Maryland Department of the Environment
Guidance for Municipal Separate Storm Sewer System (MS4) Permittees for Completing Restoration Project Portfolios as Part of a Maximum Extent Practicable (MEP) Analysis
April 12, 2019

As part of the new MS4 Phase I permit development process, the Maryland Department of the Environment (Department) set out to determine what is the maximum extent practicable (MEP) for a permit term restoration requirement. Part of the analysis requires the completion of a proposed Restoration Project Portfolio, detailing restoration projects to be planned, designed, and/or constructed during and after the next permit term. Doing so allows each jurisdiction the flexibility to develop a portfolio of best management practices (BMPs) based on local priorities. To assist jurisdictions in completing the restoration portfolio, the Department offers the Excel workbook, "Restoration Projects 2020-2027_4-3-19.xlsx". Specific reporting requirements are summarized below.

DESCRIPTION OF REQUIREMENTS

Complete the provided spreadsheet for restoration projects to be planned, designed, and/or under construction from calendar year 2020 through 2027. These projects can be annual BMPs (including water quality trading credits) and capital projects. This restoration portfolio acts as an extension of the recent FAP submittal; thus, proposed activities for the next five years can include those practices reported in the 2018 Financial Assurance Plan. However, the Department requests that the portfolio identify nutrient and sediment reductions as well as the local concerns that would be addressed. This information should be more specific for the first reporting year but may be more generalized for the remaining reporting years.

HOW TO SUBMIT INFORMATION

Below, each section of the spreadsheet is outlined along with guidance on providing data. Please submit all files electronically via compact disc, email, or ftp and as a hard copy. Please ensure that the following actions are taken:

- **Remaining Unmet Restoration Obligation from Previous Permit (Impervious Acres)**
    - Please enter the number of acres remaining that must be treated to meet your previous permit restoration requirement. This value would be zero if you completed restoration of the full impervious acres required under your previous permit.

- **Remaining Unmet Restoration Obligations from Previous Permit**
    - In this section you should report any unmet impervious surface restoration obligation remaining from the previous permit. The BMPs listed in this section

are those proposed to be implemented in the next five-year permit term to address this unmet restoration obligation. Use BMP types and classes from the MDE Geodatabase. If a project has multiple types of a single BMP, identify the amount in the Number of BMPs column.

- BMPs used to address unmet restoration obligations shall be reported in terms of impervious acres treated or equivalent impervious acres. Projects should be credited using the 2014 Accounting Guidance and any additional guidance updates found on the Department's webpage, e.g., stream restoration, outfall stabilization, CMAC. .
- Provide the estimated cost for the entire project. If needed, identify additional planning or design costs as a separate line item in the spreadsheet.
- Implementation status should be: Planning, Design, or Under Construction.
- The projected implementation year should be from 2020 to 2025.
- Identify any total maximum daily load (TMDL) parameters, local water quality objectives (e.g., sediment, trash), and local concerns (e.g., climate resiliency) that will be addressed. Please use the comments column to describe in detail the co-benefits of the BMP.
- Please ensure that all formulas for subtotals and totals are updated to reflect the applicable time periods.

- **Obligations from Previous Permit That Must Be Continued**
  - In this section you should report any obligations from the previous permit that must be continued through the next five-year permit term and/or replaced with a permanent BMP. This section should include water quality trades that must continue annually and that must be replaced with permanent BMPs prior to the end of the permit term. Trades from the previous permit must be replaced with BMPs (annual or capital). Use BMP types and classes from the MDE Geodatabase. If a project has multiple types of a single BMP, identify the amount in the Number of BMPs column.
  - For annual BMPs implemented during the previous permit, a TN and TSS load reduction shall be computed using the 2014 Accounting Guidance. Replacement BMPs must, at a minimum, provide this obligated TN and TSS load reduction. However, when these annual practices are converted to new permanent BMPs, benefits from these shall be reported using the 2019 Accounting Principles.
  - Provide the estimated cost for the entire project. If needed, identify additional planning or design costs as a separate line item in the spreadsheet.
  - Implementation status should be: Planning, Design, or Under Construction. It is acceptable if a project will not be completed by 2027.
  - The projected implementation year should be from 2020 to 2027.
  - Identify any total maximum daily load (TMDL) parameters, local water quality objectives (e.g., sediment, trash), and local concerns (e.g., climate resiliency) that will be addressed as additional benefits. Please use the comments column to describe in detail the co-benefits of the BMP.

- Please ensure that all formulas for subtotals and totals are updated to reflect the applicable time periods.

- **Proposed Restoration for the Next Permit**
  - In this section you should report proposed new BMPs to implement as part of the next permit restoration requirement. Use BMP types and classes from the MDE Geodatabase. If a project has multiple types of a single BMP, identify the amount in the Number of BMPs column.
  - Impervious Acres and Reductions for TSS andTN for proposed projects to be implemented during the next permit shall be reported using the accounting principles provided the 2019 Accounting Principles. Provide the estimated impervious acres treated for each project (excluding alternative BMPs). Include estimated total suspended solids (TSS) and total nitrogen (TN) load reductions for each structural and annual project. Alternative BMPs like street sweeping, tree planting, and stream restoration will no longer receive an equivalent impervious acre credit. Instead, use Bay Program guidance to determine and report estimated TSS and TN load reductions.
  - Provide the estimated cost for the entire project. If needed, identify additional planning or design costs as a separate line item in the spreadsheet.
  - Implementation status should be: Planning, Design, or Under Construction. It is acceptable if a project will not be completed by 2027.
  - The projected implementation year should be from 2020 to 2027.
  - Identify any total maximum daily load (TMDL) parameters, local water quality objectives (e.g., sediment, trash), and local concerns (e.g., climate resiliency) that will be addressed. Please use the comments column to describe in detail the co-benefits of the BMP.
  - Please ensure that all formulas for subtotals and totals are updated to reflect the applicable time periods.

