Meeting Minutes
2023 Virginia Stormwater Handbook
Stakeholder Advisory Group (SAG) Meeting #3
Friday September 23, 2022

Location: DEQ Headquarters
1111 East Main Street
Richmond, VA 23219
Start – 9:30 AM

Attendees:

- SAG Members
    - Don Rissmeyer, ACEC Virginia – alternate
    - Jared Webb, American Electric Power
    - Lisa Ochsenhir, AquaLaw – alternate
    - James Taylor, Balzer & Associates
    - Peggy Sanner, Chesapeake Bay Foundation (CBF)
    - Allison Lee, Center for Watershed Protection (CWP) – alternate
    - Mike Kitchen, Christopher Consultants
    - Melanie Mason, City of Alexandria
    - Jack Dawson, City of Charlottesville
    - Mike Huggins, City of Danville – alternate
    - Scott Smith, City of Hampton
    - Matthew Huston, City of Harrisonburg
    - Charles Bodnar, City of Virginia Beach
    - Logan Borror, City of Waynesboro
    - Rene' Hypes, Virginia Department of Conservation and Recreation (DCR)
    - James Filson, Dewberry – alternate
    - Hannah Zegler, Dominion – alternate
    - Jerry Stonefield, Fairfax County
    - Joe Wilder, Frederick County
    - Zach LeMaster, Gentry Locke – alternate
    - Doug Moseley, GKY & Associates
    - Benjamin Slaighter, Hazen and Sawyer
    - KC Filippino, Hampton Roads Planning District Commission (HRPDC)
    - Chris French, Hydro International
    - Justin Doyle, James River Association
    - Melissa Burgh, JMT (Johnson, Mirmiran & Thompson, Inc)
    - Dale Chestnut, JMU
    - Laurence Bensonm, Kimley-Horn
    - Kateri Simon, Luck Ecosystems
    - Norm Goulet, Northern Virginia Regional Commission (NOVARC)
    - Dave Maxwell , Prince William County – alternate
    - Pat Bradley, RES (Resource Environmental Solutions, LLC) – alternate
    - Ashley Hall, Stantec

    - Jacob Dorman, SW Manufacturers Assn
    - Liz Scheessele, Timmons Group
    - Justin St. Clain, Town of Christiansburg
    - Blair Blanchette, Virginia Conservation Assistance Program (VCAP)
    - Darrell Marshall, Virginia Department of Agriculture and Consumer Services (VDACS)
    - Alex Foraste, Virginia Department of Transportation (VDOT)
    - Clayton Hodges, Virginia Polytechnic Institute and State University – alternate
    - Brian Parker, VTCA – alternate
- Excused Absences
    - Jason Papacosma, Arlington County
    - Greg Hoffman, CWP
    - Richard Jacobs, Culpeper SWCD
    - Shawn Harden, Dewberry
    - Andrew Clark, HBAV
    - John Burke, Montgomery County
    - Joseph Caterino, RES
    - Patricia Colatosti, Town of Christiansburg
    - Rob Lanham, VTCA
- Members of the Public
    - Stephanie Collins, BHE GT&S
    - Rachel Morales, Columbia Gas VA
- DEQ Staff
    - Evan Branosky
    - Andrew Hammond
    - Brandon Bull
    - Nelson Daniel
    - Joe Crook
- Arcadis / Contractor for Handbook Development
    - Fernando Pasquel
    - James Patteson
    - Michael Wooden
    - Nirali Desai

- Welcome and second meeting recap
    - Evan Branosky (Chief Stormwater Policy Advisor, DEQ) welcomed the SAG members back for the third meeting. He introduced the DEQ staff members in attendance, and reviewed the content and outcomes of the prior SAG meeting. A summary is in the attached PowerPoint presentation.
    - Evan discussed the procurement process DEQ followed to select Arcadis as the contractor to create the Stormwater Handbook. Arcadis will continue to participate in the SAG mettings – as the handbook contractor – but will not be a member of the SAG.

- Handbook Development Tasks

- Evan introduced the Arcadis staff and explained that while Arcadis will develop content for the handbook, the SAG members, directly and through subcommittees, will help decide priorities, organization, and specific ideas for the handbook. The goal is to have the handbook complete in 2023.
- Fernando Pasquel (Arcadis) explained the different tasks, timeline, and workplan Arcadis is considering, covering: Task 100 – planning and outreach; Task 200 – facilitation; Task 300 – stormwater and erosion and sediment control; Task 400 through Task 600 – BMP specifications; Task 700 – handbook production.
- James Patteson (Arcadis) provided an overview of 4 proposed subcommittees: 1) erosion and sediment control and stormwater BMPs; 2) calculations; 3) handbook outline & chapters; and 4) handbook planning, production and outreach. He asked SAG members to select their preferred sub-committee(s) by adding their name to the appropriate chart and ranking their top 3 choices.
- Arcadis staff provided an overview of their team and shared thoughts about selecting members for the preliminary subcommittees based on their ranking and area(s) of expertise.

- Background Assessments
  - The Arcadis Team provided background information and talked about their approach to the task of developing content for the handbook. This included a list of manuals and issues they will review:
    - Manuals from other states such as New York and, Pennsylvania;
    - Local/regional stormwater manuals;
    - Chesapeake Bay Preservation Act: local requirements/manuals;
    - Specifications to be reviewed in background assessment;
    - A handbook's approach to VSMP vs non-VSMP authorities;
    - Emerging technologies/lessons learned/state of practice; and
    - Manufactured treatment devices.
  - SAG members suggested other stormwater manuals and issues to consider including stormwater issues specific to karst terrain, resilience, characteristics of specific physiographic regions in Virginia, and Maryland's stormwater manual.
  - The PowerPoint presentation that follows the minutes contains additional information.
- After a break for lunch, SAG members divided up into four groups to brainstorm and report on ideas/concerns for each of the four preliminary subgroups.
  - Handbook planning, production, and outreach:
    - Consider a digital format, recognizing the need to meet ADA requirements for digital content.
    - The subcommittee had concerns about training burdens and meeting the needs of different stakeholders.
  - Erosion and sediment control and stormwater BMPs:
    - Account for regional differences.
    - Post-construction maintenance requirements.
    - Identify issues with material suppliers and material specifications for BMPs.
    - Infiltration testing requirements should be consistent.

        - Ensure consistency with Chesapeake Bay Preservation Act requirements.
        - Make the handbook usable for all project sizes.
    - Calculations
        - Energy balance.
        - Linear development (more guidance, examples).
    - Outline and chapters
        - Base handbook on workflow patterns.
        - Dislikes – hard to updated current manuals, lack of flexibility.
- SAG members also provided written feedback to Arcadis on the following questions:
    - What do you like and dislike based on your experience using Virginia's local and regional handbooks & manuals?
    - In your experience, what are the most important changes to VA's stormwater program over the last 30 years? (i.e., What is not covered in prior handbooks that is critical to cover through this effort?)

- PUBLIC COMMENT
    - Evan invited members of the public who were at the meeting to comment. No one commented.

Evan thanked SAG members for their participation and said the presentation, meeting minutes, and dates for future meetings will be sent to all SAG members soon.

The meeting ended at 2:45 pm.

