

Date Submitted to EPA: 12/21/2018  
EPA Approved: TBD  
Date Amended: N/A  
Amendment Notes: N/A

## Narragansett Bay Watershed SCP Melville Ponds (RI0007029L-01) Portsmouth, RI

### Key Findings

This SCP Report is for Melville Ponds (RI0007029L-01) located within the Narragansett Bay Watershed (Figure 1-A).

Table 1-A: Subwatershed Summary

Impairment(s)	Evaluation Methodology	RIDOT Reduction Target % (Acres)	Existing Treatment	Potential Treatment	Runoff Reduction	Remaining RIDOT Reduction Target	NonRIDOT Treatment Credit
Total Phosphorus	IC Method	47% (3.8 ac)	0.0 ac	4.9 ac	15 ac-ft	0.0 ac	52%

### Site Description

#### Subwatershed Description

- The subwatershed is located in Portsmouth, RI.
- The subwatershed is 490 acres and 19% impervious (94 acres).
- The general land uses within the subwatershed are forest, farmland, open space, residential, institutional, and commercial.

#### RIDOT Discharging Area

- RIDOT maintained property is 11.3 total acres and 8.0 impervious acres.
- No "Other RIDOT roadways" exist in this subwatershed.
- The subwatershed area decreased from approximately 586 acres to 490 acres (-16 percent) due to changes identified during desktop review and site visits.
- There are no High Priority outfalls (Appendix 6).
- There is 1 Priority outfall (Paragraph 20.b).
- There are no RIDOT MS4 discharge points for which RIDOT must provide a schedule for initiating IDDE inspections (Appendix 8).
- There are no MS4 outfalls for which RIDOT shall identify upgradient interconnections (Appendix 9).
- There are no TMDL Priority outfalls.
- There is 1 incoming MS4 interconnection and 8 private incoming interconnections.
- There is 1 outgoing interconnection.

### Non-Discharge Areas

- RIDOT did not identify any non-discharge areas.

### Sewered/Combined Sewer Areas

- There are no areas in the subwatershed that are sewer.
- There are no areas that discharge to a combined sewer.

### Reduction Target Development

- RIDOT's IC reduction target is 3.8 acres.
- There are no TMDLs relevant to this subwatershed.
- A TMDL for total phosphorus is planned for 2023<sup>1</sup>.

### Existing Stormwater Controls

- No STUs currently exist within the subwatershed.

### Potential Enhanced Non-Structural Stormwater Controls

- RIDOT did not identify any non-structural controls.

### Potential Structural Stormwater Controls

- RIDOT has identified that structural control measures are needed to reduce its effective IC to achieve the RIDOT IC reduction target.
- RIDOT identified 9 opportunities for potential STUs within the subwatershed (Table 2-A) with a total IC reduction credit of 3.5 acres.
- This SCP includes areas that will be modified as part of a TIP projects (as of November 2018) scheduled for the next 6 years within the subwatershed with an assumed 50% treatment level with a total IC reduction credit of 1.4 acres.

---

<sup>1</sup> RIDEM, March 2018, 2016 Integrated Water Quality Monitoring and Assessment List – Appendix A 2016 Index of Waterbodies and Category Listing. Available at: <http://dem.ri.gov/programs/benviron/water/quality/surfwq/pdfs/iwr16.pdf>

Table 2-A: STU Stormwater Controls Summary

STU ID	Stormwater Control Type	Catchment Area (ac)	Impervious Cover (ac)	Treatment Depth (in) (Depth of Runoff Treated)	Runoff Reduction (ac-ft)	Equivalent IC Reduction Credit (ac)	Estimated Cost	Cost per IC Reduction Acre (\$/ac)	Retrofit Priority
SCP-MVP-004	Bioretention Swale	0.8	0.8	0.2	0.1	0.3	\$28,500	\$114,000	1
SCP-MVP-005	Bioretention Swale	2.0	0.4	0.6	0.2	0.2	\$26,000	\$123,800	1
SCP-MVP-002	Infiltration Basin	2.9	2.5	1.1	8.3	2.5	\$47,800	\$19,400	1
Percent RIDOT Reduction Reached 77%									
SCP-MVP-009	TIP	0.9	0.6	1.0	1.1	0.3	--	--	2
SCP-MVP-007	TIP	0.6	0.4	1.0	0.7	0.2	--	--	2
SCP-MVP-008	TIP	2.2	1.9	1.0	3.4	0.9	--	--	2
Percent RIDOT Reduction Reached 115%									
SCP-MVP-006	Bioretention Basin	0.4	0.2	2.5	0.2	0.2	\$39,500	\$263,300	3
SCP-MVP-001	Infiltration Swale	1.6	0.3	2.7	1.3	0.3	\$51,200	\$189,600	3
SCP-MVP-003	Bioretention Swale	0.3	0.2	1.0	0.1	0.1	\$23,800	\$183,100	3
Percent RIDOT Reduction Reached 129%									
Total		11.3	8.0		15.3	4.9	\$216,800		

