601 acres in Virginia (2 percent), and 153 acres in West Virginia (24 percent).

### BMP Implementation

#### Credited BMPs

The 2019 Progress scenario includes 27 US FWS BMPs with 21 BMPs in Maryland, 5 BMPs in Pennsylvania, and 1 BMP in Virginia. The US FWS provided two sources of BMP information: a master list of all practices implemented at US FWS facilities (the All USFWS BMP List) and the agency’s 2020 progress submissions. Those spreadsheets indicate that the agency has BMPs in Maryland, Pennsylvania, Virginia, and West Virginia. Table 2-14 includes the number of BMPs credited in the 2019 Progress scenario, the estimated number of BMPs that were eligible for credit, and the data quality rating provided by the agency.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2‑14. Number of US FWS BMPs Credited in 2019 Progress vs. US FWS BMP Records | | | |
| Jurisdiction | BMPs in 2019 Progress | Estimate of BMPs Eligible for Credit | Data Rating |
| Maryland | 21 | 22 | Medium |
| Pennsylvania | 5 | 2 | Medium |
| Virginia | 1 | 10 | Medium |
| West Virginia | 0 | 1 | Medium |

The agency indicated that the 2019 Progress scenario is reasonably accurate for 2019 progress BMPs, but it does not include historical BMPs. For this reason, they rated the quality of the data in the 2019 Progress scenario as Medium.

Maryland. The agency’s 2020 progress submission does not include BMPs installed before June 30, 2019. Of the practices and programs listed in the All USFWS BMP List, about 22 rows describe practices that correspond to eligible BMP types, include some metric for the BMP drainage area or quantity, and specify a date installed. However, because the All USFWS BMP List is not in the Maryland reporting template, a full assessment of the reportability of the data cannot be completed, and BC cannot confirm what data was submitted to MDE as a part of 2019 reporting.

Pennsylvania. The All USFWS BMP List includes 12 practices and programs in Pennsylvania. Most of the projects are related to water quality monitoring or wastewater improvements. There are two BMPs that appear to be eligible for credit: a vegetated treatment area or filter strip and an established riparian buffer. It is not clear if these entries correspond to individual BMPs or if multiple are consolidated in a single row.

Virginia. The All USFWS BMP List includes over 100 practices and programs at US FWS sites in Virginia. Of that total, about 10 practices may be eligible for credit with enough information to successfully report to DEQ.

West Virginia. Most of the 26 practices tracked in the All USFWS BMP List at West Virginia facilities are agricultural BMPs, water conservation measures, or related to wastewater treatment. Only one BMP appears to include sufficient information to be successfully reported.

#### BMP Crediting

All BMPs that are included in the CAST 2019 Progress scenario for US FWS are fully credited.

### Pollutant Loads

Table 2-15 summarizes the 2019 Progress loads of TN, TP, and TSS for US FWS by state basin. At a minimum, the loads in Virginia and West Virginia do not reflect the reductions achieved from the implementation of BMPs in those jurisdictions. BMP inputs in Maryland and Pennsylvania appear to generally correspond to the federal agency’s BMP record; therefore, the loads in these jurisdictions should reflect the BMP implementation.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑15. US FWS 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| MD Eastern Shore of Chesapeake Bay | 128,102 | 15,674 | 19,544,589 | 142,143 | 26,643 | 74,694,037 |
| MD Patuxent River Basin | 34,731 | 5,260 | 10,469,988 | 26,155 | 4,349 | 2,420,298 |
| MD Potomac River Basin | 786 | 99 | 181,148 | 634 | 101 | 153,689 |
| MD Susquehanna River Basin | 420 | 19 | 14,008 | 2,052 | 1,189 | 5,728,633 |
| PA Susquehanna River Basin | 852 | 68 | 193,933 | 592 | 27 | 47,191 |
| VA Eastern Shore of Chesapeake Bay | 1,342 | 148 | 123,125 | 2,500 | 1,017 | 4,370,560 |
| VA James River Basin | 26,276 | 3,179 | 4,279,509 | 27,020 | 6,100 | 20,883,792 |
| VA Potomac River Basin | 4,874 | 865 | 1,628,221 | 9,560 | 4,401 | 18,977,749 |
| VA Rappahannock River Basin | 12,824 | 1,704 | 3,025,730 | 14,761 | 4,091 | 16,838,883 |
| VA York River Basin | 5,876 | 1,856 | 4,140,001 | 14,611 | 7,850 | 33,579,409 |

## USFS

The USFS owns 1,195,138 acres in Virginia; of those, only 4,313 acres or 0.4 percent are part of the Developed source sector. In West Virginia, the agency owns 267,280 acres, of which 4,525 acres or 2 percent are developed.

### BMP Implementation

The 2019 Progress scenario does not include any BMPs for the USFS. The USFS provided a copy of the 2020 progress submission in Virginia, which included five BMPs implemented before June 30, 2019. However, the reported BMP types are floodplain restoration on pasture, which is not a credited practice for federal agencies due to the lack of pasture acres for federal agencies in CAST.

USFS did not provide a BMP record for West Virginia, so BC and EPA were not able to verify if the 2019 Progress scenario accurately reflects the number of BMPs that ought to be credited to the agency in that state.

### Pollutant Loads

Table 2-16 summarizes the 2019 Progress loads of TN, TP, and TSS for USFS by state basin.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2‑16. USFS 2019 Progress Loads (lbs/year) | | | | | | |
| Jurisdiction | EOS | | | EOT | | |
| TN | TP | TSS | TN | TP | TSS |
| VA James River Basin | 1,741,403 | 226,366 | 474,146,240 | 622,336 | 90,644 | 131,824,525 |
| VA Potomac River Basin | 650,103 | 70,493 | 142,714,141 | 329,495 | 37,431 | 57,174,724 |

## Conclusions

Table 2-17 summarizes the results of the BMP data comparison between the 2019 Progress scenario and the federal agency BMP data. The table includes a ratio of the number of BMPs credited to the agency to the number of BMPs estimated to be eligible for credit. The cells are color-coded based on the data quality rating, as assigned by the federal agency:

* Gray indicates that no data rating was assigned by the federal agency.
* Green represents a High data quality based on the number of BMPs credited versus the number of eligible BMPs.
* Gold represents a Medium data quality based on the number of BMPs credited versus the number of eligible BMPs or the accuracy of the data in the 2019 Progress scenario.
* Red represents a Low data quality based on a lack of BMP representation in the 2019 Progress scenario or low data accuracy.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 2-17. BMP Count (Credited/Eligible) in 2019 Progress by Agency & Jurisdictiona | | | | | | |
| Agency/State | MD | NY | PA | VA | DC | WV |
| ARS | 0 / Unknown |  |  |  | 0 / Unknown |  |
| DoD | 1,406 / 1,664 | 1 / 1 | 302 / 288 | 50 / 1,374 | 125 / 71 | 0 / 7 |
| GSA | 15 / 61 | 0 / Unknown | 0 / Unknown | 0 / Unknown | 68 / Unknown | 0 / Unknown |
| NASA | 29 / 29 |  |  | 3 / 29 |  |  |
| NPS | 0 / 28 |  | 0 / 0 | 0 / 5 | 26 / 52 | 0 / 6 |
| Smithsonian | 0 / Unknown |  |  | 0 / Unknown | 22 / Unknown |  |
| US FWS | 21 / 22 |  | 5 / 2 | 1 / 10 |  | 0 / 1 |
| USFS |  |  |  | 0 / 0 |  | 0 / Unknown |

1. Table shows the ratio of the number of credited BMPs to the number of eligible BMPs. The color indicates the data rating assigned by the federal agency.

Based on the results in Table 2-17, the following observations should inform the assessment of remaining effort for federal agencies and next steps for both federal agencies and the jurisdictions:

* Federal agencies generally have low or medium confidence in the accuracy and completeness of the 2019 Progress BMP inputs**.** Intentional coordination between federal agencies and the jurisdictions could lead to credit for existing BMPs in future progress years. Therefore, the evaluation of the additional effort required by federal agencies from the 2019 Progress loads may be reduced by improved reporting.
* The greatest confidence exists for BMPs reported in Pennsylvania.The load results for federal agencies in the 2019 Progress scenario are most likely to accurately reflect the actual progress achieved.
* There is not enough information to assess the data record in Washington, D.C. due to a lack of response from three of five agencies in the District**. However, both NPS and DoD ranked the data quality as low. Discussions between DoD and DOEE are ongoing to address concerns about the DoD BMP record, the DOEE BMP record, and the role and obligations of federal agencies under the District’s municipal separate storm sewer system (MS4) permit.**
* In Maryland, federal agencies noted missing records and incorrect information associated with some BMPs. MDE has experienced issues with its data reporting system, which should be resolved.
* The least confidence exists for BMP records reported in Virginia.There are low BMP counts for federal agencies in Virginia in the 2019 Progress scenario, despite the considerable amount of federal agency land in the state (over 1.7 million acres).DEQ has had difficulties assigning federal agency codes to BMPs reported by the federal community in past progress years. At a minimum, a number of DoD BMPs were labeled as non-federal in the final 2019 Progress scenario. DEQ has indicated that this issue will be resolved in the 2020 Progress scenario.
* BMPs are not credited in West Virginia. Despite the presence of five agencies, there are no BMPs credited to federal landholders. Based on correspondence with the jurisdiction, it is possible that federal BMPs may not be assigned to the correct agency.
* Data management contributes to underreporting and lack of credit. Some agencies did not respond to the request for BMP information. Others indicated that it would require an unduly large effort to compile the agency’s full record of implemented BMPs. This indicates that some facilities or agencies are not maintaining a record of BMPs on site and may not be providing annual reporting to jurisdictions. Furthermore, many of the provided datasets were not in the jurisdiction reporting template. While this is not inherently a problem, it can lead to the omission of fields required by jurisdictions, especially for agencies with facilities in multiple jurisdictions.
* Federal agencies have limited staff and resources for BMP data management and reporting. Federal agencies are limited by the funding and staff allocated to stormwater programs. This reality supports the need for the use of simple but intentional data management practices.

Federal Planning Goals

This section will assess the sources of FPGs for federal agencies, the calculation methodologies, and a comparison of the level of effort needed to each FPG source.

## Background

The jurisdiction Phase II WIPs, which were finalized in 2012, did not consistently include federal facility targets, in part due to concerns about the availability of data and the analytical capabilities of CAST at that time (VA DEQ 2012, 11 & 39) (PA DEP 2012, 38-39). In its review of the 2012-2013 two-year milestones, EPA identified needed improvements to federal agencies’ reporting of BMPs. This led to the formation of the Federal Facilities Targets Action Team (FFTAT) which was charged with developing a target setting protocol for federal agencies. The resulting document, the *Protocol for Setting Targets, Planning BMPs and Reporting Progress for Federal Facilities and Lands* (Protocol), described federal facilities subject to target loads, the required data from federal facilities, the methodology for the target calculations, as well as expectations for implementation, reporting, and two-year water quality milestones (Chesapeake Bay Program 2015, 2).

The Protocol defined 2017 and 2025 targets for individual federal facilities. Jurisdictions were given the option to use their own method or to utilize the EPA Default Method developed for the Protocol. Washington, D.C., New York, and Pennsylvania elected to use the default method. Maryland and Virginia used state-specific methods, and West Virginia used the default method only for facilities not covered under a permit with numeric pollutant reduction requirements. The default method calculated the pollutant loading rate per acre by state basin and then determined the required reduction in the loading rate (expressed in pounds per acre per year) between 2009 and 2025. Individual facility managers were expected to determine the baseline pollutant load for their facility using Chesapeake Bay Facility Assessment Scenario Tool (BayFAST) to translate the pollutant load rates to actual loads (Chesapeake Bay Program 2015, 2-4).

In 2017, at the midpoint of the Chesapeake Bay TMDL implementation period, EPA made significant changes to the Chesapeake Bay Watershed Model, including the removal of BayFAST from the suite of modeling tools. Development of the jurisdiction Phase III WIPs occurred concurrently. The Local Planning Goals Task Force recommendations, which were approved by the Chesapeake Bay Principal Staff Committee in December 2016 and incorporated into EPA’s *Expectations for the Phase III WIPs*, gave jurisdictions the option to define local area planning goals for federal facilities (Local Planning Goals Task Force 2016, 4). In 2018 and 2019, the Federal Facilities Workgroup meetings included discussions about the ongoing development of local area planning goals for federal facilities. Prior to the release of the draft Phase III WIPs, Virginia, Pennsylvania, and Washington, D.C. provided an opportunity for federal agencies to comment on the proposed federal planning goals. Virginia indicated that changes were made to the FPGs following this comment period. There is no record of any agreements, votes, or other consensus regarding the FPG development by the Federal Facilities Workgroup (Federal Facilities Workgroup 2018).

Ultimately, the Phase III WIP FPG methodologies varied by jurisdiction.