Maryland Department of the Environment
Physical Capacity Questionnaire for Municipal Separate Storm Sewer System (MS4) Permittees as Part of a Maximum Extent Practicable (MEP) Analysis
April 12, 2019

1. What is the typical implementation time frame (from planning through construction) for a restoration project? Provide a typical Gantt chart for the following three main classes of BMPs and break down into planning, design, and construction phases: 1. Large upland stormwater projects (e.g., new and retrofits for ponds, bioretention, infiltration basins, etc.); 2. Instream restoration projects; and, 3. Alternative projects (not annual) (e.g., tree planting). Provide a written justification to explain the time frames for each BMP class and phase.

2. Provide the average time to authorize capital improvement project (CIP) budgets for the initial project planning phase and for the design phase of a typical restoration project (assumes CIP approval for each phase is required). Do you have the ability to combine these two phases or do you have to get CIP approval for each phase consecutively?

3. Provide the average time to procure professional planning, design, and construction services. Is procurement done in phases(e.g., procurement for planning, then procurement for design, and then procurement for construction)? How would a pay for performance type of contract or a design-build-operation-maintenance contract affect these time frames? Please provide information on any innovative contracting mechanism you use to reduce procurement timeframes and what those reduced time frames are.

4. Provide the number of requests for proposals (RFPs) for BMP construction and for BMP design advertised during the past 5 year permit term. Of these, how many bids were submitted for each RFP and how many required re-advertising? Was there a trend over the permit term in the number of bid submittals received? How many unique companies provided bids for all RFPs?

5. Provide information on contracting limitations that result in longer project implementation times. Examples: Limited qualified construction contractors; Woman owned business enterprise (WBE) or minority owned business enterprise (MBE) requirements limit available qualified construction contractors and/or engineering contractors. Describe the issue and provide the time extension that results due to the issue.

6. Provide a typical time frame required to obtain permits from local, State, and federal agencies for the three main BMP project classes (i.e., upland stormwater ponds, instream restoration, and alternative projects) prior to construction. Describe how these time frames affect the overall project implementation time frames described in Question #1. How can these time frames be reduced to help get these projects out the door faster?

7. What type of a project do you consider as "low-hanging fruit"? What is your remaining capacity of available "low-hanging fruit" projects (estimate the number and impervious acre treatment total)?

8. Complete the spreadsheet provided for restoration projects to be planned, designed, and/or constructed from 2020 through 2027. Include for each restoration project the estimated impervious acres treated, estimated total nitrogen (TN) reduction, and estimated total suspended sediments (TSS) reduction; any local total maximum daily load (TMDL) parameter (or other water quality objective) addressed; estimated cost; implementation status; and projected completion year. Include projects that will be in the planning or design phase but will not be completed until after 2025. This information should be more specific for the first reporting year but may be more generalized for the remaining reporting years.

9. Provide a copy of your 5 year CIP for restoration projects (2020-2027).

10. Provide a copy of your operating budget for annual restoration projects (FY2019).

11. Provide a copy of your operating and maintenance budget for all BMPs implemented under the MS4 permit? (FY2019)

Part I. Instructions for Completing Restoration Project Portfolios

As part of the new MS4 Phase I permit development process, the Maryland Department of the Environment (Department) set out to determine what is the maximum extent practicable (MEP) for a permit term restoration requirement. Part of the analysis requires the completion of a proposed Restoration Project Portfolio, detailing restoration projects to be planned, designed, and/or constructed during and after the next permit term. Doing so allows each jurisdiction the flexibility to develop a portfolio of best management practices (BMPs) based on local priorities. To assist jurisdictions in completing the restoration portfolio, the Department offers the Excel workbook, "Restoration Project Portfolio.xlsx". Specific reporting requirements are summarized below.

DESCRIPTION OF REQUIREMENTS

Complete the provided spreadsheet for restoration projects to be planned, designed, and/or under construction from the end of the 4th generation permit through 2027. These projects can be annual BMPs (including water quality trading credits) and capital projects. This restoration portfolio acts as an extension of the recent FAP submittal; thus, proposed activities for the next five years can include those practices reported in the 2018 Financial Assurance Plan. However, the Department requests that the portfolio identify nutrient and sediment reductions as well as the local concerns that would be addressed. This information should be more specific for the first reporting year but may be more generalized for the remaining reporting years.

HOW TO SUBMIT INFORMATION

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    - Please enter the number of acres remaining that must be treated to meet your previous permit restoration requirement. This value would be zero if you completed restoration of the full impervious acres required under your previous permit.

- **Remaining Unmet Restoration Obligations from Previous Permit**
    - In this section you should report any unmet impervious surface restoration obligation remaining from the previous permit. The BMPs listed in this section are those proposed to be implemented in the next five-year permit term to address this unmet restoration obligation. Use BMP types and classes from the MDE Geodatabase. If a project has multiple types of a single BMP, identify the amount in the Number of BMPs column.
    - BMPs used to address unmet restoration obligations shall be reported in terms of impervious acres treated or equivalent impervious acres. Projects should be

credited using the 2014 Accounting Guidance and any additional guidance updates found on the Department's webpage, e.g., stream restoration, outfall stabilization, CMAC.
    - Provide the estimated cost for the entire project. If needed, identify additional planning or design costs as a separate line item in the spreadsheet.
    - Implementation status should be: Planning, Design, or Under Construction.
    - The projected implementation year should be from the end of the 4th generation permit through 2025.
    - Identify any total maximum daily load (TMDL) parameters, local water quality objectives (e.g., sediment, phosphorus, trash), and local concerns (e.g., climate resiliency) that will be addressed. Please use the comments column to describe in detail the co-benefits of the BMP.
    - Please ensure that all formulas for subtotals and totals are updated to reflect the applicable time periods.