## Site Description

### Subwatershed Description

Melville Ponds (RI0007029L-01) is located within the Narragansett Bay subwatershed (Figure 1-A). The subwatershed is located in the central region of the Town of Portsmouth, with Lawton Brook (RI0007035R-04) and Lawtown Valley (RI0007035L-06) to the south. The headwaters begin in Melville Upper Pond (known locally as Thurston Gray Pond), just south of Bradford Avenue. From here water flows north under Bradford Avenue then west through a series of smaller ponds before finally reaching Melville Lower Pond by the coast, east of Alexander Road and south of Cromwell Drive. The Melville Ponds outlet to the northwest via an unnamed tributary to Narragansett Bay. The land use directly surrounding this series of ponds is mostly forest with a small portion of residential. The Rhode Island Department of Environmental Management (RIDEM) water quality classification for the Melville Ponds is Class A. Designated use goals associated with this classification include fish and wildlife habitat, fish consumption, and primary and secondary contact recreation. According to RIDEM's Clean Water Act (CWA) Integrated List of Waterbodies – Appendix A 2016 Index of Waterbodies and Category Listing,<sup>2</sup> the impairment affecting this waterbody segment is total phosphorus. RIDEM has classified Melville Ponds as a Category 5 waterbody that is not supporting fish and wildlife habitat, but fully supporting primary and secondary contact recreation. A TMDL for total phosphorus is planned for 2023.

RIDOT maintained property in the subwatershed is 11.3 acres; 8.0 acres of which is impervious. ArcGIS online Figure 1/2 shows the subwatershed with the impaired waterbody segments, the Rhode Island Department of Transportation (RIDOT) maintained roadways, the RIDOT maintained property (catchment area) that is discharging to the waterbody, and the outfalls that are discharging to the waterbody. According to 2011 land use data obtained from the Rhode Island

<sup>2</sup> RIDEM, March 2018, 2016 Integrated Water Quality Monitoring and Assessment List – Appendix A 2016 Index of Waterbodies and Category Listing. Available at: <http://dem.ri.gov/programs/benviron/water/quality/surfwq/pdfs/iwr16.pdf>

Geographic Information System (RIGIS),<sup>3</sup> the subwatershed consists of residential (varying density), institutional, commercial, cropland, brushland, and forest.

### RIDOT Discharging Area Description

ArcGIS online Figure 3 shows RIDOT maintained roadways and catchment areas, outfalls, catch basins, interconnections, and RIDEM-listed impaired water bodies located within the subwatershed, as discussed below.

### Subwatershed Boundary Delineation

The RIDEM-provided subwatershed boundary was reviewed through desktop analysis and site visits. As a result of this review, the subwatershed area decreased from approximately 586 acres to 490 acres (-16 percent). A subwatershed boundary modification memo was sent to RIDEM on December 31, 2018.

A revised subwatershed was delineated using automated ArcSWAT tools and 1-meter LiDAR elevation data. While the new delineation generally concurred with the HUC14 delineation, it did include minor variations around the subwatershed perimeter resulting from the use of higher-resolution data for the delineation. Beyond the minor variations due to topographic data, 4 specific modifications were made to the Melville Ponds subwatershed boundary.

1. The existing delineation had overlapping area with the Lawton Valley Reservoir (RI0007035L-06) subwatershed. The revised subwatershed boundary for Lawton Valley Reservoir and Melville Ponds were updated to be coincident.
2. The subwatershed boundary between Melville Pond and Lawton Valley Reservoir (RI0007035L-06) was adjusted to reflect Town of Portsmouth's records which indicate that Flint Corn Road drains north to Mill Lane and into the Melville Ponds subwatershed. Town roads east of Flint Corn and south of Mill Lane drain into the Lawton Valley Reservoir subwatershed.
3. The higher-resolution elevation data resulted in the automated delineation excluding the King Charles Drive subdivision. A drainage channel, which discharges to the East Passage, runs along an elevated section of road which forms the subwatershed boundary. The revised delineation includes the mobile home park between Donna Drive and Cathy Circle.
4. The Cimmaron Drive neighborhoods are U.S. Navy property and drainage infrastructure information could not be obtained. Based on an analysis of topography and aerial imagery, it is assumed these neighborhoods drain north to Upper Melville Pond.

### Other RIDOT Roadways

Preliminary evaluation of this subwatershed determined RIDOT roads are properly identified and no "Other RIDOT roadways" exist in this subwatershed.

### RIDOT Roadways

---

<sup>3</sup> Rhode Island Department of Environmental Management, Rhode Island Department of Administration, Statewide Planning Program, Photo Science, Inc. [www.rigis.org](http://www.rigis.org)

RIDOT maintained roadways in the subwatershed include: West Main Road (RI-114). RIDOT maintains 11.3 acres of property (impervious and pervious) within the subwatershed, all of which are directly or indirectly discharging to Melville Ponds with 8.0 acres of impervious cover. The RIDOT direct and indirect discharging areas include the following:

Table 3-A: Direct and Indirect Discharging Areas

RIDOT Roadway	Roadway Type	ROW Description	Adjacent Land Use	Drainage System
West Main Road (RI-114)	four lane roadway with narrow shoulders on both sides	right-of-way (ROW) width ranging from 40- to 90- feet	medium density residential and commercial	closed drainage systems with direct discharge to Melville Ponds