* Maryland does not address or identify FPGs for federal agencies in its Phase III WIP document, though permitted facilities would be subject to permit requirements.
* New York incorporated the 2015 Protocol reduction goals by reference.
* Pennsylvania and Washington, D.C. utilized an approach similar to the EPA Default Method.
* Virginia set FPGs for reductions from unregulated land and documented that all regulated lands will be subject to the reductions specified in the MS4 permit.
* West Virginia states it did not define FPGs for federal agencies.

During the development of the Phase III WIPs and since their approval in December 2019, federal agencies have raised concerns about the clarity and equity of some FPGs. Furthermore, some Phase III WIPs (Maryland and New York) do not include numeric targets for federal agencies to quantitatively assess their progress. For these reasons, EPA updated the Protocol’s default method calculations for this task, incorporating the latest land use data and scenarios from CAST. The results of these updated calculations are discussed and included later in this section.

## Potential Sources of FPGs

This section will compare the methodology used to develop three potential sources of FPGs for federal agencies: the updated EPA Default Method, the Phase III WIP documents, and the WIP 3 Final CAST scenario developed based upon the jurisdictions’ Phase III WIP strategies reported to EPA.

### EPA Default Method

The Protocol default method defined federal facility targets as a change in the pollutant loading rate from the Developed source sector by state basin between 2009 and 2025. The 2009 and 2025 loads were assessed using the 2009 Progress scenario and the 2025 WIP scenario, which was based on the inputs provided by the jurisdictions for the Phase II WIPs (Chesapeake Bay Program 2015, 9). The federal facility targets were presented to federal agencies as the expected change in the pollutant loading rate (in lbs/acre/year) between 2009 and 2017 and the expected change in the pollutant loading rate between 2017 and 2025. The 2025 target is also expressed as a percent reduction from 2017.

The Protocol documents stipulates that targets, “developed prior to the 2017 Midpoint Assessment and modeling calibration should be considered interim as they may change with future model revisions” (Chesapeake Bay Program 2015, 1) Therefore, EPA acknowledged that the 2025 targets in the Protocol might change during the development of the Phase III WIPs, due to the development of the Phase 6 Chesapeake Bay Watershed Model (CAST), and other aspects of the Midpoint Assessment.

The updated EPA Default Method builds on the Protocol approach. The FPGs are defined as a percent reduction from the 2019 Progress loads, as defined in CAST-2019. The percent reduction is calculated from the percent difference between the 2019 Progress and the WIP 3 Final scenario (as run in CAST-2017d) loads for the Developed and Natural source sectors on non-federal land by state basin. The percent reduction only includes these source sectors because the Developed and Natural source sectors are the only sources assigned to federal agencies in CAST. This modification avoids penalizing federal agencies for not having assigned loads for, or the potential to create reductions from, other source sectors, such as Agriculture or Wastewater. Furthermore, because the percent reductions are based on the prescribed level of effort for non-federal partners, it provides greater assurance of equity between federal and non-federal land.

### Phase III WIP Documents

This section will briefly describe the methods used by the jurisdictions to set FPGs for federal agencies in the Phase III WIP documents.

#### Maryland

Maryland coordinated closely with stakeholders to develop local area planning goals based on proposed BMP implementation identified by the local partners (MDE 2019, C-1-C-49). However, Maryland did assign local area planning goals to federal facilities and does not specifically address expectations for federal agencies in the Phase III WIP document. Federal sites covered under the MS4 General Permit for State and Federal Agencies are subject to nutrient and sediment reduction requirements (MDE 2019, 28), which call for the additional treatment of 20 percent of existing impervious developed land. However, the expected load reductions from the MS4 permits are not quantified in the Phase III WIP document. The 20 percent restoration requirement is consistent with the interim approach documented by Maryland in the Protocol, but those interim target loads and reductions are now out of date (Chesapeake Bay Program 2015, 10-13). The ambiguity in the Phase III WIP is not equitable compared to the process followed for local areas and creates the potential for confusion regarding the state’s expectations for federal agencies through 2025.

#### New York

New York developed local area planning goals based the available land for BMP implementation and the difference in loads between the 2018 Progress and the jurisdiction’s 2025 implementation scenario. However, the State Department of Environmental Conservation (NYSDEC) did not define federal planning goals. Instead, the Phase III WIP document referenced the reduction requirements developed in the Protocol (NYSDEC 2019, 134). As mentioned previously, the Protocol utilized modeling tools that have since been updated and was intended to provide only interim goals.

#### Pennsylvania

In the Pennsylvania Phase III WIP, federal and non-federal entities are expected to reduce an equivalent percentage (73.92 percent) of the controllable load, which is defined as the difference between the 2010 No Action and the 2010 E3 scenarios (PA DEP 2019, 26). This is a mathematically equal, but not equitable, level of effort for federal partners. Non-federal partners, like local counties, can apply BMPs and policies to reduce loads from the Agriculture and Wastewater source sectors, among others, to achieve the local area planning goals. To date, significant reductions have been achieved by reducing pollutant loads from wastewater treatment plants, and large reductions are anticipated from agricultural lands through 2025. Because only Developed and Natural acres are assigned to federal agencies, they are limited to a smaller suite of BMPs to reduce pollutant loads. When DoD attempted to develop a scenario to meet the FPG documented in the Phase III WIP, it could not create an implementation scenario that achieved the specified reductions.

This concern was documented in the Phase III WIP, and discussions between EPA, Pennsylvania Department of Environmental Protection (PA DEP), and the federal community are ongoing about revisions to the FPGs. Due to the ongoing conversation about the feasibility of the original FPGs and the pending changes to the Pennsylvania Phase III WIP, these FPGs are considered interim and will not be included in the level of effort evaluation in Section 3.3.

#### Virginia

Virginia quantified FPGs as reductions from unregulated land. The FPGs were defined as the difference between the unregulated load in the 2017 Progress scenario and the unregulated load in the 2025 VA Specified WIP II scenario. This methodology is consistent with the approach used for local area planning goals for non-federal planning district commissions and soil and water conservation districts (VA DEQ 2019, 31-32). However, there are ongoing concerns about the proper attribution of federal BMPs to the correct agency code for BMPs reported by the federal community to the DEQ BMP Warehouse and those transformed into the Warehouse from the state’s Stormwater Construction General Permit database. Though there are reporting errors in the 2017 Progress scenario that attribute federal BMPs to non-federal partners, once the issues are corrected, federal agencies will see additional reductions. Therefore, the FPG methodology is considered equitable, pending the needed improvements to the state’s reporting system.