- **Obligations from Previous Permit That Must Be Continued**
    - In this section you should report any obligations from the previous permit that must be continued through the next five-year permit term and/or replaced with a permanent BMP. This section should include water quality trades that must continue annually and that must be replaced with permanent BMPs prior to the end of the permit term. Trades from the previous permit must be replaced with BMPs (annual or capital). Use BMP types and classes from the MDE Geodatabase. If a project has multiple types of a single BMP, identify the amount in the Number of BMPs column.
    - For annual BMPs implemented during the previous permit, a TN and TSS load reduction shall be computed using the 2014 Accounting Guidance. Street lane miles and/or mass loading reductions may be noted in the comments column. Replacement BMPs must, at a minimum, provide this obligated TN and TSS load reduction. However, when these annual practices are converted to new permanent BMPs, benefits from these shall be reported using the 2019 Accounting Principles.
    - Provide the estimated cost for the entire project. If needed, identify additional planning or design costs as a separate line item in the spreadsheet.
    - Implementation status should be: Planning, Design, or Under Construction. It is acceptable if a project will not be completed by 2027.
    - The projected implementation year should be from the end of the 4th generation permit through 2027.
    - Identify any total maximum daily load (TMDL) parameters, local water quality objectives (e.g., sediment, phosphorus, trash), and local concerns (e.g., climate resiliency) that will be addressed as additional benefits. Please use the comments column to describe in detail the co-benefits of the BMP.
    - Please ensure that all formulas for subtotals and totals are updated to reflect the applicable time periods.

- **Proposed Restoration for the Next Permit**

- In this section you should report proposed new BMPs to implement as part of the next permit restoration requirement. Use BMP types and classes from the MDE Geodatabase. If a project has multiple types of a single BMP, identify the amount in the Number of BMPs column.
- Impervious Acres and Reductions for TSS andTN for proposed projects to be implemented during the next permit shall be reported using the accounting principles provided the 2019 Accounting Principles. Provide the estimated impervious acres treated for each project (excluding alternative BMPs). Include estimated total suspended solids (TSS) and total nitrogen (TN) load reductions for each structural and annual project. Alternative BMPs like street sweeping, tree planting, and stream restoration will no longer receive an equivalent impervious acre credit. Instead, use Bay Program guidance to determine and report estimated TSS and TN load reductions. For street sweeping and inlet cleaning, report lane miles or mass loading reductions in the comments column.
- Provide the estimated cost for the entire project. If needed, identify additional planning or design costs as a separate line item in the spreadsheet.
- Implementation status should be: Planning, Design, or Under Construction. It is acceptable if a project will not be completed by 2027.
- The projected implementation year should be from the end of the 4th generation permit through 2027.
- Identify any total maximum daily load (TMDL) parameters, local water quality objectives (e.g., sediment, phosphorus, trash), and local concerns (e.g., climate resiliency) that will be addressed. Please use the comments column to describe in detail the co-benefits of the BMP.
- Please ensure that all formulas for subtotals and totals are updated to reflect the applicable time periods.

Restoration Projects To Be Planned, Designed, and/or Constructed from CY 2020 Through CY 2027
[INSERT MS4 NAME]

Remaining Unmet Restoration Obligation from Previous Permit (Impervious Acres):

REST BMP ID	REST BMP TYPE[1]	BMP CLASS[1]	NUM BMP	IMP ACRES	TSS REDUCTION (lbs/year)	TN[5] REDUCTION (lbs/year)	IMPLEMENTATION COST	IMPLEMENTATION STATUS[2]	PROJECTED IMPLEMENTATION YEAR	TMDL PARAMETER OR WQ OBJECTIVE ADDRESSED	GENERAL COMMENTS[7]
Remaining Unmet Restoration Obligations from Previous Permit											
Annual Operational Programs (Unmet Obligations from Previous Permit)[3,4]											
Street Sweeping		A									
		A									
		A									
		A									
		A									
		A									
Catch Basin Cleaning		A									
		A									
		A									
		A									
		A									
Septic Sytem Pumping		A									
		A									
		A									
		A									
		A									
		A									
Subtotal Operations[3]			0	0			$0				
Capital Projects (Unmet Obligations from Previous Permit Term)											
Subtotal Capital			0	0			$0				
Other (Unmet Obligations from Previous Permit Term)											
Subtotal Other			0	0			$0				
Total of Remaining Obligations from The Previous Permit			**0**	**0**			**$0**				
Obligations from Previous Permit That Must Be Continued											
Annual Operational Programs Required to be Maintained from Previous Permit[3,4]											
Street Sweeping		A									
		A									
		A									
		A									
		A									
Catch Basin Cleaning		A									
		A									
		A									
		A									
		A									
Septic Sytem Pumping		A									
		A									
		A									
		A									
		A									
Subtotal Operations[3]			0		0	0	$0				
Capital Projects (Proposed to Replace Annual Obligations)											

Subtotal Capital			0	0	0	0	$0				
Other (Proposed to Replace Annual Obligations)											
Subtotal Other			0	0	0	0	$0				
Total of Obligations from Previous Permit That Must Be Continued			**0**	**0.0**	**0.0**	**0.0**	**$0**				
Proposed Restoration for the Next Permit											
Operational Programs[4]											
Street Sweeping		A									
		A									
		A									
		A									
		A									
Catch Basin Cleaning		A									
		A									
		A									
		A									
		A									
Septic Sytem Pumping		A									
		A									
		A									
		A									
		A									
Subtotal Operations[5]			0		0	0	$0				
Capital Projects											
Subtotal Capital			0	0	0	0	$0				
Other											
Subtotal Other			0	0	0	0	$0				
Total for Next Permit			**0**	**0.0**	**0.0**	**0.0**	**$0**				
Total for Remaining Obligations from The Previous Permit and Prosed Activities for the Next Permit			0	0.0	0.0	0.0	$0				

Check with MDE Geodatabase:
Rest BMP ID, type, class, number of BMPs, impervious acres, built date, implementation cost should match the various geodatabase tables for BMPs (AltBMPLine, AltBMPPoint, AltBMPPoly, and RestBMP)-- aggregated by type and status.