### Outfall Catchment Delineation

RIDOT catchment areas by discharge location within the subwatershed are summarized in Appendix A-A. Catchments in the Melville Ponds subwatershed were delineated based on a desktop review of RIDOT drainage data, 1-meter resolution LiDAR data, Google Earth, and 3-inch resolution aerial imagery. The RIDOT right-of-way (ROW) boundary was determined based on parcel boundaries obtained from the Town of Portsmouth. Non-RIDOT catchments were delineated only for those RIDOT catchments with a proposed STU. In general, runoff from the northern portion of the subwatershed is conveyed via pipes to an outgoing interconnection at the north end of the subwatershed (structure ID CB-47618), while runoff from the remainder of the subwatershed is conveyed via pipes to a low-lying outfall in the center of the subwatershed (structure ID OF-9008840). Catchments were confirmed by a field visit that took place in October 2018. The field visit confirmed general questions regarding roadway crown, superelevation, drainage patterns, infrastructure, location of utilities, and identification of other potential constraints. OF-9008840 was unable to be field verified due to dense vegetation and access limitations.

### Illicit Discharge Detection and Elimination Priority Outfalls

There are 2 mapped RIDOT outfalls within the Melville Ponds subwatershed. There are no High Priority outfalls (as defined in Appendix 6) and 1 Priority outfall (as defined by paragraph 20.b) located in the subwatershed. The one Priority outfall (Structure ID OF-9008840) is located on the western side of West Main Road, between Russo Road and Melville Elementary School. There are also no RIDOT MS4 discharge points for which RIDOT must provide a schedule for initiating IDDE inspections (per Appendix 8). There are no MS4 outfalls for which RIDOT shall identify upgradient interconnections (per Appendix 9).

During system mapping activities, dry-weather discharge was noted at the priority outfall. Follow-up dry-weather sampling at this priority outfall will occur by June 30, 2019 where samples of non-stormwater discharge will be collected and analyzed as described in Paragraph 20d of the Consent Decree.

### TMDL Priority Outfalls

There is no TMDL for the subwatershed.

### Interconnections

Interconnections are shown on ArcGIS online Figure 3. RIDOT utilized available Town of Portsmouth drainage data, RIDOT drainage data, and reviewed local topography and surface drainage patterns to identify possible interconnections.

MS4: RIDOT identified 1 location where the Town of Portsmouth's municipal separate storm sewer system (MS4) ties into the RIDOT drainage system (incoming interconnection) and 1 location where RIDOT drainage ties into the municipal drainage system adjacent to the ROW (outgoing interconnection). This incoming municipal interconnection (Structure ID 47604) is located at the intersection of Mill Lane and West Main Road (Route-114). The outgoing interconnection (Structure ID CB-47618) is located at the north end of the subwatershed at approximately 1351 West Main Road.

Private: The desktop review, drainage system mapping, and field visits identified 8 potential private interconnections.

RIDOT reviewed its Physical Alterations Permit Application (PAPA) database. This database lists permits requested by adjacent properties to tie into the RIDOT storm drainage system and includes an analysis of the applicant's contribution to the RIDOT storm drainage system. The current PAPA database did not contain entries for any of the potential interconnections listed above. The interconnections are included in RIDOT's online mapping database. RIDOT will add all private interconnections for which the owner is unknown to its IDDE program to verify that only stormwater flows are being discharged and will have the owners file for a PAPA. RIDOT will review future PAPA permit requests for compliance with its TAC 0071 – PAPA Guidance – Public and Private Tie-Ins to the State's Drainage System and its RIPDES permit and to ensure that only stormwater flows are being introduced to their system.

### Non-Discharge Areas

RIDOT did not identify any non-discharge areas in the subwatershed.

### Sewered/Combined Sewer Areas

There are no areas in the subwatershed that are sewer.

There are no areas in the subwatershed that discharge to a combined sewer system.

### Flow and Water Quality Monitoring Data

As part of this SCP, RIDOT reviewed the following sources for existing flow and water quality monitoring data:

- University of Rhode Island (URI) Watershed Watch
- Groundwater Elevation Data

#### URI Watershed Watch<sup>4</sup>

The URI Watershed Watch has one monitoring site within the Melville Ponds subwatershed at Melville Pond – Upper.

#### Groundwater Elevation Data

Groundwater elevation data was obtained from the United States Department of Agricultural National Cooperative Soil Survey and includes soil classification, standard groundwater depths, and infiltration rates.

## Reduction Target Development

According to the RIDEM's CWA Integrated List of Waterbodies – Appendix A 2016 Index of Waterbodies and Category Listing, the impairment(s) affecting Melville Ponds (RI0007029L-01) is total phosphorus. A TMDL for total phosphorus is planned for 2023.

#### Impervious Cover Method

As shown in Table 4-A-2 the subwatershed's percent IC is greater than 10%, thereby indicating that stormwater is a likely contributor to the impairment. To meet RIDOT's apportioned responsibility for achieving the subwatershed IC reduction target, RIDOT's effective IC within the subwatershed will need to be reduced by the percentage calculated in Table 4-A-2. (Note: The TMDL Method was not performed for this water body, and as a result, there is no Table 4-A-1: TMDL Method: Pollutant Reduction Target Summary)

Table 4-A-2: Impervious Cover Method: Pollutant Reduction Target Summary

Subwatershed Total Area:	490 acres
Subwatershed Total IC Area (%):	94 acres (19%)
Subwatershed Target IC (10%):	49 acres
Subwatershed IC Reduction Target:	47%
RIDOT Contributing Total Area to Waterbody:	11.3 acres
RIDOT Contributing Total IC Area to Waterbody:	8.0 acres
RIDOT IC Reduction Target:	3.8 acres
Pollutants of Concern:	Total Phosphorus

#### Non-Stormwater Related Impairments

The Melville Ponds (RI0007029L-01) are not impaired by non-stormwater related impairments.