In addition to achieving the specified load reductions, federal facilities are also expected to:

* Meet all applicable regulatory requirements (MS4, Industrial Stormwater, Wastewater, Erosion and Sediment Control, Post-Construction Stormwater, and Chesapeake Bay Preservation Act).
* Reduce loads from all agency owned lands managed for agricultural use (45 percent TN reduction goal from 2017 levels).
* Reduce loads from all onsite systems (septic and alternative onsite systems) on federal agency owned lands (6 percent TN reduction goal from 2017 levels).
* Ensure that any forest harvesting is accompanied by implementation of the full suite of silviculture water quality practices.
* Account for and offset any load changes resulting from changes in land use through time.
* Account for and offset the federal agencies share of load changes resulting from climate change. This will be quantified by the Chesapeake Bay Program in 2021. Virginia estimated the additional reduction is 1.72 million pounds of nitrogen and 0.19 million pounds of phosphorus (VA DEQ 2019, 132-133).

Some of these expectations do not have associated regulatory drivers to help enforce implementation. In addition, federal agencies do not have mechanisms to track or report reductions from agricultural and septic sources. Together, these create challenges for federal agencies to implement the additional expectations listed above.

#### Washington, D.C.

In Washington, D.C., DOEE defined FPGs for “major” federal agencies, which include Department of Agriculture (including ARS), DoD, GSA, NPS, and the Smithsonian Institution. The Phase III WIP also specifies a local area planning goal for non-federal land. The distinction of major and other federal agencies was made based on DOEE’s assessment of the agencies’ ability to track land use, pollutant load, and BMP information (DOEE 2019, 54). Federal agencies disagreed with the designation of FPGs to federal agencies because federal agencies pay a stormwater utility fee to DOEE to implement the MS4 permit, including the Chesapeake Bay TMDL nutrient and sediment reductions. In addition, if DOEE funds are used to implement a stream restoration project on federal land, DOEE will take credit for the BMP.

The same calculation methodology was applied for both federal and non-federal goals. DOEE determined the controllable load, which is the difference between the 2010 No Action and the 2010 E3 scenario loads, with the wastewater sector load removed. Then, DOEE applied a percent reduction to the controllable load, which is the required reduction for the federal agency. The percent reduction was higher in the tidal portions of the Anacostia and Potomac River basins. The non-federal local area planning goal includes an additional load reduction of 6,000 pounds TN and 1,028 pounds TP to offset the anticipated effects of climate change. No effort was added to the FPGs for climate impacts (DOEE, 2019, 54-57).

The FPG methodology is equitable between federal and non-federal entities. However, unlike other non-federal ratepayers of the stormwater utility fee, federal agencies have required load reductions specified in the Phase III WIP document. For this reason, equity as utility rate payers need to be addressed with federal agencies.

#### West Virginia

The West Virginia Phase III WIP did not define FPGs for federal agencies. The WIP notes that federal landowners are subject to the requirements of the Construction Stormwater General Permit and Section 438 of the Energy Independence and Security Act, which addresses stormwater runoff requirements for federal projects. The West Virginia DEP will continue to track and report BMPs reported by federal agencies, but no additional implementation is required by the Phase III WIP (WV DEP 2019, 68-69).

### Phase III WIP FPG Summary

Table 3-1 includes a summary of the FPGs in the jurisdictions’ Phase III WIP documents. The key questions that would inform a discussion about the suitability of the FPGs are:

* Is the FPG defined numerically? Or is a clear method described that the federal agencies could replicate to determine the final load they are expected to achieve?
* Is the FPG considered equitable based on feedback from EPA, the jurisdictions, and federal agencies? If not, why?
* If the equitability of the FPG cannot be assessed, what is the reason?

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| --- | --- | --- | --- | --- | --- |
| Table 3‑1. Assessment of Phase III WIP FPGs | | | | | |
| Jurisdiction | Is the FPG Defined Quantitatively? | Units | Is the FPG Considered Equitable? | Reason |
| Maryland | No | N/A | Unclear | Lack of documented expectations |
| New York | No | N/A | Unclear | Outdated modeling tools |
| Pennsylvania | Yes | Reduction & target load | No | Infeasible load reductions |
| Virginia | Partial | Reduction | Yes |  |
| Washington, D.C. | Yes | Reduction & target load | No | Stormwater fee payment |
| West Virginia | No | N/A | Yes |  |

### WIP 3 Final Scenario

The WIP 3 Final scenario is comprised of BMP implementation data provided by the jurisdictions to demonstrate the load reductions achieved by the strategies described in the Phase III WIPs. The WIP 3 Final scenario was developed in CAST-2017d and used by EPA to evaluate whether the Phase III WIPs would achieve the state planning targets. For this reason, the Chesapeake Bay Program agreed that the results of the scenario in CAST-2017d would remain the official version for future evaluations. Therefore, all references to the WIP 3 Final scenario in this Report refer to the CAST-2017d version, which is labeled as the WIP 3 Official Version scenario in CAST-2019.

Because the scenario was run in CAST-2017d, loads in the Natural source sector are calculated regionally. As a result, federal Natural loads will be impacted by the implementation of BMPs on non-federal land. This will impact the calculated level of effort to reach the WIP 3 Final scenario loads and should be considered when loads from CAST-2019 are compared to this scenario.

Because scenario was constructed by the jurisdictions, the source of the implementation data in the scenario inputs varies. Table 3-2 summarizes if the WIP 3 Final scenario includes BMPs from federal agencies by jurisdiction.

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| --- | --- | --- | --- | --- | --- | --- |
| Table 3‑2. Presence (Green) & Absence (Red) in the WIP 3 Final Scenario by Agency & Jurisdiction | | | | | | |
| Agency/State | MD | NY | PA | VA | DC | WV |
| ARS |  |  |  |  | ✓\* |  |
| DoD | ✓ | \*\* | ✓ | ✓ | ✓ |  |
| GSA | ✓ |  | ✓\* |  | ✓ |  |
| NASA | ✓ |  |  | ✓ |  |  |
| NPS | ✓\* |  |  | ✓\* | ✓ |  |
| Smithsonian |  |  |  |  | ✓ |  |
| US FWS | ✓ |  | \*\* | ✓ |  |  |
| USFS |  |  |  |  |  |  |
| \*Agency did not have BMPs in the 2019 Progress scenario but has BMPs in the WIP 3 Final scenario  \*\*Agency has BMPs in the 2019 Progress scenario but does not have BMPs in the WIP 3 Final scenario | | | | | | |

Maryland. The Maryland inputs to its Phase III WIP CAST scenario for local areas were provided by the local stakeholders. It is not clear how the BMP inputs from federal agencies were developed. For example, NPS does not have credited BMPs in the 2019 Progress scenario (see Table 2-1) but is assigned BMPs in the WIP 3 Final scenario for Maryland.