2023 Virginia Stormwater Handbook

Stakeholder Advisory Group

Meeting #3 (September 23, 2022)

Agenda

• **Welcome & 2nd Meeting Recap**	
✓ FOIA Information	Evan Branosky, DEQ
✓ 2nd Meeting Content and Outcomes	Joseph Crook, DEQ
✓ Procurement Update	D. Nelson Daniel, DEQ
• **Handbook Development Tasks**	
✓ Team Overview	Evan Branosky, DEQ
✓ Task Description and Workplan	Fernando Pasquel, Arcadis
✓ Preliminary SAG Sub-Committees	James Patteson, Arcadis
Break	
• **Background Assessments**	
✓ Purpose and Outcomes	Arcadis Team
✓ Approach	
Lunch Break	
• **Background Assessments (continued)**	
✓ Review of Manuals	Arcadis Team
✓ Emerging Technologies	
✓ Brainstorm	

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Agenda

• **Brainstorm: Handbook Suggestions** ✓ Workgroup Discussions ✓ Report Out • What do you like and dislike based on your experience using Virginia's local and regional handbooks & manuals? • In your experience, what are the most important changes to VA's stormwater program over the last 30 years? (i.e., What is not covered in prior handbooks that is critical to cover through this effort?)	Arcadis Team
Break	
• **Public Comment**	All
• **Wrap-Up**	Evan Branosky, DEQ

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Welcome & 2nd Meeting Recap

FOIA Information

1. The SAG is a public body subject to the Freedom of Information Act (FOIA). As such, all business of the group must be conducted in a public forum that has been noticed in accordance with the Act and minutes must be prepared.

2. Emails may be considered as the conduct of business. Thus, individual members of the SAG should not use "reply to all" when receiving emails from DEQ. Also, any member of the SAG that wants to provide information to the group should send it to the DEQ Project Manager for distribution.

3. If more than two members of the SAG serve on a subcommittee, those subcommittees are also public bodies and thus subject to FOIA rules.

NOTE

- Subcommittees seeking to meet virtually will be subject to § 2.2-3708.2. (Meetings held through electronic communication means), of the *Code of Virginia*.

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Welcome & 2nd Meeting Recap

2nd Meeting Content & Outcomes

- VESCH & SWM BMP Analysis

  ✓ BMP Categories
  ✓ Potential Priotization

- Contractor Background Assessment

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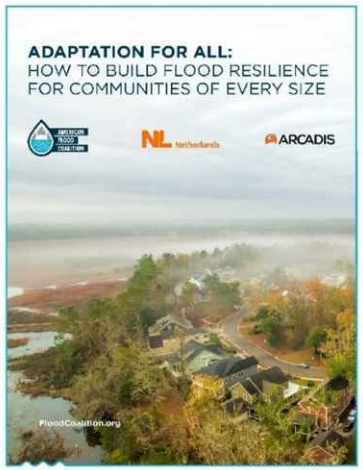
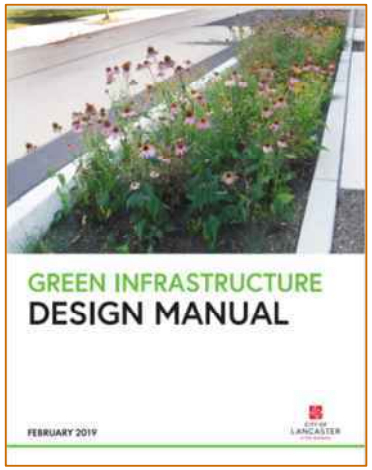
Team Overview

- **Arcadis**
- Blue Heron Leadership Group, LLC
- True Purpose Leadership
- Storm and Stream Solutions, LLC
- Legacy Engineering, PC
- Green Print Partners
- AMT





Task Description and Workplan

- Task 100 – Handbook Planning and Outreach
- Task 200 – Facilitation
- Task 300 – Stormwater & E&S Chapters
- Task 400 – BMP Specifications
- Task 500 – MTD Specifications
- Task 600 – E&S Specifications
- Task 700 – Handbook Production

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Workplan

Developed in Task 100

- Project Initiation Meeting
- Project Management, Tools, and Plans
- Project Meetings
- DEQ Requests and Coordination
- Stormwater Handbook Outline
- Schedule and Final Work Plan

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Preliminary SAG Sub-Committees

- ESC & SWM BMPs
- Calculations (H&H, Water Quality)
- Outline & Chapters
- Handbook Planning, Production, Outreach

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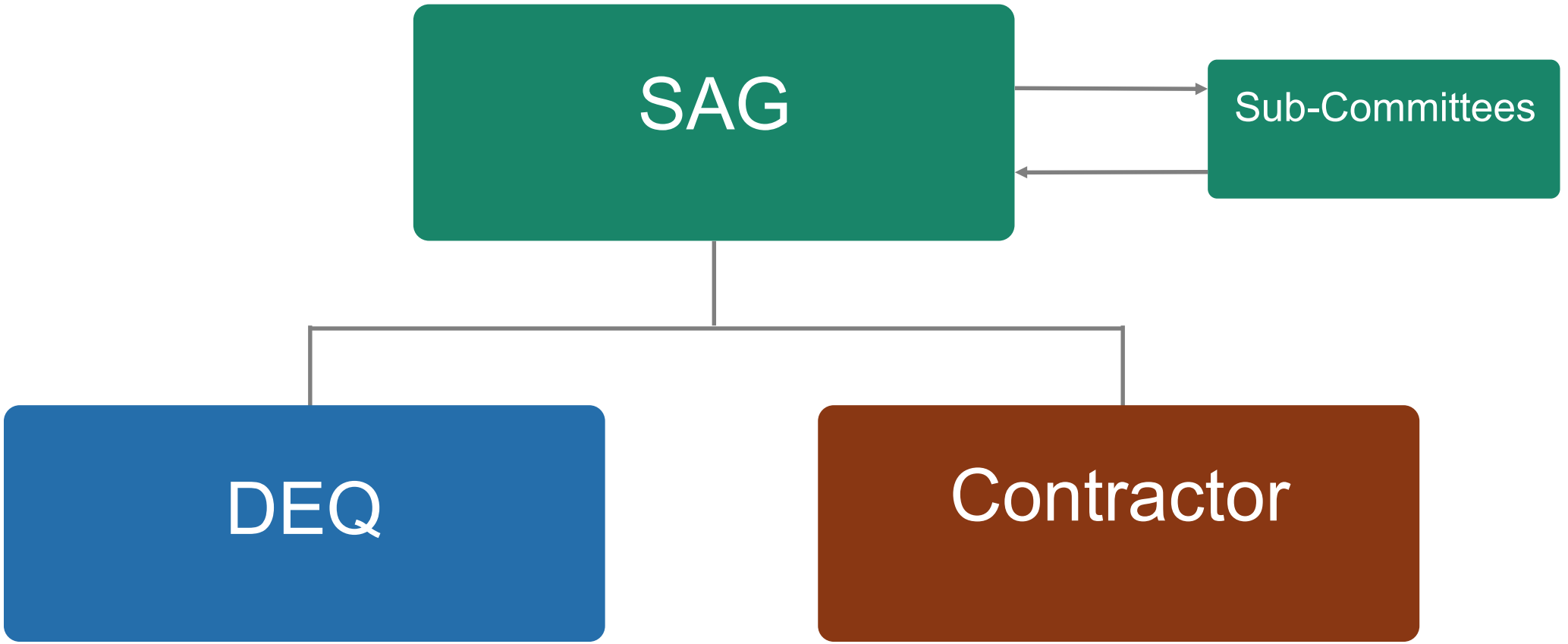
Project Purpose & Process