Notes:
1 Use BMP types and classes from the MDE Geodatabase.

BMP Class	
Code	**Code Description**
A	Alternative BMP
E	ESD
S	Structural BMP

BMP Classification	BMP Type Code	BMP Type
Alternative Surfaces (A)		
E	AGRE	Green Roof – Extensive
E	AGRI	Green Roof – Intensive
E	APRP	Permeable Pavements
E	ARTF	Reinforced Turf
Nonstructural Techniques (N)		
E	NDRR	Disconnection of Rooftop Runoff
E	NDNR	Disconnection of Non-Rooftop Runoff
E	NSCA	Sheetflow to Conservation Areas
Micro-Scale Practices (M)		
E	MRWH	Rainwater Harvesting
E	MSGW	Submerged Gravel Wetlands
E	MILS	Landscape Infiltration
E	MIBR	Infiltration Berms
E	MIDW	Dry Wells
E	MMBR	Micro-Bioretention
E	MRNG	Rain Gardens
E	MSWG	Grass Swale
E	MSWW	Wet Swale
E	MSWB	Bio-Swale
E	MENF	Enhanced Filters
Ponds (P)		
S	PWED	Extended Detention Structure, Wet
S	PWET	Retention Pond (Wet Pond)
S	PMPS	Multiple Pond System
S	PPKT	Pocket Pond
S	PMED	Micropool Extended Detention Pond
Wetlands (W)		
S	WSHW	Shallow Marsh
S	WEDW	ED – Wetland
S	WPWS	Wet Pond – Wetland
S	WPKT	Pocket Wetland
Infiltration (I)		
S	IBAS	Infiltration Basin
S	ITRN	Infiltration Trench
Filtering Systems (F)		
S	FBIO	Bioretention
S	FSND	Sand Filter
S	FUND	Underground Filter
S	FPER	Perimeter (Sand) Filter
S	FORG	Organic Filter (Peat Filter)
S	FBIO	Bioretention
Open Channels (O)		
S	ODSW	Dry Swale
S	OWSW	Wet Swale
Other Practices (X)		
S	XDPD	Detention Structure (Dry Pond)
S	XDED	Extended Detention Structure, Dry

S	XFLD	Flood Management Area
S	XOGS	Oil Grit Separator
S	XOTH	Other
Alternative BMPs		
A	MSS	Mechanical Street Sweeping
A	VSS	Regenerative/Vacuum Street Sweeping
A	IMPP	Impervious Surface Elimination (to pervious)
A	IMPF	Impervious Surface Elimination (to forest)
A	FPU	Planting Trees or Forestation on Pervious Urban
A	CBC	Catch Basin Cleaning
A	SDV	Storm Drain Vacuuming
A	STRE	Stream Restoration
A	OUT	Outfall Stabilization
A	SPSC	Regenerative Step Pool Storm Conveyance
A	SHST	Shoreline Management
A	SEPP	Septic Pumping
A	SEPD	Septic Denitrification
A	SEPC	Septic Connections to WWTP

Part III. Instructions for Completing the Financial Capacity Spreadsheet

For the development of the new Phase I Large Municipal Separate Storm Sewer System (MS4) permit, the Maryland Department of the Environment (Department) will consider each permittee's determination of what is the maximum extent practicable (MEP) for the implementation of stormwater permit requirements. In order to do this, the Department recommends a Financial Capacity Analysis (FCA) process that includes a spreadsheet for relevant data input and a questionnaire for providing the context behind the data. The FCA builds on the information developed during the previous permit cycle and provides further information on how the cost of stormwater management can be viewed in context with median household income (MHI), socioeconomic considerations, and the financial wherewithal of each local government. To assist jurisdictions in completing this analysis, the Department developed the Excel workbook, "Financial Capacity Spreadsheet.xlsx". This spreadsheet compiles information related to the municipal cost of stormwater services on households, key socioeconomic indicators, and financial capacity indicators regarding Phase I Large MS4 Programs.

The Financial Capacity Spreadsheet and associated data and calculations were developed in coordination with the University of Maryland's Environmental Finance Center, which provided important research, analysis, and recommendations. The data requested by the Department can be gathered easily from accessible U.S. Census Bureau information, financial reporting websites, and county/city budgets.

HOW TO COMPILE AND SUBMIT INFORMATION

The spreadsheet can be completed using the instructions below. All data for items 2 through 4 should be a five-year average (e.g., permit term). Data found in the 2017 American Community Survey (ACS) at http://factfinder.census.gov/ already combines census data for the five-year period 2013-2017, and is acceptable for completing this spreadsheet.

1. County/City Name

Enter Name of County or City Permittee.

2. Cost as a Percent of Household Income

The total annual municipal expenses for public stormwater-related infrastructure can be compared to the median household income (MHI). This comparison can be used to describe the financial impact to the residential community of these services if they were paid for by each household. Go to the 2017 ACS website. Select "Income" from the left menu and navigate to "2017 American Community Survey" "Selected Economic Characteristics (Employment, Commute, Occupation, Income, Health Insurance, Poverty, etc.)".

Enter the following data in the spreadsheet:

2a. Determine the median household income (MHI)

This information can be obtained from the 2017 ACS "Selected Economic Characteristics (Employment, Commute, Occupation, Income, Health Insurance, Poverty, etc.)"

2b. Determine the total number of households (H_{total})

The "Total Households" can be found in the ACS's "Selected Economic Characteristics (Employment, Commute, Occupation, Income, Health Insurance, Poverty, etc.)" under "Income and Benefits". According to the ACS and Puerto Rico Community Survey 2017 Subject Definitions, "A household includes all the people who occupy a housing unit. (People not living in households are classified as living in group quarters.) A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live separately from any other people in the building and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people who share living arrangements."

