CHESAPEAKE BAY
PHASE III WATERSHED IMPLEMENTATION PLAN

HAMPTON ROADS
REGIONAL PLANNING FRAMEWORK, SCENARIO, AND STRATEGIES

Prepared by the staff of the
HAMPTON ROADS PLANNING DISTRICT COMMISSION

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Chesapeake Bay Program
A Watershed Partnership

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Attachment A: Narrative Final Report

Chesapeake Bay Regulatory and Accountability Program (CBRAP) Project

Please submit this form electronically, along with the rest of the quarterly report material to: baygrant@deq.virginia.gov and CC your DEQ Project Manager.

Project Title	Hampton Roads PDC Phase III WIP Planning Assistance		
Contract #	16650		
Organization	Hampton Roads Planning District Commission #23		
Select Report Type	_____ Interim (by 9/15/18)	_____ Final (by 12/14/18)	
Name & Title of Individual Reporting	KC Filippino, Senior Water Resources Planner	Date:	12/14/2018

Disclaimer:
The Best Management Practices (BMP) input deck developed by the Hampton Roads Planning District Commission (HRPDC) for the Virginia Department of Environmental Quality (DEQ) Local Area Planning effort solely represents a theoretical implementation of BMPs by 2025, strictly for the unregulated developed (non-MS4), natural, and septic sectors, based upon information supplied to the PDC by the DEQ as of June 2018. This theoretical scenario is just one of hundreds of possibilities that may, or may not, occur between now and 2025 in the unregulated developed (non-MS4), natural, and septic sectors. Furthermore, this submittal does not represent any commitment, by any of the local governments to implement or fund the BMP's, Programmatic Actions or Strategies.

Executive Summary

HRPDC stakeholders developed a BMP input deck and programmatic actions to address nitrogen and phosphorus load reductions in Hampton Roads on unregulated developed and natural acres and for septic systems. After four stakeholder meetings driven by data analysis, input, and discussion, the group determined that they were unable to meet the local area planning goals put forth by DEQ. Stakeholders could commit to putting BMPs on thousands of acres of unregulated developed and natural lands and they corrected septic system data but these efforts did not result in decreased nitrogen loads. Justification for not meeting the goal falls into five categories: **1) the identified unregulated developed and natural acres include state-owned and private property acres, 2) common BMPs applicable in the Coastal Plain do not achieve high nutrient reductions, 3) many BMPs used in the region are not available for Bay Program credit, 4) site selection, maintenance, reporting and verification of BMPs is an administrative and financial burden, and 5) future land use projections likely overestimate future loads.**

While the input deck did not reflect implementation on enough acres to meet the nitrogen goals, stakeholders used this opportunity to identify key programmatic actions that might increase implementation by eliminating major hurdles for localities, private property owners, or non-governmental organizations (NGOs) when considering implementing voluntary BMPs.

Three major themes describe these suggestions: **1) Create incentive programs and increase funding, 2) conduct research and increase BMP crediting, and 3) improve reporting and verification**. In order to develop a robust voluntary program, there must be incentives do so and funding to support them. Stakeholders also determined that more evaluation and research must go into existing BMP expert panel reports and BMPs that are in use must have crediting options. Reporting and verification methods for the BMP Warehouse, VDH and DEQ reporting requirements for septic systems, and future land use modeling must be more streamlined, comprehensive, and understandable. A list of 43 programmatic actions were submitted by the stakeholders and described in detail below.

In addition to the programmatic actions, HRPDC stakeholders have agreed to endorse a proposal by Hampton Roads Sanitation District (HRSD) that would close a wastewater treatment plant and treat the waste at a higher level of nutrient reductions. As a regional WIP III strategy, this would remove 500,000 lbs of nitrogen and 100 lbs of phosphorus before 2025 if state funds were acquired.

1. Introduction

As a part of the HRPDC Phase III Watershed Implementation Plan (WIP) for the Chesapeake Bay TMDL, four stakeholder meetings were held to discuss possible BMPs and programmatic actions in the unregulated developed (non-MS4), natural, and septic sectors. Meetings were held on August 2, September 6, October 10, and December 6, 2018. Between 35 and 40 stakeholders were present at each meeting including representatives from DEQ (central office and Tidewater Regional Office), VA Department of Health (VDH), local health districts, the Department of the Navy (DoN), VA Coastal Policy Center (VCPC), Port of Virginia, Hampton Roads Sanitation District (HRSD), HRPDC localities, the Chesapeake Bay Foundation, The Elizabeth River Project, Wetlands Watch, VA Department of Transportation (VDOT), VA Department of Forestry (VDOF), Colonial Soil Water Conservation District (SWCD), and consultants.