New York. New York developed its 2025 Program Goal scenario with a focus on runoff reduction and stormwater treatment BMPs, erosion and sediment control measures, urban forestry, and urban nutrient management (NYSDEC 2019, 104-105). New York did not include federal facilities in its local planning goal process, which may explain their omission from the 2025 Program Goal scenario. However, the scenario also excludes existing implementation of BMPs at federal facilities (DoD).

Pennsylvania. The Pennsylvania WIP includes statewide implementation, anticipated reductions from Countywide Action Plans, and input from federal agencies. The DoD and US FWS submitted plans to PA DEP to demonstrate how they will meet the federal planning goals (PA DEP 2019, 10). However, only DoD and GSA are included in the jurisdiction’s portion of the WIP 3 Final scenario. The WIP 3 Final scenario also does not include current implementation of BMPs by US FWS.

Virginia. During the development of the Phase III WIPs, VADEQ determined that the implementation scenario from the Phase II WIP would meet its current state planning targets. As a part of its outreach, federal agencies were asked to provide a scenario of BMPs to achieve the FPG. According to the Phase III WIP, input from DoD, US NASA, NPS, US FWS, and USFS was incorporated in Virginia’s Final WIP III CAST scenario (VA DEQ 2019, 46). Those agencies, excluding USFS, have assigned BMP inputs in the WIP 3 Final scenario.

Washington, D.C. DOEE requested pollutant reduction scenarios in CAST from federal agencies during the development of its Phase III WIP. Though some agencies did not meet the DOEE deadline to submit scenarios, DOEE was committed to incorporating their input upon receipt (DOEE 2019, 62). All landholding federal agencies identified in CAST have assigned BMPs in the WIP 3 Final scenario. Federal agencies, excluding ARS, also have BMP implementation in the 2019 Progress scenario. DOEE has clarified that federal agencies are not committed to achieve the implementation in the WIP 3 Final scenario; if the FPGs defined in the Phase III WIP are achieved, DOEE’s expectations for that federal agency are met.

West Virginia. The West Virginia Phase III WIP scenario (WV WIP3) did not prescribe implementation or retrofits on federal facilities. Given that no BMPs are credited to federal agencies in the 2019 Progress scenario, it is not clear if currently implemented BMPs at federal facilities are included in the WIP 3 Final scenario.

Across the jurisdictions, the WIP 3 Final scenario is inconsistent in the inclusion of existing federal BMPs and federal agency input regarding future implementation. However, because the scenario was a key element in the evaluation of the Phase III WIP, it is included in this comparison as one potential endpoint for federal agencies. It represents the jurisdiction’s expectation for federal load reductions through 2025 to achieve state planning targets. The scenario results should be viewed with caution when compared to results from CAST-2019. Because it was run in CAST-2017d, the scenario results will include reductions from the regionalized Natural load source group, which are also influenced by changes in loads from other source sectors.

## Level of Effort Comparison

The level of effort required by federal agencies to achieve the FPGs is presented as the percent reduction required from the 2019 Progress scenario to the Phase III WIP, updated EPA Default Method, and the WIP 3 Final scenario FPGs. All loads are calculated at edge of tide.

### Effort by State Basin

Tables 3-3 to 3-10 will compare the percent reduction from the 2019 Progress scenario to the updated EPA Default Method load and the WIP 3 Final scenario by state basin. Because the Phase III WIP FPGs were not calculated at the state basin scale, they are not included in these tables. For each state basin and pollutant pair, the highest remaining reduction value is highlighted in red; the FPG source with the lower level of effort is highlighted in green.

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| --- | --- | --- | --- | --- |
| Table 3‑3. ARS Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Patuxent River Basin | 2.9% | 1.1% | 4.6% | 5.4% |
| MD Potomac River Basin | 1.0% | 4.0% | 2.6% | 8.3% |
| DC Potomac River Basin | 4.4% | 0.4% | 6.8% | 0.3% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3‑4. DoD Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Eastern Shore of Chesapeake Bay | 1.0% | 0.6% | 0.7% | 0.2% |
| MD Patuxent River Basin | 2.9% | 5.9% | 4.6% | 12.0% |
| MD Potomac River Basin | 1.0% | 6.5% | 2.6% | 8.9% |
| MD Susquehanna River Basin | 1.3% | 8.3% | 3.2% | 9.7% |
| MD Western Shore of Chesapeake Bay | 2.5% | 8.6% | 2.3% | 8.9% |
| NY Susquehanna River Basin | 17.4% | 0.0% | 14.9% | 14.1% |
| PA Potomac River Basin | 0.0% | 4.0% | 0.0% | 26.9% |
| PA Susquehanna River Basin | 0.5% | 2.1% | 0.0% | 11.6% |
| VA Eastern Shore of Chesapeake Bay | 11.2% | 18.1% | 4.1% | 31.2% |
| VA James River Basin | 7.2% | 15.5% | 6.3% | 11.4% |
| VA Potomac River Basin | 7.3% | 0.4% | 6.5% | 0.0% |
| VA Rappahannock River Basin | 4.2% | 7.8% | 2.0% | 48.5% |
| VA York River Basin | 7.8% | 9.7% | 4.4% | 10.9% |
| DC Potomac River Basin | 4.4% | 13.6% | 6.8% | 14.5% |

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| --- | --- | --- | --- | --- |
| Table 3‑5. GSA Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Eastern Shore of Chesapeake Bay | 1.0% | 0.001% | 0.7% | 0.03% |
| MD Patuxent River Basin | 2.9% | 0.05% | 4.6% | 1.1% |
| MD Potomac River Basin | 1.0% | 1.2% | 2.6% | 4.5% |
| MD Western Shore of Chesapeake Bay | 2.5% | 0.2% | 2.3% | 2.5% |
| NY Susquehanna River Basin | 17.4% | 0.0% | 14.9% | 0.0% |
| PA Potomac River Basin | 0.0% | 0.1% | 0.0% | 0.0% |
| PA Susquehanna River Basin | 0.5% | 0.0% | 0.0% | 0.0% |
| VA James River Basin | 7.2% | 0.0% | 6.3% | 0.0% |
| VA Potomac River Basin | 7.3% | 0.0% | 6.5% | 0.0% |
| DC Potomac River Basin | 4.4% | 0.8% | 6.8% | 39.7% |
| WV Potomac River Basin | 0.0% | 0.0% | 6.1% | 0.0% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3‑6. NASA Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Patuxent River Basin | 2.9% | 0.06% | 4.6% | 1.16% |
| MD Potomac River Basin | 1.0% | 3.4% | 2.6% | 12.56% |
| VA York River Basin | 7.8% | 13.0% | 4.4% | 18.90% |

