

TMDL Implementation Plan Requirements

In addition to the requirements listed in Paragraph C(4)(a)(xix) of the Consent Agreement, each TMDL IP must include the following information:

1. For Impaired Water Body Segments with approved TMDLs, identification of the applicable TMDL(s), the pollutant(s) of concern, the required pollutant load reductions for Warwick, as required by Paragraph C(4)(a)(xix) of the Consent Agreement, and all other recommendations and requirements of the TMDL(s) applicable to Warwick.
2. For non-bacteria pollutants of concern, a combination of structural stormwater controls and enhanced non-structural BMPs that collectively satisfy the pollutant load reduction requirements in such TMDLs as listed in Attachment N of the Consent Agreement. The total required pollutant load reduction (in mass per year) shall be expressed as the required pollutant load reduction percentage multiplied by the pollutant loading rate (as mass per acre per year) multiplied by the area of Warwick's impervious cover in the Impaired Sub-Watershed that discharges directly or indirectly to the Impaired Water Body Segment. Warwick may implement a mixture of types and sizes of controls across catchment areas to the MS4 Discharge Point(s) in an Impaired Sub-Watershed to meet the required pollutant load reduction.
3. For bacteria, a combination of structural stormwater controls and enhanced non-structural BMPs that collectively satisfy the requirements of Attachment O of the Consent Agreement, to the maximum extent practicable, unless the TMDL has specifically determined that such controls are not required. The TMDL IP shall include, but not be limited to the following:
 - a. The total area of the Impaired Sub-Watershed for the Impaired Water Body Segment;
 - b. The total area of all impervious cover in the Impaired Sub-Watershed (the Rhode Island GIS impervious cover layer is an acceptable source for this information), incorporating updated mapping of catchment delineations produced during mapping of the MS4;
 - c. The percentage of the total area in the Impaired Sub-Watershed that is impervious cover. If the overall Impaired Sub-Watershed impervious cover percentage is 10% or below and there are no additional RIDEM-approved TMDL recommendations or requirements for Warwick in the Impaired Sub-Watershed, no further information needs to be submitted with the IP for the purposes of this paragraph;
 - d. The percentage reduction in all impervious cover that is required to reach 10% impervious cover in the entire Impaired Sub-Watershed;
 - e. The total area of impervious cover in the Impaired Sub-Watershed that drains to the MS4 (excluding impervious cover from interconnected MS4s) to the Impaired Water Body Segment;

- f. A map showing the total area of impervious cover in the Impaired Sub-Watershed owned or operated by Warwick that discharges directly or indirectly to the Impaired Water Body Segment;
 - g. The product of Paragraphs 3.d and 3.e of this Attachment, which represents the Equivalent Area of Warwick impervious cover required to be eliminated under Paragraph 1 of Attachment O in the Consent Agreement.
4. An assessment of the pollutant load reductions achieved and an assessment of compliance with the pollutant load reduction requirement or Attachment O of the Consent Agreement. Warwick shall use the procedures specified in Attachment P of the Consent Agreement to calculate the pollutant removal, runoff volume reduction, and peak flow attenuation achieved by structural stormwater controls and enhanced non-structural BMPs, unless the RIDEM approves an alternative methodology. Warwick may include the pollutant removal, runoff volume reduction, and peak flow attenuation achieved by:
 - a. Structural stormwater controls installed by Warwick prior to the effective date of this Agreement provided that Warwick demonstrates that the structural control is performing in accordance with manufacturer design or specifications, including verification of the physical capacity of the structural control;
 - b. Enhanced non-structural BMPs to the extent that such BMPs go beyond the scope of the required 6 minimum control measures specified in the General Permit (for example, for additional sweeping, pollutant load reduction credit for the difference in pollutant removal between sweeping once per year and the actual proposed sweeping schedule); and
 - c. Structural stormwater controls that are recommended or required by the RIDEM-approved TMDLs or by this Agreement that are installed by Warwick after the effective date of the Consent Agreement.
5. For each waterbody segment, Warwick shall select a combination of structural stormwater controls and enhanced non-structural BMPs that collectively achieve the most stringent level of control for pollutant load reduction required by Paragraphs 2 and 3 above to the maximum extent practicable, unless the RIDEM approves an alternative level of control.
6. A map or maps showing the extent of all pervious and impervious areas contributing flow to the MS4 discharge points to the Impaired Water Body Segment. The map(s) must include the MS4, including the locations of Warwick roads and facilities, catch basins, interconnections with other MS4s, and the MS4 discharge points, and flow directions sufficient to identify which areas contribute to each of the MS4 discharge point. The outfall points associated with each catch basin shall be provided. If any the MS4 discharge points discharge to another MS4, the entire path through the other MS4 does not need to be mapped, but the eventual discharge location must be identified. If any non-Warwick areas contribute flow to the MS4, the inflow point must be indicated and the approximate size of the area contributing inflow must be noted, but the entire non-Warwick area does not need to be mapped in detail. The map(s) must show all existing and proposed structural controls in detail sufficient to determine areas contributing flow to each structure. If the IP is submitted electronically, the map(s) may be submitted as a