In an effort to understand loads associated with the unregulated developed, natural, and septic sectors, the first two meetings were dedicated to defining and mapping what is known about these sectors. The unregulated developed lands include state lands and any general and individual industrial VPDES permittee that has been excluded from MS4 delineated service areas. The natural land use sector includes forested lands, shorelines, buffers, and degraded and eroded shoreline and stream reaches. On-site wastewater, or septic systems, were discussed in more detail during the second stakeholder meeting. The on-site data provided by DEQ from the Chesapeake Bay Program's CAST model was found to be very inaccurate so the main goal was to get accurate numbers for this sector. Stakeholders were asked to: 1) provide any BMP data in their unregulated developed and natural sectors, 2) provide an accurate count of on-site sewer systems and associated BMPs, 3) consider any BMP implementation that could be conducted outside of regulated MS4 areas, and 4) develop funding requests or policy changes (programmatic actions) that would need to be made in order for implementation to occur.

This report will highlight the findings of stakeholder input and specific requests as well as provide detail for some programmatic actions and why stakeholders within the HRPDC found them to be important to incorporate for a successful Phase III WIP. For the purposes of this effort, Gloucester County was not a part of the HRPDC and all federal lands were excluded.

2. Land use sectors

2.1. Unregulated developed and Natural Acres

A mapping exercise was conducted to identify all land types categorized as regulated via an MS4 permit, regulated for construction, unregulated developed (non-MS4), federal lands, agriculture, and natural acres within the Bay watershed of the HRPDC boundaries, exclusive of Gloucester County (Fig.1). According to the Bay Program's Phase 6 land use model, there are more acres of natural lands compared to any other land use in the region (Table 1).

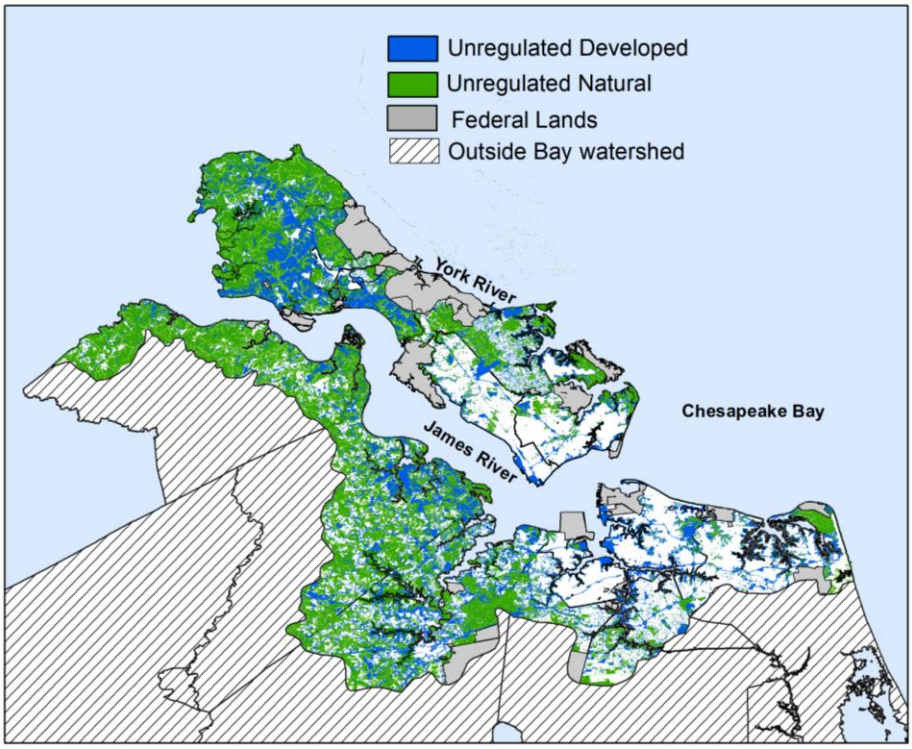

Figure 1. Unregulated developed and natural lands, exclusive of federal lands, within the Bay watershed for the HRPDC boundaries (excluding Gloucester Co.) based on USGS Phase 6 Land use.