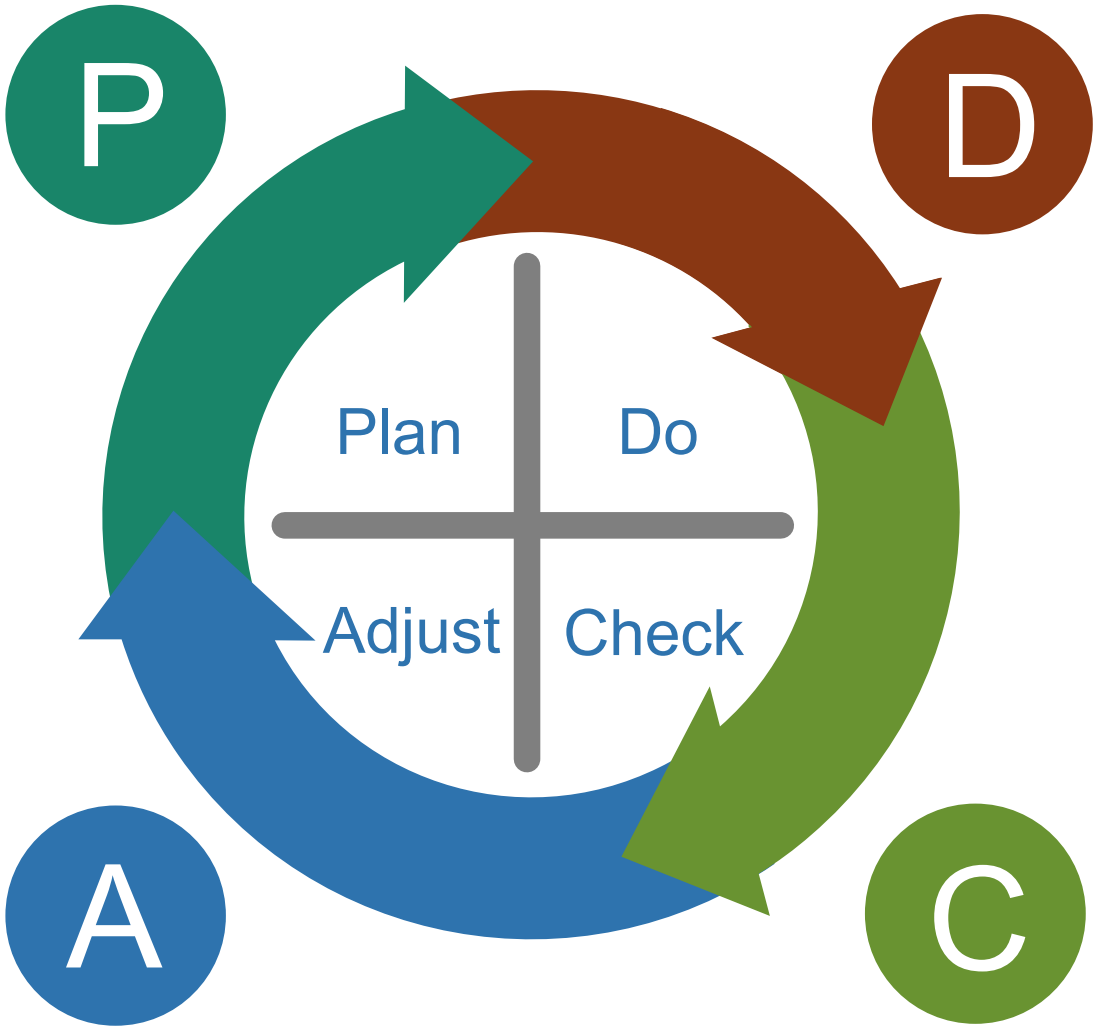
SAG Terms of Reference



Project Purpose & Process

SAG Processes & Procedures

- SAG directs Sub-Cmtes, DEQ, & Contractor
- All suggest content
- Contractor offers Best Professional Judgement



- Contractor prepares text, drawings, & other content
- SAG, Sub-Cmtes, & DEQ may contribute

- Contractor revises content
- Contractor finalizes content

- SAG, Sub-Cmtes, & DEQ review draft content
- SAG & DEQ provide feedback within timeline

Issues requiring rulemakings or guidance will go to the Parking Lot

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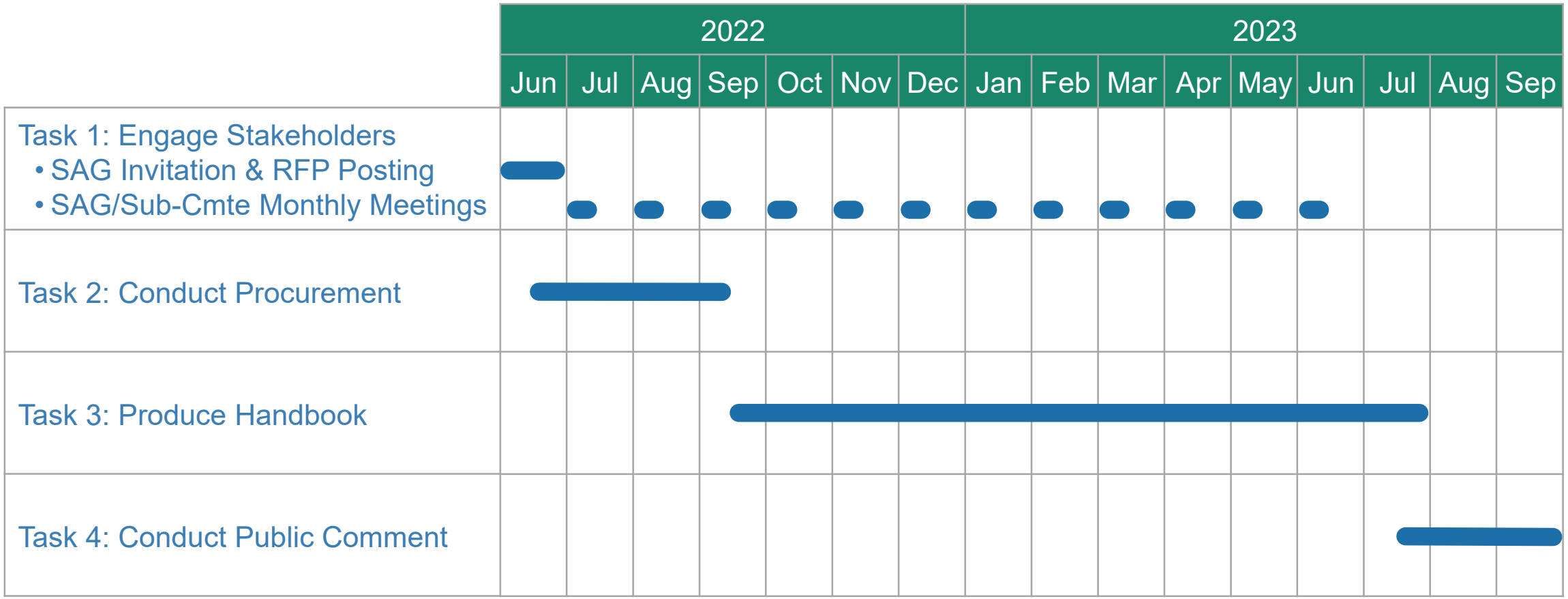
Project Purpose & Process

SAG Processes & Procedures (cont'd)

NOTE: Schedule is for planning purposes only and subject to change.