---

<sup>4</sup> University of Rhode Island (URI) Watershed Watch. Available at: <https://web.uri.edu/watershedwatch/uri-watershed-watch-monitoring-data/>

## Existing Stormwater Controls

No stormwater treatment units (STUs) currently exist to treat stormwater from RIDOT's property directly or indirectly discharging to Melville Ponds (RI0007029L-01). Under existing conditions, RIDOT's estimated equivalent IC exceeds the RIDOT IC reduction target.

## Potential Enhanced Non-Structural Stormwater Controls

RIDOT did not identify any non-structural stormwater controls. Enhanced street-sweeping is not required by the Consent Decree because the subwatershed does not drain to a Newport Water Supply Reservoir, and other potential non-structural controls were deemed infeasible.

## Potential Structural Stormwater Controls

RIDOT has identified that structural controls are needed to reduce its effective IC within the contributing subwatershed to achieve the required RIDOT IC reduction target. Appropriate locations are potentially available for control measures, as shown in ArcGIS online Figure 4.

Specific stormwater controls have been identified that may be considered for implementation, as described in the following section. See sub-section Evaluation of Infeasible Stormwater Controls for more information regarding locations where retrofit STUs are not currently feasible.

### Stormwater Controls Description

RIDOT identified specific locations and several general locations for potential structural STUs within this subwatershed. ArcGIS online Figure 4 shows potential STU locations with catchment areas, including non-RIDOT areas and Appendix C-A lists site-specific constraints.

Below are descriptions of the potential STUs including location, conceptual design, RIDOT ROW treated, hydrologic soil group based on United States Department of Agriculture National Cooperative Soil Survey, major constraints, and any partnership required.

#### SCP-MVP-001

SCP-MVP-001 is a linear infiltration swale proposed along the eastern side of West Main Road (Route 114), adjacent to 1351 West Main Road at the edge of the ROW. The majority of the STU catchment is outside of the RIDOT ROW. Stormwater will enter the STU via curb cuts just upstream of the northern catch basin, passing through a pretreatment system. The soils in the area are mapped as hydrologic soil group A, so the STU will be designed to infiltrate to underlying natural soils, depending on the local depth to groundwater and soil infiltration capacity. Site review identified overhead wires, utility poles within the ROW, and vegetation just outside the ROW, however these constraints are unlikely prevent STU implementation at this location.

#### SCP-MVP-002

SCP-MVP-002 is an infiltration basin proposed on the west side of West Main Road (Route 114), under the open grass area just south of the Melville Elementary School, adjacent to 1351 West Main Road. The majority of the STU catchment is outside the RIDOT ROW. Stormwater will enter



the STU via a curb cut just upstream of the northern catchbasin (Structure ID CB-49317). An overflow system will be designed to bypass flows in excess of the design volume to reenter RIDOT's storm drain system at the next downstream catch basin on West Main Road. The soils in the area are mapped as hydrologic soil group A, so the STU will be designed to infiltrate to underlying natural soils, depending on the local depth to groundwater and soil infiltration capacity. Site review identified potential obstacles to implementation at these locations. There is an above-grade electric utility box between the RIDOT ROW and the proposed STU location and a telecommunication manhole within the site. Analysis of historical aerial imagery revealed the site was previously developed with a water tower. There is potential for unknown subsurface elements (foundations, piping, and other utilities), and these constraints will need to be reviewed during feasibility to determine if a STU can be implemented at this location. This STU is located on Town of Portsmouth property and will require a partnership with the Town. Additionally, RIDOT will coordinate with the Melville Elementary School to facilitate capturing runoff from the school's roof drains, parking lot, and to assist with site drainage issues.

#### SCP-MVP-003

SCP-MVP-003 is a linear bioretention swale proposed along the eastern side of West Main Road (Route 114), adjacent to Russo Road. The majority of the STU catchment is within the RIDOT ROW. Stormwater will enter the STU via a curb cut, passing through a pretreatment system. Poor soils prevent infiltration into natural soils, so an underdrain will be installed and connected to the nearest downstream catch basin across the street. An overflow system will be designed to bypass flows in excess of the design volume to reenter RIDOT's storm drain system. Site review identified overhead wires, limited ROW space, and utility poles within the site, however these constraints are unlikely to prevent STU implementation at this location.

#### SCP-MVP-004

SCP-MVP-004 is a linear bioretention swale proposed along the western side of West Main Road (Route 114), adjacent to Scotty Drive. The majority of the STU catchment is within the RIDOT ROW. Stormwater will enter the STU via curb cuts just upstream of the closest upstream catch basin, passing through a pretreatment system. Poor soils prevent infiltration into natural soils, so an underdrain will be installed and connected to the nearest downstream catch basin. An overflow system will be designed to bypass flows in excess of the design volume to reenter RIDOT's storm drain system. Site review identified overhead wires and a fieldstone wall just outside of the RIDOT ROW, however these constraints are unlikely to prevent STU implementation at this location. This STU is located in a segment of the RIDOT ROW subject to a TIP in 2022 (Project ID 1360), and may be implemented as part of that project.