Table 1. HRPDC acres by sector (excluding federal facilities) within the Bay watershed according to CAST 2017 Progress (v9)

Sector	Acres
Natural	290,311
Regulated Developed (MS4)	170,550
Unregulated Developed (non-MS4)	71,247
Agriculture	58,279
Regulated Construction	6,659

Once all land uses were identified, it was determined that there were discrepancies when comparing locality-provided data with data from CAST. Private, local, state-owned, and regulated construction acres were included in the unregulated developed and natural sectors in CAST. Through data calls, localities and VDOT provided delineated MS4 service areas, localities provided VA Pollution Discharge Elimination System (VPDES) permittee industrial acres, and HRPDC staff derived state-owned lands through locality parcel data (Table 2). Stakeholders determined that state-owned (non-MS4) and VPDES permittee lands should not be included in the region's available acres for local area planning goal (LAPG) reductions. What the region considers unregulated developed total 42,053 acres and natural lands total 271,155 acres. Because of this difference in land classification and the fact that HRPDC localities own a significant portion of regulated land, there are less public acres that localities can implement BMPs on. Localities can only encourage private land owners to implement BMPs and state-owned lands and VPDES permittees should have their own LAPGs. Programmatic actions to address this recommendation can be found in section 3.1 of this report.

Table 2. CAST and locality-provided Land Use. (*Unregulated developed and natural acres in HRPDC are classified differently than the Bay model acres. Value is calculated as the unregulated developed acres provided by CAST 2017 Progress (v9) minus regulated construction, state-owned (non-MS4) and VPDES permittee acres. $^{+}$ Natural acres in HRPDC are calculated as the natural acres provided by CAST 2017 Progress (v9) minus state-owned natural acres.)

Sector/land use type	CAST 2017 Progress (v9) Acres	HRPDC-derived Acres
Unregulated Developed		
State-owned (non-MS4)	-	9,192
VPDES permittee	-	13,343
Regulated construction	6,659	-
HRPDC-derived unregulated developed	-	**42,053***
Total unregulated developed	71,247	
Natural		
State-owned natural lands	-	19,156
HRPDC-derived natural lands	-	**271,155**$^{+}$
Total natural lands	290,311	

2.2. Septic

Similar to what was uncovered in the land-use analysis, discrepancies were found in the septic sector. With the input of localities, local Health District representatives and VDH staff, it was determined that there is vast under-reporting of conventional systems, pump-outs, sewer connections, and alternative/denitrifying systems from localities to VDH, and VDH to DEQ. This is primarily due to a lack of regulatory authority, only pump-outs in the Chesapeake Bay Preservation Act (CBPA) are required to be reported, and VDH only has data for BMPs in which

a permit for maintenance is required. In the past, data was provided directly to the Bay Program from HRPDC, but was never used. Rather the number of systems and pump-outs are based on population and sewer service area. However, the sewer service area for the region was never provided to the Bay Program for the region. Through a series of data calls an accurate estimate of systems and BMPs were collected (Table 3). While we are confident in the actual number of conventional and alternative systems and connections, the data for pump-outs and other BMPs are estimates. We assume that systems are pumped out once every five years. Representatives from the Health Districts were not familiar with many of the terms that are used by the Bay Program and DEQ for crediting septic BMPs. The septic crosswalk was provided to VDH for clarification; however it does not appear that they have the knowledge or data on secondary treatment BMPs in our area. All alternative systems were reported as the BMP for enhanced denitrification. Obtaining all of the above-mentioned data accurately is a primary focus moving forward with the intent to propose policy and/or funding mechanisms to ensure the VDH data set remains accurate and stays current.

Table 3. Septic system and BMP data for HRPDC within the Bay watershed.

	CAST 2017 Progress (v9) Systems and BMPs	**HRPDC-derived Systems and BMPs**
Total systems	10,030	18,076
Connections	366	2,612
Annual Pump-outs (2017)	32.3	3,615
Denitrification – Conventional	69.6	63
Denitrification – Enhanced	9.7	339
Secondary Treatment – Conventional	170	170
Secondary Treatment – Enhanced	24	-

3. Proposed BMP Input Deck

The proposed input deck submitted by HRPDC (attached) was put together through stakeholder input and locality-specific data calls. Stakeholders provided BMPs that are currently in the ground, and in many cases differ than the 2017 Progress acres provided, and projected BMPs through 2025. Acres from the Phase II WIP column were not used as the region does not feel that these were accurate reflections of what the region had agreed to during Phase II WIP development. The Phase II WIP was not specific for this region; it included statewide strategies instead of using the regional strategies submitted by the HRPDC to the Commonwealth in 2012.