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	Stormwater Handbook Tasks	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
Task 1	**1.0 Handbook Planning and Outreach**													
	1.1 Project Initiation and Management													
	Weekly and Biweekly Calls	X X X X	X X X X	X X X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X
	Milestone Progress Meetings	X		X			X			X			X	
	1.2 Work Plan, Schedule, SharePoint Data Management	DWP	FWP											
	1.3 Manual Outline and Format		O			Update								
	1.4 Public Outreach												C	
	1.5 Updates Coordination													
	Task 1 Deliverables	X X	X	X	X	X	X	X	X	X	X	X	X	X
Task 2	**2.0 Facilitation**													
	2.1 SAG Planning													
	2.2 SAG Meetings	X	X	X	X	X	X	X	X	X	X	X	X	
	2.3 SAG Subcommittees (5) Calls/Meetings	X	X X X	X X X		X X X	X X X	X X X	X X X	X X X	X X X			
	Task 2 Deliverables	X	X	X	X	X	X	X	X	X	X	X	X	X
Task 3	**3.0 Stormwater and E&S Chapters**													
	3.1 Background Assessment and Outlines													
	3.2 Content (Monthly Releases)													
	3.3 Resilience and Equity Chapters Coordination													
	Task 3 Deliverables	X	X	X	X	X	X	X	X	X	X	X		X
Task 4	**4.0 BMP Specifications**													
	4.1 Background Assessment and Outlines						Update							
	4.2 Content (Monthly Releases)													
	4.3 Specifications													
	Task 4 Deliverables	X	X	X	X	X	X	X	X	X	X	X		X
Task 5	**5.0 MTD Specifications**													
	5.1 Background Assessment and Outlines						Update							
	5.2 Content (Monthly Releases)													
	5.3 Specifications													
	Task 5 Deliverables	X	X	X	X	X	X	X	X	X	X	X		X
Task 6	**6.0 E&S Specifications**													
	6.1 Background Assessment and Outlines						Update							
	6.2 Content (Monthly Releases)													
	6.3 Specifications													
	Task 6 Deliverables	X	X	X	X	X	X	X	X	X	X	X		X
Task 7	**7.0 Handbook Production**													
	7.1 Templates and SharePoint Site Organization													
	7.2 Digital Alternative Selection			TM										
	7.3 Updates Implementation Plan				TM									
	7.3 Draft Production and ADA Compatability												15-Aug	
	7.4 Final Handbook Production													30-Sep
	Task 7 Deliverables		X	X									X	X

NOTE: Draft Schedule is for planning purposes only and subject to change.

Background Assessments: Purpose and Outcomes

- Build on DEQ and SAG list of resources
- Review available data and information
- Review existing design standards
- Review the regulations and code of Virginia
- Outcomes
  - Handbook Outline
  - Final Workplan

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Approach to Conduct Background Assessments

- Drawn from a diverse selection of States and localities
  - Review of international manuals is planned
- Focus on the more recent manuals, similar climates, etc.
- What stands out?
  - How do they address climate resilience, regional impacts, geology, equity
- Layout and Formatting
  - Ease of use, interactive, online, how is content organized?
- How have ESC & BMPs evolved?

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Manuals and Design Standards Under Consideration for Review with SAG Support

- Virginia Beach Public Works Design Standards Manual and Amendments to VDOT's Specs. and Stds.
  - SWM Design Requirements
  - Sea Level Rise/Recurrent Flooding Analyses
  - Interjurisdiction considerations
- Northern Virginia BMP Handbook and LID Supplement
- Fairfax County Public Facilities Manual
- Prince William County Design & Construction Standards Manual
- Chesterfield County Environmental Engineering Reference Manual
- Richmond DPU, Stormwater Management Design and Construction Standards Manual
- Roanoke County Stormwater Management Design Manual
- Other recent manuals?

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Review Data & Design Standards (Sample Documents)

- CSN Expert Panel Reports, RSC, Infiltration and Filtering Practices presentations, Climate Change Vulnerabilities and Resilient Design Considerations for BMPs, etc.
- NOAA Atlas 14 + 20% design storms to account for climate resilience (VA Beach)
- Sea Level Rise of 1.5’ “non-critical” infrastructure; 3.0’ “critical” infrastructure (VA Beach)
- MARISA – IDF Tool and documentation
- Other items to be reviewed:
  - Variances, Annual Standards and Specifications, Violations, Failure Reports, etc.
  - Other data or design standards?

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Manuals Currently Under Review

- Pennsylvania
- North Carolina
- Western Washington
- Washington DOT
- New Jersey
- Florida
- Georgia
- New York
- South Carolina
- Maryland
- Minnesota
- West Virginia
- Tennessee
- Hawaii

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Stormwater & ESC Manual Highlights

Western Washington

- ***Integrated E&S and SWM*** Interactive PDF with links to toolbars, Source Control BMPs, & SWPP Guidance
- ***"Functionally Equivalent" BMPs*** – Equivalent technologies to BMPs in the manual, chemical treatment applications for stabilization.
- Extensive resources for ***concrete handling*** and material delivery
- Enhanced treatment for sensitive watersheds, ***lots of interesting BMPs and topics, trading framework***
- ***Diverse source control and behavioral BMPs***, custom continuous simulation platform

New Jersey

- Extensive design and calculation guidance
- Extensive ***landscaping guidance*** including native plant propagation dedicated chapter on groundwater recharge and spreadsheet tool
- Detailed design guidance, easy to understand requirement and standards tables for each BMP, use of icons, detailed BMP specific guidance, nice graphics
- Chapters on ***blue roofs*** and subsurface gravel, ***groundwater mounding*** guidance

North Carolina

- ***Flexible compliance options***, exemptions for low density, extensive guidance on topics like swale design, cistern, porous pavement, level spreaders, good explanatory photos and supporting graphics.
- ***Proprietary Products*** incorporated by name into the manual with detailed guidance – StormFilter, SilvaCell, Filterra, Bay Filter

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Stormwater & ESC Manual Highlights (contd.)

South Carolina

- Manual is ***entirely online*** and ***integrated with erosion and sediment control***.
- BMPs are clearly organized into categories, consistently formatted, provide ***typical plan symbols***.
- CAD Details

New York

- Innovative ***outfall design based on geomorphic assessment***, waiver for large flow control for larger rivers based on hydrologic analysis
- Live crib walls, fascines, staking
- ***Cost Analysis*** of Erosion and Sediment Control Practices
- ***Winter Stabilization*** specification

Minnesota

- Interesting wiki style publishing, extensive technical resources and compilation of up-to-date research, MIDS system that provides ***flexible compliance options***, emphasis on treatment trains, comprehensive BMP level guidance
- ***Construction General Permit Applicability***
- ***Average Bid Prices*** – web-based manual keeps this current

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Stormwater & ESC Manual Highlights (contd.)

Pennsylvania

- BMPs for special protection watersheds (skimmers), ***Expansion of traditional BMPs***, Timber Harvesting, Sinkhole Repair, ABACT – ***Antidegradation Best Available Combination of Technologies***, Standard ***Worksheets***, Extensive resources for design calculations

Washington State DOT

- ***Operational practices*** that minimize erosion risk – ***Certified Erosion and Sediment Control Lead*** onsite, scheduling.

Maryland

- Gabion BMPs, ***temporary condition*** volume guidelines applicable to ponds to be converted

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Stormwater & ESC Manual Highlights (contd.)