PDF or other image file, or as a GIS file in a format acceptable to RIDEM. The same map(s) may be used to meet the requirements of this paragraph and paragraph 3.f. in this Attachment.

7. A description of how Warwick has worked, or will work, cooperatively with the operators of all stormwater systems that are interconnected with the MS4 and from which, or into which, stormwater discharges to the Impaired Water Body Segment.

8. A list of all direct or indirect discharges from the MS4 and the Warwick-owned or operated areas to the Impaired Water Body Segment. For each such discharge, the list shall identify the following information:

- a. Discharge location;
- b. Size and material of pipe/outfall;
- c. All existing discharge data (flow data and water quality monitoring data);
- d. If the discharge is a connection to another system, the owner/operator of the receiving system; and
- e. All non-Warwick stormwater systems, which contribute flow to the outfall through interconnections, and an estimate of the acreage of non-Warwick contributing area.

9. A description of all existing and proposed structural stormwater controls and proposed enhanced non-structural BMPs that will be used to meet requirements in paragraphs 1 through 3 of this Attachment and Paragraph C(4)(a)(xix) of the Consent Agreement. The description must include the following information for each control:

- a. Type of control;
- b. For existing structural controls, a photo and documentation that the structural control is performing in accordance with manufacturer design or specifications, including verification of the physical capacity of the structural control;
- c. For proposed structural controls, a preliminary design plan of the structural control;
- d. For all structural controls, the structural dimensions and physical storage capacity of the control to hold runoff volume, and for infiltration controls, the soil type and associated hydrologic soil group present at the control;
- e. For all structural controls, the area contributing drainage to the control;
- a) for all structural and non-structural controls, the area of Warwick's impervious cover treated by the control;
- f. For all structural controls, the treatment depth provided by the control (e.g. for controls treating only impervious cover, the physical storage capacity divided by the area treated; for controls treating both pervious and impervious cover, the calculations according to Attachment P of the Consent Agreement);
- g. For all controls, effective pollutant removal that will be achieved by the control (expressed as a percentage removal);
- i. For all structural controls where the Impervious Cover Standard is applicable,

- i. The Runoff Volume Reduction Factor (for controls that provide infiltration) and the basis for the calculation,
- ii. The Peak Flow Attenuation Factor (for controls that provide peak flow reduction);
- j. For proposed controls, siting and permitting requirements for the control;
- k. For proposed controls, identification of all known obstacles to implementation of the control (and any plans to overcome such obstacles); and
- l. For proposed controls, preliminary engineering requirements for the control.

10. A listing of all areas of impervious cover being treated to meet requirements in paragraphs 1 through 3 of this Attachment and Part C(4)(a)(xix) of the Consent Agreement. The listed areas should be non-overlapping. The listing must include the following information for each area:

- a. Short identification of area;
- b. Total size of area;
- c. Total amount of Warwick's impervious cover, pervious cover and types of pervious cover (in the area);
- d. All controls providing pollutant removal for the area;
- e. Effective pollutant removal by the controls;
- f. Where non-bacteria TMDLs are applicable, total pollutant removal by the controls (in mass per year); and
- g. Where the IC method is applicable:
 - i. All controls providing runoff volume reduction
 - ii. The resulting runoff volume reduction factor
 - iii. The total runoff volume reduction
 - iv. All controls providing peak flow attenuation
 - v. The resulting peak flow attenuation factor
 - vi. The resulting equivalent pervious cover factor
 - vii. The resulting equivalent area credit for the area.