#### SCP-MVP-005

SCP-MVP-005 is a linear bioretention swale proposed along the western side of West Main Road (Route 114), adjacent to Mill Lane. The majority of the STU catchment is outside of the RIDOT ROW. Stormwater will enter the STU via a curb cut, passing through a pretreatment system. Poor soils prevent infiltration into natural soils, so an underdrain will be installed and connected to the nearest downstream catch basin across the street. An overflow system will be designed to bypass flows in excess of the design volume to reenter RIDOT's storm drain system. Site review identified overhead wires, vegetation just outside the RIDOT ROW, utility poles and an above-grade electric utility box within the site, however these constraints are unlikely to prevent STU

implementation at this location. This STU is located in a segment of the RIDOT ROW subject to a TIP in 2022 (Project ID 1360), and may be implemented as part of that project.

#### SCP-MVP-006

SCP-MVP-006 is a bioretention basin proposed along the eastern side of West Main Road (Route 114), across from the Russo road intersection, outside of the RIDOT ROW. The majority of the catchment area is within the RIDOT ROW. Stormwater will enter the STU via curb cuts just upstream of the nearest upstream catch basin to the south, passing through a pretreatment system. Poor soils prevent infiltration into natural soils, so an underdrain will be installed and connected to the nearest downstream catch basin to the north. An overflow system will be designed to bypass flows in excess of the design volume to reenter RIDOT's storm drain system. Site review identified no potential obstacles to implementation at this location. The proposed STU is on Navy property and represents a partnership opportunity.

#### TIP STUs

The RIDOT Transportation Improvement Plan (TIP) identifies RIDOT projects that are scheduled to be designed and constructed in the near future.

Appendix D-A lists the TIP projects (as of November 2018) scheduled for the next 5 years within the subwatershed. Areas that will be modified as part of a TIP project where potential STU locations were not identified are included within this SCP with an assumed 50% treatment level. Stormwater controls will be included in TIP projects to the maximum extent practicable.

#### SCP-MVP-007, SCP-MVP-008

- TIP ID: 1360
- TIP Year: 2022
- TIP Category: Pavement Capital
- Project Name: Rt 114, West Main Rd (John Kesson to Mill Ln)
- Municipality: Middletown, Portsmouth
- Description: Resurfacing roadway with box widening for turn lanes, limited sidewalk replacement, limited sidewalk extension and handicapped ramp installation.

#### SCP-MVP-009

- TIP ID: 5161
- TIP Year: 2024
- TIP Category: Transportation Alternatives
- Project Name: Aquidneck Island Bikeway - Melville Connector
- Municipality: Portsmouth
- Description: Design and construct a shared-use bicycle pedestrian facility linking West Main Road at Old West Main Road to Burma Road at Stringham Road in Portsmouth.

#### Limited ROW STUs

RIDOT did not identify any roadways as areas with limited ROW STUs.

### Infeasible Stormwater Controls

Through this evaluation, RIDOT determined that certain areas of the direct and indirect discharging area are not feasible for retrofit stormwater controls. These locations are shown in ArcGIS online Figure 4 with specific constraints listed in Appendix C-A. In general, constraints included proximity to environmental resources and physical constraints limiting the construction and/or function of a potential STU. Although some constraints are manageable via creative design and permitting, other constraints or the combination of multiple constraints make locations prohibitive for retrofit STUs. These locations may be feasible for STUs in the future if conditions change and will be evaluated as transportation designs occur.

### Stormwater Controls Calculations

Calculations showing effective IC reduction credit for potential stormwater controls is attached as Appendix B-A and summarized in Table 1-A.

## Implementation

Existing and potential enhanced non-structural and structural controls are summarized in Table 5-A below.

Table 5-A: Stormwater Controls Summary

STU ID	Stormwater Control Type	Catchment Area (ac)	Impervious Cover (ac)	Treatment Depth (in) (Depth of Runoff Treated)	Runoff Reduction (ac-ft)	Equivalent IC Reduction Credit (ac)	Estimated Cost	Cost per IC Reduction Acre (\$/ac)	Retrofit Priority
SCP-MVP-004	Bioretention Swale	0.8	0.8	0.2	0.1	0.25	\$28,500	\$114,000	1
SCP-MVP-005	Bioretention Swale	2.0	0.4	0.6	0.2	0.21	\$26,000	\$123,800	1
SCP-MVP-002	Infiltration Basin	2.9	2.5	1.1	8.3	2.47	\$47,800	\$19,400	1
SCP-MVP-009	TIP	0.9	0.6	1.0	1.1	0.30	--	--	2
SCP-MVP-007	TIP	0.6	0.4	1.0	0.7	0.20	--	--	2
SCP-MVP-008	TIP	2.2	1.9	1.0	3.4	0.94	--	--	2
Percent RIDOT Reduction Reached 115%									
SCP-MVP-006	Bioretention Basin	0.4	0.2	2.5	0.2	0.15	\$39,500	\$263,300	3
SCP-MVP-001	Infiltration Swale	1.6	0.3	2.7	1.3	0.27	\$51,200	\$189,600	3
SCP-MVP-003	Bioretention Swale	0.3	0.2	1.0	0.1	0.13	\$23,800	\$183,100	3
Percent RIDOT Reduction Reached 128%									
Total		11.3	8.0		15.3	4.92	\$216,800		

RIDOT will implement this SCP through:

1. Non-Constructed Measures
2. RIDOT New Construction and Re-Construction Projects
3. Retrofit Projects

RIDOT constructs STUs as part of either programmed or retrofit projects until the RIDOT IC or pollutant reduction target is met.