Georgia

- Great graphical layout, with call-out boxes highlighting ***key plan elements*** to be shown on the erosion and sediment control plan.
- ***Karst Geology*** – maps of areas, implementation considerations, etc.
- ***Stormwater O&M***

Florida

- ***BMP Trains nutrient removal tool*** assess average annual removal effectiveness of nutrients and compliance. It allows for ***flexibility of materials and treatment trains***. Tested, proprietary media has been incorporated into the tool.

Hawaii

- **In-depth Treatment Control Design**
- Typical pollutants associated with common projects
- Expected ***pollutant removal efficiency*** for BMPs (High, Med, Low)

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Innovative BMPs

Post Construction BMPs

- ***Floating wetlands*** (NC)
- ***Blue roofs*** (NJ)
- Subsurface gravel wetlands (NJ)
- Adjustable outlets for constructed wetlands (NC)
- Using parking lots for detention (NC)
- Media filter drains (WA)
- Wet vaults (WA)
- ***Linear sand filters*** (WA)
- Underground injection wells (WA/NY/FL)
- High Gradient Step Pool Swales (MN)
- ***Iron Enhanced Sand Filter*** (MN)
- Stormwater Wetlands (SC)
- Enhanced Grass Swales (SC)

Erosion and Sediment Control BMPs

- ***Operational BMPs*** - scheduling & logistics (WA/SC)
- Dealing with high pH water (WA)
- Chemical treatment methods (Multi)
- Vegetation filtration using spray fields (WA)
- Grade Stabilization / Drop Spillways (GA)
- Skimmers (PA, FL)
- Most manuals group practices (Stabilization, conveyance, filtering, etc)
- ***Concrete Handling*** (various)
- Dewatering Practices - rim ditching, Horizontal Wells, Well Point System (FL)
- ***Coastal Dune Stabilization*** (GA)
- Conversion Guidance (MD)

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Innovative Trading and Compliance Approaches

Regional basin program that allows transfers within large areas draining to a regional basin (WA)

Transfer program that shifts stormwater management from low to high priority watersheds (WA)

Flexible compliance options that sets performance goal for an unrestricted site and then defines levels of alternative options that the designer must proceed through one by one (MN – MIDS)

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Innovative Guidance Topics & Features

- Source control BMPs for topics such as spills, pet waste, material storage, irrigation (WA)
- ***Flexibility in compliance*** – some manuals offer multiple compliance options with tradeoffs, simple methods that are more conservative for example (FL, WA, NC, NY)
- Flow control exemptions for larger rivers based on downstream hydrologic analysis (NY)
- Guidance/exemptions for low density developments (NC)
- Different flow rate standards for on and offline BMPs (NC)
- ***Downstream geomorphic assessments to ensure stability at outfall locations (NY)***
- ***Site or activity specific guidance (WA, PA, NC, MN)***
  - Solar farms, airports, rail yards, manufacturing, drilling operations, deicing, etc.
- Enhanced requirements
  - Separate design standards for enhanced phosphorus removal (MN)
  - Enhanced treatment requirement for sensitive watersheds (WA, PA)
- ***Detailed guidance for retrofits (NC)***
- Guidance/procedure for evaluating groundwater mounding (NJ)
- Guidelines for BMPs arranged in series (MN)
- Post construction soil restoration/decompaction (WA, MN)

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Manufactured Treatment Devices (MTDs)

- Background on MTDs in VA
- MTD testing and verification across the U.S.
- ASTM Committee Activities
- STEPP Initiative

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Why Consider MTDs?

- Pollution treatment in size-restricted settings
- Pre-treatment and other treatment services in the context of treatment train/stormwater system treatment configurations
- Retention services to enable stormwater capture and use for resiliency planning and to meet on-site retention standards (example: rainwater harvesting system)
- Retrofitting of existing stormwater infrastructure for enhanced performance efficiency (example: real-time controls for stormwater pond)
- Treatment where critical structural support is needed, such as H20 and larger dead loads
- Targeted treatment to meet TMDL requirements and other regulatory obligations

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MTDs in Virginia

Categories

- VA BMP Clearinghouse
  - Hydrodynamic Structure
  - Filtering Structure
  - Manufactured Bioretention System
- Additional Categories
  - *Gross Solids/Trash Capture*
  - *Rooftop and Wall Systems*
  - *Process Enhancements*
    - *Example: Real-time Controls (RTCs)*

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Pre-Meeting Feedback: BMP Additions & Revisions

Proprietary BMPs

- ACF Environmental Pretx
- ACF Environmental Rain Guardian
- ACF Environmental Trash Guard Plus
- Aqua-Swirl SW Treatment System
- Aqua-Swirl Xcelerator Treatment System
- Aqua-Filter Stormwater Filtration System
- Aqua-Ponic Stormwater Biofiltration System
- Barracuda Max Hydrodynamic Separator
- BayFilter using Enhanced Media Cartridges
- BioPod Biofilter
- Cascade Separator
- Continuous Deflective Separator Stormwater Treatment Device
- Dandy Curb, Bag, Curb Bag, Sack, & Curb Sack
- Dandy Dewatering Bag/Dirt Bag
- Debris Separating Baffle Box Hydrodynamic Separator
- Downstream Defender
- Dual Vortex Separator Stormwater Treatment Device
- EcoPure BioFilter Filtration System
- Erosion Eel
- Fiber Filter Tubes (e.g., Terra Tube – Fiber Filtration Tube)
- Filtrexx Compost Filter Sock
- Filtrexx Compost Blankets
- Filterra Bioretention Systems
- Filterra Bioscape
- First Defense Optimum Vortex Separator
- FloGard Perk Filter (using ZPC Filter Media)
- FocalPoint High Performance Modular Biofiltration System
- Grate Pyramid
- Gutter Buddy & Gutter Gator
- HydroChain Vortex Filter
- HydroDome Stormwater Separator
- HydroFilter
- HydroStorm Hydrodynamic Separator

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VA MTD Application Process

Submit application

- Identify treatment type:
  - Hydrodynamic Structure
  - Filtering Structure
  - Manufactured Bioretention System (provide infiltration rate)
- Certification
  - TAPE
  - NJDEP
  - Other
- Proprietary BMP History
- Maintenance (generic inspection and maintenance plan/procedure)

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Brief MTD Evaluation History in Virginia

2008- Revised SWM regulations passed

2009- New regulations suspended

2011- Final revised stormwater regulations were approved

2014- Implemented on July 1

- Resulted in RR Method and Parts II.B and II.C

<u>July 1, 2014- December 29, 2021</u>

Specific to MTDs:

Guidance Memo No. 14-2009

- Procedures for approval of MTDs under II.B
- "Interim" guidance period
- DEQ intended to develop evaluation procedures

Out with the Old

Guidance Memo GM14-2009

Table 1 - Summary of Testing Procedures with Associated % TP Removal Efficiencies

Testing Protocol Followed	Chemical Parameter	Certification	% TSS Removal[1]	%TP Removal[1]
TARP*	TSS	Required	< 50% ≥ 50% ≥ 80%	Up to 10% Up to 20% Up to 40%
Other (TARP*, TAPE**, USGS, etc.)	TP	If Available	N/A	Up to 50%

Established clear intent for the following:

1) Field monitoring
2) Total Phosphorus (TP) as the monitored pollutant of concern
3) Robust test protocols

Demonstrated Need for Stronger Guidance

- Not long after GM14-2009 implementation, approval variability appears:
  - Reciprocity rule change in 2014 GA Session (§62.1-44.15:28.A.9)
  - Monitoring results other than TAPE/TARP were accepted
  - Approval of HDS system for greater than 20% TP