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| --- | --- | --- | --- | --- |
| Table 3‑7. NPS Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Patuxent River Basin | 2.9% | 3.7% | 4.6% | 23.9% |
| MD Potomac River Basin | 1.0% | 1.8% | 2.6% | 7.7% |
| MD Western Shore of Chesapeake Bay | 2.5% | 0.1% | 2.3% | 0.7% |
| PA Potomac River Basin | 0.0% | 3.8% | 0.0% | 11.2% |
| PA Susquehanna River Basin | 0.5% | 2.7% | 0.0% | 19.4% |
| VA James River Basin | 7.2% | 7.0% | 6.3% | 17.0% |
| VA Potomac River Basin | 7.3% | 4.1% | 6.5% | 8.1% |
| VA Rappahannock River Basin | 4.2% | 2.6% | 2.0% | 7.6% |
| VA York River Basin | 7.8% | 7.1% | 4.4% | 12.2% |
| DC Potomac River Basin | 4.4% | 3.5% | 6.8% | 3.7% |
| WV Potomac River Basin | 0.0% | 0.8% | 6.1% | 11.3% |

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| --- | --- | --- | --- | --- |
| Table 3‑8. Smithsonian Institution Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Potomac River Basin | 1.0% | 0.05% | 2.6% | 1.1% |
| MD Western Shore of Chesapeake Bay | 2.5% | 7.4% | 2.3% | 13.3% |
| VA Potomac River Basin | 7.3% | 3.7% | 6.5% | 9.8% |
| DC Potomac River Basin | 4.4% | 0.0% | 6.8% | 0.0% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3‑9. US FWS Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| MD Eastern Shore of Chesapeake Bay | 1.0% | 0.6% | 0.7% | 0.2% |
| MD Patuxent River Basin | 2.9% | 5.9% | 4.6% | 12.0% |
| MD Potomac River Basin | 1.0% | 6.5% | 2.6% | 8.9% |
| MD Susquehanna River Basin | 1.3% | 8.3% | 3.2% | 9.7% |
| PA Susquehanna River Basin | 0.5% | 1.9% | 0.0% | 15.5% |
| VA Eastern Shore of Chesapeake Bay | 11.2% | 8.9% | 4.1% | 11.8% |
| VA James River Basin | 7.2% | 0.0% | 6.3% | 16.7% |
| VA Potomac River Basin | 7.3% | 0.0% | 6.5% | 6.1% |
| VA Rappahannock River Basin | 4.2% | 9.7% | 2.0% | 13.2% |
| VA York River Basin | 7.8% | 5.9% | 4.4% | 13.7% |
| WV Potomac River Basin | 0.0% | 1.3% | 6.1% | 12.9% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3‑10. USFS Percent Reductions Required, 2019-2025 (%) | | | | |
| Jurisdiction | TN | | TP | |
| EPA Default Method | WIP 3 Final Scenario | EPA Default Method | WIP 3 Final Scenario |
| VA James River Basin | 7.2% | 3.3% | 7.2% | 18.3% |
| VA Potomac River Basin | 7.3% | 4.2% | 7.3% | 21.3% |
| WV James River Basin | 1.1% | 2.5% | 1.1% | 12.2% |
| WV Potomac River Basin | 0.0% | 2.0% | 0.0% | 17.4% |

In general, the EPA Default Method requires a smaller percent reduction than the WIP 3 Final scenario for TP. In 44 out of 61 agency-state basin combinations in Tables 3-3 through 3-8, the EPA Default Method result is less than the WIP 3 Final Scenario for TP. For TN, 29 out of 61 agency-state basin results show the EPA Default Method with a lower TN percent reduction, meaning that the WIP 3 Final Scenario requires a lower level of effort at about the same rate across all federal agencies.

### Effort by Jurisdiction

The following graphs (Figures 3-1 to 3-12) compare the percent reduction from the 2019 Progress scenario to the updated EPA Default Method loads, the WIP 3 Final loads, and Phase III WIP FPGs, when numeric goals are available, by jurisdiction. If a bar is not present for an FPG source included in the graph legend, the expected percent reduction is zero, meaning that no additional reductions are required, and the federal agency should maintain the existing load through 2025.

Figure 3‑1. Percent reduction required from the 2019 Progress scenario to achieve potential TN FPGs in Maryland.

Figure 3‑2. Percent reduction required from the 2019 Progress scenario to achieve potential TP FPGs in Maryland.

As stated previously, there are no quantified Phase III WIP goals for federal agencies in Maryland.

Figure 3‑3. Percent reduction required from the 2019 Progress scenario to achieve potential TN FPGs in Pennsylvania.

Figure 3‑4. Percent reduction required from the 2019 Progress scenario to achieve potential TP FPGs in Pennsylvania. The percent reduction from the EPA Default Method is 0%.

Because the Phase III WIP FPGs in Pennsylvania are considered interim, they are not included in this comparison. Based on the revised EPA Default Method, federal agencies have met the 2025 load goal and need to only maintain the current 2019 Progress loads.

Figure 3‑5. Percent reduction required from the 2019 Progress scenario to achieve potential TN FPGs in New York.

Figure 3‑6. Percent reduction required from the 2019 Progress scenario to achieve potential TP FPGs in New York.

Like Maryland, there are no quantified Phase III WIP goals for federal agencies in New York. The WIP 3 Final scenario does not call for additional reductions of TN for DoD or TN and TP for GSA.

Figure 3‑7. Percent reduction required from the 2019 Progress scenario to achieve potential TN FPGs in Virginia.

Figure 3‑8. Percent reduction required from the 2019 Progress scenario to achieve potential TP FPGs in Virginia.

The Phase III WIP FPGs included in Figures 3-7 and 3-8 only represent the expected load reductions from non-regulated land. Therefore, the percent reductions for the Phase III WIP do not capture the required reductions associated with MS4 permits and the other conditions listed in the Virginia Phase III WIP.

Figure 3‑9. Percent reduction required from the 2019 Progress scenario to achieve potential TN FPGs in Washington, D.C.

Figure 3‑10. Percent reduction required from the 2019 Progress scenario to achieve potential TP FPGs in Washington, D.C.

In Washington, D.C., the WIP Final scenario percent reductions are based on BMP input scenarios provided by federal agencies. DOEE expects federal agencies to achieve the load reductions documented in the Phase III WIPs, not the modeled loads in the WIP 3 Final scenario. As shown in Figures 3-9 and 3-10, some agencies (GSA, NPS, Smithsonian) have achieved some FPGs from the Phase III WIP and WIP 3 Final scenario.

Figure 3‑11. Percent reduction required from the 2019 Progress scenario to achieve potential TN FPGs in West Virginia.

Figure 3‑12. Percent reduction required from the 2019 Progress scenario to achieve potential TP FPGs in West Virginia.

