Frequently Asked Questions

Regulatory Requirements

1. **Pertaining to grandfathering, does the deadline date submittal include any land development application such as an Exploratory Sketch Plan in New Castle County, or is it strictly for a project-specific Sediment and Stormwater plan?**

   The Interim Guidance Policy provides an explanation of the trigger for each delegated agency for when a project may be considered grandfathered.

2. **How will sites which are developed and have functioning and previously approved stormwater management facilities be handled if those sites are redeveloped?**

   A site that was developed under the previous regulations will need to meet the redevelopment criteria for the RPv to achieve a 30% reduction in the effective imperviousness of the site. If the site reduces imperviousness due to redevelopment, that impervious reduction will be factored into the 30% reduction in effective impervious. If 30% reduction in effective impervious is not met by removing impervious, other runoff reduction BMPs would need to be employed to meet that requirement.

   DURMMv2 can factor impervious removal into the analysis. As a trial, input an existing impervious area on the LOD sheet and then input a post-developed condition with a 30% reduction in imperviousness. (Note that changes in impervious areas must be consistent within the same Hydrolgic Soil Group.) The LOD sheet will show that the site meets the RPv without any additional BMPs (notwithstanding some rounding errors). A combination of impervious area reduction and BMPs can be used to meet the necessary runoff reduction. However, if there is a net increase in impervious area, the additional impervious must be managed the same as new development.

3. **When is the Operation and Maintenance Plan submitted?**

   The Operation and Maintenance Plan for each post construction stormwater management BMP will be drafted from the BMP plan sheet(s) that is prepared with the Sediment and Stormwater Management Plan prior to construction. The BMP plan sheet will be amended with the post construction verification document information as well as the remaining items of the Operation and Maintenance Plan Review Checklist located in Article 5.01.2 of the Technical Document. The final Operation and Maintenance Plan must be submitted prior to issuance of a Notice of Completion for a project (*Delaware Sediment and Stormwater Regulations* 6.5.6.3).

4. **Are the total volume control requirements of the Mill Creek, Little Mill Creek, Red Clay Creek, White Clay Creek, Persimmon Creek and Shellpot Creek areas in NCC still in effect?**

   The volume control requirements for the watersheds listed were written into the Sediment and Stormwater Law under an amendment sponsored by Sen. Karen Peterson. The runoff reduction requirements and "no adverse impact" criteria under the revisions to the Delaware Sediment & Stormwater Regulations (DSSR) fulfill the volume control requirements in those specific watersheds, as well as all the others throughout the State.

5. **Are TMDL requirements still going to be enforced in watersheds where there are already requirements in place and enforced?**

   The Department views TMDL goals on a watershed-wide basis, taking all sectors (ie. agriculture, wastewater, stormwater, etc.) into account. It is hoped that the new runoff reduction requirements will meet the goals established for new development. These runoff reduction goals will initially replace any specific nutrient or pollutant reduction criteria for all watersheds in the State, including the Inland Bays and Chesapeake Bay. If the Department determines the runoff reduction approach is not meeting TMDL goals for the new development sector, the Department will take an adaptive management approach and assess the need for imposing such criteria. If that becomes necessary, a formal regulation revision process would be required, however.

Technical Document

Plan Review Process

1. **What is the difference between the items on page 3 and the items on page 5 of the Stormwater Assessment Study Checklist?**

   Since the Stormwater Assessment Study (SAS) GIS web application has been developed, the current SAS checklist is very redundant and needs to be revised. When it was developed originally, the info on page 3 was meant to be a collection of information available from various sources with regard to the project. The items on page 5 were meant to be layers pulled into a single GIS map project for the site. Ultimately, the goal is to have enough

information from the SAS submittal to be able to facilitate a discussion at the project application meeting and to complete the Stormwater Assessment Report.

2. **How can I get the actual GIS data that is used in the Stormwater Assessment Study GIS Web App?**

   The GIS community within the State of Delaware feels this data should be released through a single clearing house to ensure data integrity. The Delaware GeoSpatial Data Exchange (https://dataexchange.gis.delaware.gov/) currently serves that purpose and adding new layers requires a formal vetting process. Users that open a free account are able to download at least some of the layers used in the Stormwater Assessment Study GIS web app.