Corrected, current, and proposed BMP implementation in our input deck does not achieve the requested load reduction goals for nitrogen. Even by implementing BMPs on additional acres compared to the 2017 Progress load acres and increasing septic pump-outs, connections, and BMPs; nitrogen loads increase compared to 2017 Progress loads, most likely due to increased development projections. The reasons for not being able to achieve these goals are as

follows: 1) the identified unregulated developed and natural acres include state-owned and private property, 2) common BMPs applicable in the Coastal Plain do not achieve high nutrient reductions, 3) many BMPs used in the region are not available for Bay Program credit, 4) site selection, maintenance, reporting and verification of BMPs is an administrative and financial burden, and 5) future land use projections likely overestimate future loads. Each reason is addressed in detail below.

3.1. The identified unregulated developed and natural sectors include state-owned and private property acres

Once it was clear that the classification of unregulated developed and natural lands included state-owned and private property acres, stakeholders requested that LAPGs should be applied separately to these entities. We request that the state establish its own LAPGs and implement BMPs as demonstration projects on these lands (see Programmatic Template #29). Conserving state lands, increasing tree canopy, reducing impervious surfaces, and increasing buffers are just a few examples of BMPs that could make considerable reductions on the approximately 30,000 acres of state-identified lands in Hampton Roads. The state could also take the lead on developing relationships, finance, develop, and construct BMPs on private unregulated developed or natural lands (see Programmatic Template #8) and expand on lessons learned from VCAP.

Since most of the property owned by Hampton Roads localities is in the MS4 delineated service area, to meet the LAPGs, localities would need to put many more BMPs on private property. This would require significant staff time to create relationships with private property owners. Education, potential land purchase, and follow-up management and verification are just a few of the hurdles that local governments would have to overcome in order to find more acreage to implement BMPs. There are many industrial facilities that are already regulated by the stormwater VPDES permit but have impervious surfaces that are not covered by an MS4 permit or the VPDES permit. Stakeholders would like to see the Commonwealth address this loophole such that VPDES permittees submit GIS layers that delineate which acres are part of their industrial process and which acres are discharging to MS4s or waterways (see Programmatic Template #17). Once this area is accounted for, localities can partner with these permittees to better treat this source of non-point source pollution. The Commonwealth should develop a new program or expand on the VA Environmental Excellence Program (VEEP) to encourage VPDES permittees to treat their run-off from parking lots and other non-industrial impervious areas. In Hampton Roads, MS4s have carved the entire facility out of their MS4 service area, accounting for over 13,000 acres that are currently unregulated developed sources of nitrogen and phosphorus that are not being accounted for unless those areas are covered in the industrial activity of the VPDES permit.

3.2. Common BMPs applicable in the Coastal Plain do not achieve high nutrient reductions

The most popular BMPs used in Hampton Roads have low nutrient removal rates. The top BMPs for the region were bioretention/raingardens in C/D soils, dry detention ponds and hydrodynamic structures, filtering practices, impervious surface reduction, wet ponds and wetlands, and urban shoreline management. According to reduction estimates for individual BMPs provided by CAST for Hampton Roads localities, impervious surface reductions offers the greatest nitrogen reduction at approximately 5.2 lbs N/ unit. All other practices recommended are less than 3 lbs N/unit and many of these practices would not be put implemented on a large scale. Also, many infiltration practices are challenging to implement in the Coastal Plain due to the high groundwater table. Urban shoreline management is popular for many localities and NGOs, as there are many co-benefits associated with improving these shorelines but the practice also does not achieve high nutrient reductions (see Programmatic Template #2 & 3). The Expert Panel for Shoreline Management eventually provided nitrogen and phosphorus reductions for Protocol 1, but the value provided for VA is very low and may not be representative of the prevented nutrient loads in Hampton Roads. Programmatic Actions recommend conducting research specifically in the Coastal Plain to determine what the loads are and how effective living shorelines in the Coastal Plain are in terms of nitrogen and phosphorus reductions.