Also: No specified way for converting treatment volume to a treatment flow rate

Pathway to Greater Robustness

Late 2017- Sizing Guidance (DEQ's preferred method) posted to BMP Clearinghouse

April 2019- DEQ proposed new process

- Two approval pathways
  - VA Specific Protocol (To be developed) and Reciprocity (TAPE GULD and NJDEP)
- Stakeholder feedback caused a pivot

August 2019- Consensus reached on new guidance pathway

- Reciprocity to be defined as NJDEP/TAPE
- TBD implementation schedule

Spring 2020- HB882 passed in General Assembly

- Codified use for "verified and certified" MTDs

December 2020

- Proposed new guidance consistent with HB882

December 2021

- New DEQ guidance became effective on 12/29/21

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House Bill 882- Passed in 2020

Key change: "Provide for the use of a proprietary best management practice ***only if another state, regional, or national certification program has verified and certified its nutrient or sediment removal effectiveness***"

Created a sunset provision in two parts:

MTDs listed on Clearinghouse ***prior to July 1, 2020***, ***shall by December 31, 2021,*** provide documentation to DEQ showing that another state, regional, or national certification program has verified and certified its nutrient or sediment removal effectiveness.

MTDs that fail to provide DEQ with the documentation required by the ***second enactment of this act*** shall ***not be approved for use*** in any stormwater management plan ***submitted on or after January 1, 2022***, until such proprietary BMP provides the Department with such required documentation.

Change Ushered in by HB882

New Guidance needed to:

- Implement program reset
- Redefine non-proprietary and proprietary BMPs
- Clarify acceptable certification programs
  - NJDEP/TAPE identified; Alternate programs on case-by-case basis
- Review MTDs listed prior to 7/1/20 MTDs for certification standard
  - Required submittal of verification and certification info before 12/31/21
- Acceptance policy for BMPs seeking listing on/after 7/1/2020

GM21-2006- Effective date 12/29/21

Table 1 – Removal efficiencies[1] assigned by DEQ based on other certifications.

Certification	DEQ Assigned TP Removal
TAPE TP Removal: ≥50%	50–65%
TAPE TSS Removal: ≥80%	40%
NJDEP TSS Removal: 80%	40%
NJDEP TSS Removal: 50%	20%

[1] Defined as the change in the average event mean concentration (EMC).
"TAPE" means Washington State's Technology Assessment Protocol – Ecology program.
"NJDEP" means New Jersey Department of Environmental Protection.
"TP" means total phosphorus; "TSS" means total suspended solids.

- With TAPE GULD for TP, up to 65% TP removal credit may be given
- Preserves a case-by-case process for additional state, regional, or national certification programs
- Prior approved MTDs (pre-7/1/20) not meeting certification standard not allowed on plans submitted on/after 1/1/22
- MTD sizing tied to certification program; hydraulic loading rates published

2022 General Assembly Activity

HB1224:

1.A.9. Provide for the *certification* *and* use of a proprietary best management practice only if another state, regional, or national ~~certification~~ program has verified ~~and certified~~ its nutrient or sediment removal effectiveness *and all of such program's established test protocol requirements were met or exceeded.* *As used in this subdivision and any regulations or guidance adopted pursuant to this subdivision, "certification" means a determination by the Department that a proprietary best management practice is approved for use in accordance with this article*;

MTD Testing Across the U.S.

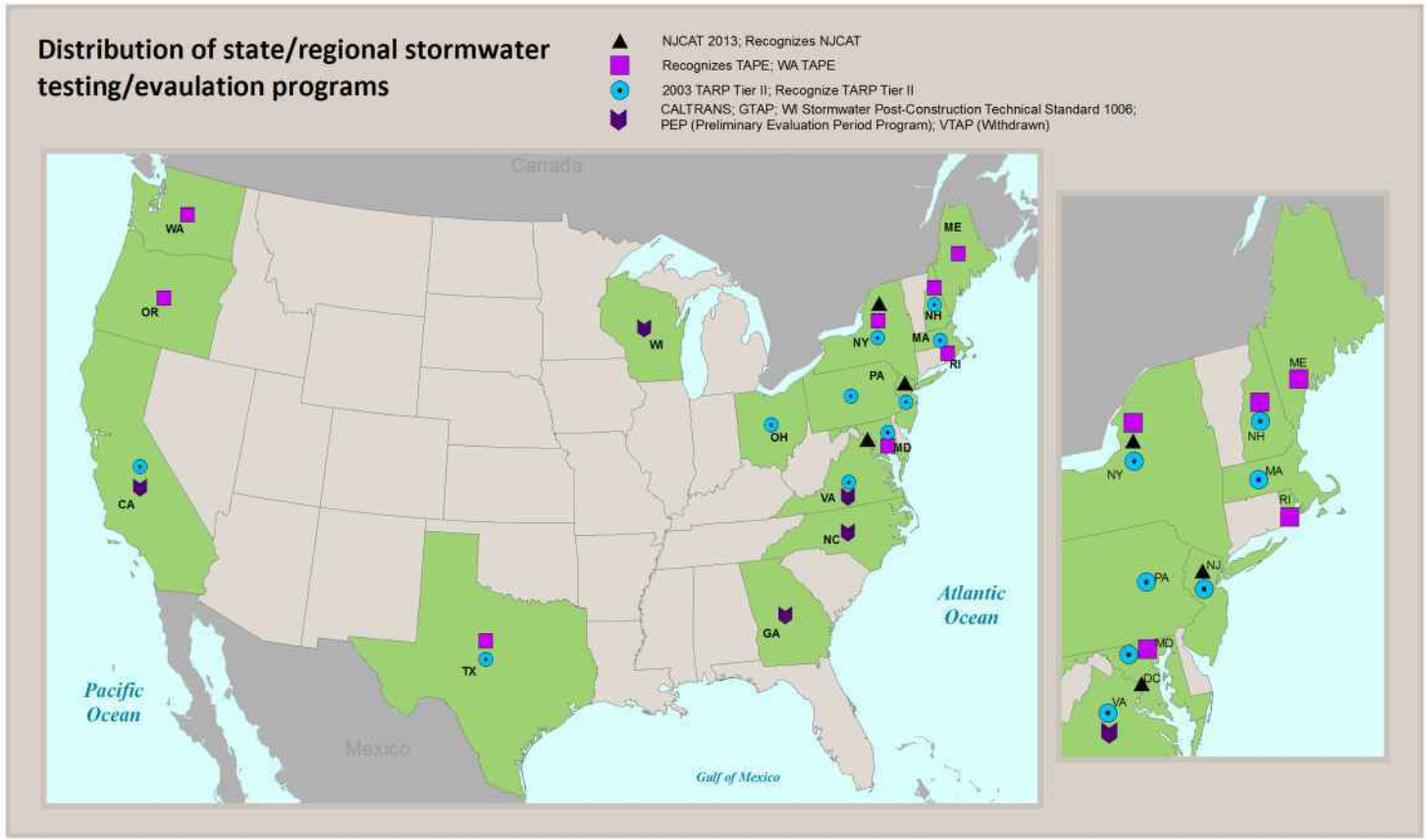
Testing requirements and programs vary by jurisdiction and have changed over time

Commonly recognized testing program include:

- TARP
- EPA ETV
- **TAPE**
- **NJCAT**

Other programs include:

- GTAP
- Caltrans
- WI Standard
- VTAP (now defunct)



MTD Testing Across the U.S.