   The soils data for all three Delaware counties can be downloaded directly through the Web Soil Survey (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) by clicking on the "Download Soils Data" tab. The spatial data only has the shapefile for the soil type boundaries. Additional attributes need to be added manually.

3. **Can StreamStats be used for the upstream/downstream hydrologic analysis?**

   The StreamStats application only reports a peak discharge, thus if a hydrograph is needed (such as for the Level 1 analysis) the applicant will need to develop that hydrograph outside of the StreamStats application. However, the hydrograph should be calibrated to the regression curve discharges for the appropriate storm event. This typically requires a different RCN to be used for different storm events.

   In theory, the peak discharges derived from the regression curves in the Delaware StreamStats application could be used for the Level 2 analysis to determine the steady flow water surface elevations. However, watershed delineation methods and calculation of reach attenuation could lead to invalid results. The preferred approach is to develop a hydrograph based on the watershed delineated at the upstream site boundary and calibrate it to the regression curve discharge for the appropriate storm event. This hydrograph can then be reach routed through the site to determine the final peak discharge at the site outlet to be used for the HEC-RAS steady flow analysis.

4. **What are the best sources of topographic data for deriving cross-sections to be used for hydraulic modeling?**

   The order of preference for topographic data is as follows:

   a. Field-run survey data; modeling of hydraulic structures such as pipes, culverts and/or bridges typically requires at least some field survey data to be collected

b. Surface model derived from the base LiDAR data that can be downloaded from the NOAA Digital Coast web site (http://www.csc.noaa.gov/digitalcoast/data/coastallidar)

c. Surface model derived from the Delaware 2' Contour data that can be downloaded from the Delaware Geospatial Data Exchange web site (https://dataexchange.gis.delaware.gov/dataexchange/download.aspx)

d. Cross sections derived from Delaware StreamStats web site (http://water.usgs.gov/osw/streamstats/delaware.html) (NOTE: Although this is the quickest method to derive cross-sectional data, the base Digital Elevation Model used for the Delaware StreamStats application only has a 10M resolution. Therefore any cross-sections derived from this surface model should only be used for a coarse, "first-cut" analysis. Final analysis used for compliance purposes should be based on one of the data sources listed above.)

5. **Why do I need to do a HEC analysis? Why can I not just model everything using TR-20? There is a lot of detailed information that would need to be obtained for the HEC analysis, including accurate detailed topography at culverts and bridges including upstream and downstream cross sections at the culverts etc. which could make the analysis quite expensive. With TR-20 analysis, we could more easily make assumptions at the bridges and culverts.**

   You do not need to use HEC-HMS. However, if a dispute arises and DNREC is asked to resolve it we will be using the results from an analysis using HEC software on which to base our decisions. There are a number of advantages to using the HEC software. The HEC package that includes HEC-HMS and HEC-RAS can do any analysis DNREC would need as well as or better than proprietary software packages. The HEC package is supported by the USACE and is available for free download from the HEC web site. There are also plugins available to the ESRI GIS platform that automates both hydrologic and hydraulic analyses. HEC-HMS and HEC-RAS are endorsed by FEMA for performing floodplain analysis.

   Detailed survey data is not needed for a simple hydrologic analysis in HEC-HMS. The detailed information is needed for a hydraulic analysis to determine water surface elevations in HEC-RAS. TR-20 does not have this capability either. However, the other advantage of using HEC-HMS is that the hydrographs can be easily imported into HEC-RAS if needed.

6. **Is GIS Hydro acceptable for developing CN and Tc values for a watershed to input into a hydraulic modeling program?**

   GIS Hydro uses a 30M base DEM for watershed delineations. Since the StreamStats app uses a 10M base DEM, it is considered to be the best available data to be used for

watershed delineations. However, GIS Hydro provides fairly accurate estimates for RCN and Tc, and since StreamStats does not estimate either the RCN or the Tc, GIS Hydro could be used to develop these parameters to derive a hydrograph. However, these parameters should be adjusted as necessary to calibrate the hydrograph to the regression curve discharges from the StreamStats app, not the GISHydro discharges.

To summarize:

1. Use StreamStats to delineate the watershed and determine the peak discharges for the 10-yr and 100-yr storm events.
2. Estimate the watershed RCN and Tc and adjust as necessary within reasonable limits to calibrate to the peak discharges determined in the first step.