Homeowner BMPs like bioretention, rain gardens, rain barrels, and using less fertilizer have become very popular in the region. The Virginia Conservation Assistance Program (VCAP) is extremely successful, for the Virginia Dare SWCD, supply exceeds demand for private property cost-share BMPs. However, there are not enough staff or stable funding resources to grow the program or even continue it at its current level. Similar programs are found throughout region, like Elizabeth River Project's RiverStar Homes, askHRGreen's Bay Star Homes, and Lynnhaven River Now's Pearl Homes programs. These are also very successful programs but they do not have the funds or reach to affect every homeowner within the Bay watershed in our region. While homeowner BMPs do not contribute to significant amounts of nutrient reductions, they go a long way in terms of stewardship for local waterways and educating private property owners on the importance of their non-point source contributions. Expanding and providing stable funding and adequate staff for the SWCDs to continue to administer VCAP would ensure this program stays successful (see Programmatic Template #9). If this can be achieved, there should also be consideration to allow cities that are not part of SWCDs to participate (see Programmatic Template #10). Finally, the verification, reporting, and general requirements for homeowner BMPs should be streamlined and easier to use with options for NGOs or homeowners to use the SMART app (see Programmatic Template #11 &12).

Septic system BMPs and enhancements offer nitrogen reductions, but the overall load is small when compared to other source-sector loads (3.6% of all nitrogen loads statewide, 0.5% of all nitrogen loads in Hampton Roads). It could be beneficial to improve upon septic system maintenance, pump-outs, and BMPs, particularly for other local water quality concerns, but it is unclear how much funding should be devoted to this effort. For our region, the number of systems currently and projected in the model is underestimated, therefore planning septic BMPs is challenging until the correct nitrogen loading is provided in order for it to be off-set. Many

recommendations were put forward for improving this program (see Programmatic Template #20-24).

3.3. Many BMPs used in the region are not available for Bay Program credit

There are BMPs being implemented in the region at very high rates that are not included for Bay Program nutrient credit: wetland enhancement, creation, and rehabilitation for tidal wetlands, manufactured treatment devices (MTDs), oyster restoration, boater-pump out programs, and litter and floatables prevention programs. Significant amounts of effort and funding are spent restoring shorelines throughout Hampton Roads. In 2017, localities and NGOs, with the help of federal grants, invested millions of dollars into living shoreline creation. As mentioned in section 3.1, this BMP does not receive a significant amount of nitrogen credit. Tidal wetlands are also not considered for nutrient reduction credit the way that non-tidal wetlands are for creation, rehabilitation, and enhancement. Many localities are implementing hybrid shorelines that include living shorelines and oyster reefs for stabilization that offer benefits for areas that are prone to flooding from tides or rain, provide habitat, and may reduce bacteria impairments. However, these implementation strategies will not receive any additional nutrient reductions since oyster reef restoration and some of the hybrid designs that may include a partially 'hardened' shoreline for protection are not available for credit within the Bay Program model (see Programmatic Template #1, 3, and 39).

In Hampton Roads, MTDs have been implemented on over 400 acres of regulated and unregulated lands. These BMPs are already reducing nitrogen and phosphorus and many more would likely be implemented if credit within the Bay model was available. Many MTDs can be used to reduce a variety of pollutants, particularly in small urban landscapes that do not have space for larger, traditional BMPs. Including MTDs for Bay Program credit will likely increase innovation and drive down overall costs. For many years the Commonwealth has been working to put all MTDs on a level playing field, ensure that they are all properly sized, and appropriate credit is given for each practice (see Programmatic Template #13). There are parallel efforts on the national level and within the Bay Program to establish guidelines so that these devices can be appropriately tested and used for credit, but no official timeline has been set forth for when they will be allowed in the Bay Model.

There are also many BMPs that may not receive credit in the Bay model because there was not a specific load source identified in the model and therefore there is no associated reduction. However, these BMPs are still being implemented by localities to encourage stewardship for water quality and to address other local TMDLs. In partnership with many localities, education opportunities and boat pump-outs are conducted by HRSD year-round and likely reduce the amount of boats discharging illegally in no-discharge zones (NDZs). The Expert Panel report has been receiving attention at the Water Quality Goal Implementation Team (GIT) level and we look forward to addressing any issues or concerns and helping to provide data from HRSD's program to ensure that appropriate credit is given (see Programmatic Template #40). Localities also implement litter prevention and floatable removals programs (see

Programmatic Template #41). Funds are being invested to educate and provide mechanical removal of floatables in some cases but there is no nutrient load associated with litter and therefore no reduction credit is provided. This is an opportunity to educate and to remove pollutants, but the constraints of the model have hindered these practices such that localities cannot receive credit, and therefore may not continue to invest if they don't address TMDL goals.