MTD testing is common/norm and valued

- MTDs are tested and evaluated in a significant number of states and communities (likely between 40-60%)
- In recent surveys, over 80% of states and communities have expressed support for MTD testing and evaluation programs
- EPA has expressed support for testing/evaluation

MTD testing/evaluation can come in various forms

- Lab-based testing
- Field-based testing
- Academic research/studies
- Field monitoring
- Use of testing protocols or standards (or not)

DEQ

Goal of STEPP

- Develop a national testing/evaluation and verification program for stormwater products **and** practices
  - Increase overall performance
  - Create level/higher playing field
  - Provide greater confidence in performance of stormwater systems
  - Improve water quality

DEQ

Principles of STEPP

- Reduce cost and time to get to market
- Built upon Washington TAPE and NJCAT
- Focus on **verification**
- Recruitment
  - Need to get states and others on board
- Equity
  - Public domain **AND** MTDs
- Café Plan Approach
  - Lab and Field options
- Continual Improvement
  - Program will evolve over time
  - Incorporate new scientific techniques & evaluation tools

DEQ

Verification vs. Certification

Verification

Test performance of products/practices in a standard way

Certification

Performance of verified products/practices meets regulatory performance standards

DEQ

ASTM Activities

ASTM E64 Subcommittees

- E64.01 – Lab Evaluation
- E64.02 – Field Evaluation
- E64.03 – Component Evaluation
- E64.04 – Nonpoint Control Measures
- E64.90 – Executive

DEQ

ASTM Activities

- ASTM E64 Committee on Stormwater Control Measures
  - https://www.astm.org/COMMITTEE/E64.htm
- NJCAT protocols being standardized
- WA TAPE protocol field test methods standards initiated
- Trash capture standard finalized

DEQ

ASTM E64 Activities

Lab Testing Standards

- Sediment/Hydrodynamic Systems (HDS)
  - WK68662 – Standard Test Method for Measurement of Hydraulic Characteristics of Hydrodynamic Stormwater Separators and Underground Settling Devices
  - WK68663 – Standard Test Method for Measurement of Suspended Sediment Removal Efficiency of Hydrodynamic Stormwater Separators and Underground Settling Devices
  - WK67310 – Scour of Hydrodynamic Separators and Settling Devices
  - WK52521 - Laboratory Performance Verification of Hydrodynamic Separators for the Treatment of Stormwater
  - WK30222 – Silica Test Sediments for the Evaluation of Stormwater Treatment Devices
- Filters
  - WK657861 – Hydraulics of Filtration Units
- Gross Solids
  - **WK71295 – Determining the Trash Removal Performance of Stormwater Treatment Devices**

DEQ

ASTM Activities

General Standards

- ASTM E3318-22 - Standard Terminology for Standards Relating to Stormwater Control Measures (ansi.org)

Field Testing Standards

- WK80881 – Standard Practice for Field Pollutant Removal Assessment of Stormwater Control Measures using Automated Samplers

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Manual Features and Formatting

- Most manuals are available as ***PDF downloads***, that appear to be developed in readily accessible graphical software packages.
- **Helpful features**
  - ***"Yes/no" comparison photographs to demonstrate proper maintenance, design, and construction***
  - Use of icons to identify habitat values for different plants
  - Hyperlinking internally and to external sites
  - Use of color coding, bolding, etc. to cue repeated topics – example "What do the Rules Say?"
  - Use of text and ***break out boxes***
  - Colored plan view and section schematics
  - How to ***step-by-step processes for design and calculations***
  - Detailed annotated photographs showing interim installation steps, etc.
  - Design Calculation worksheets and nomographs
  - Color photographs showing proper installation

Wiki Format

DEQ

Typical Stormwater Chapters

Impacts of Urbanization – water quality, flow control etc., can sometimes blend into sizing and administrative requirements, often includes referencing back to regulations

Plan Preparation – how to develop a stormwater plan, the review process, administrative requirements – sometimes blended with requirements section

Site Planning – how to plan a development project to minimize impacts, typically includes non-structural BMPs – reducing impervious etc., use of "LID"

Sizing – sizing of individual BMPs, can sometimes be incorporated into standards for individual BMPs. Can sometimes include calculation guidance.

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Typical Stormwater Chapters (contd.)

Calculations – either a stand-alone chapter or integrated into sizing, BMP standards, or design examples

BMP Selection – typically include tables relating BMPs to requirements or feasibility criteria, sometimes incorporated into design standards.

Standards for Common Components – geotextile, inlets, outlets, piping, etc. Sometimes includes calculations on pipe sizing, orifices etc.

Standards for Individual BMPs – typically organized by type or function, often includes schematics, design formulae, pro/cons/feasibility criteria, specifications for materials, planting guidance. Sometimes including construction, maintenance, modeling guidance, calculations, design examples

DEQ

Typical Stormwater Chapters (contd.)

Infiltration Testing/Soils – sometimes include as a stand alone or appendix, sometimes incorporated into Individual BMP sections for infiltrating BMP

Design Examples – can be a stand-alone chapter or integrated into BMP specifics or as an appendix, sometimes incorporates calculation guidance

Maintenance – sometimes included as a stand alone or integrated into individual BMP sections (or both)

Construction – sometimes included as a stand alone or integrated into individual BMP sections

Landscaping/Vegetation - sometimes included as a stand alone or integrated into individual BMP sections or as an appendix

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Typical ESC Chapters

Earth Disturbance Impacts – most manuals include some background information on erosion and sediment control.

Regulatory Authority – most manuals will define the statutory regulations and requirements

Plan Content – required items for the erosion and sediment control plan. Many include narrative descriptions as well as checklists.

Construction BMPs – Most manuals group by type: stabilization, erosion control, filters, traps/basins, etc.

Calculations / Worksheets – Typically in narrative and / or worksheet form

Standards – Checklists, Details, Worksheets, Plan Notes, etc.

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Calculations

Ease of Use

Most state ESC Manuals provide ***worksheet guidance*** for required calculations.

Stormwater Modeling

Most states still allow the use of ***NRCS*** based methods, although ***continuous-simulation*** based methods are being incorporated as suggested alternatives

- ***Washington has a custom modeling platform set up for continuous simulation***

Interesting/New topics

- Sizing based on flow *duration* rather than peak flow or volume (WA)
- Use of ***"built upon area" that combines impervious and compacted adjacent pervious*** (NC)
- Continuous simulation-based methods and custom modeling tools (WA, NY)

Useful Resources

Detailed guidance on specific technical issues time of concentration, directly vs. non-directly connected impervious, ***how to define the pre-development condition***

- State/region specific precipitation data, design storms, curve numbers.
- ***Companion modeling and spreadsheet tools***
- ***Typical on-lot ESC BMP installation details***