Also include a detailed description of the process and rationale for the selection of the areas being treated and the controls selected for each area.

11. Cost estimates for all proposed structural stormwater controls and enhanced non-structural BMPs, including construction, inspections and maintenance, and on-going operating costs.

12. Evaluation of pollutant removal achieved for the Impaired Sub-Watershed for Impaired Water Body Segments with an RIDEM-approved non-bacteria TMDL. Include the following information for each pollutant of concern:

- a. The required pollutant reduction (according to paragraph 2 of this Attachment expressed as mass per year);
- b. Total pollutant reduction achieved by all existing and proposed structural controls and enhanced non-structural BMPs in the Impaired Sub-Watershed (according to

paragraphs 9 and 10 of this Attachment, as a sum of mass per year over all areas listed according to paragraph 10 of this Attachment); and

c. An assessment of whether the required pollutant load reduction will be met.

13. For Impaired Sub-Watersheds subject to the Impervious Cover Standard, an evaluation of the Equivalent Area credits achieved for the Impaired Sub-Watershed and other information related to benefits achieved, including:

a. The Equivalent Area of the City impervious cover required to be treated, as calculated under paragraph 1 of Attachment O of the Consent Agreement;

b. The total Equivalent Area credits achieved for the Impaired Sub-Watershed by Warwick controls;

c. An assessment of whether the required Equivalent Area credits will be met;

d. The total pollutant (as phosphorus) reduction achieved by Warwick controls across the Impaired Sub-Watershed; and

e. The yearly groundwater recharge volume (calculated as runoff reduction) across all existing and proposed structural controls that provide infiltration.

14. If the total pollutant load reduction and Equivalent Area credits that will be achieved by the proposed and existing structural stormwater controls and proposed enhanced non-structural BMPs do not meet the pollutant load reduction requirements under Paragraph C(4)(a)(xix) of the Consent Agreement and paragraph 2 of this Attachment, and the treatment level requirement of the Impervious Cover Standard under paragraph 3 of this Attachment and Attachment O of the Consent Agreement, then Warwick shall explain why achieving those requirements that are not achieved is not feasible and why the proposed and existing structural controls and proposed enhanced non-structural BMPs will achieve the maximum pollutant reduction and maximum level of treatment to meet the Impervious Cover Standard that are feasible. Where the RIDEM-approved TMDLs specify that groundwater recharge is to be achieved to the maximum extent feasible, Warwick shall also explain why the proposed and existing structural controls will achieve the groundwater recharge to the maximum extent feasible. Warwick's explanations must include a list of all locations considered for structural stormwater controls, including locations on Warwick roadways, associated rights of way, and easements and on public and privately-owned property adjacent to the Warwick property, and a narrative description of the physical, technical, legal, and cost constraints that affect the suitability of those locations and other possible locations in the Impaired Sub-Watershed for structural stormwater controls. Warwick may include in its narrative description a discussion of road closure/access issues, highway design guidelines including safety, issues relating to soils and slopes, issues relating to resource areas (e.g. wetlands, rare species, areas of historic significance), and issues relating to utilities. Warwick shall evaluate non-Warwick property for location of potential structural controls where there is a good opportunity for achieving beneficial treatment of Warwick impervious cover.

15. For Impaired Water Body Segments with RIDEM-approved TMDLs, a description of how the IP addresses all other recommendations or requirements of the

TMDLs specific to Warwick. The IP shall also address any additional requirements for TMDL implementation plans specified in the TMDLs that are not otherwise addressed pursuant to this Attachment. Where the TMDL identifies priority outfalls (or requires the MS4 operator to identify priority outfalls) and requires the MS4 operator to design and construct structural controls to reduce the pollutant of concern and stormwater volumes to the maximum extent feasible, the IP shall include a discussion of the priority outfalls identified, an evaluation of the feasibility of distribution of Warwick infiltration controls (or controls that provide equivalent water quality treatment where infiltration controls are not feasible), throughout the drainage area of the outfalls (including upland areas), and how the Warwick controls selected reduce the pollutant(s) of concern and stormwater volumes discharged by Warwick impervious cover to priority outfalls to the maximum extent feasible.