West Virginia DEP did not set FPGs for federal agencies in the jurisdiction’s Phase III WIP, so that source is not included in Figures 3-11 and 3-12.

### Effort Summary with BMP Data Quality Ratings

Table 3-11 puts the results from Figures 3-1 to 3-12 in the context of the data quality ratings provided by the federal agencies for the 2019 Progress scenario, which were summarized in Table 2‑17. The rows are shaded by data quality rating with red for low quality, yellow for medium quality, and green for high quality. In most cases, a low or medium data quality was the result of the agency’s BMPs being underrepresented in the 2019 Progress scenario. When BMPs are undercounted, the estimated level of effort will appear higher than the value if eligible BMPs were credited. Therefore, for those rows shaded in gray, yellow, or red, there is a lower confidence that the calculated level of effort reflects the actual remaining effort. A more accurate estimate of the remaining effort should be evaluated after improvements are made to the reported BMP record.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 3‑11. Level of Effort Summary with Shading Based on Data Quality | | | | | | | | |
| State | Agency | TN (2019-2025 Percent Reduction) | | | TP (2019-2025 Percent Reduction) | | | |
| Phase III WIP | EPA Default Method | WIP 3 Final | | Phase III WIP | EPA Default Method | WIP 3 Final |
| Maryland | ARS | N/A | 1.0% | 4.0% | | N/A | 2.6% | 8.3% |
| DoD | N/A | 2.0% | 7.0% | | N/A | 2.6% | 8.8% |
| GSA | N/A | 1.9% | 0.6% | | N/A | 2.5% | 3.7% |
| NASA | N/A | 1.3% | 2.9% | | N/A | 2.9% | 10.8% |
| NPS | N/A | 1.0% | 1.8% | | N/A | 2.6% | 7.8% |
| SI | N/A | 2.2% | 6.0% | | N/A | 2.4% | 12.1% |
| US FWS | N/A | 1.3% | 1.3% | | N/A | 1.3% | 10.5% |
|  |  |  |  |  | |  |  |  |
| New York | DoD | N/A | 17.4% | 0.0% | | N/A | 14.9% | 14.1% |
| GSA | N/A | 17.4% | 0.0% | | N/A | 14.9% | 0.0% |
|  |  |  |  |  | |  |  |  |
| Pennsylvania | DoD | N/A | 0.4% | 2.3% | | N/A | 0.0% | 15.3% |
| GSA | N/A | 0.5% | 0.0% | | N/A | 0.0% | 0.0% |
| NPS | N/A | 0.2% | 3.3% | | N/A | 0.0% | 12.4% |
| US FWS | N/A | 0.5% | 1.9% | | N/A | 0.0% | 15.5% |
|  | |  |  |  | |  |  |  |
| Virginia | DoD | 7.9% | 6.9% | 8.6% | | 9.1% | 5.7% | 7.6% |
| GSA | 0.0% | 7.3% | 0.0% | | 0.0% | 6.5% | 0.0% |
| NASA | 0.9% | 7.8% | 13.0% | | 0.0% | 4.4% | 18.9% |
| NPS | 2.6% | 6.7% | 4.5% | | 6.6% | 5.3% | 9.5% |
| SI | 4.2% | 7.3% | 3.7% | | 10.5% | 6.5% | 9.8% |
| US FWS | 0.0% | 6.8% | 2.8% | | 1.5% | 4.9% | 12.9% |
| US FS | 4.1% | 7.2% | 3.6% | | 19.6% | 6.4% | 19.2% |
|  | | | | | | | | |
| Washington, D.C. | ARS | 8.7% | 4.4% | 0.4% | | 21.8% | 6.8% | 0.3% |
| DoD | 1.1% | 4.4% | 13.6% | | 10.5% | 6.8% | 14.5% |
| GSA | 0.0% | 4.4% | 0.8% | | 12.4% | 6.8% | 39.7% |
| NPS | 1.9% | 4.4% | 3.5% | | 0.0% | 6.8% | 3.7% |
| SI | 0.0% | 4.4% | 0.0% | | 0.0% | 6.8% | 0.0% |
|  |  |  |  |  | |  |  |  |
| West Virginia | DoD | N/A | 0.0% | 1.5% | | N/A | 6.1% | 10.8% |
| GSA | N/A | 0.0% | 0.0% | | N/A | 6.1% | 0.0% |
| NPS | N/A | 0.0% | 0.8% | | N/A | 6.1% | 11.3% |
| US FWS | N/A | 0.0% | 1.3% | | N/A | 6.1% | 12.9% |
| US FS | N/A | 5.03% | 2.0% | | N/A | 5.76% | 17.1% |
|  | | | | | | | | |
| Data Quality Key | | No Rating | Low | Medium | | High |  | |

## Findings and Recommendations

The results in this section indicate additional effort remaining for federal agencies through the end of Chesapeake Bay TMDL in 2025. The following recommended steps will help federal agencies to close the gap:

* As documented in Section 2, there are potential improvements to the federal BMP record in CAST, which would be expected to reduce loads through the reporting and crediting of existing BMPs. Federal agencies and the jurisdictions should work together to build stronger confidence in the data reported. Federal agencies should evaluate their internal processes to ensure the required annual reporting is completed. Where it is necessary, and when funding allows, agencies and facilities should undertake efforts to collect missing information for existing BMPs. This is often more cost effective than installing a new BMP. Jurisdictions should prioritize resolving BMP reporting and tracking with federal agencies for records that originate in their data reporting system and continue to coordinate with federal agencies on BMP verification and reporting questions.
* To clearly identify a federal level of effort through the end of the TMDL, EPA, the jurisdictions, the Federal Facilities Workgroup, and other appropriate entities need to reach a consensus on the FPGs. This Report provides an initial assessment of the strengths and weaknesses of each potential source.
* Updated EPA Default Method: The revised load reductions calculated by EPA provide an equitable method to assign reductions to federal agencies. However, because these values were developed outside of the Phase III WIPs, it is not clear if jurisdictions can still meet their state planning targets with the potential for reduced effort from federal agencies. Also, the use of the state basin scale may create additional effort for facility managers attempting to calculate load reductions from facilities with land in multiple state basins.
* Phase III WIPs: These are EPA-approved documents developed through coordination between EPA, the jurisdictions, and their partners. However, federal agencies and other parties have raised concerns about the equity about some FPGs, and other jurisdictions do not specify quantitative loads that federal agencies can use to track their progress.
* WIP 3 Final: The inputs to the scenario reflect BMP implementation that will achieve the state planning targets. However, it appears that the information used to develop the scenario may not have included input from federal agencies. Furthermore, any loads evaluated from the official scenario in CAST-2017d will include the impacts of the Natural source sector and the regionalized loads associated with the Stream Bed and Bank.
* The assessment should be informed by more information from the jurisdictions on the expectations and intent of the effort documented in the Phase III WIPs. It should also consider the scale of the impact of federal load reductions on the overall achievement of the planning targets.