2c. Determine the average annual cost (total cost averaged over past 5 years) for public stormwater related infrastructure (flood control, water quality, conveyance, quantity management). Services should include maintenance, construction, design, restoration, management, inspection, etc. (TAC_{storm})

2d. Determine the total annual cost for public stormwater management programs per household (HC_{storm})

$$HC_{storm} = TAC_{storm} \div H_{total}$$

2e. Determine the percent of MHI spent on public stormwater related management programs ($\%MHI_{storm}$)

$$\%MHI_{storm} = HC_{storm} \div MHI$$

2f. Determine the total annual stormwater remediation fee per household (HC_{fee})

Maryland's stormwater management law allows for a County or municipality to establish stormwater remediation fees (also known as stormwater fees, stormwater utility fees, water quality protection and restoration fees, or water quality protection charges). These fees serve as a source of revenue for expenses of stormwater services such as capital improvements for stormwater management, operations and maintenance, and planning. Because county and city fee structures can vary (equivalent residential units, impervious acres), it is important to determine the average fee paid for the various household sizes. For MS4s with fees, information on funding structures and the cost for households can be obtained through the county/city public works or environmental departments. Large MS4s, excluding Montgomery County, can also use data from

Watershed Protection and Restoration Program annual reports to determine the average fee per household. This information represents the total revenue that could be collected from each residential household from the stormwater remediation fee. This amount can be compared to the total annual household costs of providing stormwater-related management services.

2g. Determine the average percent of MHI spent annually on the stormwater remediation fee ($\%MHI_{storm}$)

$$\%MHI_{fee} = HC_{fee} \div MHI$$

This information can be used to help characterize the relative cost of stormwater remediation per household. For jurisdictions where the stormwater remediation fee covers only a portion of the total cost of stormwater-related services, additional costs may be incurred by each household.

3. Cost of Impervious Surface Restoration as a Percent of Household Income

3a. Determine the total spent in the previous permit term on the impervious surface restoration plan (ISRP)

The ISRP describes the list of stormwater projects the jurisdiction implemented to restore 20% of a jurisdiction's unmanaged impervious area. While it is one of many requirements of the NPDES MS4 permit, it is the most expensive and difficult to implement and therefore is a good representation of the level of effort. This information can come from an MS4's most recent Financial Assurance Plan (FAP) submission or from its annual reports.

3b. Determine the average annual cost of the ISRP during the previous permit term (TAC_{ISRP})

Determine the annual cost of the ISRP by dividing the total cost by the number of years of ISRP implementation under the previous permit term.

3c. Determine the annual cost per household for the ISRP during the previous permit term (HC_{ISRP})

$$HC_{ISRP} = TAC_{ISRP} \div H_{total}$$

3d. Determine the percent of MHI spent on the ISRP during the previous permit term ($\%MHI_{ISRP}$)

$$\%MHI_{ISRP} = HC_{ISRP} \div MHI$$

This information can be used to determine the relative cost of restoration activities per household.

3e. Determine the total projected cost for the proposed restoration portfolio

The restoration portfolio represents a jurisdiction's proposed MS4 restoration activity for the next permit term.

3f. Determine the projected annual cost for the proposed restoration portfolio (TAC_{Rest})

Determine the annual cost of the proposed restoration portfolio by dividing the total cost by the number of years in the proposal.

3g. Determine the projected annual cost per household for the proposed restoration portfolio (HC_{Rest})

$$HC_{Rest} = TAC_{Rest} \div H_{total}$$

3h. Determine the percent of MHI spent on projected cost for the proposed restoration portfolio ($\%MHI_{Rest}$)

$$\%MHI_{Rest} = HC_{Rest} \div MHI$$

This information can be used to determine the relative cost of proposed restoration projects per household. This percent of MHI for proposed restoration can be compared to the percent of MHI for the previous permit term's ISRP.

4. Cost for Low Income Residential Customers as a Percent of Household Income

Compare the cost of all stormwater services, including the ISRP proposed restoration portfolio, operation and maintenance of the stormwater system, and other permit costs to income in the lower income brackets. An income of $25,000 is used to represent the upper bound of the lower low income bracket.

From the ACS website for the "2017 American Community Survey" "Selected Economic Characteristics (Employment, Commute, Occupation, Income, Health Insurance, Poverty, etc.)", collect the following data:

4a. Determine the percentage of households with income <$25,000/yr

Aggregate percentages for all household income brackets <$25,000/yr. An income of $25,000 is used to represent the upper boundary of the lower median household income of the low income bracket. The percentage of households earning less than $25,000 can be used to show the distribution of income levels in the community.

4b. Determine the percentage of income for low income households spent on public stormwater related management programs ($\%LHI_{storm}$)

$$\%LHI_{storm} = HC_{storm} \div \$25{,}000$$

This information can be used to determine whether the costs of services if paid for by each household disproportionately impacts lower income households.

4c. Determine the percentage of income for low income households spent on stormwater remediation fees ($\%LHI_{fee}$)

$$\%LHI_{fee} = HC_{fee} \div \$25{,}000$$

This information can be used to determine whether the stormwater remediation fees paid by each household disproportionately impacts lower income households.

4d. Determine the percentage of income for low income households spent on the ISRP during the previous permit term ($\%LHI_{ISRP}$)

$$\%LHI_{ISRP} = HC_{ISRP} \div \$25{,}000$$

This information can be used to determine whether the costs of restoration if paid for by each household disproportionately impacts lower income households.

4e. Determine the percentage of income for low income households spent on the projected cost of the restoration portfolio ($\%LHI_{Rest}$)

$$\%LHI_{Rest} = HC_{Rest} \div \$25{,}000$$

This information can be used to determine whether the projected costs of the proposed restoration portfolio if paid for by each household will disproportionately impact lower income households.

5. Key Socioeconomic Indicators

The percent unemployed and percent of individuals below the poverty level are additional economic indicators of an MS4 community.