3.4. Site location, maintenance, reporting, and verification of BMPs is an administrative and financial burden

Currently Phase II MS4 permittees are required to report BMPs into the BMP Warehouse and Phase I MS4 permittees will likely be required to in the future. There are 11 Phase I and Phase II MS4s in Hampton Roads, the remaining localities do not have the resources and/or staff to dedicate to implementing, maintaining, and tracking voluntary BMPs. Many MS4 localities have well-established recording, reporting, and verification systems and databases already in place and it is no small task to begin the process anew with the Warehouse. While this effort is focused on unregulated urban lands, stakeholders became aware that BMPs in the regulated urban sector, reported in required annual reports, have not been recorded in the BMP Warehouse (see Programmatic Template #30). There are limited resources and staff within DEQ to address this issue, and while localities are working one-on-one with DEQ to begin the process, adding enough state staff to maintain accurate records of BMPs is a necessary first step before asking localities to implement more BMPs. For unregulated localities, there is no incentive or requirement to enter BMPs into the Warehouse. BMPs are being implemented in these localities, whether at the homeowner level or to make improvements for local water quality. However, these BMPs are also not being reported into the BMP Warehouse because it is a labor intensive task, and the maintenance and verification procedures required by the Bay Program are likely not being implemented. The overall consensus of stakeholders was that significant funding and staff time would have to be provided to encourage reporting BMPs that aren't required (see Programmatic Template #5). To that end, the stakeholders would like the Commonwealth to provide a statement of assurance that actions on unregulated developed lands will continue to be voluntary (see Programmatic Template #38) while ensuring a sufficient framework exists for Bay Program verification and reporting to be done at minimal expense to localities. A voluntary program can remain voluntary, while still adhering to reporting requirements.

If hurdles of maintenance and verification can be overcome, a program could also be developed to implement retrofits on unregulated developed lands, a cost-share program similar to the agriculture BMP cost-share program, could be an effective approach (see Programmatic Template #6). Additionally, the Commonwealth must ensure that post-construction BMPs that are in the Construction General Permit BMP database make it into the BMP Warehouse and that localities are able to track, maintain, and verify those BMPs in an efficient way (see Programmatic Template #19).

3.5. Future land use projections likely overestimate future loads

Another factor to consider is the amount of growth projected for the region. It is unlikely that the increased acreage in developed land that is predicted by the land use change model will be realized in Hampton Roads in 2025. If warranted, there is a potential need for the region to do its own assessment. The Commonwealth should also consider updating the 2013/2014 land use/land change analysis conducted by Worldview Solutions (see Programmatic Template #37). The Chesapeake Conservancy and other partners are conducting this analysis for 2017/2018 but that does not encompass the entire state, only the parts within the Bay watershed and uses a different methodology than the state previously used. Aside from the importance this data set has for the Bay TMDL, there are many co-benefits to the state that have been considered by Worldview Solutions, see Applications of the Virginia Statewide Land Cover Database for more details.

To counteract growth, DEQ suggested land use policy BMPs, specifically the Growth Management Scenario, until the VA-specific policy could be completed by the Bay Program. However, these land use policy BMPs were not considered for implementation by the stakeholders because there was a general agreement that these BMPs are not realistic. One of the major hurdles for these BMPs is the requirement that they be implemented locality-wide. Even if the Growth Management scenario were considered for each locality, on top of the BMP implementation provided in the proposed input deck, nitrogen loads in the unregulated developed sector would still be greater than those in 2017 Progress. Localities would have to make many significant changes to comprehensive plans and make political commitments that aren't possible to acquire through this process. The concept of land conservation in general was discussed, and it was agreed that localities need to ensure that what land that is already conserved is represented in the model. According to the DCR Conservation Lands Database (2018), within the Bay Watershed in HRPDC, there are 36,105 acres of non-federal conserved lands and 14,732 acres of conservation easements. Together, these conserved lands account for 17% of the natural lands in our region. It is unclear how many acres are recognized as conserved within the Bay model. This would be valuable information to have in order to ground-truth model inputs and to plan for future conservation acres.