### Non-Constructed Measures

RIDOT has performed various actions toward compliance with the municipal separate storm sewer system (MS4) General Permit:

- Portsmouth and RIDOT are MS4 operators in the Melville Ponds subwatershed and have prepared Phase II Stormwater Management Plans (SWMP). The entire watershed is regulated under the Phase II program. In 2009, stormwater outfalls and catch basins throughout Middletown were mapped as part of Phase II requirements.
- RIDOT's SWMPP and its 2011 Compliance Update outline its goals for compliance with the MS4 General Permit. It should be noted that RIDOT has chosen to enact the General Permit statewide, not just for the urbanized and densely populated areas that are required by the permit. RIDOT has finished mapping its outfalls throughout the state and is working to better document and expand its catch basin inspection and maintenance programs along with its BMP maintenance program. Storm Water Pollution Prevention Plans (SWPPP) are being utilized for RIDOT construction projects.

### RIDOT New Construction and Re-Construction

New and re-construction projects whose scope and limits have been defined at the time of SCP development are included within this SCP with an assumed 50% treatment level. In areas where potential STUs were proposed within these limits, IC reduction credit was calculated as usual and the assumed 50% treatment level was ignored.

### Retrofits

Retrofit STUs have been identified as part of this SCP. Table 5-A includes estimated costs and implementation priority for these controls. Cost estimates for STUs were obtained from guidance in EPA's memo "Methodology for developing cost estimates for Opti-Tool", RIDOT Weighted Average Unit Prices for calendar years 2017 and 2018, and experience from prior stormwater projects. Costs from EPA's memo have not been adjusted to the current year. Average unit costs were developed based on a typical STU retrofit scenario and include considerations for mobilization and demobilization, soil erosion and sediment control, contingency, engineering and design fees, and construction administration. Individual STU costs were then adjusted based on STU size, with larger systems being more cost-effective than smaller systems. Cost estimates presented in this SCP should be considered as Order of Magnitude as defined by the American Association of Cost Engineers and are expected to be accurate within a plus 50% or minus 30% range as they were developed without detailed engineering data.

STU retrofit priorities were determined based on per-acre cost of IC reduction, constructability, and necessity for achieving the RIDOT IC reduction target. STUs more difficult and/or expensive to implement were generally given lower priority, unless they are necessary for achieving the reduction target, in which case they were tagged as priority 1 or 2. STUs located in TIP areas were given retrofit priorities based on the project start date, where near-term projects are higher priority and longer-term projects are lower priority.

Table 6-A shows the implementation schedule for the major milestones for design and construction of the retrofit STUs. Although these target implementation dates have been identified

at this time based on the STU prioritization, RIDOT may implement certain STUs on an alternate schedule if cost efficiencies are identified. Examples of potential cost saving opportunities include:

- Constructing STUs along a highway corridor that spans multiple SCP subwatersheds at the completion of all associated SCPs
- Modifications in planned roadway project timelines or scopes
- Identification of partnering opportunities.

Table 6-A: Structural Controls Target Implementation Schedule

STU Priority Level	Feasibility & Scope Start	Recommended Target Dates by		
		Design Start	Construction Advertise	Construction Finalized
Priority Level 1	June 2019	January 2021	June 2022	June 2023
Priority Level 2	June 2021	January 2023	June 2024	June 2025
Priority Level 3	June 2023	As needed to fulfill target	As needed to fulfill target	As needed to fulfill target

Note: Target dates are based on an assumed EPA approval within six months of SCP submittal. The dates only apply to STU's that are determined feasible and are needed to fulfill the required RIDOT reduction target.

#### Municipal and Private Partnerships

There are no existing partnerships, therefore Appendix E-A is not included.

Two potential STUs are proposed on land not within the RIDOT ROW. SCP-MVP-002 is proposed in on municipal property the open area south of the Melville Elementary School. SCP-MVP-006 is proposed in open area on Naval Station property west of West Main Road. RIDOT will coordinate with the Town of Portsmouth, the Melville School district, and the Naval Station to discuss the possibility of easements or other mechanisms to construct these STUs.

#### IDDE Activities

RIDOT has completed IDDE dry weather screening at all outfalls within this subwatershed.

During system mapping activities, dry-weather discharge was noted at one outfall (Structure ID OF-9008840). Follow-up dry-weather sampling at this outfall will occur by June 30, 2019 where samples of non-stormwater discharge will be collected and analyzed as described in Paragraph 20d of the Consent Decree. Between April 1 and November 30, 2019, RIDOT will inspect and sample the remaining outfalls where flow was not observed during dry-weather inspections under wet weather conditions for parameters listed in Paragraph 21c.