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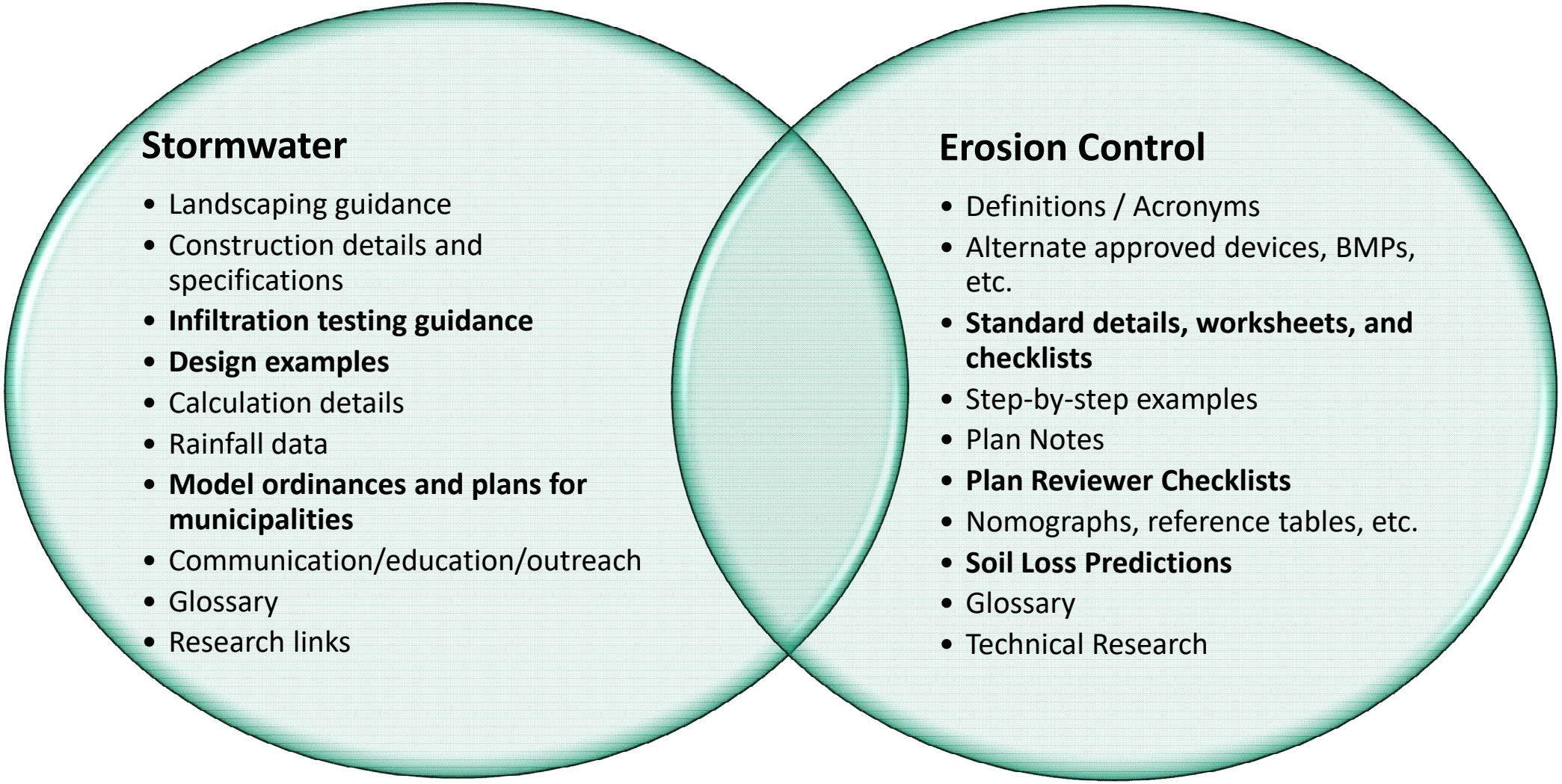
Typical Appendices



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Background Assessments Brainstorm

SAG Feedback, Discussion, and Questionnaire

- Local/Regional Stormwater Manuals
- Chesapeake Bay Preservation Act Local Requirements / Manuals
- Specifications to Reviewed in Background Assessment
- Handbook Approach to VSMP vs Non-VSMP Authorities

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Brainstorm: Handbook Suggestions

SAG members groups based on preliminary sub-committees

- Issues and content to cover in your sub-committee
- What do you like and dislike based on your experience using Virginia's local and regional handbooks & manuals?
- In your experience, what are the most important changes to VA's stormwater program over the last 30 years? (i.e., What is not covered in prior handbooks that is critical to cover through this effort?)
- Please complete questionnaire (handout)
- **Report Out**

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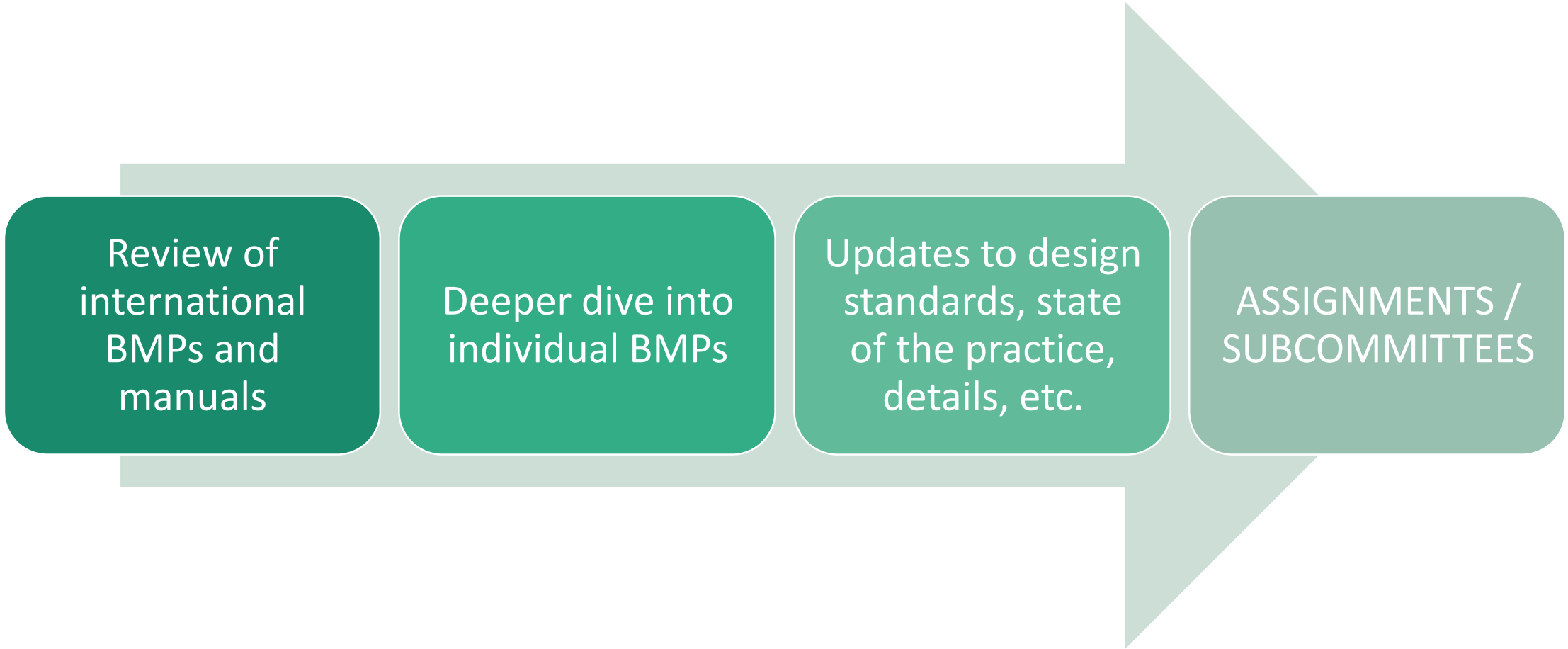
Next Steps



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2023 Virginia Stormwater Handbook

Stakeholder Advisory Group

Meeting #3 (September 23, 2022)

The meeting is adjourned.

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