From the ACS website for the "2017 American Community Survey" "Selected Economic Characteristics (Employment, Commute, Occupation, Income, Health Insurance, Poverty, etc.)", collect the following data:

5a. Determine the percent unemployed for the population 16 years and over in the labor force

This percentage can be compared to the 2017 national average reported in the ACS "Selected Economic Characteristics" for the United States under "Population 16 years and over" "In labor force" "Civilian labor force" "Unemployed" (i.e., 4.1%). Per the

U.S. Environmental Protection Agency's 1997 "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development"[1] (hereafter referred to as EPA's CSO Guidance), the jurisdiction's unemployment values can be compared to the national average to characterize the strength of the local economy.

5b. Determine the median household income (same as 2a above)

This rate should be compared to the 2017 national average reported in the ACS "Selected Economic Characteristics" for the United States (i.e., $57,652). The jurisdiction's median household income can be compared to the national average to characterize the jurisdiction's overall earning capacity.

5c. Determine the percent of individuals (all people) below the poverty level

This rate should be compared to the 2017 national average reported in the ACS "Selected Economic Characteristics" for the United States (i.e., 14.6%).

6. Financial Capacity Indicators

The general obligation (GO) bond rating, revenue bond rating, and net debt as a percentage of full market property value (FMPV) all indicate how the municipality fares in reference to debt. Financial management indicators help determine how great the tax burden is on existing properties within the community. It is an indication of whether the community has a relatively high or low tax rate which would indicate a potential for concern if additional fees are added. Bond ratings can be obtained from Moody's Investors Services (https://www.moodys.com/) or Standard & Poor's (S&P) (https://www.standardandpoors.com/en_US/web/guest/home). Debt information is typically available through a jurisdiction's annual financial statements. The FMPV data should be available through the local assessor's office or the Maryland Department of Taxation and Assessment. Collect the following data:

6a. Provide permittee's government GO bond rating

Strong: S&P (AAA, AA, A) or Moody's (Aaa, Aa, A)
Mid-range: S&P (BBB) or Moody's (Baa)
Weak: S&P (BB, B, CCC, CC, C, D, R, SD) or Moody's (Ba, B, Caa, Ca, C)

6b. Provide permittee's government revenue bond rating

Strong: S&P (AAA, AA, A) or Moody's (Aaa, Aa, A)
Mid-range: S&P (BBB) or Moody's (Baa)
Weak: S&P (BB, B, CCC, CC, C, D, R, SD) or Moody's (Ba, B, Caa, Ca, C)

[1] U.S. EPA. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

6c. Calculate the net debt as a percentage of % FMPV

Determine the jurisdiction's FMPV and net debt. Then, divide the government's net debt by the FMPV. Values less than 2% indicate a strong rating.

6d. Calculate the property tax revenues as a % of FMPV

Determine the jurisdiction's total annual property tax revenues. Divide total annual property tax revenues by FMPV. Values less than 2% indicate a strong rating. Combined, these values help characterize the jurisdiction's ability to issue additional debt.

6e. Provide permittee's tax collection rate

Provide the rate of collection for annual property tax revenues. Values above 98% indicate a strong system. This information helps characterize the jurisdictions ability to manage financial obligations.

REFERENCES

U.S. Census Bureau. 2017. "American Community Survey and Puerto Rico Community Survey 2017 Subject Definitions". Accessed at https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf?#

U.S. Conference of Mayors, American Water Works Association and Water Environment Federation. 2013. "Affordability Assessment Tool for Federal Water Mandates". Accessed at http://www.mayors.org/urbanwater/media/2013/0529-report-WaterAffordability.pdf."

U.S. Environmental Protection Agency. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development". Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

Part IV. Recommendations on Evaluating Financial Capacity as Part of an MEP Analysis

Evaluating the financial capacity of a local jurisdiction to perform all stormwater services, is an important factor in determining the maximum extent practicable (MEP) level of implementation for Phase I Large municipal separate storm sewer system (MS4) permittees. A jurisdiction's financial capacity can be informed by characterizing the economic conditions of the community, estimating the per household municipal costs and expenditures, and characterizing the financial wherewithal of its government to pay for stormwater-related services. MDE recognizes that each Phase I Large MS4 jurisdiction is unique in its socioeconomic makeup and how stormwater programs are funded. Generally, sources of revenue used to pay for stormwater-related services include a combination of a dedicated fee or utility; general property and income tax revenues; grants and loans; and bond sales. The ability of a jurisdiction to adequately manage these funding sources is critical to the level of stormwater services provided. The data gathered in the Financial Capacity Analysis (FCA) spreadsheet and the narrative responses to the questions below will help each jurisdiction describe its MEP for performing stormwater-related services; economic status and its ability to afford these services; and its capacity to generate funds for these services.

It is recommended that each jurisdiction first complete the FCA spreadsheet. Then, the Department suggests that each jurisdiction answer the following questions that provide important local context regarding its FCA data and MEP analysis.

1. **What was the prior per household municipal cost of stormwater services and restoration activities for a jurisdiction's residents?**

   This first set of calculations in the FCA spreadsheet can be used to describe the municipal cost per household for stormwater-related services provided to the residential community in the past five years. Including the past and planned restoration costs and the costs of infrastructure maintenance and repair, inspection and education programs allows the jurisdiction to account for various costs - both capital and operational. These calculations can help characterize the relationship between these costs and residential household income.

   a. **What was the estimated annual municipal cost of providing stormwater-related management services to residential customers?**

      The five-year average annual cost of providing the full range of stormwater-related services can be compared to the median household income (MHI) of the community. The MHI provides a middle value of all the income ranges in a community. As the middle value, the MHI represents the income for at least half of the households.[1]

[1] U.S. Census Bureau. 2017. "American Community Survey and Puerto Rico Community Survey 2017 Subject Definitions" at pp. 86. Accessed at https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf?#

While percent of MHI may be a good indicator for communities that are homogeneous in income, each MS4 jurisdiction has unique income distributions. Capturing information on lower income brackets can help "tease out" the impacts of stormwater service costs on lower income households. The U.S. Census Bureau developed a Supplemental Poverty Measure (SPM) and determined that "At the national level, for a two-adult, two-child household in 2010, the SPM income threshold was set at $24,343."[2] Based on this, the FCA spreadsheet uses an income of $25,000/year, which represents the upper bound of the low income brackets, as a surrogate to provide information on this income group. While this does not reflect all lower income households, it is a good starting point for this analysis. Information collected in question 2c. below can be used to further characterize stormwater-related services on low income residents.

b. What is the estimated annual cost of the stormwater remediation fee to residential customers?