#### Public Outreach

During development of this SCP, RIDOT met with the Town of Portsmouth on May 2<sup>nd</sup>, 2018. RIDOT conveyed the Consent Decree requirements and the SCP Plan development schedule and made a request for available stormwater system mapping data. The Town of Portsmouth provided physical maps and spreadsheets describing drainage infrastructures from Mill lane north to West Passage

Drive. RIDOT will continue coordination with the Town of Portsmouth to share data, findings and plans for improvements.

## STU Operations and Maintenance Plan

Existing and newly constructed STUs will be inspected, operated and maintained to ensure functionality and longevity of the STUs. The inspection, operation and maintenance procedures for STUs are consistent with those outlined in RIDEM's Stormwater Design and Installation Standards Manual, amended in March 2015,<sup>5</sup> and RIDOT's forthcoming Linear Stormwater Manual (2019), and include inspections and maintenance that is customized to the functioning components of the STU.

## Next Steps

In the year following submission of this SCP, RIDOT will develop feasibility studies for all Priority 1 STUs listed in Table 2-A. These feasibility studies will further evaluate site characteristics and constraints, including soil infiltration rates, utility conflicts, and catchment areas to each potential STU. In addition, a 30% design, 90% design, PS&E and required Contract Advertising Documents and as-build plans will be developed for each of the Priority 1 STUs.

---

<sup>5</sup> Rhode Island Stormwater Design and Installation Standards Manual, Rhode Island Department of Environmental Management and Coastal Resources Management Council, Amended March 2015. Accessed: <http://www.dem.ri.gov/pubs/regs/regs/water/swmanual15.pdf>.

APPENDIX A-A  
MELVILLE PONDS (RI0007029L-01)

RIDOT DISCHARGING AREA SUMMARY

Appendix A-A: RIDOT Discharging Area Summary

Structure ID	Discharge Location	Description	Total Area (ac)	Impervious Cover (ac)	Pervious Cover (ac)	Pervious Cover Types
CB-47618	Non-Wetland	Outgoing Interconnection	3.4	2.2	1.2	Grass/ Forest
OF-9008840	Non-Wetland	Unknown	7.9	5.8	2.1	Grass/ Forest

APPENDIX B-A  
MELVILLE PONDS (RI0007029L-01)

STORMWATER CONTROLS  
POLLUTANT CALCULATIONS



APPENDIX B-A  
Stormwater Controls  
Pollutant Calculations - RIDOT\_Catchment

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

[illegible][illegible]

APPENDIX B-A  
Stormwater Controls  
Pollutant Calculations - Non-RIDOT\_Catchment

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

[illegible][illegible]

APPENDIX B-A  
Stormwater Controls  
Pollutant Calculations - Potential\_STU

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

[illegible]

APPENDIX B-A  
Stormwater Controls  
Pollutant Calculations - STU Storage Volume

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

[illegible]

APPENDIX B-A

Stormwater Controls

Pollutant Calculations - Reduction Targets

Segment Name:Melville Ponds (RI0007029L-01), Group 1A

Date:12/31/2018

Subwatershed ID:	Total Subwatershed Area (ac)	Total Subwatershed IC Area (ac)	RIDOT Total Area (ac) <sup>1</sup>	RIDOT Total IC Area (ac)
RI0007029L-01	490	94	11.3	8.0

<sup>1</sup> RIDOT contributing total area to waterbody is equal to total RIDOT area minus non-discharge areas (does not include non-discharge areas) and areas discharging to a CSO.

IC Standard

Total Subwatershed IC Area (%)	Subwatershed Target IC (10%) (ac)	Subwatershed IC Reduction Target (%):	RIDOT IC Reduction Target (ac)
19%	49	47%	3.8

TMDL Method

Pollutant of Concern <sup>2</sup>	Required TMDL Pollutant Reduction Target (%) <sup>3</sup>	Current RIDOT Load (lb/yr)	RIDOT Pollutant Reduction Target (lb/yr)
Aluminum	0	9.9	0
Cadmium	0	9.9	0
Copper	0	9.9	0
Lead	0	9.9	0
Zinc	0	9.9	0
Phosphorus	0	10.7	0
Nitrogen	0	67.5	0

<sup>2</sup> Zinc used as a surrogate for all metals per consent decree.

<sup>3</sup> Pollutant load reduction (%) per TMDL.

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

[illegible]

APPENDIX B-A  
Stormwater Controls  
Pollutant Calculations - STU\_WaterQuality

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

[illegible]