7. Can a larger site, especially one that is distinctly separated into different sections, be separated into two different compliance study areas?

With approval of the reviewing agency, a large site, particularly one that is distinctly separated into different sections (such as watershed boundaries), may be broken down into different compliance study areas.

8. When is the fee-in-lieu collected?

Technical Document Article 2.04 Offset Provisions includes the following description of the fee-in-lieu offset procedure: *The fee-in-lieu amount, less any adjustments for TN reduction, for the phase of the project beginning construction must be submitted to the Department prior to commencement of construction of each phase. Upon submittal of the fee-in-lieu amount for a particular project phase, the project owner's obligation for compliance with the RPv requirements for that phase will be met. The owner remains responsible for compliance with Conveyance Event (Cv) and Flooding Event (Fv) requirements, which are not eligible for compliance through an offset.*

9. For a bioswale, where is the Q or design storm peak flow rate that should be entered into the DURMM sheets?

For bioswales, the goal is to achieve 9 minutes of residence time and maintain the maximum flow depth stated in the specification for the peak discharge generated by the RPv. Once all the upstream BMPs have been accounted for, use the "Initial RCN" from Step 1.3 on the RPv sheet as the input RCN. Since DURMM v2 is mainly a volume-based tool, do a separate Tc computation to calculate your peak discharge. Note that selecting "Bioswale" on the RPv sheet will then calculate the runoff reduction credit and adjust the RCN accordingly at Step 3.6, but this is the output RCN that can be used for additional BMPs downstream or for

hydrologic routing purposes. The bioswale itself should be designed for the input RCN from Step 1.3.

10. For an infiltration trench, what does the Sv (retention volume treated by the practice) correlate to in the DURMM sheets?

For infiltration trench and all storage practices, Sv correlates to the "Storage volume" input at Step 2.1 on the RPv sheet. For a stone storage reservoir such as an infiltration trench, if a trial storage volume is entered at Step 2.1, the shortfall or excess storage will be reported at Step 5.3. Add or subtract the shortfall or excess from the original trial storage volume and adjust for the 40% void ratio to refine the storage design.

Post Construction Stormwater BMP Standards and Specifications

11. Which BMPs use the compost filtering media and which BMPs use the compost planting media?

In the 2013 Delaware Erosion & Sediment Control Handbook, the following practices all use the compost log filtering media which adheres to the particle size, compost specification in Appendix A-6: check dam, silt fence, culvert inlet protection, slope treatment, compost log sediment trap.

In the 2013 Delaware Erosion & Sediment Control Handbook, the following practices all use the compost log planting media which adheres to the particle size, amendment specification in Appendix A-6: compost blanket, topsoil amendment, bank stabilization practices.

12. Can you provide guidance for determination of whether an infiltration practice is considered a "deep well injection"?

The injection well requirements are under the purview of the DNREC Ground Water Discharges Section. It is our understanding that a facility that is exposed at the surface does not fall under the definition of a Class V Injection Well as long as at least one of the surface dimensions is greater than the depth. Currently, DNREC is only being asked to inventory these systems and these systems do not need a permit.

13. For an underdrain system with no outfall, is the entire storage area counted?

For an infiltrating facility that has no surface discharge, the entire capacity of the void space in the aggregate can be counted. If there is an underdrain that conveys flow off-line to a supplemental infiltration area, the storage in the aggregate above the invert can be counted, as well as the storage available in the underdrain itself.

14. For grass channels: If the design flow is less than 4" can the grass height requirement be lessened to match? (ie, homeowners won't maintain a 4" grass height in swales "on their property", so if the design depth is set at 2" can the grass height requirement be 2"?)

Per the standard specification, the grass height must be prescribed to be a minimum of 4" in height to qualify under our standard vegetated channel design. The Department is evaluating alternative runoff reduction credits for grass channels that are not maintained at the recommended 4" height. One concern that the engineer should be aware of, is that diminishing return on investment that is achieved when the flow depth in a channel is reduced that much especially regarding that the 2" proposed maximum conveyance depth must still manage the entire 2.7" rainfall. Though, this may very well be helpful in a channel that receives very little runoff.

15. Are as-builts required for filter strips?

Filter Strips have been included in the post construction verification document submittal checklist. In addition to collecting information on the filter strip itself, the checklist requires information to be collected regarding the filter strip's drainage area.