While the region did not advocate for a land use policy as a whole, localities are not opposed to land conservation, increasing urban tree canopy, and creating more buffers. For land conservation, stakeholders recommended that the Commonwealth incentivize local planning and fund conservation programs to conserve more local lands by 2025. This would help the Commonwealth achieve its overall goal of conserving 20% of state lands and this could be achieved by refining the Governor's goal to prioritize land conservation within the Bay watershed (see Programmatic Template #26). HRPDC would also like to work with localities to develop conservation easement ordinances in localities that do not already have one and attempt to broaden conservation easement requirements at the local level (see Programmatic Template #27). Stakeholders recommended that the Commonwealth should promote land conversion from vacant urban lots or fallow agriculture fields to forested areas. This could be aided by including

land purchasing for this purpose in SLAF (or another funding mechanism) or by creating a more robust state urban forestry program (see Programmatic Template #25). Finally, protocols could be developed to provide credit for developable lands that are placed under a permanent easement, particularly if they have recurring flooding issues. The Commonwealth should encourage the Bay Program to develop these protocols to promote land conservation and also link to FEMA's repetitive loss properties to provide a basis for taking properties out of use (see Programmatic Template #28).

Stakeholders also discussed nutrient neutral development and questioned whether or not the 0.41 lbs phosphorus/acre/year was a stringent standard for ensuring nutrient loads from new development do not increase in the future. This standard was based on the fact that estimated future development would result from the conversion of more agriculture lands to developed lands as opposed to the conversion of forest lands to developed lands. Based on analyses using VGIN-provided data, the opposite is occurring in the Commonwealth and more forested lands are being developed. This suggests that the nutrient neutral criteria must be re-evaluated and decreased to ensure that nutrient loads do not increase over time (see Programmatic Template #36).

In addition to the programmatic actions mentioned above, the stakeholder group also addressed other actions that did not necessarily fall into the above categories.

4. Incentivizing Co-benefits

Many suggestions incorporated incentives for the purpose of encouraging BMPs with multiple benefits. It was recommended that a cost-share program be created that promotes stormwater BMPs for the purposes of improving water quality while also addressing flooding concerns (see Programmatic Template #14). Providing tax incentives for shoreline management projects could also benefit an already popular BMP while aiding in flood control measures (see Programmatic Template #4). By targeting specific co-benefits and creating a sub-fund, tax incentives, or targeting federal dollars (potentially FEMA funding), BMPs could be strategically placed on unregulated acres that address two important issues. Similarly, BMPs in unregulated developed lands could also be placed more strategically in areas that have more effect on Bay water quality (see Programmatic Template #7). Targeting more 'effective basin' reductions could also be aligned with local TMDL requirements and/or flooding concerns. Another suggestion was to enhance DEQ's Brownfields Program to include prioritization of stormwater projects that reduce blight, decrease unused impervious surfaces, and abandoned properties by implementing green infrastructure BMPs (see Programmatic Template #15). The Brownfields Program is administered by DEQ and offers funding for brownfield redevelopment. This program could be extremely beneficial for Bay and local water quality, blight reduction, economic development, and potentially addressing flood risks. Stakeholders recommend increasing the Program's awareness, ensuring consistent funding, and incorporating aspects of green infrastructure into redevelopment.

Finally, research must be dedicated to directly quantify the co-benefits of water quality improvements and water quantity management (see Programmatic Template #43). The Commonwealth should encourage the Bay Program's Scientific Technical Advisory Committee (STAC) to continue to research this topic specifically for regions with a high groundwater table that are prone to flooding and obtain funding from the Bay Program's Water Quality Goal Implementation Team (GIT). Once BMPs are identified, they can be addressed through the formal Expert Panel process or as add-ons to existing panels to ensure reductions can be credited in the Bay Program model.

5. State-wide actions

Throughout this process, VDOT has been a great partner by providing their MS4 data and input into the Programmatic Template. It is challenging for BMPs to be placed in right-of-ways from both VDOT and localities' perspectives due to questions regarding ownership. For right-of-ways that are owned by VDOT, or in cases where localities and VDOT can collaborate, incentives should be provided to facilitate implementation of linear BMPs that better treat run-off closer to the roadway. Efforts should be given to advance the standards and specifications of linear BMPs under the VA Run-off Reduction Methodology. VDOT should be viewed as a resource to assist with development of standards and specifications, as well as for demonstration of implementation practicality (see Programmatic Template #18). This also links directly to ensuring the finalization of the additional roadside ditch retrofitting BMPs being examined by the Bay Program. Once these BMPs have approved reduction efficiencies, their implementation should be encouraged and demonstrated by VDOT (see Programmatic Template #42). Consideration should also be given to evaluate VDOT's role with respect to tree removal and tree plantings. It is widely known that trees are excellent BMPs. VDOT's removal of trees to implement structural BMPs along roadways should be re-evaluated and VDOT should be encouraged to plant trees where viable.