APPENDIX B-A  
Stormwater Controls  
Pollutant Calculations - STU\_WaterQuality

Segment Name: Melville Ponds (RI0007029L-01), Group 1A  
Date: 12/31/2018

Subwatershed ID	Total RIDOT area (acres)	RIDOT IC area (acres)	RIDOT Non- Discharge Area (acres)	RIDOT CSO Discharge Area (acres)	RIDOT Phosphorus Load (lbs/yr)	TP Reduction Target (%)	TP Reduction Target (lbs/yr)	Existing STUs TP Reduction (lbs/yr)	Potential STUs TP Reduction (lbs/yr)	Total TP Reduction (lbs/yr)	TP Reduction by NonRIDOT Area (%)	RIDOT Nitrogen Load (lbs/yr)	TN Reduction Target (%)	TN Reduction Target (lbs/yr)	Existing STUs TN Reduction (lbs/yr)	Potential STUs TN Reduction (lbs/yr)	Total TN Reduction (lbs/yr)	TN Reduction by NonRIDOT Area (%)	RIDOT Zinc Load (lbs/yr)	Zinc Reduction Target (%)	Zinc Reduction Target (lbs/yr)	Existing STUs Zinc Reduction (lbs/yr)	Potential STUs Zinc Reduction (lbs/yr)	Total Zinc Reduction (lbs/yr)	Zinc Reduction by NonRIDOT Area (%)	RIDOT TSS Load (lbs/yr)	TSS Reduction Target (%)	TSS Reduction Target (lbs/yr)	Existing STUs TSS Reduction (lbs/yr)	Potential STUs TSS Reduction (lbs/yr)	Total TSS Reduction (lbs/yr)	TSS Reduction by NonRIDOT Area (%)	Effective IC Reduction Target (%)	Effective IC Reduction Target (acres)	Existing STUs Effective IC Reduction <i>(acres)</i>	Potential STUs Effective IC Reduction <i>(acres)</i>	Total Effective IC Reduction <i>(acres)</i>	Total Effective IC Reduction Achieved <i>(acres)</i>	IC Reduction by NonRIDOT Area (%)
RI0007029L-01	11.3	8	0	0	10.7	0	0	0.0	7.9	7.9	62.63	67.5	0.00	0	0.0	56.7	56.7	69.35	9.9	0	0.00	0.0	6.9	6.9	52.00	49.25			0.0	2866	2866	43.12	47%	3.8	0.0	4.9	4.9	129	52.25



APPENDIX C-A  
MELVILLE PONDS (RI0007029L-01)

IDENTIFIED CONSTRAINTS  
FOR STU IMPLEMENTATION

Appendix C-A: Identified Site Constraints Limiting STU Implementation

	Environmental Constraints																Physical Constraints							Access Constraints		Other			
Catchment ID	FEMA Floodplain (FIRM)	Inundation Surfaces (RIGIS)	Outstanding Resource Waters (RIGIS)	Surface Water Protection Areas (RIGIS)	Freshwater Wetlands (RIGIS)	OWTS Critical Resource Area (RIDEM)	Coastal Features (CRMC)	Endangered Species (RI Natural Heritage Program)	Environmental Justice Area (RIDEM)	Open Space / Conservation Land (RIGIS)	Cultural / Historic Resources (RIGIS)	Underground Storage Tanks (RIDEM)	Leaking Underground Storage Tanks (RIDEM)	CERCLIS/National Priority List (US EPA)	Environmental Land Use Restriction (RIDEM)	Other Resource Area	Non-RIDOT Property / Limited Right-Of-Way	Soils (Poor Infiltration Capacity) (Urban Fill)	Groundwater Resources	Ledge (Bedrock)	Existing Vegetation	Steep Slopes	Elevated Topography	Utilities	Safety	Road Closure	Other	STU Recommended	
PT-MVP-001																					X			X					X
PT-MVP-002																	X							X					X
PT-MVP-003																	X	X				X		X					X
PT-MVP-004																	X	X			X								X
PT-MVP-005																		X			X	X		X					X
PT-MVP-006																	X	X											X
NF-MVP-007																	X	X		X	X	X		X					
NF-MVP-008																	X	X			X	X		X					
NF-MVP-009																	X	X			X			X					
NF-MVP-013																	X	X		X	X	X		X					
TP-MVP-010																	X	X			X								
TP-MVP-011																		X			X	X		X					
TP-MVP-012																	X	X		X	X	X		X					

APPENDIX D-A  
MELVILLE PONDS (RI0007029L-01)

TIP PROJECTS

Appendix D-A: TIP Projects Scheduled for FY 2019-2025 as of November 2018

TIP ID	TIP Project Name	Location	TIP Project Description	TIP Project Status
1360	Rt 114, West Main Rd (John Kesson to Mill Ln)	Middletown, Portsmouth	Resurfacing roadway with box widening for turn lanes, limited sidewalk replacement, limited sidewalk extension and handicapped ramp installation.	2022-2023
5161	Aquidneck Island Bikeway - Melville Connector	Portsmouth	Design and construct a shared-use bicycle pedestrian facility linking West Main Road at Old West Main Road to Burma Road at Stringham Road in Portsmouth.	2024-2025

FIGURE 1-A  
MELVILLE PONDS (RI0007029L-01)

SUBWATERSHED OVERVIEW





- SCP Watershed
- RIDOT Catchment Area
- NonRIDOT Catchment Area
- RIDOT Maintained Roads
- Town Boundaries
- Wetlands
- Impaired Streams, TMDL
- Impaired Streams, No TMDL
- Impaired Lakes & Estuaries, TMDL
- Impaired Lakes & Estuaries, No TMDL
- RIDOT Outfalls
- Priority Outfalls
- Existing STU
- Potential STU Location**
  - Retrofit Priority 1
  - Retrofit Priority 2
  - Retrofit Priority 3



0 1,000 Feet

**Figure 1-A**  
**Melville Ponds**  
**RI0007029L-01**  
**Impaired Subwatershed**  
**December 2018**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