A similar analysis can be performed using just the stormwater remediation fee to isolate the annual cost of this revenue-generating mechanism for providing stormwater services to residential customers. The five-year average annual cost of the stormwater fee can be compared to MHI. This information can be used to help characterize the relative cost of stormwater remediation fee per household. For jurisdictions where the stormwater remediation fee covers only a portion of the total costs of stormwater related services, additional costs may be incurred by each household.

MDE recommends determining whether the stormwater remediation fee paid by each household disproportionately impacts lower income households. MDE recommends using the income of $25,000/year to represent the upper bound of the lower low income bracket.

c. What was the annual cost of the impervious surface restoration plan (ISRP) to residential customers?

Using the total cost of the ISRP during the previous permit term, the average annual cost can be compared to the MHI. Again, MDE recommends determining whether the stormwater remediation fee paid by each household disproportionately impacts lower income households. In addition, the percent of MHI for stormwater remediation fee can be compared to past ISRP spending.

[2] U.S. Conference of Mayors, American Water Works Association and Water Environment Federation. 2013. "Affordability Assessment Tool for Federal Water Mandates" at pp 19. Accessed at http://www.mayors.org/urbanwater/media/2013/0529-report-WaterAffordability.pdf."

d. What is the projected annual cost of the proposed restoration portfolio to residential customers?

Using the projected total cost of the proposed restoration portfolio, the average annual cost can be compared to the MHI. Again, MDE recommends determining whether the proposed restoration portfolio cost that may be paid by each household disproportionately impacts lower income households. The percent of MHI for stormwater remediation fee can be compared to the projected cost of the restoration portfolio. Additionally, the percent of MHI for the previous permit term's ISRP can be compared to the percent of MHI for the proposed restoration portfolio.

2. How do socioeconomic factors characterize the economic health of a jurisdiction? Are there indications that there are vulnerable populations in a jurisdiction that need to be considered?

Information on income distribution in a jurisdiction can be used to determine if lower income populations are disproportionately impacted by the costs of stormwater services. Household income statistics are broken down in the Census Data to help with this evaluation. While this low income indicator is important, many jurisdictions have programs to reduce the cost of these stormwater services.

a. How does the percent unemployed compare to the national average?

The percent unemployed shows the total number of unemployed people in a community.[3] This percentage can be compared to the national average reported in the American Community Survey (ACS) to help characterize the socioeconomic conditions of a jurisdiction. An unemployment percentage of greater than 1% above the national average is a local economic indicator that helps to show how stormwater costs may impact the unemployed. This 1% parameter comes from the U.S. Environmental Protection Agency's 1997 "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development"[4] (hereafter referred to as EPA's CSO Guidance).

b. How does the MHI compare to the national average?

Although the MHI does not specifically represent impacts of costs on lower income residents, comparing the MHI to the national average shows the overall earning capacity in a jurisdiction and provides additional information on the economic conditions of the residential community. According to the EPA's CSO Guidance, if the MHI of the community is more than 25% below the national average, the community would be considered economically vulnerable.

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[3] U.S. Census Bureau. 2017. "American Community Survey and Puerto Rico Community Survey 2017 Subject Definitions" at pp. 66. Accessed at https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf?#

[4] U.S. EPA. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

c. What is the percentage of individuals below the poverty level and how does it compare to the national average?

The U.S. Census Bureau uses family size and income thresholds to determine estimates for the percentage of families and people whose income is below the poverty level.[5] This information can be used to describe the percentage of individuals in a jurisdiction that are below the poverty level compared to the national average. Percentages greater than 1% above the national average may indicate that a jurisdiction has a greater number of residents in poverty.

d. Are there any methods in place to reduce the annual cost of public stormwater-related services? Is a method in place to reduce the annual cost of stormwater-related services for low income residential customers?

Based on the answers in questions 1a, 1b, 1c, and 1d of this document, the costs on low income residents for providing stormwater-related services may be a large percentage of household income. Using the answers to questions 2a and 2c of this document, as well as the calculated cost for stormwater-related services on low income residents, describe all methods in place to reduce the cost on vulnerable populations. Additionally, have fee reduction requests from low income households impacted water or stormwater service revenues?

3. What is the financial capacity of a jurisdiction to borrow additional funds for stormwater-related management programs?

The ability of a jurisdiction to borrow additional funds can provide further information on how stormwater-related cost represents the community's MEP. The General Obligation (GO) and revenue bond ratings as well as the net debt as a percentage of full market property value (FMPV) all indicate how a jurisdiction fares in reference to debt. Known as debt burden, this information can characterize a jurisdiction's ability to issue additional debt to finance stormwater-related services.

a. Does the GO bond rating indicate a strong borrowing capacity?

GO bond ratings represent the ability of a jurisdiction to repay its debt. GO bond debt is paid by revenue from taxes (usually local property taxes). Revenue from the sale of GO bonds are the primary long-term debt funding mechanism of a community.[6] Moody's ratings of Aaa, Aa, and A, or Standard & Poor's ratings of AAA, AA, and A indicate a financially stable jurisdiction.

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[5] U.S. Census Bureau. 2016. "How the Census Bureau Measures Poverty". Accessed at https://www.census.gov/topics/income-poverty/poverty/about.html

[6] U.S. EPA. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." at pp. 21. Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

b. Does the revenue bond rating indicate a strong borrowing capacity?