The CBPA and associated programs made significant progress towards the Bay TMDL, however this progress has been limited to only the Tidewater portion of the state. Stakeholders would like to see the CBPA program be expanded to incorporate all localities within the Bay watershed (see Programmatic Template #32). This would be a very effective way to improve local water quality, would provide equity among MS4s, and would be easy to adopt since it is a well-established program. However, it is clear that there are funding deficiencies within the CBPA and expansion will only exacerbate that. Funding deficiencies are especially noticeable in Agriculture Assessments and septic pump-out programs. Current programs should have the level of funding they need to operate effectively and so that the program can be expanded watershed-wide (see Programmatic Template #33). There are also some requirements within the CBPA program that prohibit effective environmentally-friendly practices that may also address flooding concerns. Stakeholders seek flexibility in requirements for temporary disturbances in the Resource Protection Area (RPA) in order to facilitate brownfield conversion to green

infrastructure and address flooding concerns in coastal areas (see Programmatic Template #34). The Commonwealth should evaluate CBPA regulations and incorporate more flexibility.

In the Hampton Roads region, major efforts are underway to reduce nitrogen and phosphorus loads in stormwater, and these are well-documented in the 11 MS4 permittees Action Plans. Many permittees have the ability to take advantage of implementing BMPs on unregulated developed land, subtracting a baseline for nutrient reduction, and claiming any reductions above baseline for their MS4 permit compliance. The locality invests significant resources into these BMPs, and continues on with the maintenance and verification, but only receives a portion of the reduction credit. Stakeholders request that the Commonwealth work with EPA to remove the baseline requirement so that MS4 localities could claim all of the reduction credits and revise the state's Chesapeake Bay TMDL Action Plan guidance to reflect this (see Programmatic Template #35). This would give localities the incentive to implement BMPs beyond their delineated service areas and address water quality across the locality, targeting local TMDL concerns and/or flooding concerns. Since many of the stakeholders were comprised of stormwater managers for the region's MS4s, there was a consensus that the region continue to encourage the Commonwealth to adhere to the MS4 permit requirements long-term approach of 5%, 35%, and 60% reductions over three 5-year permit cycles. Significant progress has been made with this system and will ensure that progress will continue beyond the 2025 deadline (see Programmatic Template #31).

6. Proposal to provide achieve LAPG goal through wastewater achievements

In an effort to consider all options by adopting a one water approach, HRSD reached out to the stakeholder group and proposed to close the Boat Harbor Treatment Plant in Newport News and send the waste to another facility for better treatment as a WIP III strategy for the region. The Boat Harbor Treatment plant has a small footprint that would preclude it from upgrades for additional nutrient reductions in the future. By closing the plant and building a pipe across the James River to convey the waste to the Nansemond-Suffolk treatment plant, 500,000 lbs of nitrogen and 100 lbs of phosphorus would be reduced through improved treatment technologies. The cost is estimated at $200 million, and the region is requesting that project funds come from the state's Water Quality Improvement Fund (WQIF) surplus funds or sub-funds of the WQIF. Bay clean up benefits all Virginians within the watershed, but the cost is disproportionately borne by coastal residents connected to centralized sewer systems. This proposal is very cost effective at $400/lb nitrogen compared to the proposed input deck which would cost $30,477/lb nitrogen, based on annualized costs obtained via CAST. The focus on nitrogen over phosphorus reduction is also important, as nitrogen is the limiting nutrient for the southern portion of the Bay and LAPG nitrogen reductions are significantly greater than phosphorus reductions.

While this request does not directly address the voluntary load reductions of unregulated developed, natural, and septic sectors, the overwhelming reduction in nitrogen (almost 12 times the LAPG) would be a positive for the region in terms of the savings to ratepayers and the

improvements to water quality. This proposal is in addition to the suite of programmatic actions that the region has put forward, and would like to see acted upon in the long-term, as these build on programs that already exist and need stability and funds to continue. HRSD's proposal would be accomplished by 2025 with state funding and would benefit the James River basin and help Virginia reach its 2025 TMDL goals.