If these recommendations are implemented, some potential actions EPA and the Federal Facilities Workgroup may undertake includes:

* Consistent tracking and reporting of all federal BMPs.
* The development of BMP Crediting Reports for federal agencies. A BMP Crediting Report evaluates the status of each individual BMP in the state database, NEIEN, and CAST and then identifies why the BMP was not credited, if that is the case. The reports, which would evaluate the crediting status of the federal agencies’ BMPs, would help provide accountability for both federal agencies and jurisdictions and identify action needed to improve future reporting.
* After the FPG source is selected, a second effort should quantify the actual remaining effort. The calculated percent reduction by state basin could then be used by facility managers to determine the load reductions expected from them at their individual facility.
* If the updated EPA Default Method is selected, the Federal Facility Workgroup should consider updating the Protocol to reflect the new methodology and load results.

Conclusions

Based on the results of this Report, BC has identified a series of conclusions from the existing data and developed recommendations for consideration by the Federal Facilities Workgroup for future efforts.

## Conclusions

The Chesapeake Bay Program’s ability to assess the contribution and resulting progress of federal agencies has improved since the release of the Phase 6 version of CAST. However, the quality of the model’s results is dependent on the quality of the data entered into the model. The responsibility for the quality of federal data belongs to the federal agencies who report data to the jurisdictions and to the jurisdictions who submit the data to NEIEN. Regarding the data inputs to the CAST 2019 Progress scenario, this Report has two conclusions:

* Most federal agencies rate the accuracy and completeness of the data in 2019 Progress scenario as low or medium compared to the data reported to the jurisdictions.
* The data maintained by federal agencies often includes missing information or other issues that may prevent the BMPs from being accepted by the jurisdiction or NEIEN. In some cases, federal agencies do not submit data to the jurisdictions, despite the presence of facilities in the state.

Therefore, any strategy to reach a 2025 goal should include improvements to reporting through coordination between federal agencies and jurisdictions to ensure that the CAST results accurately reflect the actual implementation of BMPs on federal land.

A goal of this Report was to quantify the remaining reduction required by federal agencies to achieve FPGs. Reviewing the Phase III WIPs, however, BC found that several jurisdictions did not provide a clear numeric goal against which federal agencies could evaluate their progress. In others, discussions about the equity of the provided FPGs are ongoing. In addition, the WIP 3 Final scenario, which was used to determine if the Phase III WIP strategies would meet the state planning targets, includes inconsistent input for federal BMP implementation from federal agencies and jurisdictions. For the purposes of this Report, EPA updated the Default Method described in the Protocol, but this revised methodology has not yet been presented to or approved by the Federal Facilities Workgroup. Regarding the question of FPGs for federal agencies, this Report draws the following conclusions:

* The updated EPA Default Method, which is based on an equal level of effort as non-federal entities on the developed load source sector, requires a smaller percent reduction for TP from 2019 Progress loads than the Phase III WIP FPGs (when available) or the WIP 3 Final scenario. The results for TN are mixed.
* There is a lack of consensus around the 2025 endpoint for federal agencies from the Phase III WIPs.

Based on the above conclusions, BC has identified the recommended next steps in Section 4.2 to assist federal agencies, jurisdictions, and EPA in working toward the end of the TMDL in 2025.

## Recommended Next Steps

Next steps are organized by those for the federal agencies, the jurisdictions, and EPA.

The following recommendations are provided for federal agencies:

* Annually report BMP information. It is recommended that federal agencies include the entire BMP record in their annual progress reporting (unless directed otherwise by the jurisdiction) to ensure the BMP record reported by the jurisdiction consistently includes both progress and historical BMPs. This practice can also help federal agencies track and report inspection and maintenance of BMPs, which is also necessary to maintain credit over time. Another recommendation is that federal agencies save a record of all past data submissions in one location in their internal system.
* Evaluate internal data management practices. Federal agencies should consistently use the state reporting templates, or an adapted template, to track their BMPs. This approach provides several benefits: it ensures all required information is tracked in the format requested by the jurisdiction and simplifies the reporting process.
* Where budgets and staff resources permit, consider efforts to fill gaps in data for existing BMPs. Compared to the cost of design and construction, data collection can be a more cost-effective strategy to increase modeled TMDL credit. The same is true for BMP verification: it is typically less expensive to inspect and repair existing BMPs to regain TMDL credit for expired practices than to construct new BMPs. If there are questions about the jurisdiction’s data requirement, federal agencies should contact the jurisdiction to discuss the BMP record and strategies to improve reporting.

The following recommendations are provided for jurisdictions:

* Ensure all BMPs are reported under the proper agency code. In Virginia and West Virginia, the 2019 Progress scenario included federal BMPs assigned to the non-federal agency. These issues should be addressed promptly to ensure that credited BMPs are correctly attributed to the appropriate federal agency.
* Increase coordination with federal agencies during annual progress reporting. The purpose of this coordination may include sharing information about corrective actions federal agencies can take to address problems with BMP records.
* Participate in discussions about the appropriate FPGs. Both Washington, D.C. and Pennsylvania are working with federal agencies or EPA to address concerns about FPGs established in those jurisdictions. In addition, both Pennsylvania and New York are working with EPA to address other shortfalls in their Phase III WIP strategies. As discussions around FPGs evolve as a part of these ongoing efforts, jurisdictions should be engaged in the process.

The following recommendations are provided for EPA:

* Coordinate a discussion around the FPGs to develop consensus among the stakeholders and set a clear expectation for federal agencies through 2025. There are outstanding questions about the level of effort and equity of the FPGs in some of the Phase III WIPs. If an alternative approach is to be used, it should be based on consensus among the partners in the Federal Facilities Workgroup and approved by other bodies within the Chesapeake Bay Program. EPA should also consider documenting the final approach and expectations for federal agencies based on that consensus.
* Evaluate the value of subsequent analyses or other efforts to further assist federal agencies and the jurisdictions to implement the recommendations of this Report.

Limitations

This document was prepared solely for US EPA in accordance with professional standards at the time the services were performed and in accordance with the contract between US EPA and Brown and Caldwell dated June 29, 2020. This document is governed by the specific scope of work authorized by US EPA; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by US EPA and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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Federal Agency Progress Evaluation Excel

An Excel workbook with the results of the BC analyses will be included with the final version of this Report.