Revenue bond ratings reflect the financial conditions and management of a jurisdiction. These bonds are repaid from revenue generated from user or service fees.[7] Moody's ratings of Aaa, Aa, and A, or Standard & Poor's ratings of AAA, AA, and A indicate a financially stable jurisdiction.

c. Have either one of the bond ratings impacted past borrowing capacity and is there a potential for impacts to future borrowing?

A strong borrowing capacity will indicate a jurisdiction's ability to sufficiently borrow funds to pay for stormwater-related services. A weaker borrowing capacity will show a jurisdiction may be limited in the ability to increase debt to fund additional projects. Based on the bond ratings, jurisdictions should explain how borrowing during the previous permit term was impacted by bond ratings. The jurisdiction should also explain how borrowing during the next permit term could be impacted by current bond ratings.

d. Net debt as a percentage of FMPV?

Net debt is debt repaid by property taxes. The FMPV is the price a willing buyer would pay for real property and in this context it represents the full market value of real property in the jurisdiction. The calculated net debt as a percentage of FMPV provides a measurement of the debt burden on residents. It accounts for all debt issued by the jurisdiction and can be compared to a benchmark found in EPA's CSO Guidance to serve as an indicator of financial stability.

4. How great is the tax burden on existing properties within the community?

Financial management indicators help determine how great the tax burden is on existing properties within the community. These indicators can show whether a jurisdiction has a relatively high or low tax rate, which would indicate potential for concern if additional fees are added.

e. What is the property tax revenue collection rate and does it indicate a large amount of contributions from the tax base?

The property tax revenue collection rate serves as a measurement of tax collection system performance and residents' acceptance of tax levels.[8] The rate can be compared to an EPA CSO Guidance benchmark to indicate performance. A collection rate above 98% would be indicative of strong performance. A poor collection rate would be indicative of a tax structure that is burdensome on the residential population of the jurisdiction.

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[7] U.S. EPA. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." at pp. 21. Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

[8] U.S. EPA. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." at pp. 34. Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

f. Do the property tax revenues as a percentage of FMPV indicate that additional fees would cause an increased strain on the community?

The property tax revenues as a percentage of FMPV can be used to characterize the financial ability of a jurisdiction to support debt.[9] This comparison also provides information on how effective the local government is in providing services. A value below 2% indicates a financially strong community.

[9] U.S. EPA. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." at pp. 32. Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

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U.S. Census Bureau. 2016. "How the Census Bureau Measures Poverty". Accessed at https://www.census.gov/topics/income-poverty/poverty/about.html

U.S. Census Bureau. 2017. "American Community Survey and Puerto Rico Community Survey 2017 Subject Definitions". Accessed at https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2017_ACSSubjectDefinitions.pdf?#

U.S. Conference of Mayors, American Water Works Association and Water Environment Federation. 2013. "Affordability Assessment Tool for Federal Water Mandates". Accessed at http://www.mayors.org/urbanwater/media/2013/0529-report-WaterAffordability.pdf."

U.S. Environmental Protection Agency. 1997. "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development". Accessed at https://www3.epa.gov/npdes/pubs/csofc.pdf.

Financial Capacity Spreadsheet			
1	County/City Name		
2	Cost As A Percent Of Household Income		
2a	Median Household Income (MHI)		
2b	Total Number Of Households In Jurisdiction		
2c	Average Annual Cost For Public Stormwater Related Management Programs		
2d	Annual Cost For Public Stormwater Related Management Programs Per Household		$ -
2e	% Of MHI Spent On Public Stormwater Related Management Programs		0.00%
2f	Total Annual Stormwater Remediation Fee Per Household		
2g	% Of MHI Spent Annually On Stormwater Remediation Fee		0.00%
3	Cost Of Impervious Surface Restoration As A Percent Of Household Income		
3a	Total In Previous Permit Term Spent On The Impervious Surface Restoration Plan (ISRP)		
3b	Average Annual Cost Of The ISRP During The Previous Permit Term		
3c	Annual Cost Of The ISRP Per Household During The Previous Permit Term		$ -
3d	% Of MHI Spent On The ISRP During The Previous Permit Term		0.00%
3e	Total Projected Cost For Restoration Portfolio		
3f	Projected Annual Cost For Restoration Portfolio		
3g	Projected Annual Cost For Restoration Portfolio Per Household		$ -
3h	% Of MHI Spent On Projected Cost Of Restoration Portfolio		0.00%
4	Cost For Low-Income Residential Customers As A Percent Of Household Income		
4a	Percentage Of Households With Annual Income <$25,000		
4b	% Of Income For Low Income Households Spent On Public Stormwater Related Management Programs		0.00%
4c	% Of Income For Low Income Households Spent On Stormwater Remediation Fees		0.00%
4d	% Of Income For Low Income Household Spent On The ISRP		0.00%
4e	% Of MHI For Low Income House Spent On Projected Cost Of Restoration Portfolio		0.00%
5	Key Socioeconomic Indicators		
5a	Percentage Unemployed		
5b	Median Household Income		
5c	Percent Of Individuals (All People) Below Poverty Level		
6	Financial Capacity Indicators		
6a	Debt Indicators	Bond Rating – GO[1] Bonds	
6b		Bond Rating – Revenue Bonds	
6c		Net Debt As A % Of FMPV[2]	
6d	Financial Management Indicators	Property Tax Revenues As % Of FMPV	
6e		Property Tax Revenue Collection Rate	

Notes:

1. GO = General Obligation
2. FMPV = Full Market Property Value

Moody's	Aaa
	Aa
	A
	Baa
	Ba
	B
	Caa
	Ca
	C
S&P	AAA
	AA
	A
	BBB
	BB
	B
	CCC
	CC
	R
	SD
	D

Parameter from 2017 ACS	2017 Value
National Average MHI	$ 57,652.00
National Percent Unemployed	4.1%
National Percent of Individuals Below Poverty Level	14.6%